# Limits to Monetary Policy Transmission at the Zero Lower Bound and Beyond: The Role of Nonbanks

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# Introduction

- To paraphrase Kashyap and Stein (2000)'s, **"What do thousands of observations on loan contracts say about the transmission of monetary policy?"**

- A new popular policy tool around the world: Zero or negative short-term interest rates
    - Its effectiveness is being debated
    - Not much known about financial stability implications

- Since the ZLB period in **the United States** and more recently in **Europe**, a large portion of syndicated term loans has been originated with interest rate floor clauses

- Use contract terms from Thomson Reuters LPC to study
    - Factors behind the prevalence of interest rate floors
        - (Expected)low policy rates and shadow banks
    - Implications for monetary policy transmission
        - Higher borrowing costs, allocation of credit to known, repeat borrowers
    - Implications for financial stability
        - Loan features that may increase credit risk

# Syndicated term loan market & Literature

- Market for syndicated **term** loans
  - **U.S.**: Loan originations $700 - 900B >$ high-yield bond issuance $400 - 500B$
    - Outstanding non-mortgage loans of **U.S.** nonfinancial corporates $3.5 trillion and bonds $5 trillion
  - **U.S.**: Nonbanks are large investors, well over 50 percent of originations are institutional loans
  - **EU**: Market smaller, nonbank participation weaker
  - Majority of loans are leveraged and made to opaque borrowers

- Not much on monetary policy transmission through shadow banks (nonbanks)
  - Usual: Interest-rate pass-through, lending channel of monetary policy
  - During the ZLB period: Gilchrist, Lopez, and Zakrajsek (2015)
  - **EU** bank lending under negative rates: Heider, Saidi, and Schepens (2016)
  - **Floating rate channel**: Ippolito, Ozdagli, and Perez (2016)
  - **Reversal interest rate theory**: Brunnermeier and Koby (2016)

- Pricing of syndicated loans
  - **More to pricing than spreads**: Berg, Saunders, and Steffen (2016)
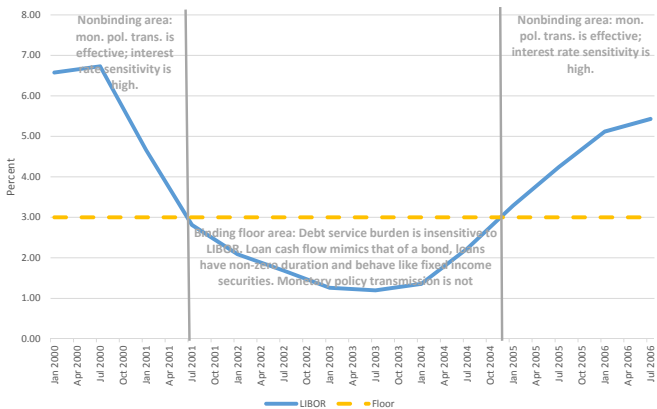  - Micro foundations for floors: Cohen, Lee, and Stebunovs (in progress)

# Term loan originations by borrower rating
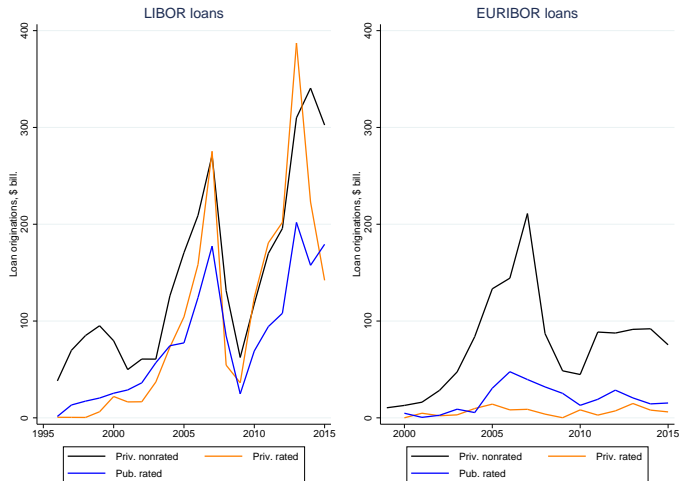


- Opaque, private borrowers account for a very large share of loans

# Floors: Nonlinearities in monetary policy transmission

- Loans are floating rate credits based on a benchmark index (**LIBOR**, **EURIBOR**)
- Borrowing cost: $Cost = \underbrace{max(benchmark, floor) + annualized\ fees +}_{'base'} \underbrace{spread}_{credit\ risk\ price}$

