The Cross-Market Spillover of Shocks through Multi-Market Banks

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Introduction

- The recent financial crisis raised new concerns about the transmission of financial shocks through the financial system.
- This paper studies the implications of multimarket banking for the spillover of shocks across regional mortgage markets.
- It focuses on the U.S. housing market collapse of 2007-2009.

Implications of multimarket banking on the transmission of shocks

Relative to single-market banks, multimarket banks may respond to an outside economic shock by:

- **Decreasing** local lending because the shock reduces overall bank capital (supply shock).

  → Spillover effect

- **Increasing** local lending because the shock:
  - Reduces borrowers' creditworthiness and/or loan demand in other markets (demand shock).
  - Multimarket banks can shift lending from other markets.

  → Substitution effect

Main Questions

- Do multimarket banks transmit economic shocks across markets (does spillover effect exceed substitution effect)?
  - Economic shock: Increase in mortgage default rates.
- Is the sensitivity of lending to outside economic shocks bigger in peripheral markets than in core markets?
  - Peripheral markets: those in which a multimarket bank does a small share of its total lending.
- If outside shock reduces portfolio lending (loans held on books), does bank offset decline by increasing private securitized lending (loans sold to non-GSE outsiders)?

Main Findings

- **Spillover effect exceeds substitution effect**: multi-market banks reduce mortgage lending in response to higher mortgage defaults in other markets.
- **Peripheral versus core market effect**: effect is bigger in peripheral markets.
- **Response of securitized lending**: Banks make up for the some of the decline in portfolio lending by increasing securitized lending in same market.

Peripheral versus core markets

- Why is the effect in peripheral markets bigger than in core markets?
  - Response to bigger supply shock: Loan losses in other markets will cause a bigger decline in capital, the greater the share of those markets in bank's total lending.
  - The "Cut and Run" effect: A given decline in capital will cause bank to reduce lending more in peripheral markets than in core markets.

Response of securitized loans

- Why do banks partly offset decline in portfolio lending by increasing securitized lending?
  - A decrease in bank capital due to outside shocks only affects bank's willingness to originate and hold loans, not its willingness to originate and sell loans.
  - Bank can earn fee income by selling some of the loans it was originating (rather than not originating them at all)

