

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

David Elliott<sup>1</sup>   Ralf Meisenzahl<sup>2</sup>   José-Luis Peydró<sup>3</sup>

<sup>1</sup>Bank of England

<sup>2</sup>Federal Reserve Bank of Chicago

<sup>3</sup>Imperial College London and CEPR

Workshop on Banking and Institutions

Helsinki

22 August 2022

## Disclaimer

The views expressed in this paper are those of the authors, and do not necessarily represent the views of the Bank of England, Federal Reserve Bank of Chicago, Board of Governors or staff of the Federal Reserve System

# 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)

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

# 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)
- ▶ Source of major concern for EME policymakers
  - ▶ US monetary policy spillovers can lead to distortions and financial stability risks globally (Caruana 2012; Rajan 2014)
- ▶ 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)
  - ▶ Particularly for EME lending (Brauning and Ivashina 2020)

# 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)
- ▶ Source of major concern for EME policymakers
  - ▶ US monetary policy spillovers can lead to distortions and financial stability risks globally (Caruana 2012; Rajan 2014)
- ▶ 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)
  - ▶ Particularly for EME lending (Brauning and Ivashina 2020)
- ▶ But nonbanks increasingly important in credit markets
  - ▶ Scant evidence on how *global nonbank lending* responds to US monetary policy

# This paper: What about nonbanks?

- ▶ **Research questions:**
  - ▶ How does US monetary policy affect lending by nonbanks to non-US firms?
  - ▶ What are the real economic effects?
- ▶ Answers are theoretically ambiguous

# This paper: What about nonbanks?

- ▶ **Research questions:**

- ▶ How does US monetary policy affect lending by nonbanks to non-US firms?
- ▶ What are the real economic effects?

- ▶ Answers are theoretically ambiguous

- ▶ **Reinforcement**

- ▶ 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)
- ▶ These mechanisms could work in similar way for banks and nonbanks



# This paper: What about nonbanks?

## ▶ **Research questions:**

- ▶ How does US monetary policy affect lending by nonbanks to non-US firms?
- ▶ What are the real economic effects?

## ▶ Answers are theoretically ambiguous

## ▶ **Reinforcement**

- ▶ 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)
- ▶ These mechanisms could work in similar way for banks and nonbanks

## ▶ **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 shocks (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:
  - ▶ Borrowers in emerging markets
  - ▶ Riskier borrowers
- ▶ 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; 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 to recent evidence on domestic transmission of monetary policy shocks (Drechsler, Savov and Schnabl 2017, 2022; 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

Global syndicated lending market

Loan-level results

Firm-level results

Conclusions

# 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: investment banks & finance companies
- ▶ Matched to Compustat Global data on borrowers
- ▶ Main sample:
  - ▶ Dollar loans from lenders in all countries to non-US borrowers
  - ▶ 1990 - 2019
- ▶ Also compare:
  - ▶ Dollar vs non-dollar loans
  - ▶ US vs non-US lenders
  - ▶ US vs non-US borrowers

# Outline

Global syndicated lending market

Loan-level results

Firm-level results

Conclusions

# 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 credit demand (Khwaja and Mian 2008)
    - ▶ Apart from lead arranger, members of syndicate not chosen by borrower (Bruche, Malherbe and Meisenzahl 2020)

# 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 credit demand (Khwaja and Mian 2008)
    - ▶ Apart from lead arranger, members of syndicate not chosen by borrower (Bruche, Malherbe and Meisenzahl 2020)
- ▶ Monetary policy reflects economic conditions
  - ▶ Instrument US monetary policy using monetary policy *shocks* of Jarocinski and Karadi (2020)
    - ▶ High-frequency changes in interest rate derivatives purged from 'Fed information effect'
  - ▶ 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



# Global lending by banks

- ▶ Collapse dataset to borrower-lender-currency-quarter level
- ▶ Restrict sample to dollar loans from banks to non-US borrowers
- ▶ Loan-level regression:

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

where  $b$  = borrower,  $l$  = lender,  $t$  = quarter

- ▶ Fed Funds rate instrumented by Jarocinski-Karadi shocks
- ▶ Macro controls for both borrower and lender countries

# Global lending by banks

Dependent variable:	Log(New credit amount)					
	(1)	(2)	(3)	(4)	(5)	(6)
Fed Funds	-0.142*** (0.014)	-0.131*** (0.016)	-0.126*** (0.022)	-0.089*** (0.032)	-0.130*** (0.022)	-0.126*** (0.022)
Fed Funds × EME borrower				-0.063* (0.036)		
Dollar index					-0.004 (0.003)	
VIX						-0.001 (0.004)
Lender fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Borrower fixed effects	No	Yes	Yes	Yes	Yes	Yes
Lender macro controls	No	No	Yes	Yes	Yes	Yes
Borrower macro controls	No	No	Yes	Yes	Yes	Yes
Observations	56,512	55,614	36,343	36,343	36,343	36,343
Kleibergen-Paap <i>F</i> -statistic	4,104.2	1,240.5	743.9	352.4	832.2	801.7

