FAR MEETING: RECONSIDERING THE EVIDENCE FROM THE FINANCIAL CRISIS

NEW YORK FED
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Causes and responses

- Credit boom and household leverage
  - Systemic leverage
  - Underwriting standards
  - Replacing the shadow banking system
- Counter party risk and contagion
- Internal risk management of banks
- Regulatory complexity

Credit Boom and House Price Increases

- Common view
  - Innovations and perverted incentives in credit supply led to distortions in the allocation of credit, especially to subprime sector and poorer households
  - Poor incentives undermined underwriting standards, led to fraudulent loan origination and liar loans (income overstatement)
  - Loose lending standards led to house price boom and defaults once lending stopped

- Alternative view
  - Credit expanded across the income distribution, systemic increase in household leverage; mortgage crisis was a middle class crisis
  - Credit demand and house price expectation important drivers of mortgage boom
  - House values increased and provided collateral for increased borrowing across the income distribution
  - Potential build-up of systemic risk prior to the crisis

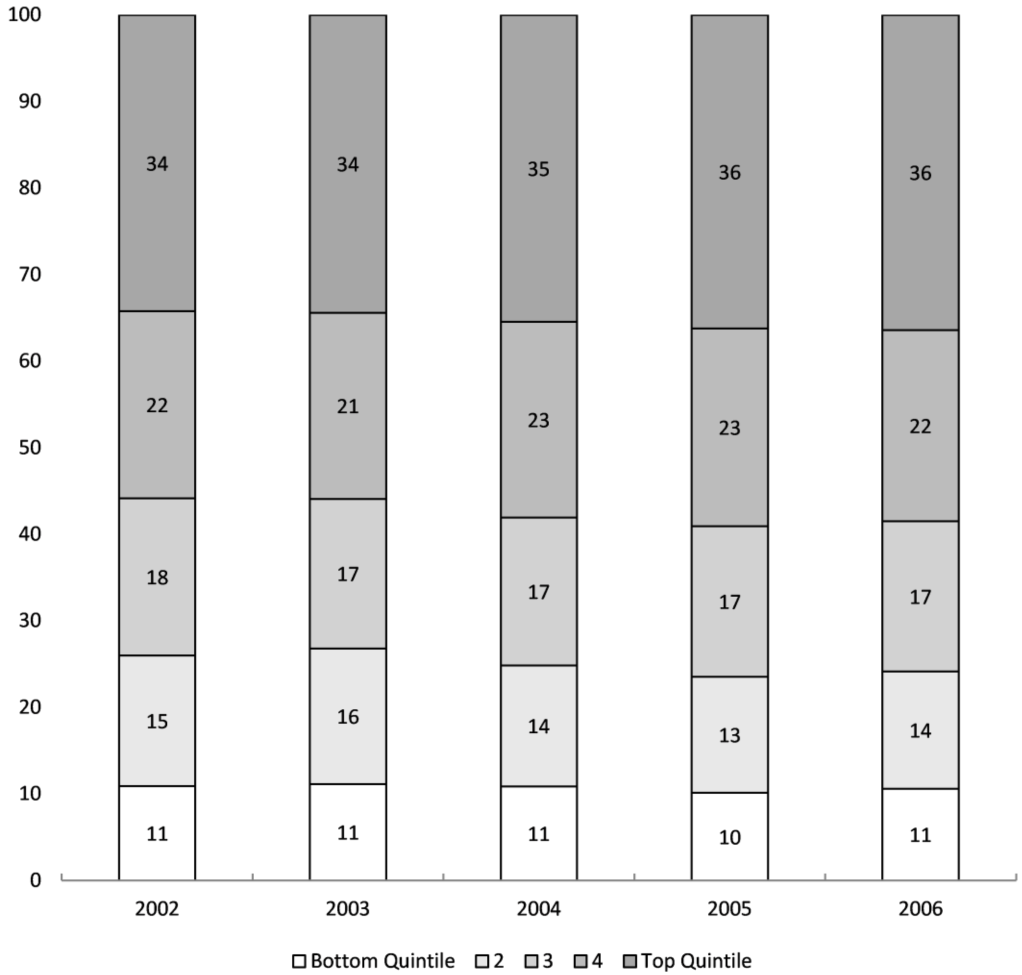
Supporting evidence

- Credit expanded across the income distribution, not just the poor or subprime
  - Middle/high income households had a much larger contribution to overall mortgage debt before the crisis than the poor
  - Mortgage debt-to-income levels (DTI) in-line with prior years, no decoupling at origination

- Sharp increase in delinquencies for middle class and prime borrowers after 2007
  - Middle class and higher FICO score borrowers make up much larger share of defaults, especially in areas with high house price growth

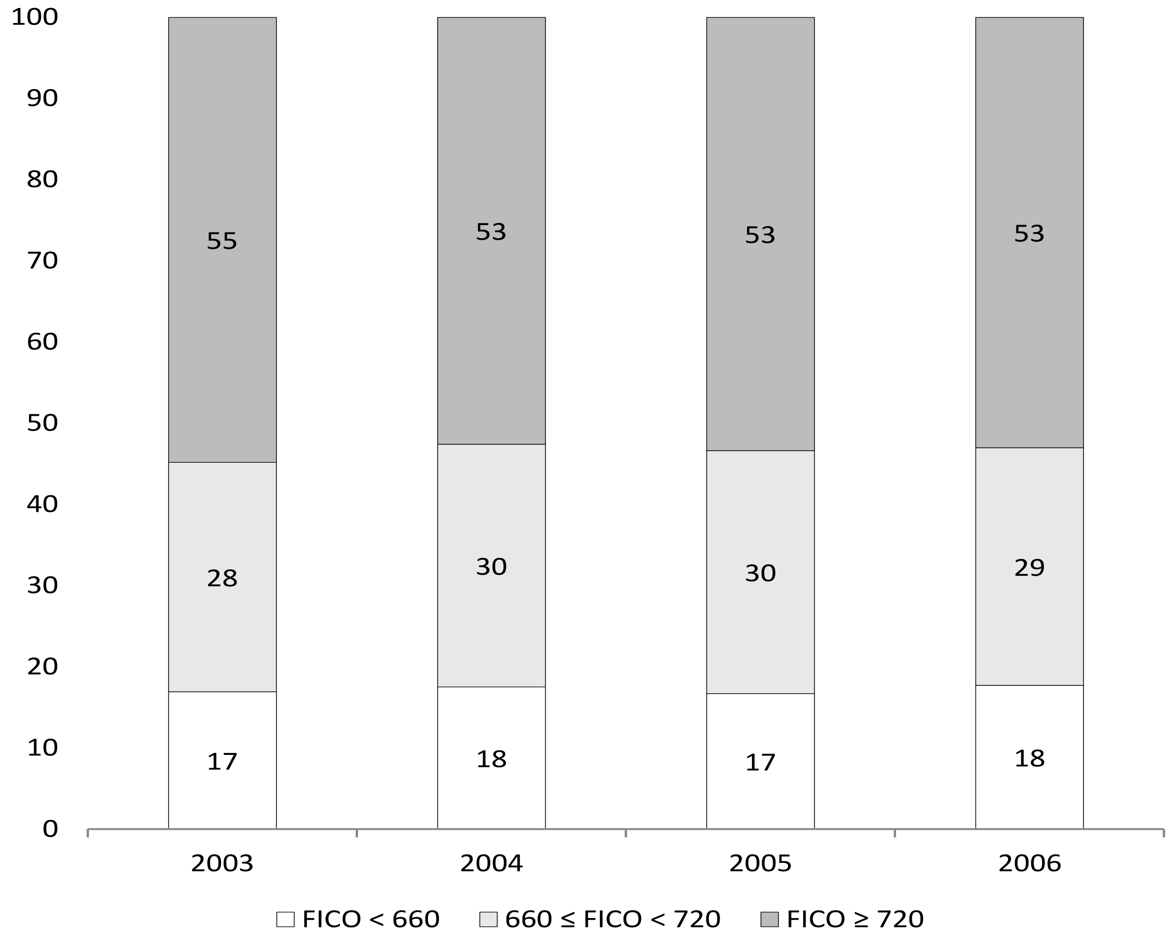
- Incidence of overstatement is concentrated in a few neighborhoods.
  - LTV distribution stays stable across time.

