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

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2nd Annual Conference on International Roles of the US Dollar  
Federal Reserve Bank of New York  
18 May 2023
Disclaimer

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Monetary policy spillovers and bank lending

- US monetary policy spillovers
  - 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)

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
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  - 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 corporates?
  ▶ What are the real economic effects?
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- **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
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Attenuation?
▶ Recent literature on domestic US monetary transmission emphasises bank vs nonbank funding markets
  ▶ 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 nonbank lending (Elliott et al 2022)
▶ Banks typically have lower risk tolerance than nonbanks (Buchak et al 2018; Irani et al 2021; Aldasoro et al 2022)
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:**
  - Borrowers in emerging markets
  - Riskier borrowers

- But no evidence of destabilising or zombie lending

- Substitution consistent with bank vs nonbank differences in funding structure & risk tolerance

- **Real effects**
  - Borrowers with past nonbank relationships relatively increase total debt, investment, and employment

- **Implications:**
  - Nonbanks absorb shocks from US monetary policy spillovers
  - Better access to nonbank credit reduces volatility in capital flows
Contributions to literature

▶ US monetary policy spillovers & 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
  ▶ Ivashina and Sun 2011; Pozsar et al 2013; Moreira and Savov 2017; Buchak et al 2018; Irani et al 2021; Aldasoro et al 2023
  ▶ We provide cross-country evidence, highlighting important differences in developed vs emerging economies
  ▶ Highlight a setting where nonbank credit supply is more stable
Outline

Global syndicated lending market

Loan-level results

Firm-level results

Dollar funding flows

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
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Identification

- Monetary policy likely to affect both credit supply and demand
  - Syndicated loan market allows us to identify impact on credit supply
  - 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

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▶ Monetary policy reflects economic conditions
    ▶ 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:

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

where \( b = \text{borrower}, \ l = \text{lender}, \ t = \text{quarter} \)

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

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Log(New credit amount)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Fed Funds</td>
<td>-0.141***</td>
</tr>
<tr>
<td></td>
<td>(0.014)</td>
</tr>
<tr>
<td>Fed Funds × EME borrower</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.062*</td>
</tr>
<tr>
<td></td>
<td>(0.037)</td>
</tr>
<tr>
<td>Dollar index</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>VIX</td>
<td></td>
</tr>
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</tr>
</tbody>
</table>

- Lender fixed effects: Yes
- Borrower country fixed effects: No
- Borrower industry fixed effects: No
- Borrower fixed effects: No
- Lender macro controls: No
- Borrower macro controls: No

Observations: 55,798 53,055 54,924 35,723 35,723 35,723 35,723
Kleibergen-Paap F-statistic: 3,989.0 3,706.4 1,213.0 735.3 348.1 818.3 793.1

First-stage results
Global lending by nonbanks relative to banks

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

  \[
  \log(\text{New credit})_{b,l,t} = \alpha_{b,t} + \delta_l + \beta (\text{Nonbank}_l \times \text{Fed Funds}_{t-1}) \\
  + \gamma (\text{Nonbank}_l \times \text{Macro controls}_{b,l,t-1}) + \varepsilon_{b,l,t}
  \]

  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

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
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<tbody>
<tr>
<td>Log(New credit amount)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds</td>
<td>0.066***</td>
<td>0.105***</td>
<td>0.104***</td>
<td>0.188***</td>
<td>0.185***</td>
<td>0.182***</td>
<td>0.115**</td>
<td>0.114**</td>
</tr>
<tr>
<td></td>
<td>(0.024)</td>
<td>(0.020)</td>
<td>(0.019)</td>
<td>(0.057)</td>
<td>(0.055)</td>
<td>(0.055)</td>
<td>(0.051)</td>
<td>(0.054)</td>
</tr>
<tr>
<td>Nonbank lender × Dollar index</td>
<td>-0.003</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>(0.003)</td>
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<tr>
<td>Nonbank lender × VIX</td>
<td>0.004</td>
<td></td>
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<td></td>
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<td>(0.003)</td>
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<td></td>
</tr>
<tr>
<td>Fed Funds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.126***</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>(0.022)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **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, -, -, -, -, -, 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**: 55,949, 57,990, 57,495, 36,954, 36,954, 36,954, 24,102, 38,226
- **Kleibergen-Paap F-statistic**: 230.2, 256.0, 248.1, 36.4, 51.3, 40.0, 84.2, 12.4

