Nonbank Lenders as Global Shock Absorbers: Evidence from US Monetary Policy Spillovers

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Monetary policy spillovers and bank lending

- Global Financial Cycle
  - Capital flows and credit growth are strongly correlated across countries (Rey 2015)
  - Largely driven by US monetary policy (Miranda-Agrippino and Rey 2020)
  - Particularly big effects on emerging economies (Kalemli-Ozcan 2019)

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- Source of major concern for EME policymakers
  - US monetary policy spillovers can lead to distortions and financial stability risks globally (Caruana 2012; Rajan 2014)

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- International bank lending channel
  - Banks reduce non-US credit supply in response to US monetary policy tightening (Bruno and Shin 2015; Morais et al 2019)
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- But nonbanks increasingly important in credit markets
- Scant evidence on how *global nonbank lending* responds to US monetary policy

This paper: What about nonbanks?

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  - Tighter US monetary policy leads to higher volatility and hence tighter VaR limits (Bruno and Shin 2015a)
  - Dollar strength weakens balance sheets of non-US borrowers (Bruno and Shin 2015b)
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- **Attenuation**
  - Recent literature on domestic US monetary transmission emphasises bank vs nonbank funding conditions
  - When monetary policy tightens, deposits flow out of banks (Drechsler, Savov and Schnabl 2017)...
  - ...and into shadow banks such as MMFs (Xiao 2020)...
  - ...leading to relative increase in lending by nonbanks (Elliott, Meisenzahl, Peydro and Turner 2020)

Overview of results

- Identification:
  - Loan-level data from global syndicated lending market
  - US monetary policy surprises (Jarocinski and Karadi 2020)
- When US monetary policy tightens, nonbank lenders *increase* supply of dollar credit to non-US borrowers, relative to banks
- Substitution stronger for:
  - Riskier borrowers
  - Borrowers in emerging markets
  - Borrowers in countries not anchored to US dollar
- But no evidence of destabilising or zombie lending
- Real effects
  - Borrowers with past nonbank relationships relatively increase total debt, investment, and employment
- Implications:
  - Nonbanks absorb international shocks from US monetary policy
  - More diversified funding providers reduces volatility in capital flows

Contributions to literature

- Global Financial Cycle
  - Rey 2015; Bruno and Shin 2015; Bernanke 2017; Kalemli-Ozcan 2019; Avdjiev and Hale 2019; Iacoviello and Navarro 2019; Miranda-Agrippino and Rey 2020
  - We provide *micro evidence* demonstrating *heterogeneity* across financial intermediaries
- International transmission of shocks to financial intermediaries
  - Peek and Rosengren 1997; Cetorelli and Goldberg 2012; Gianetti and Laeven 2012; de Haas and van Horen 2013; Morais et al 2019; Brauning and Ivashina 2020
  - We link this literature to recent micro evidence on domestic transmission of *monetary policy* shocks (Drechsler, Savov and Schnabl 2017, 2019; Xiao 2020)
- Drivers and implications of growth in nonbank lending
  - Pozsar et al 2013; Moreira and Savov 2017; Buchak et al 2018; Fuster et al 2019; Irani et al 2020
  - We provide *cross-country evidence*, highlighting important differences in developed vs emerging economies

Outline

Data

- Global syndicated lending market
  - Loans extended to one borrower by multiple lenders
  - Bank and nonbank lenders
  - Important source of cross-border funding, particularly for EMEs
- DealScan data
  - Loan-level data for *primary* market
  - Includes identities of borrowers and lenders, allowing us to classify lenders as banks or nonbanks
  - Main nonbank lenders in primary market: finance companies and investment banks
- Matched to Compustat Global data on borrowers
- Main sample:
  - *Dollar* loans from *lenders in all countries* to *non-US borrowers*
  - 1990 - 2017
- Also compare:
  - Dollar vs non-dollar loans
  - US vs non-US lenders
  - US vs non-US borrowers

Outline

Identification

- Monetary policy likely to affect both credit supply and demand
  - Syndicated loan market allows us to identify impact on credit *supply* for two reasons:
    - Multiple lenders to one borrower, so can use borrower-quarter fixed effects to control for time-varying borrower characteristics, including demand (Khwaja and Mian 2008, Chodorow-Reich 2014)
    - Apart from lead arranger, members of syndicate determined by book-building process and hence not chosen by borrower (Bruche, Malherbe and Meisenzahl 2020)