Aggregate Mortgage Origination by Buyer Income (HMDA) Stayed Stable

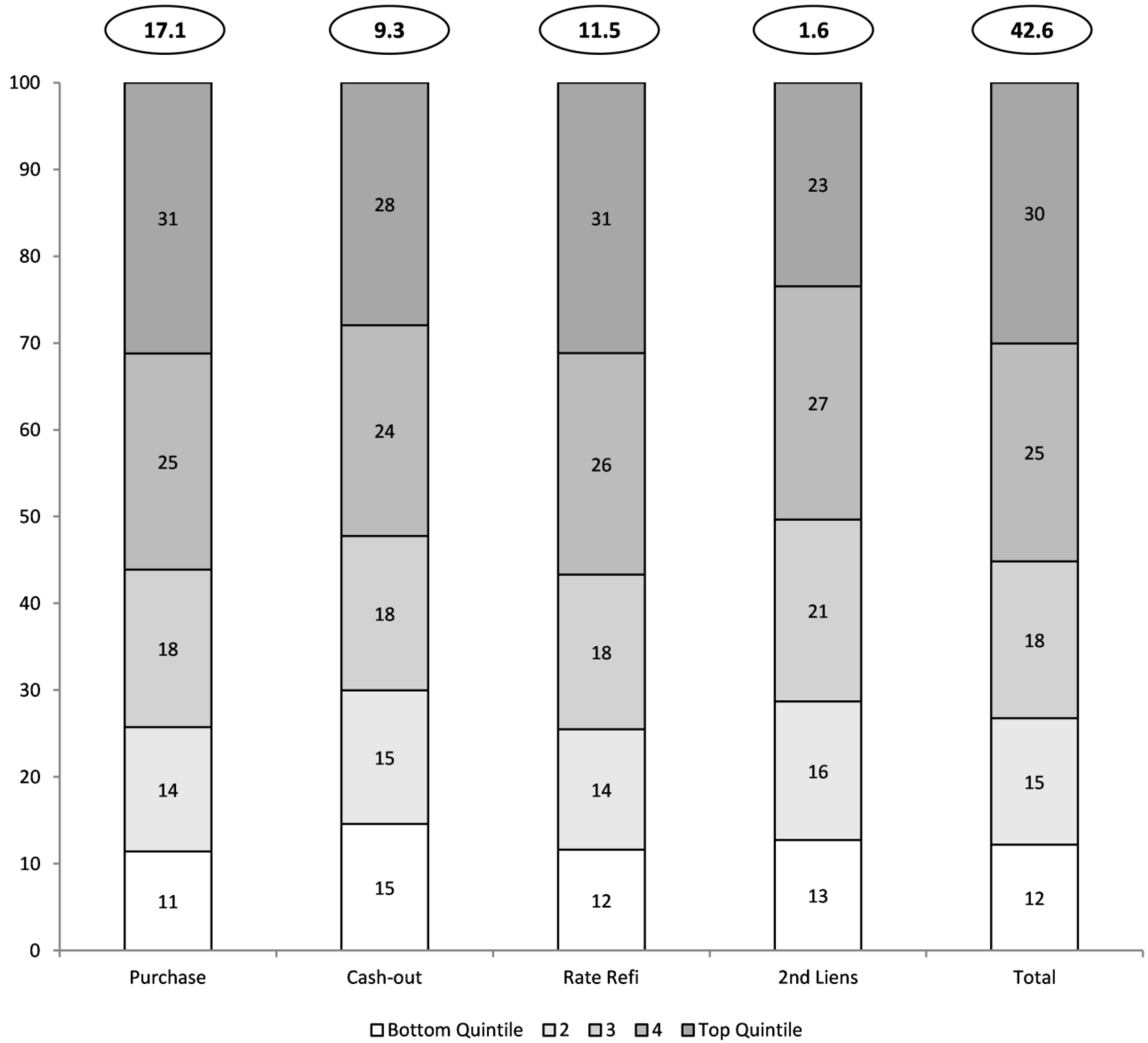


Fraction of mortgage dollars originated per year by income quintile

Origination by FICO scores



In %.. -


17.1
9.3
11.5
1.6
42.6
100
90
80
70
60
50
40
30
20
10
0
31
25
18
14
11
28
24
18
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15
31
26
18
