Nonbanks, Banks, and Monetary Policy: US Loan-Level Evidence Since the 1990s[1]

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  1. Do nonbanks attenuate or strengthen the credit channel?
  2. How does monetary policy affect nonbank risk taking?
  3. Does the nonbank credit channel affect real outcomes?

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To identify the effects of MP on credit supply of nonbanks, we exploit U.S. loan-level data for firms and households since the 1990s in conjunction with monetary policy shocks.

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▸ In *all* markets, effects are larger for riskier borrowers.

Key Take-Away

**The potency of monetary policy in lending markets depends
on the respective size of the nonbank presence.**

Corporate Loans

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- Limit of nonbanks: no deposit base means nonbanks need to access short-term funding market in case borrowers draw on credit lines.

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$$
\begin{aligned}
\text{Log(Quantity)}_{b,l,t} = {} & \alpha_{b,t} + \beta_1 \left(\text{Nonbank}_l \times \text{Monetary Policy}_{t-1}\right) \\
& + \beta_2 \left(\text{Nonbank}_l \times \text{Macroeconomic Controls}_{t-1}\right) \\
& + \delta_l + \varepsilon_{b,l,t}
\end{aligned}
$$

Sample period: 1990Q1-2012Q3 (Gertler-Karadi series).

Impact of US monetary policy on US corporate lending

	All Loans (1)	Term Loans (2)	Revolvers (3)	All Loans (4)	Term Loans (5)	Revolvers (6)
			Log(Total Credit Amount)			
Nonbank × MP	0.135***	0.193***	0.0585**	0.0549	0.308**	-0.0135
	(0.0309)	(0.0488)	(0.0268)	(0.0387)	(0.128)	(0.0512)
Nonbank × High yield				0.0748*	0.190**	0.0255
				(0.0395)	(0.0861)	(0.0506)
Nonbank × High yield × MP				0.205***	-0.0261	0.194***
				(0.0456)	(0.103)	(0.0520)
Double Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Triple Interactions	No	No	No	Yes	Yes	Yes
Borrower-quarter FEs	Yes	Yes	Yes	Yes	Yes	Yes
Lender FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	92,971	14,956	54,312	46,900	4,887	25,107
R-squared	0.811	0.817	0.829	0.792	0.819	0.804

- ‣ Nonbanks relatively increase credit supply by 12% in response to a 1sd increase in MP measure.

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▸ Stronger effects for high-yield firms, risk shifts to nonbanks →
  Reduction in the risk-taking channel of monetary policy.

Very Robust Finding

- Using alternative MP measures
  1. Shadow Rate from Wu and Xia (2016)
  2. Federal Funds Rate

- Splitting sample by type of nonbank lender
- Considering pre-crisis period only.

Nonbank Lending and Corporate Policies

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▸ Idea: Firms with existing nonbank relationships should have more access to credit from nonbanks when MP tightens.

Impact of US monetary policy on US corporate lending by prior nonbank relationship

	Total debt (1)	Leverage (2)	Liquidity (3)	Fixed assets (4)
Nonbank relation × MP	0.070**	0.032***	-0.009**	0.011***
	(0.029)	(0.007)	(0.003)	(0.003)
Double interactions	Yes	Yes	Yes	Yes
Borrower size control	Yes	Yes	Yes	Yes
Borrower FEs	Yes	Yes	Yes	Yes
Industry-quarter FEs	Yes	Yes	Yes	Yes
Observations	316,909	355,957	382,979	368,897
R-squared	0.89	0.61	0.70	0.90

Nonbank Lending and Industry-level Outcomes

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- Use industry-level nonbank share 1990-1996 as measure of access to nonbank credit (some outcome variables only available from 1997).

Industry-Level Outcomes

	Total debt	Leverage	Liquidity	Fixed assets
	(1)	(2)	(3)	(4)
Nonbank share × GK	1.054**	0.217*	-0.065	0.151**
	(0.446)	(0.096)	(0.040)	(0.059)
Macrovar Interactions	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES
Observations	4,115	4,115	4,115	4,115
R-squared	0.98	0.80	0.81	0.96

Quarterly Industry Level Outcomes

Consumer Loans

Auto Loan Market - Overview

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- NY Fed/Equifax Consumer Credit Panel, starting in 1999Q1.