First-stage results

Nonbank Lenders as Global Shock Absorbers
## Global lending by nonbanks - further robustness tests

<table>
<thead>
<tr>
<th>Loan share:</th>
<th>Log(\text{New credit amount})</th>
<th>\text{(1)}</th>
<th>\text{(2)}</th>
<th>\text{(3)}</th>
<th>\text{(4)}</th>
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<tbody>
<tr>
<td>Investment bank lender × Fed Funds</td>
<td>0.208**</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(0.083)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Finance company lender × Fed Funds</td>
<td>0.185***</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(0.069)</td>
<td></td>
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</tr>
<tr>
<td>Nonbank lender × Fed Funds × Credit line</td>
<td>0.124**</td>
<td></td>
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<tr>
<td></td>
<td>(0.057)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × Term loan</td>
<td>0.100*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.055)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × Lead arranger</td>
<td>0.217***</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(0.065)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × Participant</td>
<td>0.147***</td>
<td></td>
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<tr>
<td></td>
<td>(0.057)</td>
<td></td>
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</tr>
<tr>
<td>Nonbank lender × Fed Funds</td>
<td>0.083**</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.033)</td>
<td></td>
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</tr>
</tbody>
</table>

- **Lender fixed effects**: Yes
- **Borrower × Quarter fixed effects**: Yes
- **Lender country × Quarter fixed effects**: Yes
- **Lender macro controls × Nonbank lender**: Yes
- **Borrower macro controls × Nonbank lender**: Yes
- **Lower-order interactions**: -

<table>
<thead>
<tr>
<th>Observations</th>
<th>36,615</th>
<th>31,301</th>
<th>36,954</th>
<th>128,722</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kleibergen-Paap F-statistic</strong></td>
<td>9.8</td>
<td>8.2</td>
<td>17.4</td>
<td>29.6</td>
</tr>
</tbody>
</table>
## Alternative monetary policy measures

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Log}(New credit amount)</th>
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</thead>
<tbody>
<tr>
<td>Estimation:</td>
<td>OLS</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds</td>
<td>0.049***</td>
</tr>
<tr>
<td>Nonbank lender × Wu-Xia</td>
<td>0.046***</td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × Tightening</td>
<td>0.130***</td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × Loosening</td>
<td>0.132***</td>
</tr>
<tr>
<td>Lender fixed effects</td>
<td>Yes</td>
</tr>
<tr>
<td>Borrower × Quarter fixed effects</td>
<td>Yes</td>
</tr>
<tr>
<td>Lender country × Quarter fixed effects</td>
<td>No</td>
</tr>
<tr>
<td>Lender macro controls × Nonbank lender</td>
<td>No</td>
</tr>
<tr>
<td>Borrower macro controls × Nonbank lender</td>
<td>No</td>
</tr>
<tr>
<td>Lower-order interactions</td>
<td>-</td>
</tr>
<tr>
<td>Observations</td>
<td>57,872</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.878</td>
</tr>
<tr>
<td>Kleibergen-Paap $F$-statistic</td>
<td>-</td>
</tr>
</tbody>
</table>

### Nonbank Lenders as Global Shock Absorbers
### Variation by currency and nationality

<table>
<thead>
<tr>
<th>Dependent variable:</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × Dollar loan</td>
<td>0.086***</td>
</tr>
<tr>
<td></td>
<td>(0.030)</td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × Non-dollar loan</td>
<td>0.039</td>
</tr>
<tr>
<td></td>
<td>(0.029)</td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × US borrower</td>
<td>0.344***</td>
</tr>
<tr>
<td></td>
<td>(0.086)</td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × Non-US borrower</td>
<td>0.334***</td>
</tr>
<tr>
<td></td>
<td>(0.085)</td>
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<tr>
<td>Nonbank lender × Fed Funds × US lender</td>
<td>0.239***</td>
</tr>
<tr>
<td></td>
<td>(0.062)</td>
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<tr>
<td>Nonbank lender × Fed Funds × Non-US lender</td>
<td>0.153***</td>
</tr>
<tr>
<td></td>
<td>(0.058)</td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × Within-border loan</td>
<td>0.145***</td>
</tr>
<tr>
<td></td>
<td>(0.054)</td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × Cross-border loan</td>
<td>0.201***</td>
</tr>
<tr>
<td></td>
<td>(0.057)</td>
</tr>
<tr>
<td>Lender fixed effects</td>
<td>Yes</td>
</tr>
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<td>Yes</td>
</tr>
<tr>
<td>Lower-order interactions</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>124,171</td>
</tr>
<tr>
<td>Kleibergen-Paap F-statistic</td>
<td>21.5</td>
</tr>
</tbody>
</table>