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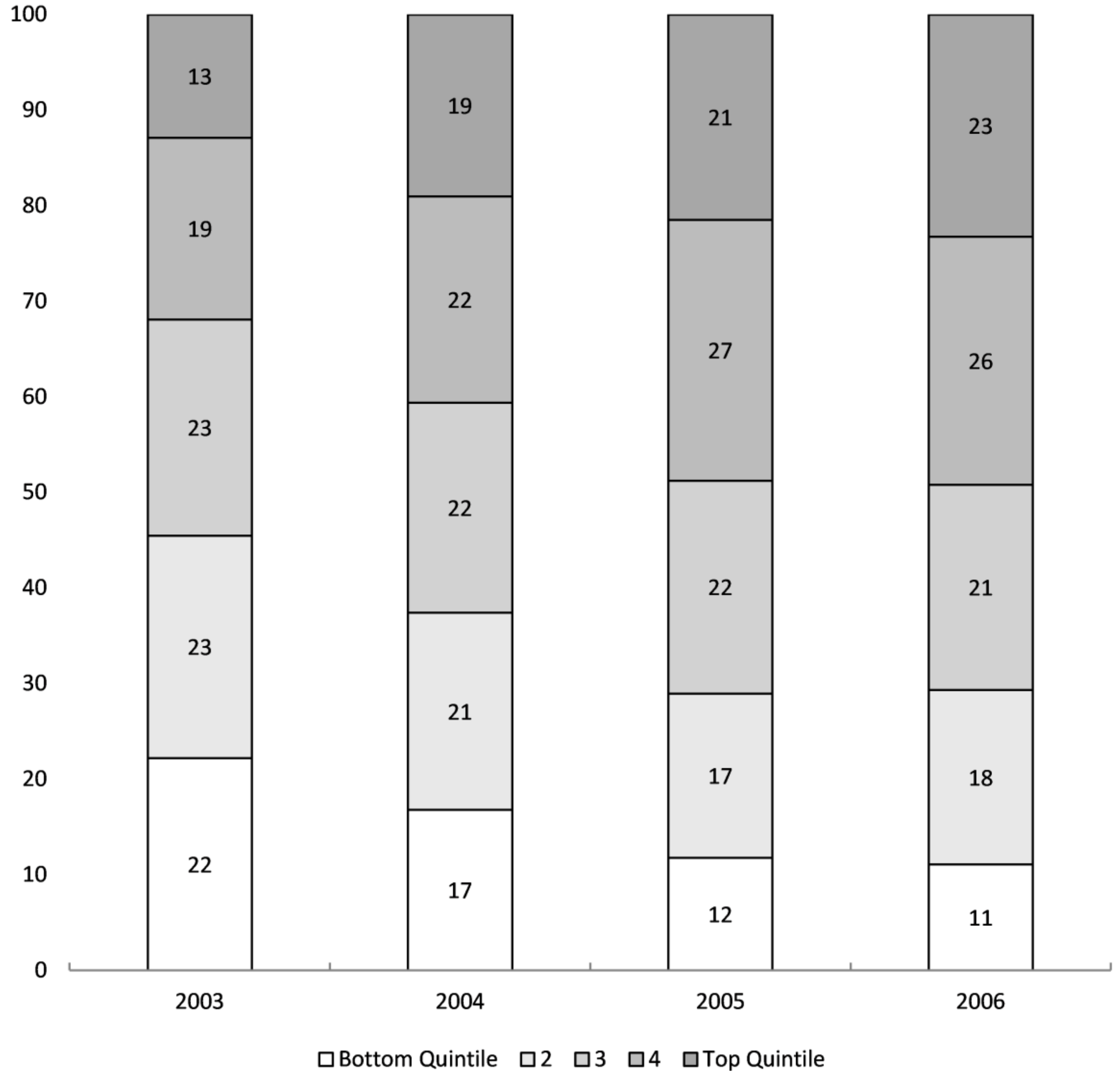
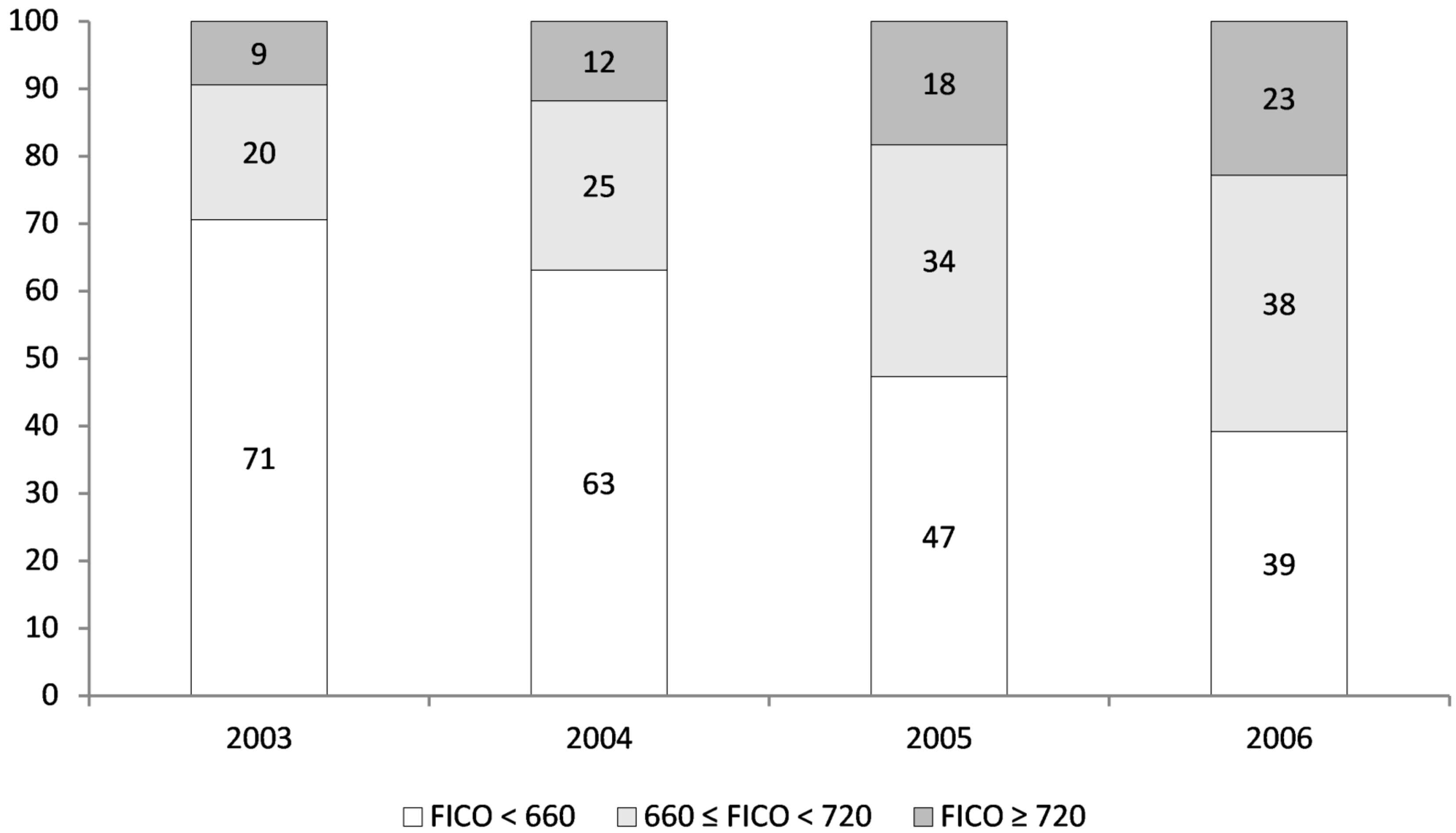
12
23
27
21
16
13
30
25
18
15
12
Purchase
Cash-out
Rate Refi
2nd Liens
Total
Bottom Quintile
2
3
4
Top Quintile

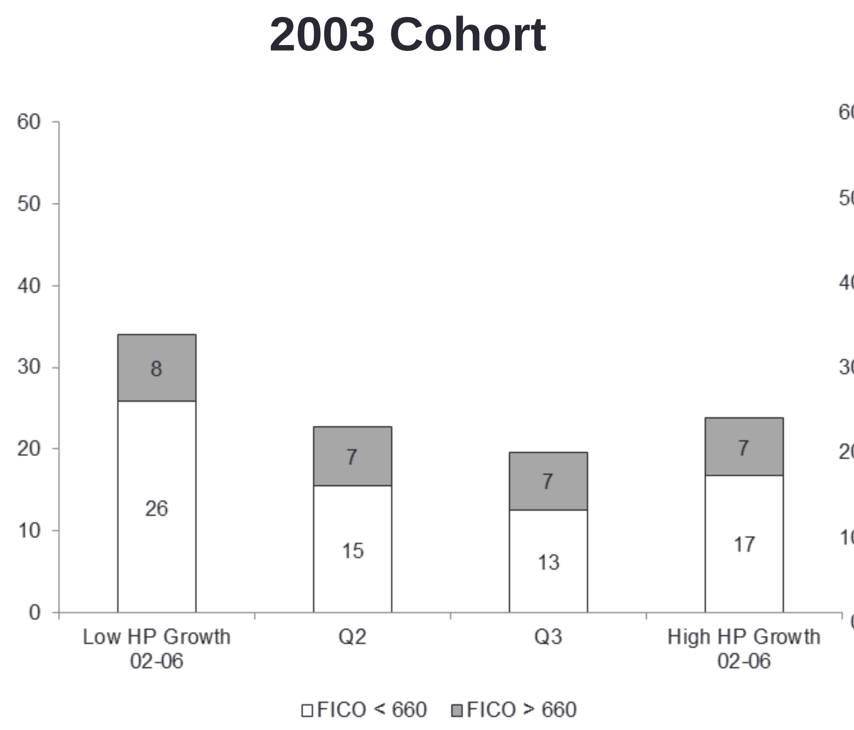
Share of Delinquent Mortgage Debt 3 Years Out by Buyer Income (LPS) – Value Weighted