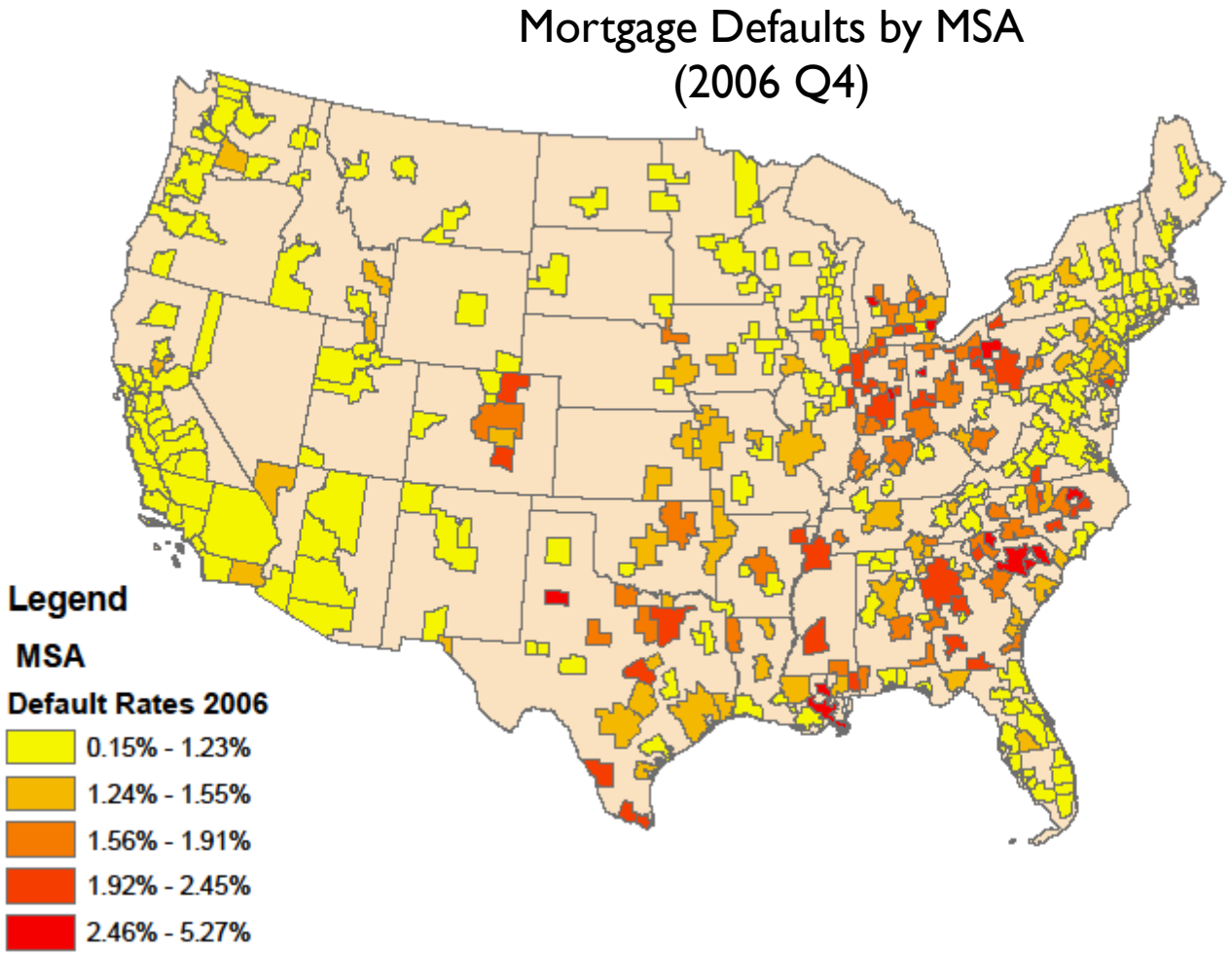
Related Literature

- Supply-side shocks
  - Bernanke and Lown(1991), Bernanke and Gertler (1995)
- Internal capital markets
  - Campello (2002), Ashcraft (2006), Huang (2008)
- Geographic diversification
  - Becker (2007), Keeton (2009)
- International transmission of financial shocks
  - Peek and Rosengren (2000)
  - Khwaja and Mian (2008)
  - Schnable (2010)
  - Cetorelli and Goldberg (2008), Correa and Murry (2009)

Data

- Home Mortgage Disclosure Act (HMDA)
  - Loan-level data of mortgage originations in the US.
  - Identify loans kept on books (portfolio) and loans sold in private securitization (securitized).
- TrenData
  - Mortgage delinquency rates (past due 90+ days) by local market.
- Call Report data
  - Bank size and capitalization.
  - Losses on loans other than residential real estate.
- Data adjusted for mergers
- Panel data: 2006 – 2009 period
  - 3500 banks and thrifts (at the top-holder level).
  - 376 Metropolitan Statistical Areas (MSAs).
  - 44,192 bank-market-year observations.