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    - Apart from lead arranger, members of syndicate determined by book-building process and hence not chosen by borrower (Bruche, Malherbe and Meisenzahl 2020)
- Monetary policy reflects economic conditions
  - Measure US monetary policy *surprises* using high-frequency changes in Fed Funds futures (Jarocinski and Karadi 2020)
  - Control for local economic conditions of borrower and lender
    - GDP growth, inflation, monetary policy, exchange rate
  - Also control for other important global factors
    - Strength of dollar, VIX, risk aversion and uncertainty indices

Global lending by banks

- Collapse dataset to borrower-lender-currency-quarter level
- Restrict sample to bank lenders only
- Loan-level regression:

$$\text{Log(New credit)}_{b,l,t} = \alpha_b + \delta_l + \beta \text{MP}_{t-1} + \gamma \text{Macro controls}_{b,l,t-1} + \varepsilon_{b,l,t}$$

  where b = borrower, l = lender, t = quarter
- US monetary policy:
  - Main measure: Jarocinski-Karadi shocks
  - Robustness: Fed Funds, Wu-Xia shadow rates
- Macro controls for both borrower and lender countries

Global lending by banks

Dependent variable:	Log(New credit amount)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
JK	-0.348***	-0.374***	-0.270***	-0.355***	-0.373***	-0.370***	-0.351***
	(0.064)	(0.066)	(0.084)	(0.063)	(0.067)	(0.068)	(0.079)
JK × EME borrower			-0.220**				
			(0.102)				
Dollar index				-0.006**			
				(0.003)			
VIX					0.001		
					(0.004)		
Risk aversion index						0.024	
						(0.059)	
Uncertainty index							0.050
							(0.061)
Lender fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Lender macro controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Borrower macro controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Observations	53,864	31,639	31,639	31,639	31,639	31,639	31,639
Number of borrowers	5,596	3,171	3,171	3,171	3,171	3,171	3,171
Number of lenders	2,422	1,663	1,663	1,663	1,663	1,663	1,663
R^2	0.420	0.821	0.821	0.821	0.821	0.821	0.821

Global lending by nonbanks relative to banks

- Add nonbank lenders to sample
- Loan-level regression:

$$\begin{aligned}\text{Log(New credit)}_{b,l,t} =& \alpha_{b,t} + \delta_l + \beta\,(\text{Nonbank}_l \times \text{MP}_{t-1}) \\ &+ \gamma\,(\text{Nonbank}_l \times \text{Macro controls}_{b,l,t-1}) + \varepsilon_{b,l,t}\end{aligned}$$

  where b = borrower, l = lender, t = quarter
- US monetary policy:
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Global lending by nonbanks relative to banks

Dependent variable:	Log(New credit amount)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Nonbank lender × JK	0.213***	0.281***	0.311***	0.298***	0.310***	0.312***	0.301***	0.283***
	(0.064)	(0.059)	(0.062)	(0.066)	(0.065)	(0.064)	(0.064)	(0.069)
Nonbank lender × Dollar index				0.002				
				(0.003)				
Nonbank lender × VIX					0.000			
					(0.003)			
Nonbank lender × Risk aversion index						-0.014		
						(0.041)		
Nonbank lender × Uncertainty index							-0.020	
							(0.046)	
Lender fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter fixed effects	Yes	Yes	-	-	-	-	-	-
Borrower industry-country fixed effects	Yes	-	-	-	-	-	-	-
Borrower fixed effects	No	Yes	-	-	-	-	-	-
Borrower-quarter fixed effects	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Lender macro controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Lender macro controls × Nonbank	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Borrower macro controls × Nonbank	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Observations	53,290	55,528	33,049	33,049	33,049	33,049	33,049	22,345
Number of borrowers	5,106	4,923	3,220	3,220	3,220	3,220	3,220	1,882
Number of lenders	2,585	2,625	1,839	1,839	1,839	1,839	1,839	1,371
R^2	0.676	0.831	0.878	0.878	0.878	0.878	0.878	0.868