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Nonbank Lenders as Global Shock Absorbers
Variation by risk

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

Results

- Borrowers in emerging markets
- High yield borrowers

Consistent with a role for differences in risk tolerance between banks and nonbanks in explaining the substitution

- Banks typically have lower risk tolerance than nonbanks (Buchak et al 2018; Irani et al 2021; Aldasoro et al 2022)
- So bank lending likely to be more sensitive to risks from US monetary policy tightening
- 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
- Substitution stronger for borrowers in countries with stronger capital controls

Results

- Financial credit inflow restrictions, using measure of Fernandez, Klein, Rebucci, Schindler and Uribe (2016)
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Loan-level results

Firm-level results

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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

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Bank borrowing (1)</th>
<th>Nonbank borrowing (3)</th>
<th>Nonbank share (5)</th>
<th>Total borrowing (7)</th>
<th>(2)</th>
<th>(4)</th>
<th>(6)</th>
<th>(8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fed Funds</td>
<td>-0.109*** (0.018)</td>
<td>0.031* (0.018)</td>
<td>0.003* (0.002)</td>
<td>-0.022** (0.010)</td>
<td>-0.066** (0.026)</td>
<td>0.070+ (0.043)</td>
<td>0.007** (0.003)</td>
<td>-0.052*** (0.013)</td>
</tr>
<tr>
<td>Country fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>-</td>
<td>-</td>
<td>Yes</td>
<td>-</td>
</tr>
<tr>
<td>Borrower fixed effects</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Macro controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>6,578</td>
<td>2,891</td>
<td>6,578</td>
<td>2,891</td>
<td>6,578</td>
<td>2,891</td>
<td>22,543</td>
<td>13,672</td>
</tr>
<tr>
<td>Kleibergen-Paap F-statistic</td>
<td>225.0</td>
<td>302.9</td>
<td>225.0</td>
<td>302.9</td>
<td>225.0</td>
<td>302.9</td>
<td>206.5</td>
<td>250.4</td>
</tr>
</tbody>
</table>

Nonbank Lenders as Global Shock Absorbers
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:

\[
\text{Outcome}_{b,t} = \alpha_b + \delta_{c,t} + \beta \left( \text{Nonbank relation}_{b,t} \times \text{Fed Funds}_{t-1} \right) \\
+ \gamma_1 \left( \text{Nonbank relation}_{b,t} \times \text{Macro controls}_{b,t-1} \right) \\
+ \gamma_2 \text{Borrower controls}_{b,t-1} + \varepsilon_{b,t}
\]
Past nonbank relationships and firm-level outcomes

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Loan indicator (1)</th>
<th>Loan size (2)</th>
<th>Total debt (3)</th>
<th>Leverage (4)</th>
<th>Total assets (5)</th>
<th>PP&amp;E (6)</th>
<th>Employment (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonbank relation × Fed Funds</td>
<td>0.021*** (0.007)</td>
<td>0.017 (0.029)</td>
<td>0.046*** (0.015)</td>
<td>0.006** (0.002)</td>
<td>0.008** (0.004)</td>
<td>0.014* (0.008)</td>
<td>0.014* (0.008)</td>
</tr>
<tr>
<td>Borrower fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Borrower controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Country × Year fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Macro controls × Nonbank relation</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>110,347</td>
<td>4,854</td>
<td>104,608</td>
<td>109,305</td>
<td>109,310</td>
<td>108,864</td>
<td>79,954</td>
</tr>
<tr>
<td>Kleibergen-Paap F-statistic</td>
<td>16.8</td>
<td>239.8</td>
<td>17.1</td>
<td>16.7</td>
<td>16.7</td>
<td>16.8</td>
<td>14.2</td>
</tr>
</tbody>
</table>
Outline

Global syndicated lending market

Loan-level results

Firm-level results

Dollar funding flows

Conclusions
Suggestive evidence on mechanism

- **US evidence** (Drechsler, Savov and Schnabl 2017; Xiao 2020):
  - When monetary policy tightens, banks raise deposit rates by less than Fed Funds rate, in order to benefit from higher net interest margins
  - So MMF yields increase relative to bank deposit rates
  - So deposits flow from banks to MMFs
  - MMFs provide short-term wholesale funding to ‘downstream’ nonbank lenders (e.g. CP and repo)

- Could a similar mechanism be driving our (international) results?