# Global lending by nonbanks relative to banks

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

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

where  $b$  = borrower,  $l$  = lender,  $t$  = quarter

- ▶ Fed Funds rate instrumented by Jarocinski-Karadi shocks
- ▶ Macro controls for both borrower and lender countries

# Global lending by nonbanks relative to banks

Dependent variable:	Log(New credit amount)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Nonbank lender × Fed Funds	0.063*** (0.024)	0.104*** (0.020)	0.102*** (0.018)	0.186*** (0.057)	0.184*** (0.054)	0.181*** (0.055)	0.117** (0.051)	0.113** (0.054)
Nonbank lender × Dollar index					-0.003 (0.003)			
Nonbank lender × VIX						0.004 (0.003)		
Fed Funds								-0.128*** (0.022)
Lender fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower country fixed effects	Yes	-	-	-	-	-	-	-
Borrower industry fixed effects	Yes	-	-	-	-	-	-	-
Quarter fixed effects	Yes	Yes	-	-	-	-	-	No
Borrower fixed effects	No	Yes	-	-	-	-	-	Yes
Borrower-quarter fixed effects	No	No	Yes	Yes	Yes	Yes	Yes	No
Lender country-quarter fixed effects	No	No	No	Yes	Yes	Yes	Yes	No
Lender macro controls	No	No	No	-	-	-	-	Yes
Borrower macro controls	No	No	No	-	-	-	-	Yes
Lender macro controls × Nonbank	No	No	No	Yes	Yes	Yes	Yes	Yes
Borrower macro controls × Nonbank	No	No	No	Yes	Yes	Yes	Yes	Yes
Sample end	2019	2019	2019	2019	2019	2019	2006	2019
Observations	56,632	58,706	58,189	37,577	37,577	37,577	24,395	38,864
Kleibergen-Paap <i>F</i> -statistic	230.1	256.0	247.0	36.9	52.0	40.6	85.4	12.6

# Global lending by nonbanks - alternative measures

Dependent variable: Loan share: Estimation	Log(New credit amount)				
	Actual IV (1)	Actual IV (2)	Imputed IV (3)	Actual OLS (4)	Actual OLS (5)
Investment bank lender × Fed Funds	0.208** (0.083)				
Finance company lender × Fed Funds	0.183*** (0.068)				
Nonbank lender × Fed Funds × Lead arranger		0.219*** (0.065)			
Nonbank lender × Fed Funds × Participant		0.148*** (0.056)			
Nonbank lender × Fed Funds			0.079** (0.032)	0.039** (0.017)	
Nonbank lender × Wu-Xia					0.036*** (0.013)
Lender fixed effects	Yes	Yes	Yes	Yes	Yes
Borrower-quarter fixed effects	Yes	Yes	Yes	Yes	Yes
Lender country-quarter fixed effects	Yes	Yes	Yes	Yes	Yes
Lender macro controls × Nonbank	Yes	Yes	Yes	Yes	Yes
Borrower macro controls × Nonbank	Yes	Yes	Yes	Yes	Yes
Lower-order interactions	-	Yes	-	-	-
Observations	37,232	37,577	129,927	37,753	37,747
Kleibergen-Paap <i>F</i> -statistic	10.0	17.7	29.7	-	-
<i>R</i> <sup>2</sup>	-	-	-	0.890	0.890

# Variation by currency and nationality

Dependent variable:	Log(New credit amount)			
	(1)	(2)	(3)	(4)
Nonbank lender × Fed Funds × Dollar loan	0.087*** (0.029)			
Nonbank lender × Fed Funds × Non-dollar loan	0.040 (0.029)			
Nonbank lender × Fed Funds × US borrower		0.342*** (0.086)		
Nonbank lender × Fed Funds × Non-US borrower		0.331*** (0.084)		
Nonbank lender × Fed Funds × US lender			0.237*** (0.062)	
Nonbank lender × Fed Funds × Non-US lender			0.153*** (0.057)	
Nonbank lender × Fed Funds × Within-border loan				0.144*** (0.053)
Nonbank lender × Fed Funds × Cross-border loan				0.199*** (0.057)
Lender fixed effects	Yes	Yes	Yes	Yes
Borrower-quarter fixed effects	Yes	Yes	Yes	Yes
Lender country-quarter fixed effects	Yes	Yes	Yes	Yes
Lender macro controls × Nonbank lender	Yes	Yes	Yes	Yes
Borrower macro controls × Nonbank lender	Yes	Yes	Yes	Yes
Lower-order interactions	Yes	Yes	Yes	Yes
Observations	125,555	141,666	37,577	37,577
Kleibergen-Paap <i>F</i> -statistic	22.1	13.0	17.3	18.8