Global lending by nonbanks - alternative measures

Dependent variable:	Term loans	Credit lines	Lead arranger	Log(New credit amount)		
	(1)	(2)	(3)	(4)	(5)	(6)
Nonbank lender × JK	0.173**	0.148***	0.104***			
	(0.071)	(0.039)	(0.038)			
Investment bank lender × JK				0.285***		
				(0.076)		
Finance company lender × JK				0.282**		
				(0.133)		
Nonbank lender × Fed Funds					0.035*	
					(0.018)	
Nonbank lender × Wu-Xia						0.035**
						(0.015)
Lender fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Borrower-quarter fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Lender macro controls	Yes	Yes	Yes	Yes	Yes	Yes
Lender macro controls × Nonbank	Yes	Yes	Yes	Yes	Yes	Yes
Borrower macro controls × Nonbank	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,085	12,097	116,101	32,765	34,976	34,970
Number of borrowers	2,085	872	8,918	3,201	3,466	3,465
Number of lenders	1,278	907	3,161	1,779	1,927	1,927
R^2	0.874	0.902	0.612	0.878	0.877	0.877

Variation by currency and nationality

Dependent variable:	Log(New credit amount)			
	(1)	(2)	(3)	(4)
Nonbank lender × JK × Dollar loan	0.259***			
	(0.062)			
Nonbank lender × JK × Non-dollar loan	0.121			
	(0.075)			
Nonbank lender × JK × US borrower		0.211***		
		(0.042)		
Nonbank lender × JK × Non-US borrower		0.242***		
		(0.054)		
Nonbank lender × JK × US lender			0.389***	
			(0.083)	
Nonbank lender × JK × Non-US lender			0.240***	
			(0.085)	
Nonbank lender × JK × Within-border loan				0.274***
				(0.078)
Nonbank lender × JK × Cross-border loan				0.328***
				(0.066)
Lender fixed effects	Yes	Yes	Yes	Yes
Borrower-quarter fixed effects	Yes	Yes	Yes	Yes
Lender macro controls	Yes	Yes	Yes	Yes
Lender macro controls × Nonbank	Yes	Yes	Yes	Yes
Borrower macro controls × Nonbank	Yes	Yes	Yes	Yes
Lower-order interactions	Yes	Yes	Yes	Yes
Observations	108,570	134,768	33,049	33,049
Number of borrowers	12,602	10,719	3,220	3,220
Number of lenders	3,363	3,422	1,839	1,839
R^2	0.966	0.832	0.878	0.880

Variation by risk

- Substitution from bank to nonbank credit is stronger for *riskier* borrowers ▸ Results
  - Borrowers in emerging markets
  - High yield borrowers
  - Borrowers in countries not anchored to US dollar

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  - Borrowers in countries not anchored to US dollar
- But no evidence of destabilising lending ▸ Results
  - No difference for lenders with heavy reliance on short-term funding
  - No difference for short-term loans
- And no evidence of 'zombie' lending ▸ Results
  - No difference for (ex-ante or ex-post) unprofitable firms

Outline

How complete is substitution?

- What happens to total firm-level syndicated credit?
- Collapse dataset to firm-quarter level
- Specification:

$$\text{Outcome}_{b,t} = \alpha_b + \beta \text{MP}_{t-1} + \gamma \text{Macro controls}_{b,t-1} + \varepsilon_{b,t}$$

- Outcomes:
  - Total credit for the firm
  - Total credit from banks
  - Total credit from nonbanks
  - Nonbank share of total

Impact of US monetary policy on firm-level syndicated credit

Dependent variable:	Total borrowing	Bank borrowing	Nonbank borrowing	Nonbank share
	(1)	(2)	(3)	(4)
JK	-0.176***	-0.292***	0.276*	0.028**
	(0.036)	(0.092)	(0.143)	(0.011)
Borrower macro controls	Yes	Yes	Yes	Yes
Borrower fixed effects	Yes	Yes	Yes	Yes
Observations	11,900	2,429	2,429	2,429
Number of borrowers	3,482	837	837	837
R^2	0.688	0.716	0.553	0.464