- **Country-level panel regressions:**

\[
\Delta \log(\text{Funding})_{c,t} = \alpha_c + \beta \Delta \text{Fed Funds}_t + \gamma \text{Macro controls}_{c,t-1} + \varepsilon_{c,t}
\]

- How does short-term dollar funding of (non-US) banks and nonbanks respond to US monetary policy?
## Bank and nonbank funding flows

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>( \Delta \text{Log(Bank dollar deposits)} )</th>
<th>( \Delta \text{Log(Nonbank dollar debt)} )</th>
<th>( \Delta \text{Log(Nonbank non-dollar debt)} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \Delta \text{Fed Funds} )</td>
<td>(-0.010)</td>
<td>(-0.011)</td>
<td>(0.114^{***})</td>
</tr>
<tr>
<td></td>
<td>(0.009)</td>
<td>(0.009)</td>
<td>(0.029)</td>
</tr>
<tr>
<td>Country fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Country macro controls</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Observations</td>
<td>1,627</td>
<td>1,080</td>
<td>1,747</td>
</tr>
<tr>
<td>Kleibergen-Paap ( F )-statistic</td>
<td>168.2</td>
<td>178.5</td>
<td>21.9</td>
</tr>
</tbody>
</table>
Outline

Global syndicated lending market

Loan-level results

Firm-level results

Dollar funding flows

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

- Several recent papers emphasise fragility of nonbank credit supply (Fleckenstein et al 2021; Irani et al 2021; Aldasoro et al 2023)...
- ...we highlight a setting where nonbank credit supply is more stable
- Access to nonbank credit reduces volatility in capital flows and economic activity associated with US monetary policy spillovers
ADDITIONAL SLIDES
## First-stage regressions for banks

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Fed Funds</th>
</tr>
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<tbody>
<tr>
<td>JK monetary policy shocks</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>(0.219)</td>
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<tr>
<td>Lender fixed effects</td>
<td>Yes</td>
</tr>
<tr>
<td>Borrower country fixed effects</td>
<td>No</td>
</tr>
<tr>
<td>Borrower industry fixed effects</td>
<td>No</td>
</tr>
<tr>
<td>Borrower fixed effects</td>
<td>No</td>
</tr>
<tr>
<td>Lender macro controls</td>
<td>No</td>
</tr>
<tr>
<td>Borrower macro controls</td>
<td>No</td>
</tr>
<tr>
<td>Observations</td>
<td>55,798</td>
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<tr>
<td>$R^2$</td>
<td>0.750</td>
</tr>
<tr>
<td>Kleibergen-Paap $F$-statistic</td>
<td>3,989.0</td>
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</table>
## First-stage regressions for nonbanks

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Nonbank lender × Fed Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Nonbank lender × JK monetary policy shocks</td>
<td>3.862***</td>
</tr>
<tr>
<td></td>
<td>(0.339)</td>
</tr>
</tbody>
</table>

<table>
<thead>
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<th></th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
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<tbody>
<tr>
<td>Lender fixed effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Borrower country fixed effects</td>
<td>Yes</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Borrower industry fixed effects</td>
<td>Yes</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Quarter fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Borrower fixed effects</td>
<td>No</td>
<td>Yes</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Borrower × Quarter fixed effects</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lender country × Quarter fixed effects</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Lender macro controls × Nonbank lender</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Borrower macro controls × Nonbank lender</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>Observations</td>
<td>55,949</td>
<td>57,990</td>
<td>57,495</td>
<td>36,954</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.764</td>
<td>0.795</td>
<td>0.809</td>
<td>0.902</td>
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<td>Kleibergen-Paap $F$-statistic</td>
<td>230.2</td>
<td>256.0</td>
<td>248.1</td>
<td>36.4</td>
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</table>
Variation by borrower risk