Geography of Mortgage Defaults



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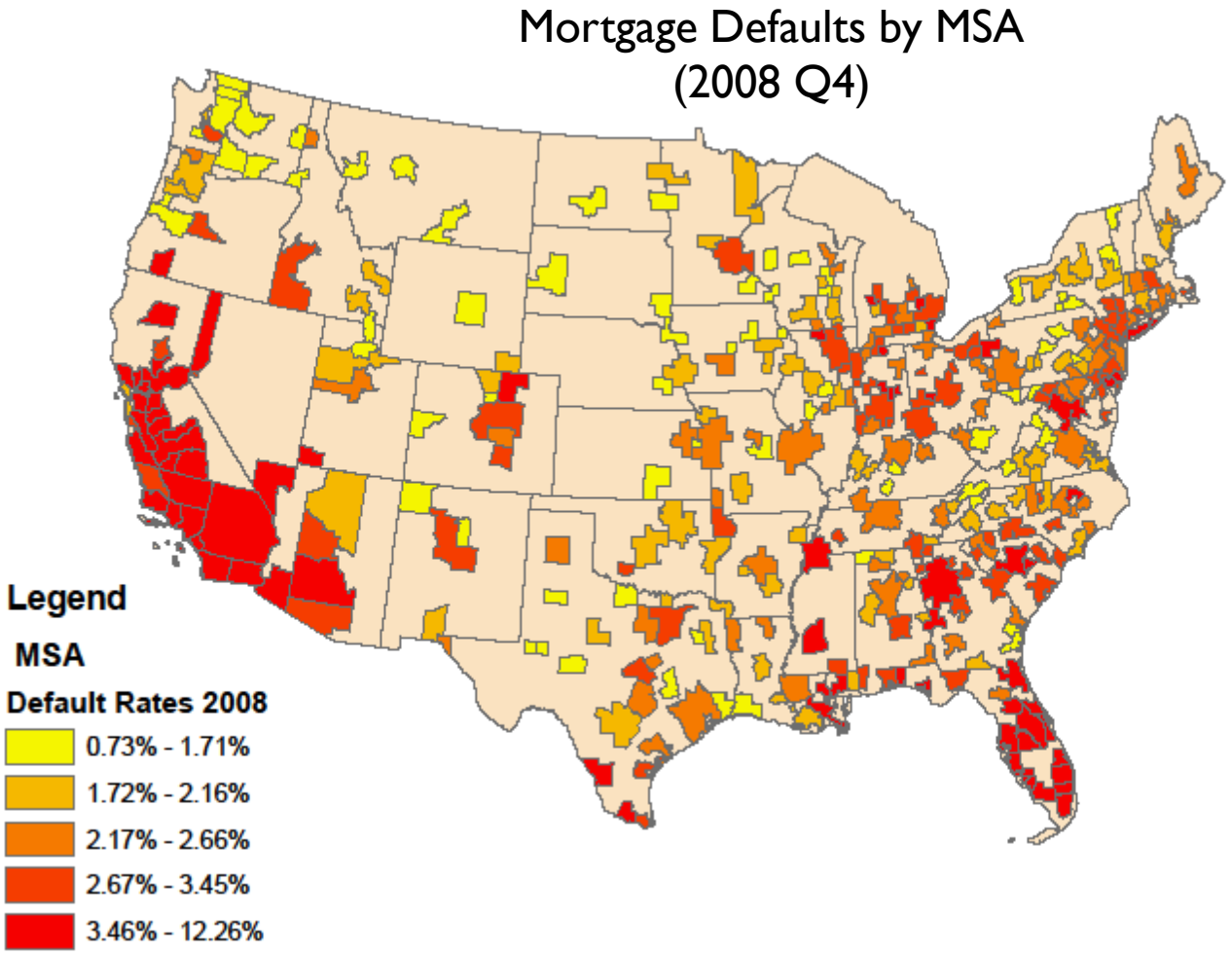

Descriptive Statistics

	Pre Crisis: 2006 -2007	Crisis: 2008-2009
	Mean	Mean
Single Market		
Loan growth	-3.44	-10.65
Size (in millions)	337	394
Multi Market		
Loan Growth	-18.25	-61.17
Size (in millions)	184,000	302,000

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Methodology

- Use bank-market regression of loan growth of bank *i*, in metro area *m*, in year *t*:

$$(1)\ LNGROWTH_{i,m,t} = b.MULTIMARKET_{i,m,t-1} + c.MULTIMARKET_{i,m,t-1} * OTHLOSS_{i,m,t-1} + d.Bank\ Controls + e.M_m + \varepsilon_{i,m,t}$$

$$(2)\ LNGROWTH_{i,m,t} = b_1.CORE_{i,m,t-1} + c_1.CORE_{i,m,t-1} * OTHLOSS_{i,m,t-1} + b_2 PERIPHERAL_{i,m,t-1} + c_2.PERIPHERAL_{i,m,t-1} * OTHLOSS_{i,m,t-1} + d.Bank\ Controls + e.M_m + \varepsilon_{i,m,t}$$

- $CORE_{i,m,t}$: market accounts for >50% of bank's total lending.
- $PERIPHERAL_{i,m,t}$: market accounts for <50% of bank's total lending.