Information and relationships

- Firm-level results on total credit suggest imperfect substitution
  - Could reflect reduced demand
  - Could also reflect informational frictions in syndicated loan market (Sufi 2007)
- Previous relationships with nonbank lenders should mitigate informational frictions
  - Support ability to borrow when US monetary policy tightens
  - Hence support real activity
- Measure of past nonbank relationships:
  - Indicator variable equal to one if firm has borrowed from a nonbank in previous syndicated loan
- Regressions at borrower-year level:

$$\begin{aligned}\text{Outcome}_{b,t} =& \alpha_b + \delta_{c,t} + \psi_{i,t} + \beta\,(\text{Nonbank relation}_{b,t} \times \text{MP}_{t-1}) \\ &+ \gamma_1\,(\text{Nonbank relation}_{b,t} \times \text{Macro controls}_{b,t-1}) \\ &+ \gamma_2 \text{Borrower controls}_{b,t-1} + \varepsilon_{b,t}\end{aligned}$$

Past nonbank relationships and firm-level outcomes

Dependent variable:	Loan indicator	New credit	Total debt	Leverage	Total assets	CAPEX	PP&E	Employment
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Past nonbank relation × JK	0.060***	-0.049	0.128***	0.018***	0.031***	0.050*	0.042*	0.037*
	(0.013)	(0.096)	(0.033)	(0.005)	(0.010)	(0.028)	(0.023)	(0.021)
Borrower fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro controls × Nonbank relation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	102,899	4,844	97,655	101,905	101,910	93,227	101,442	74,502
Number of borrowers	6,864	1,252	6,759	6,819	6,819	6,756	6,807	6,135
R^2	0.260	0.699	0.870	0.682	0.976	0.884	0.945	0.960

Outline

Conclusions and policy implications

- Nonbank lenders *attenuate* international spillovers from US monetary policy
- Also attenuate international risk-taking channel of monetary policy
- Substitution stronger for borrowers with existing relationships, leading to real effects
- Nonbank lenders as international shock absorbers
- Having more diversified funding providers (nonbanks in addition to banks) reduces volatility in capital flows from global financial cycle

ADDITIONAL SLIDES

Variation by borrower risk

Dependent variable:	Log(New credit amount)					
	(1)	(2)	(3)	(4)	(5)	(6)
Nonbank lender × JK	0.187***	0.164***	0.206***	0.251***	0.116	-0.036
	(0.048)	(0.049)	(0.056)	(0.071)	(0.089)	(0.102)
Nonbank lender × JK × EME borrower	0.173***	0.290***			0.237***	0.468***
	(0.057)	(0.074)			(0.075)	(0.089)
Nonbank lender × JK × High yield borrower			0.112**	0.140**		
			(0.048)	(0.070)		
Nonbank lender × JK × No dollar anchor					0.061	0.206**
					(0.084)	(0.094)
Lender fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Borrower-quarter fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Lender macro controls	No	Yes	No	Yes	No	Yes
Lender macro controls × Nonbank	No	Yes	No	Yes	No	Yes
Borrower macro controls × Nonbank	No	Yes	No	Yes	No	Yes
Lower-order interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	55,072	33,049	46,205	26,740	50,721	32,805
Number of borrowers	4,876	3,220	3,705	2,289	4,476	3,195
Number of lenders	2,613	1,839	2,326	1,621	2,546	1,830
R^2	0.878	0.879	0.881	0.885	0.876	0.877