## Variation by risk

- ▶ Bank-to-nonbank substitution stronger for *riskier* borrowers ▶ Results
  - ▶ Borrowers in emerging markets
  - ▶ High yield borrowers

## Variation by risk

- ▶ Bank-to-nonbank substitution stronger for *riskier* borrowers [▶ Results](#)
  - ▶ Borrowers in emerging markets
  - ▶ High yield borrowers
- ▶ But no evidence of destabilising lending [▶ Results](#)
  - ▶ No difference for lenders with heavy reliance on short-term funding
  - ▶ No difference for short-term loans



# Variation by risk

- ▶ Bank-to-nonbank substitution stronger for *riskier* borrowers [▶ Results](#)
  - ▶ Borrowers in emerging markets
  - ▶ High yield borrowers
- ▶ 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

Global syndicated lending market

Loan-level results

Firm-level results

Conclusions

# How complete is substitution?

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

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

- ▶ Fed Funds rate instrumented by Jarocinski-Karadi shocks
- ▶ Outcomes:
  - ▶ Total dollar credit for the firm
  - ▶ Total dollar credit from banks
  - ▶ Total dollar credit from nonbanks
  - ▶ Nonbank share of total

# Impact of US monetary policy on firm-level syndicated credit

Dependent variable:	Bank borrowing		Nonbank borrowing		Nonbank share		Total borrowing	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fed Funds	-0.115*** (0.018)	-0.074*** (0.026)	0.033* (0.018)	0.070 <sup>+</sup> (0.042)	0.003* (0.002)	0.008** (0.003)	-0.023** (0.009)	-0.052*** (0.013)
Country fixed effects	Yes	-	Yes	-	Yes	-	Yes	-
Borrower fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Macro controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,671	2,938	6,671	2,938	6,671	2,938	22,676	13,742
Number of borrowers	4,742	1,009	4,742	1,009	4,742	1,009	12,925	3,991
Kleibergen-Paap <i>F</i> -statistic	227.5	302.3	227.5	302.3	227.5	302.3	206.3	250.4

# Information and relationships

- ▶ Firm-level results on total credit suggest imperfect substitution
  - ▶ Could reflect reduced demand
  - ▶ Could also reflect informational frictions (Sufi 2007)
- ▶ Previous relationships with nonbank lenders should mitigate 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:

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

## Past nonbank relationships and firm-level outcomes

Dependent variable:	Loan indicator	New credit	Total debt	Leverage	Total assets	PP&E	Employment
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Nonbank relation $\times$ Fed Funds	0.021*** (0.007)	0.015 (0.029)	0.046*** (0.015)	0.006** (0.002)	0.008** (0.004)	0.014* (0.008)	0.014* (0.008)
Borrower fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro controls $\times$ Nonbank relation	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	110,527	4,867	104,786	109,483	109,488	109,042	79,991
Number of borrowers	6,844	1,274	6,751	6,797	6,797	6,790	6,187
Kleibergen-Paap <i>F</i> -statistic	16.8	239.6	17.0	16.7	16.7	16.7	14.2