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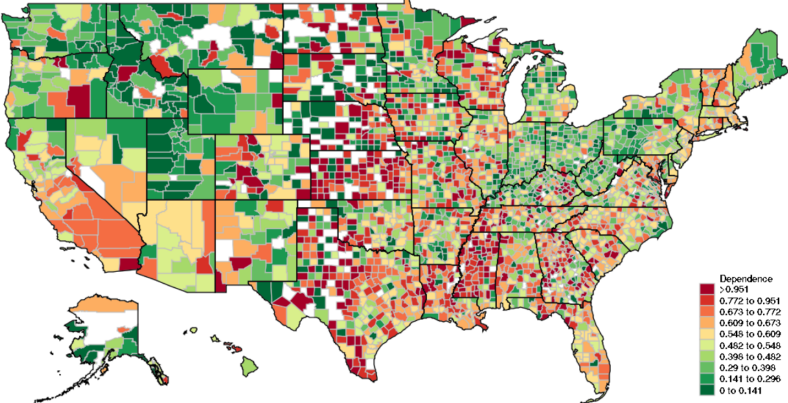
  2. Include interactions with macro controls.

$$
\begin{aligned}
\text{Log(Auto Loan)}_{ijt} = \ & \beta_1 \text{Nonbank Share } 1999Q1_j \times MP_{t-1} + \\
& \beta_2 \text{Nonbank Share } 1999Q1_j \times \text{Macro Controls}_{t-1} \\
& + \gamma X_{ijt-1} + \alpha_j + \theta_t + \epsilon_{ijt}
\end{aligned}
$$

Nonbank Dependence in the Auto Loan Market

County-Level Dependence (1999Q1)

Dependence
> 0.951
0.772 to 0.951
0.673 to 0.772
0.609 to 0.673
0.548 to 0.609
0.482 to 0.548
0.398 to 0.482
0.29 to 0.398
0.141 to 0.296
0 to 0.141

Source: Federal Reserve Board / Equifax

Household-Level Effects on Auto Loans

| | Log Amount | | |
| | Nonbank | Bank | Total |
	(1)	(2)	(3)
MP x Share 1999	0.031***	-0.032***	-0.000
	(0.007)	(0.007)	(0.001)
Double Interactions	YES	YES	YES
Household Controls	YES	YES	YES
County FE	YES	YES	YES
Time FE	YES	YES	YES
Birth Year FE	YES	YES	YES
Observations	54,243,317	54,243,317	54,243,317
R^2	0.005	0.007	0.010

Household controls include risk score, mortgage balance, consumer loan balance, credit card balance, bankruptcy indicator, and county-level income.

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$$\text{Log(Auto Sale)}_{j,t} = \beta_1 \text{Nonbank Share 1999Q1}_{j,t-1} \times MP_{t-1} + \alpha_j + \theta_{lt} + \gamma X_{j,t-1} + \varepsilon_{j,t}$$

County-Level Effects on Auto Sales

| | Auto Credit | | | | Auto sales | |
| | Nonbank | Bank | Total | | | |
	(1)	(2)	(3)	(4)	(5)	(6)
MP x 1999 Share	0.503***	-0.587***	0.109		0.034	
	(0.099)	(0.119)	(0.107)		(0.023)	
MP x Low Share				-0.117*		-0.075***
				(0.068)		(0.023)
Macro Interactions	YES	YES	YES	YES	YES	YES
County Controls	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
County FE	YES	YES	YES	YES	YES	YES
Observations	158,461	158,461	158,461	158,461	122,991	122,991
R^2	0.49	0.49	0.52	0.54	0.99	0.99

County-Level Effects on Auto Sales: Low Nonbank Presence

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	Nonbank	Bank	Total			
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Mortgages

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Nonbank Dependence in the Mortgage Market