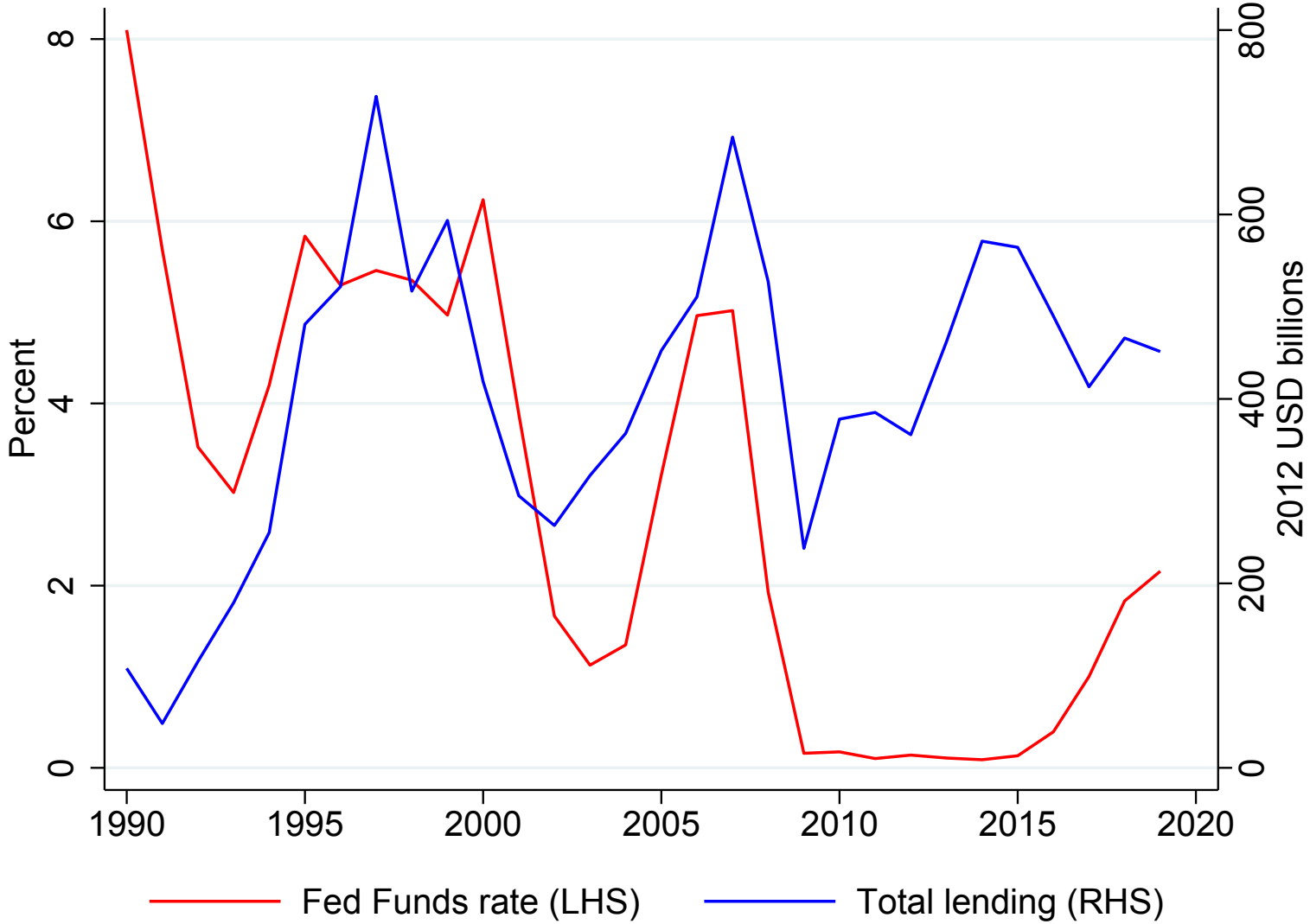
Back

No evidence of destabilising or zombie lending

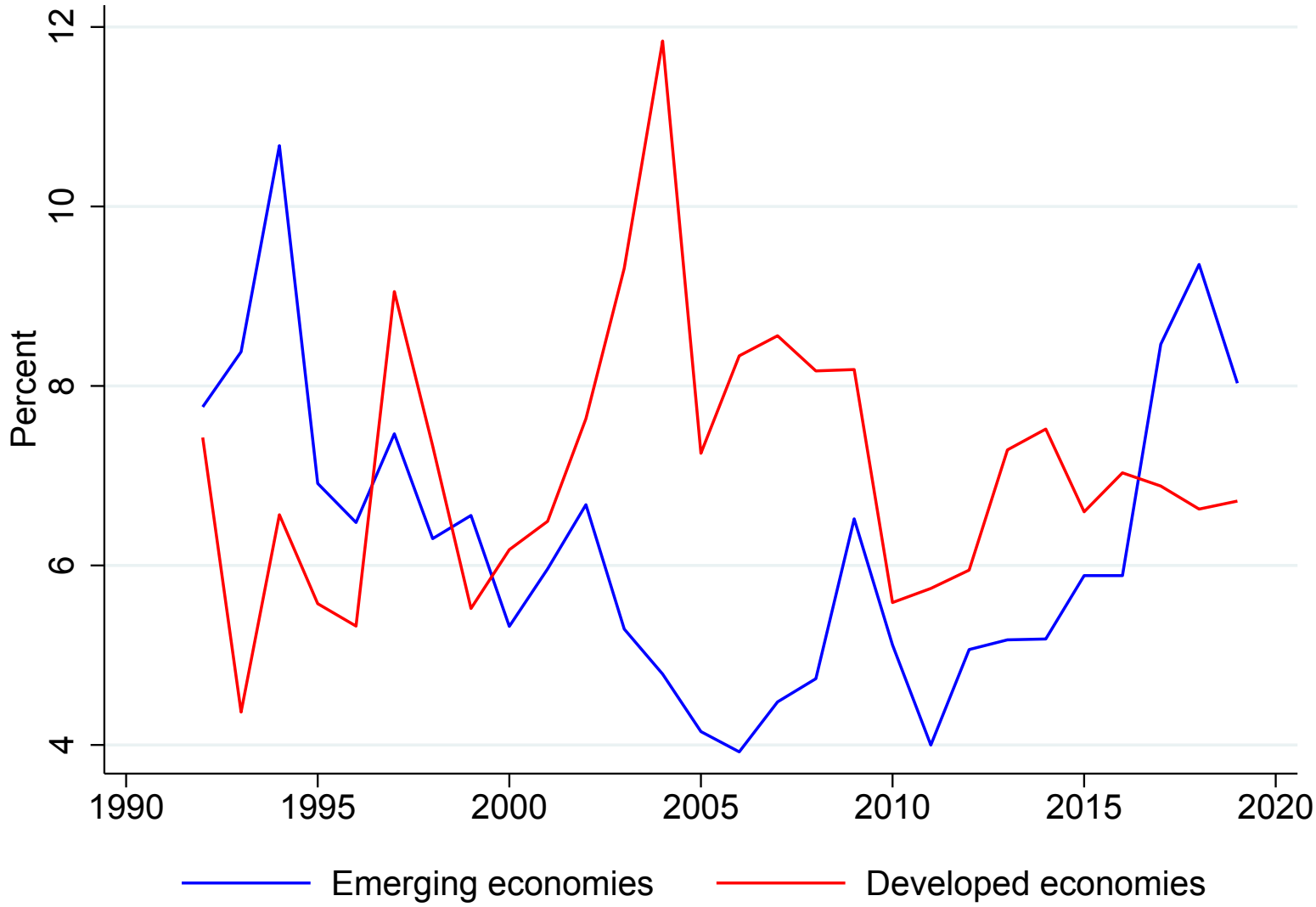
Dependent variable:	Log(New credit amount)			
	(1)	(2)	(3)	(4)
Nonbank lender × JK	0.335***	0.349**	0.262**	0.335**
	(0.099)	(0.135)	(0.131)	(0.132)
Nonbank lender × JK × Unstable nonbank lender	-0.036			
	(0.116)			
Nonbank lender × JK × Log(Maturity)		-0.008		
		(0.032)		
Nonbank lender × JK × RoA_{t-1}			-0.005	
			(0.011)	
Nonbank lender × JK × RoA_{t+1}				-0.004
				(0.010)
Lender fixed effects	Yes	Yes	Yes	Yes
Borrower-quarter fixed effects	Yes	Yes	Yes	Yes
Lender macro controls	Yes	Yes	Yes	Yes
Lender macro controls × Nonbank	Yes	Yes	Yes	Yes
Borrower macro controls × Nonbank	Yes	Yes	Yes	Yes
Lower-order interactions	Yes	Yes	Yes	Yes
Observations	33,049	32,434	15,199	15,770
Number of borrowers	3,220	3,138	1,239	1,268
Number of lenders	1,839	1,819	1,117	1,153
R^2	0.878	0.878	0.880	0.878

Back

Annual international dollar issuance



Nonbank share of lending



Global nonbank asset growth