# Outline

Global syndicated lending market

Loan-level results

Firm-level results

Conclusions

## 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

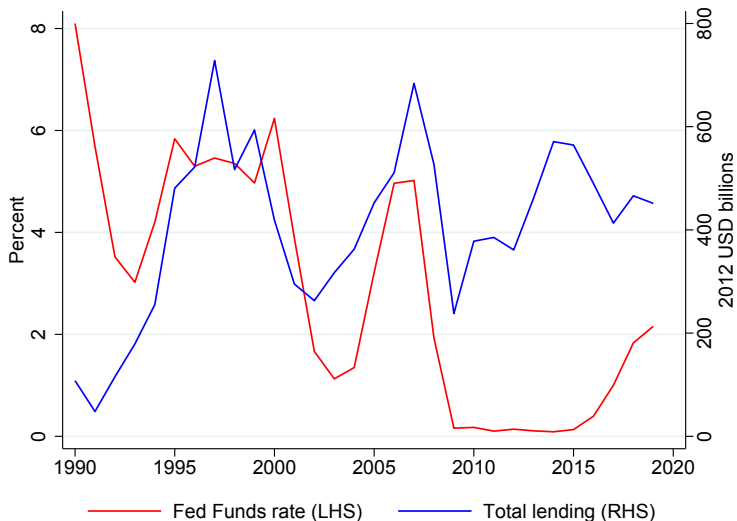
Dependent variable:	Log(New credit amount)					
	(1)	(2)	(3)	(4)	(5)	(6)
Nonbank lender × Fed Funds	0.077*** (0.021)	0.163*** (0.061)	0.146*** (0.052)	0.080*** (0.018)	0.185*** (0.060)	0.177*** (0.058)
Nonbank lender × Fed Funds × EME borrower	0.039* (0.022)	0.076*** (0.029)	0.083*** (0.026)			
Nonbank lender × Fed Funds × High yield borrower				0.040** (0.018)	0.041* (0.022)	0.022 (0.022)
Lender fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Borrower-quarter fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Lender country-quarter fixed effects	No	No	Yes	No	No	Yes
Lender macro controls	No	Yes	-	No	Yes	-
Lender macro controls × Nonbank lender	No	Yes	Yes	No	Yes	Yes
Borrower macro controls × Nonbank lender	No	Yes	Yes	No	Yes	Yes
Lower-order interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	58,189	38,377	37,577	48,342	30,781	30,047
Kleibergen-Paap <i>F</i> -statistic	165.5	14.7	19.7	140.8	15.4	21.1

▶ Back

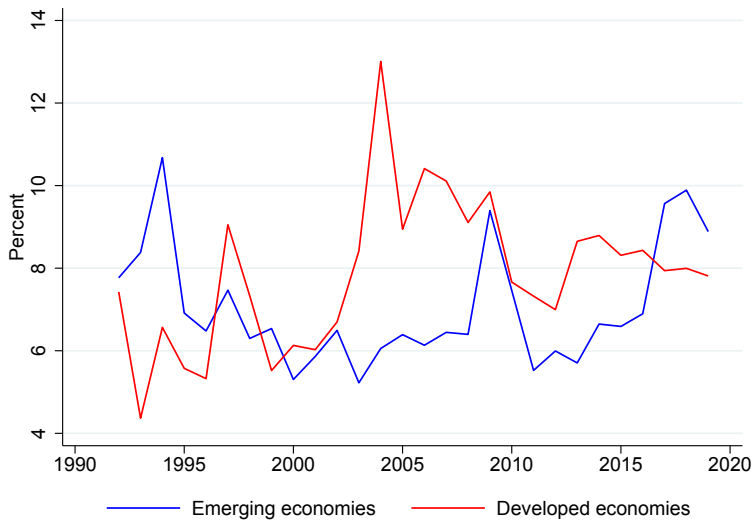
# No evidence of destabilising or zombie lending

Dependent variable:	Log(New credit amount)			
	(1)	(2)	(3)	(4)
Nonbank lender $\times$ Fed Funds	0.176*** (0.054)	0.162*** (0.050)	0.165** (0.070)	0.154** (0.068)
Nonbank lender $\times$ Fed Funds $\times$ Unstable nonbank lender	0.023 (0.044)			
Nonbank lender $\times$ Fed Funds $\times$ Log(Maturity)		0.020 (0.014)		
Nonbank lender $\times$ Fed Funds $\times$ RoA <sub>t-1</sub>			-0.002 (0.002)	
Nonbank lender $\times$ Fed Funds $\times$ RoA <sub>t+1</sub>				-0.002 (0.003)
Lender fixed effects	Yes	Yes	Yes	Yes
Borrower-quarter fixed effects	Yes	Yes	Yes	Yes
Lender country-quarter fixed effects	Yes	Yes	Yes	Yes
Lender macro controls $\times$ Nonbank lender	Yes	Yes	Yes	Yes
Borrower macro controls $\times$ Nonbank lender	Yes	Yes	Yes	Yes
Lower-order interactions	Yes	Yes	Yes	Yes
Observations	37,577	36,880	15,118	15,768
Kleibergen-Paap <i>F</i> -statistic	14.3	18.2	8.0	11.1

# Annual international dollar issuance



# Nonbank share of lending



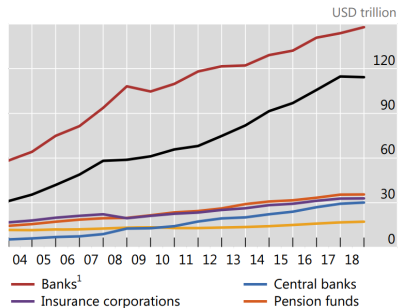
# Global nonbank asset growth

## Assets of financial intermediaries

21+EA-Group

Exhibit 2-2

### Total global financial assets



### Share of total global financial assets<sup>2</sup>