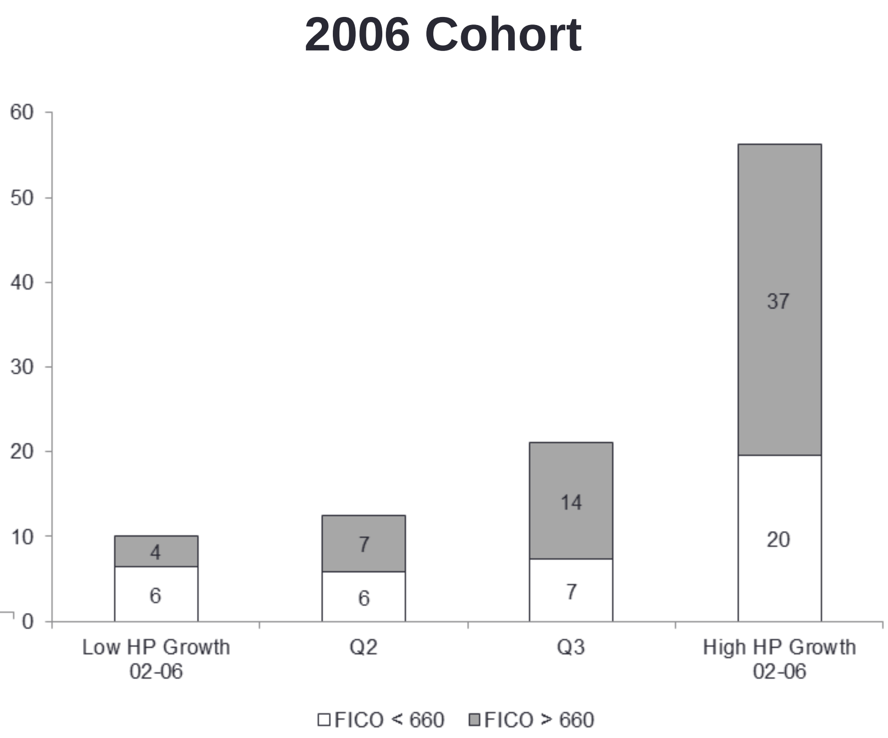


Share of Delinquent Mortgages 3 Yrs Out by FICO and Cohort (LPS) –Value Weighted



Share of Delinquency 3 Years Out by HP Growth and FICO – Value Weighted





Differences to prior results

Prior results rely on ***zip code level*** analysis (Mian and Sufi, 2009) :

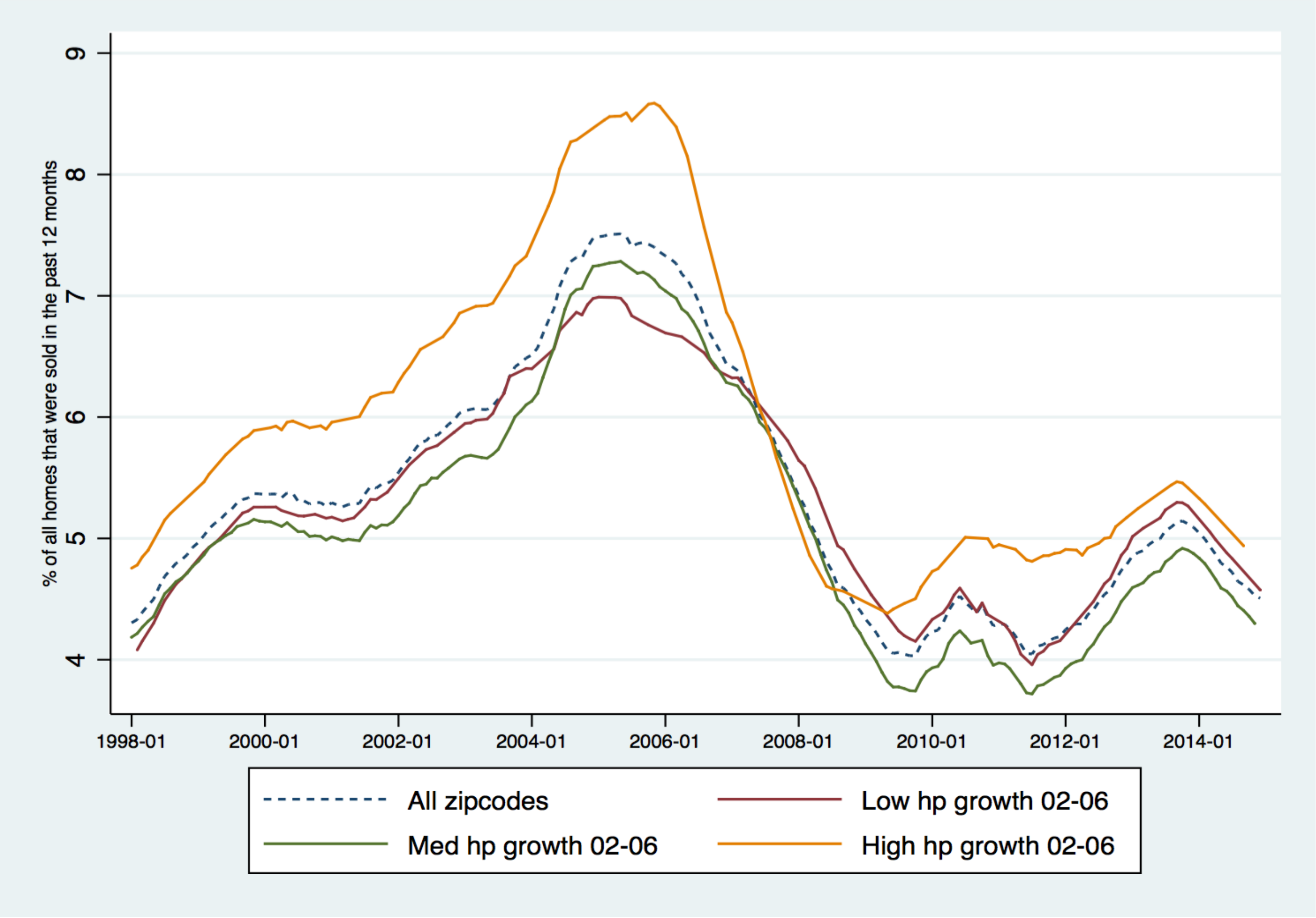
$$\Delta Mortgage_{i,2006-02} = \beta_1 \Delta IRSIncome_{i,2002-06} + c_{county} + \varepsilon_i$$

- Decompose total mortgage origination into
  - growth in individual mortgage size
  - growth in number of mortgages in a zip code
- County fixed effects only pick up *relative* changes within county
  - This is equivalent of assuming house prices change at the county level
- Per capita income growth with IRS data combines residents and home buyer income
  - If composition of buyers changes, IRS data worse reflection of buyers
  - Account for potential misreporting during this period.

Decomposition of Total Mortgage Growth

	Growth in		
	Total Mortgage Origination	Average Mortgage Size	Number of Mortgage
IRS income growth	-0.182**	0.239***	-0.402***
	(0.090)	(0.026)	(0.075)
County FE	Y	Y	Y
Number of observations	8,619	8,619	8,619
R2	0.33	0.68	0.31

