Vertical Integration and Mortgage Risk

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Abstract

- Use acquisition events between broker/dealer banks and mortgage lenders as shocks to local mortgage markets.
- We find vertical integration in residential mortgage-backed securitization led to riskier loans with higher loan-to-value ratios, foreclosure rates, and interest rates.
- The effects spilled over to nearby competitors and were associated local house price collapse after 2007.

Motivation

- Non-agency residential mortgage-backed securitization (RMBS) provides little incentives for mortgage lenders to screen borrowers, by separating a loan's originator and the bearer of the loan's risk (Keys et al 2010).
- Vertical integration between mortgage lenders and RMBS sponsors may help to regulate risky mortgage lending through the retention of RMBS equity tranches by RMBS sponsors (Demiroglu and James, 2012).
- However, Ashcraft et al (2019) shows RMBS sponsors is able to sell their equity tranches through re-securitization. Moreover, vertical integration may encourage risky lending practices because it improves profit margin per loan originated (Goldstein and Fligstein, 2017).

Research Questions

- How does vertical integration between mortgage lender and RMBS sponsor affect mortgage risks?
- What are the impacts on local housing markets?

Data

- Individual level property transactions from Zillow's Assessor and Real Estate Database,
- Loan level Home Mortgage Disclosure Act (HMDA) data.
- Sample period is 2006-2007.

Identification Strategy

To estimate the casual impacts of vertical integration on loan risks, we:

- Exploit seven acquisitions events between broker/dealer banks (RMBS sponsors) and mortgage lenders as shocks to local mortgage markets in 2006 and 2007 first half.
- Use a staggered within ZIP-code difference-in-differences framework
- Include ZIP-code-Year-Month fixed effects to control for time-varying local economic conditions
- Include Lender-County fixed effects to control for time-invariant lender characteristics

Effects on Treated Loans

$$\text{LTV}_{i,j,k,t} = \alpha + \beta \cdot Treat_{i,j,k,t} + \gamma \cdot X_{i,j,k,t} + u_{i,k} + v_{t,k} + \epsilon_{i,j,k,t}$$

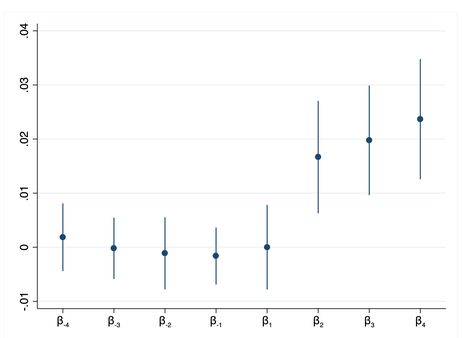

Fig. 1: Change in loan-to-value Ratio

Effects on Treated Loans Cont.

Vertical integration led to increases by:

- 1 percentage point in LTV ratios, 211 percentage points in foreclosure rates, and 77 basis points in rate spreads,
- $38,772 in dollar amounts per ZIP-code per month.

$$\text{Foreclosure}_{i,j,k,t} = \alpha + \beta \cdot Treat_{i,j,k,t} + \gamma \cdot X_{i,j,k,t} + u_{i,k} + v_{t,k} + \epsilon_{i,j,k,t}$$

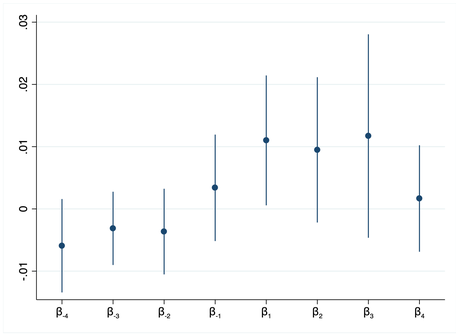

Fig. 2: Change in one-year foreclosure rates

Table 1: Interest Rate

$$\textit{Rate Spread (Higher Priced Loan)}_{i,j,k,t} = \alpha + \beta \cdot Treat_{i,j,k,t} + \gamma \cdot X_{i,j,k,t} + u_{i,k} + v_{t,k} + \epsilon_{j,k,t}$$