Dependence 1995Q1
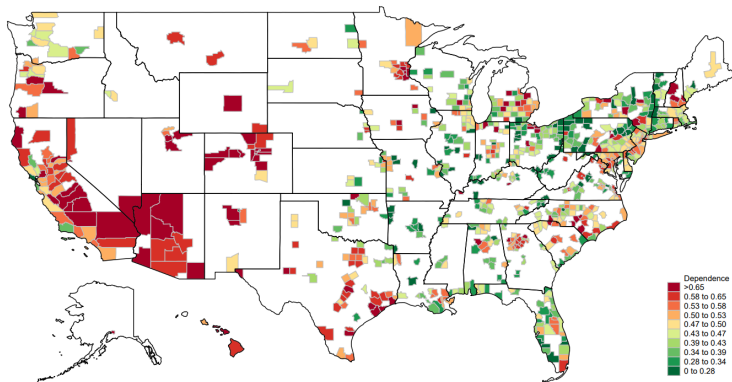
County-Level Mortgage Lending: Conforming loans

	Held New Loans Conforming			
	Bank	Nonbank	Total	Nonbank Share
	(1)	(2)	(3)	(4)
Nonbank Share 1995Q1 × MP	0.045	0.367*	0.309	0.049
	(0.425)	(0.214)	(0.319)	(0.069)
Macro Variable Interactions	YES	YES	YES	YES
Time-varying Controls	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
County FE	YES	YES	YES	YES
Observations	59,547	59,547	59,547	59,547
Adjusted R^2	0.78	0.80	0.78	0.75

County-Level Mortgage Lending: Jumbo loans

	Held New Loans Jumbo			
	Bank	Nonbank	Total	Nonbank Share
	(1)	(2)	(3)	(4)
Nonbank Share 1995Q1 × MP	-0.691	3.192***	-0.064	0.390***
	(0.913)	(0.886)	(0.856)	(0.040)
Macro Variable Interactions	YES	YES	YES	YES
Time-varying Controls	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
County FE	YES	YES	YES	YES
Observations	59,547	59,547	59,547	59,547
Adjusted R^2	0.79	0.73	0.78	0.62

House Prices and Nonbank Lending

	All New Mortgages (1)	All Mortgages (2)	House Prices (3)
Nonbank Share 1995Q1 × MP	0.583†	0.509†	0.425**
	(0.370)	(0.318)	(0.191)
Macro Variable Interactions	YES	YES	YES
County Income	YES	YES	YES
County FE	YES	YES	YES
Observations	55,062	55,062	55,062
Adjusted R^2	0.98	0.98	0.84

Towards General Equilibrium Effects

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- Allow for demand effects and control for macro variables.

- Check whether nonbanks attenuate real effects of monetary policy in each of the three markets.

- Instrument FFR with Gertler-Karadi measures.

Table : Corporate Borrowing and Real Outcomes

	Corporate Borrowing and Output		Auto Loans & Sales		Mortgages & House Prices	
	Total Debt (1)	Annual Output (2)	Total Loans (3)	Auto Sales (4)	New Mortgages (5)	House Prices (6)
FFR x Past Nonbank Share	0.228**	0.278**	0.026	0.007	0.164†	0.139***
	(0.101)	(0.112)	(0.025)	(0.022)	(0.03)	(0.050)
FFR	-0.012	-0.032***	-0.110**	-0.032*	-0.057	-0.102***
	(0.011)	(0.012)	(0.050)	(0.018)	(0.053)	(0.028)
Macro Cont.	Yes	Yes	Yes	Yes	Yes	Yes
Macro Cont. x Past Nonbank Share	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	No	No	No	No
Industry Controls	Yes	Yes	No	No	No	No
County FE	No	No	Yes	Yes	Yes	Yes
County Controls	No	No	Yes	Yes	Yes	Yes
Crisis Interactions	No	No	Yes	Yes	No	No
Kleinbergen-Paap first-stage F-Stat	260.83	97.26	19.78	132.89	29.19	29.19
Observations	4,115	863	158,461	122,991	55,062	55,062

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- Potency of monetary policy in lending markets depends on respective size of nonbank presence.