How Did Household Leverage Build Up? Increased Speed of Home Sales



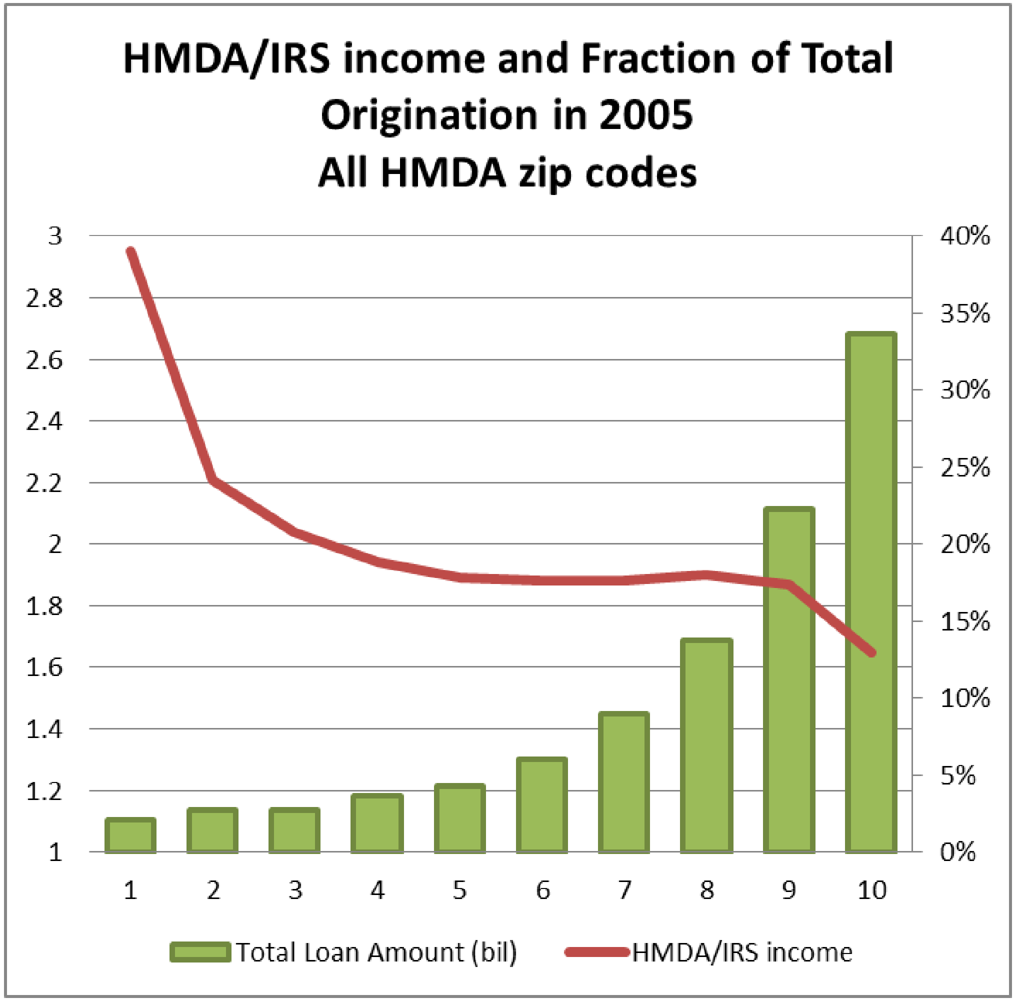
Important Policy Implications

- More focus on macro-prudential implications
  - A lot of regulation after the crisis focuses on micro-prudential regulation, for example screening of marginal borrowers
  - Systemic build up of risk can lead to losses across the financial system, e.g. strategic responses to house price drops

- Protect functioning of financial system when crisis occurs
  - How to build provisions against losses across financial institutions?
  - How to absorb or distribute losses once a crisis occurs?

Liar Loans and underwriting standards

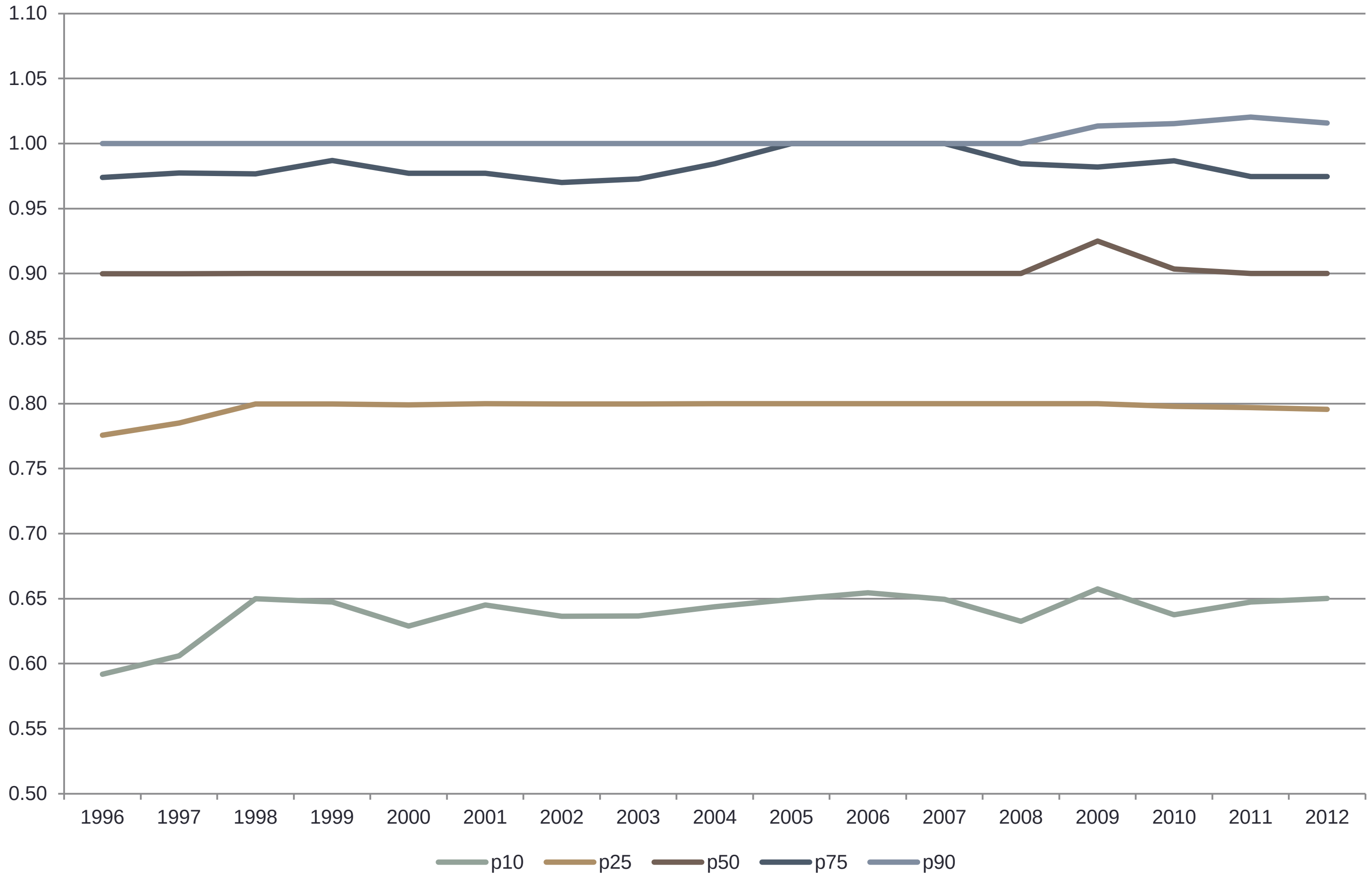
Loan Origination and MS 2015 Measure of Overstatement (All HMDA)



Test in Subsample (Average Mortgage Size)

	Growth in Average Mortgage Size					
	High GSE Fraction	Med GSE Fraction	Low GSE Fraction	High Subp Fraction	Med Subp Fraction	Low Subp Fraction
IRS income growth	0.150***	0.217***	0.231***	0.179***	0.202***	0.161***
	(0.047)	(0.029)	(0.045)	(0.051)	(0.032)	(0.030)
Buyer income growth	0.330***	0.279***	0.237***	0.169***	0.283***	0.383***
	(0.025)	(0.021)	(0.026)	(0.027)	(0.019)	(0.027)
County FE	Y	Y	Y	Y	Y	Y
Number of observations	2,203	4,355	2,061	2,119	4,326	2,174
R2	0.23	0.20	0.18	0.09	0.21	0.30