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Log(New credit amount)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds</td>
<td>0.078***</td>
</tr>
<tr>
<td></td>
<td>(0.021)</td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × EME borrower</td>
<td>0.040*</td>
</tr>
<tr>
<td></td>
<td>(0.022)</td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × High yield borrower</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lender fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Borrower × Quarter fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lender country × Quarter fixed effects</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Lender macro controls</td>
<td>No</td>
<td>Yes</td>
<td>-</td>
<td>No</td>
<td>Yes</td>
<td>-</td>
</tr>
<tr>
<td>Lender macro controls × Nonbank lender</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Borrower macro controls × Nonbank lender</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lower-order interactions</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Observations</td>
<td>57,495</td>
<td>37,753</td>
<td>36,954</td>
<td>47,845</td>
<td>30,331</td>
<td>29,597</td>
</tr>
<tr>
<td>Kleibergen-Paap F-statistic</td>
<td>165.6</td>
<td>14.5</td>
<td>19.4</td>
<td>143.4</td>
<td>15.2</td>
<td>20.8</td>
</tr>
</tbody>
</table>
No evidence of destabilising or zombie lending

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Log(New credit amount)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds</td>
<td>0.178***</td>
</tr>
<tr>
<td>(0.055)</td>
<td></td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × Unstable nonbank lender</td>
<td>0.020</td>
</tr>
<tr>
<td>(0.044)</td>
<td></td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × Log(Maturity)</td>
<td></td>
</tr>
<tr>
<td>(0.014)</td>
<td></td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × RoA_{t-1}</td>
<td></td>
</tr>
<tr>
<td>(0.002)</td>
<td></td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × RoA_{t+1}</td>
<td></td>
</tr>
<tr>
<td>(0.003)</td>
<td></td>
</tr>
<tr>
<td>Lender fixed effects</td>
<td>Yes</td>
</tr>
<tr>
<td>Borrower × Quarter fixed effects</td>
<td>Yes</td>
</tr>
<tr>
<td>Lender country × Quarter fixed effects</td>
<td>Yes</td>
</tr>
<tr>
<td>Lender macro controls × Nonbank lender</td>
<td>Yes</td>
</tr>
<tr>
<td>Borrower macro controls × Nonbank lender</td>
<td>Yes</td>
</tr>
<tr>
<td>Lower-order interactions</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>36,954</td>
</tr>
<tr>
<td>Kleibergen-Paap F-statistic</td>
<td>14.1</td>
</tr>
</tbody>
</table>
### Impact of borrower-country capital controls

<table>
<thead>
<tr>
<th>Sample:</th>
<th>Bank lenders only</th>
<th>Bank and nonbank lenders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable: Log(New credit amount)</td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Fed Funds</td>
<td>-0.066**</td>
<td>-0.076**</td>
</tr>
<tr>
<td>Fed Funds × Capital inflow restrictions</td>
<td>-0.102***</td>
<td>-0.085**</td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds</td>
<td>0.060***</td>
<td>0.126**</td>
</tr>
<tr>
<td>Nonbank lender × Fed Funds × Capital inflow restrictions</td>
<td>0.068***</td>
<td>0.094***</td>
</tr>
</tbody>
</table>

- **Lender fixed effects**
- Yes
- Yes
- Yes
- Yes

- **Borrower fixed effects**
- Yes
- Yes
- -
- -

- **Borrower × Quarter fixed effects**
- No
- No
- Yes
- Yes

- **Lender country × Quarter fixed effects**
- No
- No
- Yes
- Yes

- **Lender macro controls**
- No
- Yes
- -
- -

- **Borrower macro controls**
- No
- Yes
- -
- -

- **Lender macro controls × Nonbank lender**
- No
- No
- No
- Yes

- **Borrower macro controls × Nonbank lender**
- No
- No
- No
- Yes

- **Lower-order interactions**
- Yes
- Yes
- Yes
- Yes

- **Observations**
- 41,127
- 31,071
- 42,289
- 32,035

- **Kleibergen-Paap F-statistic**
- 380.2
- 359.0
- 116.1
- 11.9
Annual international dollar issuance

Fed Funds rate (LHS)  Total lending (RHS)
Global nonbank asset growth (FSB)

Assets of financial intermediaries

21+EA-Group

Total global financial assets

USD trillion

Share of total global financial assets

Per cent

04 05 06 07 08 09 10 11 12 13 14 15 16 17 18

Banks¹
Insurance corporations
Central banks
Pension funds
Public financial institutions
Other financial intermediaries (OFIs)