VARIABLES	(1) Higher Priced Loan Rate Spread	(2) Higher Priced Loan Rate Spread	(3) Higher Priced Loan Rate Spread	(4) Higher Priced Loan Rate Spread
Treat	0.157***	0.744***	0.146***	0.697***
	(8.276)	(13.13)	(4.187)	(7.000)
Observations	9,563,022	2,269,489	3,587,987	965,284
R-squared	0.525	0.576	0.548	0.556
Control Variables	Yes	Yes	Yes	Yes
Lender-by-CensusTract Fixed Effects	Yes	Yes	Yes	Yes
Year-by-CensusTract Fixed Effects	Yes	Yes		Yes
Clustered Standard Errors	Yes	Yes	Yes	Yes
Lender-by-Zipcode Fixed Effects	Yes	Yes	Yes	Yes
Year-by-Month-by-Zipcode Fixed Effects	Yes	Yes	Yes	Yes

Robust t-statistics in parentheses

Table 2: Loan Volume

$$\textit{Loan Volume}_{j,k,t} = \alpha + \beta \cdot Treat_{j,k,t} + u_{i,k} + v_{t,k} + \epsilon_{j,k,t}$$

Loan Volume	(1) Amount	(2) Num	(3) ln(Amount + 1)	(4) ln(Num + 1)
Treat	38,772***	0.131***	0.924***	0.0692***
	(3.799)	(4.270)	(4.495)	(4.391)
Observations	1,326,135	1,326,135	1,326,135	1,326,135
R-squared	0.503	0.515	0.410	0.484
Control Variables	Yes	Yes	Yes	Yes
Lender-by-Zipcode Fixed Effects	Yes	Yes	Yes	Yes
Year-by-Month-by-Zipcode Fixed Effects	Yes	Yes	Yes	Yes
Clustered Standard Errors	Yes	Yes	Yes	Yes

Robust t-statistics in parentheses

Spillover Effect

- Nearby loans also had higher LTV and foreclosure rates.

Table 3: Spillover effect on nearby competitors

$$LTV\ (Foreclosure)_{i,j,k,t} = \alpha + \beta \cdot TreatNearby_{i,j,k,t} + \gamma \cdot X_{i,j,k,t} + u_{i,k} + v_{t,k} + \epsilon_{j,k,t}$$

VARIABLES	(1) LTV	(2) Foreclosure	(3) LTV	(4) Foreclosure
TreatNearby	0.00602***	0.00107**	0.00280**	0.00160**
	(6.887)	(1.984)	(2.314)	(2.043)
Observations	1,183,557	1,183,557	1,108,423	1,108,423
R-squared	0.177	0.081	0.303	0.190
Control Variables	Yes	Yes	Yes	Yes
Lender-by-State Fixed Effects	Yes	Yes	Yes	Yes
Year-by-Month-by-Zipcode Fixed Effects	Yes	Yes	Yes	Yes
Block Fixed Effects	.	.	Yes	Yes
Clustered Standard Errors	Yes	Yes	Yes	Yes

Robust t-statistics in parentheses

Local House Price

- ZIP-codes with larger market shares of integrated mortgage lenders experienced greater house price declines after the financial crisis.

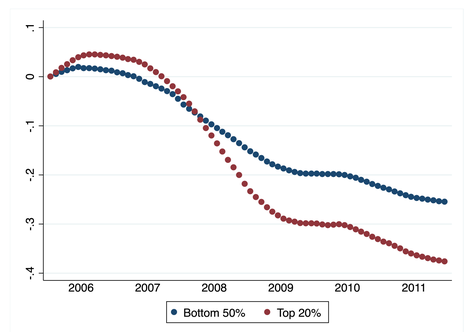

Fig. 3: House Prices and Local Exposures to Integration

Conclusion

- Vertical integration between RMBS sponsors (broker/dealer banks) and mortgage lenders led to the origination of riskier loans.
- The effects spilled over to nearby competitors and were related to the collapse of local house prices.