Combined Loan to Value Evolution

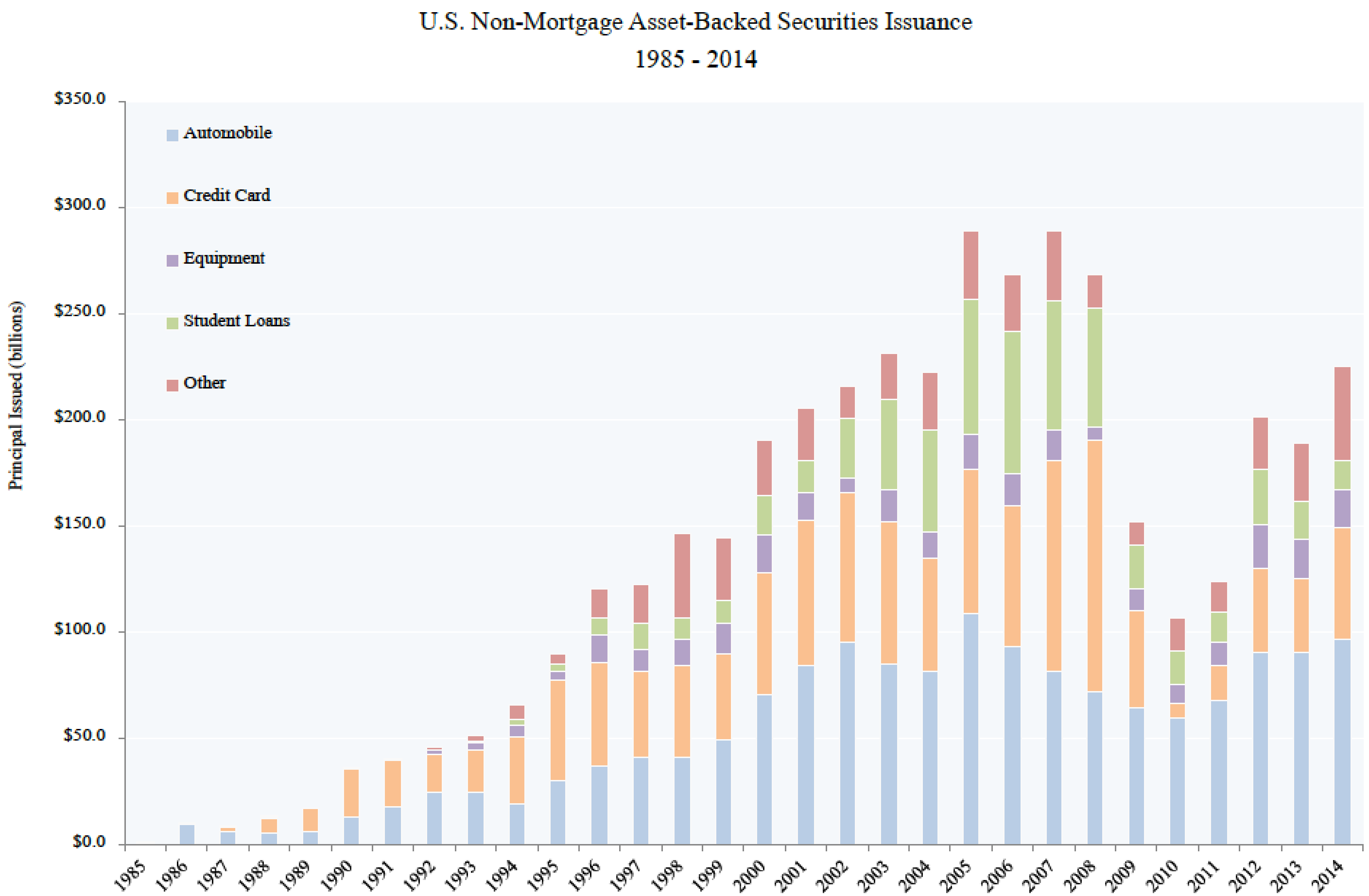


Fannie and Freddie as the new shadow banking system

Note:
[1] Agency securities are securities issued by either Ginnie Mae, Fannie Mae or Freddie Mac.

Sources:
[1] Inside Mortgage Finance, The 2015 Mortgage Market Statistical Annual CD-ROM, Volume K, Mortgage-Related Security Market.

Comparison to non-mortgage ABS



Note:
[1] "Other" comprises cell tower leases, consumer, franchise, Small Business Association, structured settlements, timeshare, utility/stranded costs, housing rental, and servicing advances.

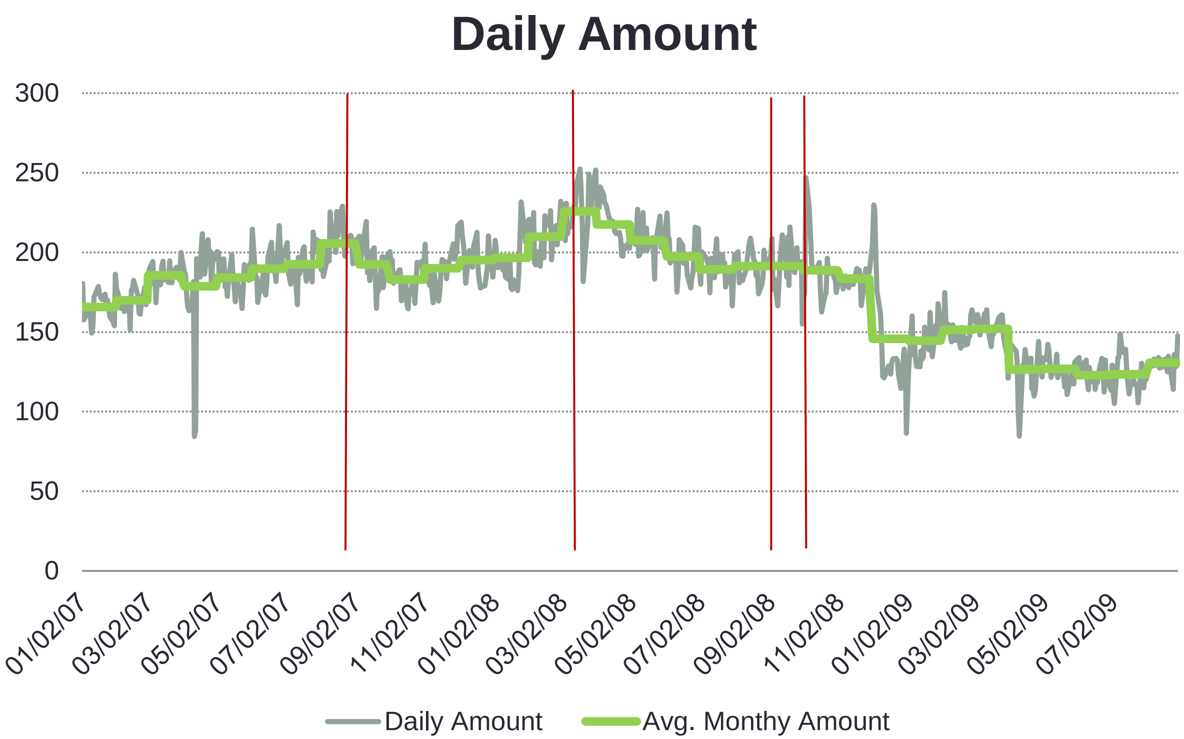
Source:
[1] SIFMA, U.S. ABS Issuance and Outstanding, available at <http://www.sifma.org/research/statistics.aspx>.

Importance of counter party risk

- Common View
  - Due to counter party risk, many markets froze and engaged in liquidity hoarding
  - Example: Common perception that Fedfund market froze after Lehman bankruptcy