- Impact of outside shocks:
  - Spillover effect : $c, c_1, c_2 < 0$
  - Substitution effect : $c, c_1, c_2 > 0$

From Pre-crisis to Crisis: Portfolio Loans

Dependent Variable: Growth in Originations

	(1)	(2)
Multi Market	43.609***	
	[6.179]	
Multi market * Other loss rate	-19.837***	
	[2.990]	
Core		15.676
		[13.241]
Core * Other loss rate		-11.499
		[7.192]
Peripheral		71.309***
		[7.420]
Peripheral * Other loss rate		-31.329***
		[3.705]
Observations	8583	8583
Market Fixed Effects	yes	yes
Adjusted R Squared	0.27	0.28

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Result 1: Portfolio Loans

- We find evidence that **spillover effects** dominate substitution effects for portfolio loans.
- A 50 bp-increase in other loss rate leads to 10 percent reduction in lending growth of multimarket banks.
- Greater effect in peripheral markets than in core markets:
  - A 50 bp-increase in other loss rate leads to insignificant effect in core markets but 15 percent reduction in peripheral markets.
- Result may reflect the effect of adverse supply shocks (e.g. reduction in capital due to loan losses in other markets).

From Pre-crisis to Crisis: Securitized Loans

Dependent Variable: Growth in Originations

	(1)	(2)
Multi Market	6.911	
	[14.015]	
Multi market * Other loss rate	11.862*	
	[6.611]	
Core		34.101
		[28.006]
Core * Other loss rate		-6.091
		[15.248]
Peripheral		6.005
		[16.563]
Peripheral * Other loss rate		14.479*
		[8.123]
Observations	3778	3778
Market Fixed Effects	yes	yes
Adjusted R Squared	0.24	0.24

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Result 2: Securitized Loans

- We find evidence that some of the decline in portfolio lending was compensated by increase in private securitized lending.
- A 50 bp-increase in other loss rate leads to 6 percent increase in securitized lending growth of multimarket banks.
- Greater effect in peripheral markets than in core markets:
  - A 50 bp-rise in other loss rate leads to insignificant effect in core markets but 8 percent rise in peripheral markets.
- Increase in securitized loans may reflect bank efforts to offset decline in portfolio lending (keep originating loans but sell them instead of holding them)

From Pre-crisis to Crisis: All Loans

Dependent Variable: Growth in Originations

	(1)	(2)
Multi Market	26.394***	
	[5.890]	
Multi market * Other loss rate	-11.864***	
	[2.850]	
Core		10.472
		[12.632]
Core * Other loss rate		-9.791
		[6.861]
Peripheral		47.042***
		[7.079]
Peripheral * Other loss rate		-19.490***
		[3.535]
Observations	8583	8583
Market Fixed Effects	yes	yes
Adjusted R Squared	0.31	0.31

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Market Fixed Effects	yes	yes
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Results 3: Total Loans

- We find evidence of a reduction in **total** mortgage lending (portfolio plus securitized) in response to adverse outside economic shocks.
- A 50 bp-increase in other loss rate leads to 6 percent net reduction in total lending of multimarket banks.
- Greater effect in peripheral markets than in core markets:
  - A 50 bp-increase in other loss rate leads to insignificant effect in core markets but 10 percent net reduction in total lending in peripheral markets.
- Result suggests that a) spillover effect dominates the substitution effect for portfolio lending, and b) securitized lending does not increase enough to compensate.

More Refinements

- We test if rise in other loss rate has bigger effect in highly peripheral markets than moderately peripheral markets:
  - Moderately peripheral market: 1 to 50 percent of bank's total loans.
  - Highly peripheral accounts for less than 1 percent.
  - As expected, we generally find that effects are even bigger in highly peripheral markets.
- We also ran pooled regressions with annual data for 2006-2009:
  - Additional support for spillover effect dominating substitution effect in portfolio lending.
  - As before, securitized lending does not increase enough to offset decline in portfolio lending.

Extensions

- Going forward: Look at
  - Public securitizations (loans sold to GSEs).
  - FHA loans.
  - Deposits at market level.

Conclusions

- We find evidence for cross-market transmission of economic shocks through multimarket banks within the US.
- Results imply that spillover effects of outside supply shocks significantly outweigh substitution effects ff outside demand shocks.
- Effects are bigger in multimarket banks' peripheral markets than in core markets.
- Private securitized lending increases in response to outside shocks but not enough to make for the decline in portfolio lending

- Our results suggest that regulators of SIFIs may want to consider the transmission of shocks through multimarket banking.