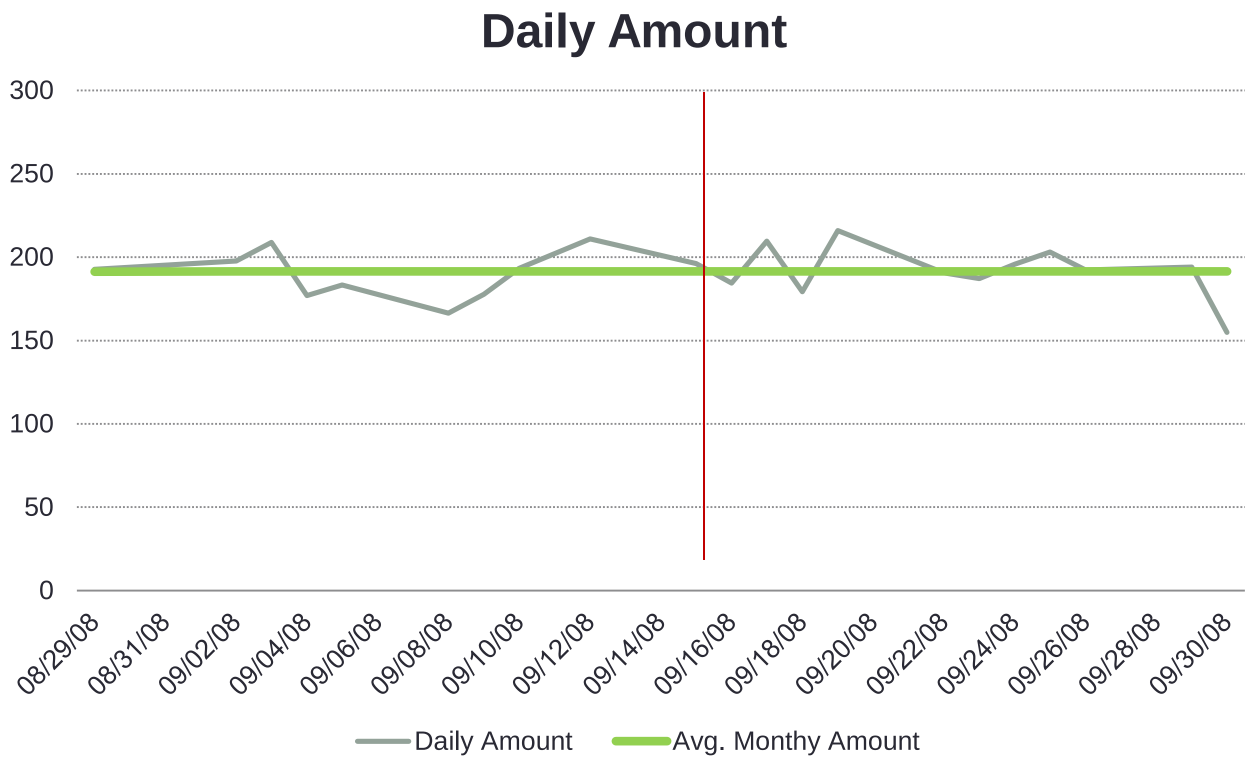
- Alternative view
  - No market wide contagion but heterogeneous response
  - Lenders become more sensitive to counter party risk
  - Adjustment through rationing, not pricing
  - No evidence that better quality borrowers were forced to discount window

Fed funds market activity



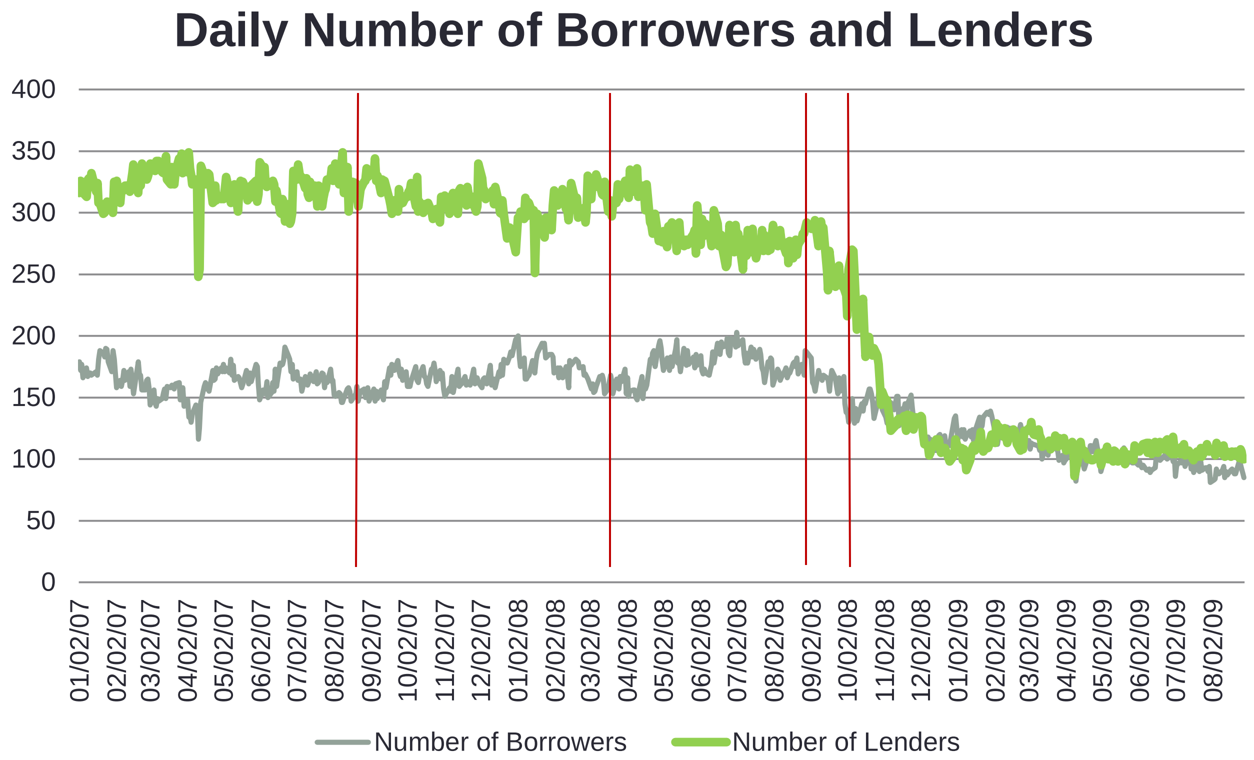
Decline in the amount of Fed funds began after IOR,
not immediately after Lehman's bankruptcy

Fed funds market activity near Lehman



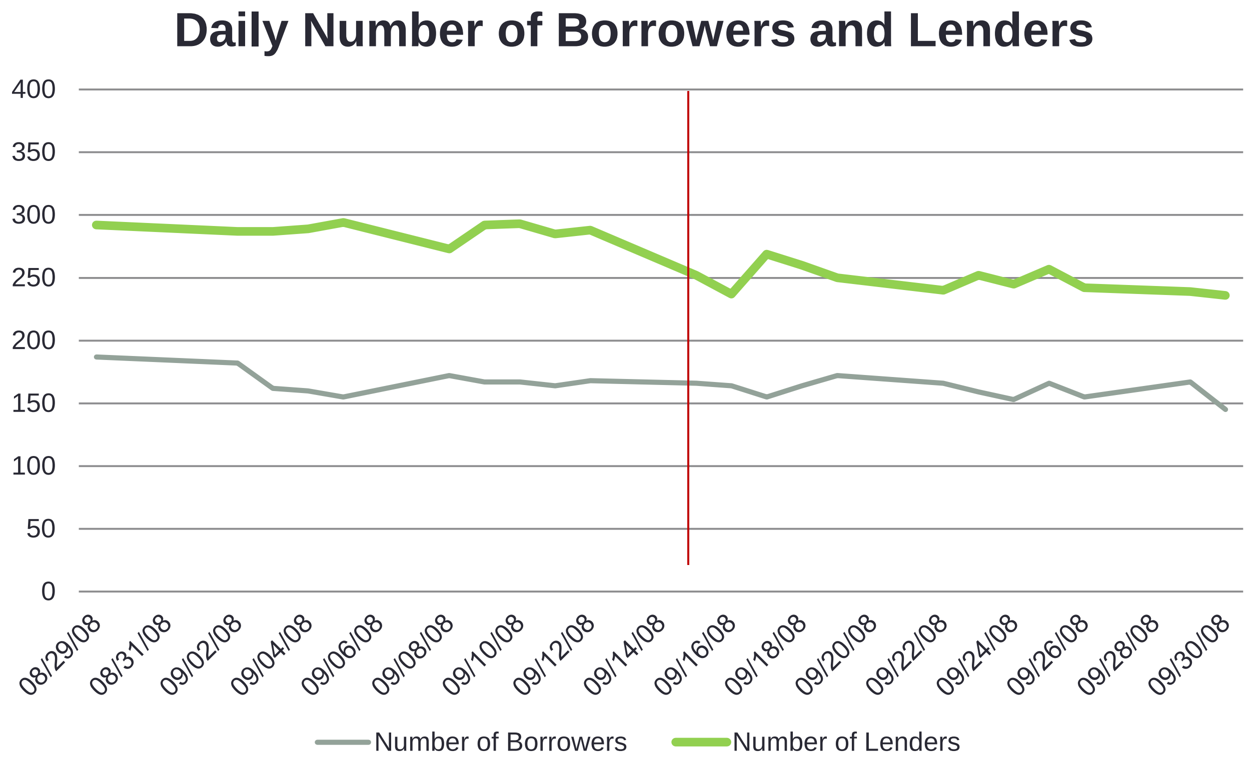
Value remains stable throughout the period

Fed funds participants



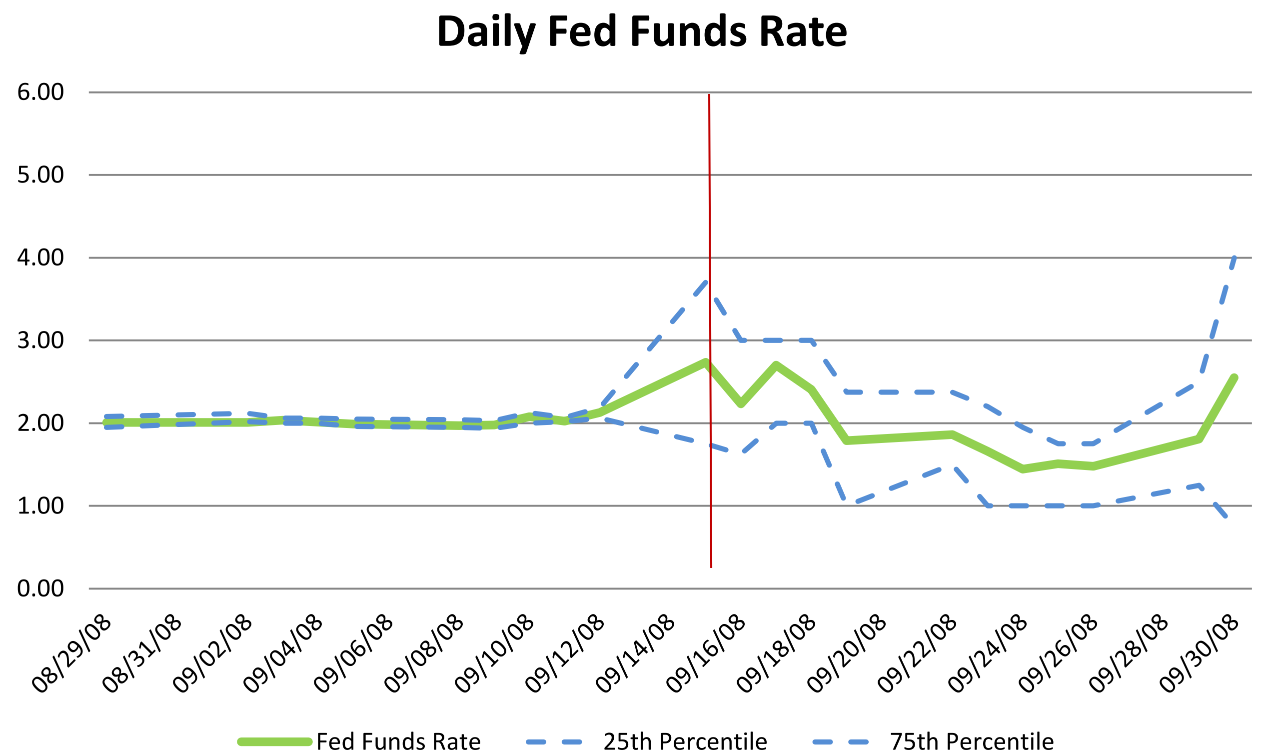
Decline in number of lenders after Lehman's bankruptcy, and even more after IOR

Fed funds participants near Lehman



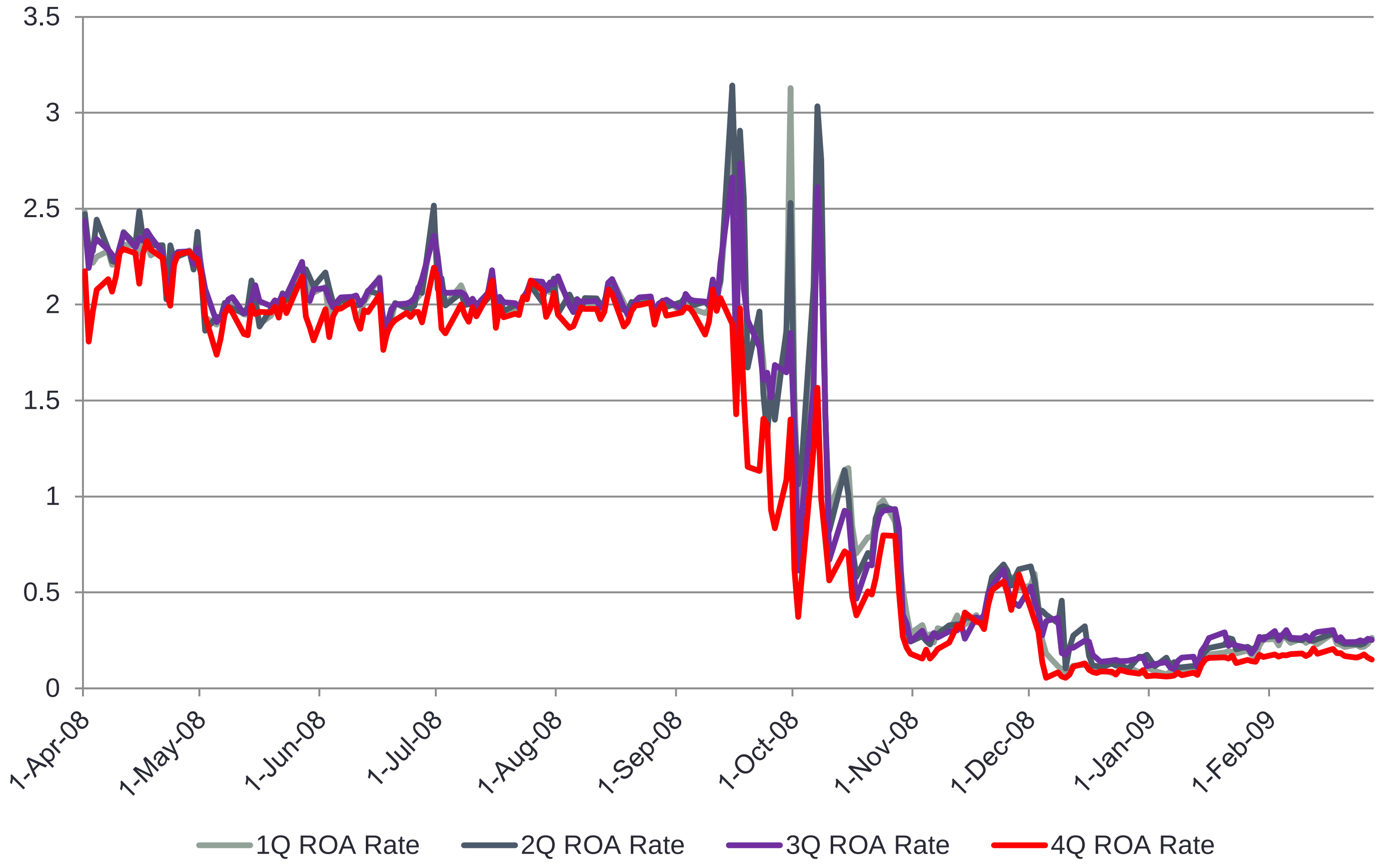
Number of lenders fall after Lehman's bankruptcy

Fed funds rates near Lehman



Rate dispersion grows surrounding Lehman's bankruptcy

Fed funds rates near Lehman II



Large heterogeneity across banks with different ROA levels

Risk Management of Banks

- Common View
  - Weaknesses in the risk-management practices of many financial firms, together with insufficient buffers of capital and liquidity aggravated crisis

- Regulatory response
  - Ensure that large, systemically critical financial institutions hold more and higher-quality capital, improve their risk-management practices, have more robust liquidity management
  - Implementation: Dodd Frank, Basel III and Stress

Regulatory Complexity