# Prevalence of floors in term loans



LIBOR loans — EURIBOR loans

Percent, by amount

Lev. term loans — All term loans
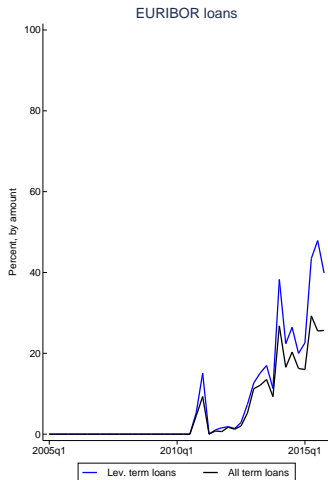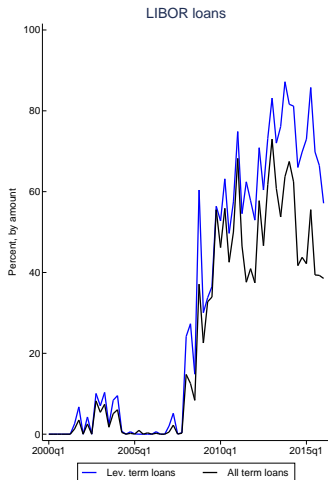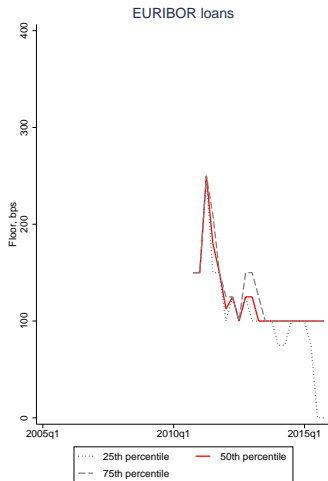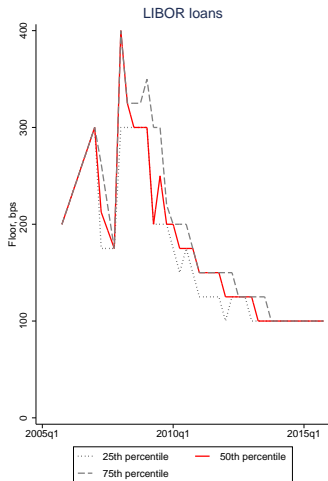
- Floors first appeared when **the United States** flirted with a ZLB in the early '00s
- Floors are very rare in credit line contracts

# Level of floors in term loan contracts



- Effective "zero" lower bound is 100 basis points

# Short-term policy and benchmark rates
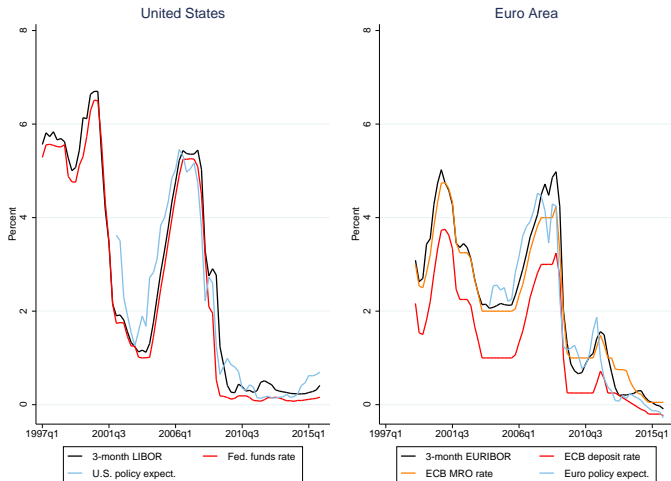


- In recent years, a ZLB in **the United States** and negative interest rates in **Europe**

# Nonbank participation in origination of term loans



- Nonbank lender loan—a loan originated by nonbanks; institutional loan—a loan structured to appeal to nonbanks
- Nonbanks avoid credit lines

# Factors explaining prevalence of floors in term loans

- Interest rate floors in **U.S.** and **EU** loans, 1996-2015

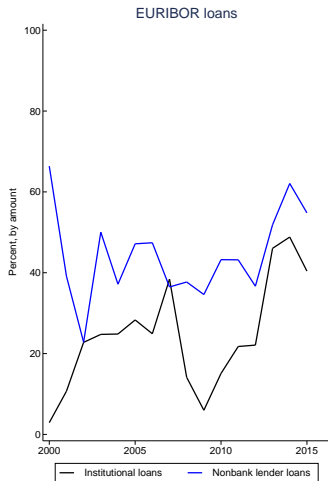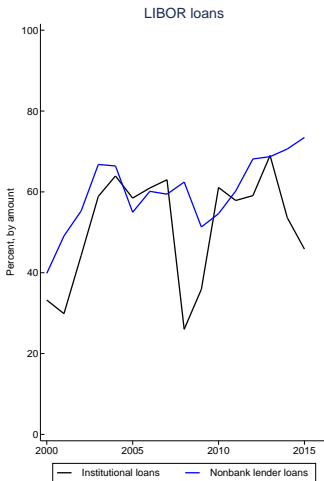$$Pr(Floor_{l,b,t} = 1|...) = \Phi(\alpha + \beta PR_t + \theta PR_t \times Nonb./Inst._{l,b,t} + \gamma Nonb./Inst._{l,b,t} + ...)$$

| | U.S. '96-05 | U.S. '06-15 | EU '06-15 |
|---|---|---|---|
| Policy rate | $-0.297^{***}$ | $-0.373^{***}$ | $-1.002^{***}$ |
| Policy rate*Nonbank lender | $-0.365^{***}$ | $-0.073$ | $-0.226$ |
| Policy rate*Inst. loan | $0.049$ | $-0.280^{***}$ | $-0.021$ |
| Nonbank lender | $0.603^{***}$ | $0.448^{***}$ | $0.861^{***}$ |
| Inst. loan type | $0.264$ | $1.578^{***}$ | $0.968^{***}$ |
| Amend./refin. loan | $0.345^{***}$ | $0.129^{***}$ | $-0.17$ |
| Borrower controls | ... | ... | ... |
| Num. of observations | 14191 | 20531 | 4453 |
| Num. of clusters | 40 | 40 | 40 |
| Pseudo R-sq. | 0.23 | 0.47 | 0.48 |

$t$ statistics in parentheses. $^{*}$ $p < .1$, $^{**}$ $p < .05$, $^{***}$ $p < .01$
Note: No fixed effects b/c of accidental parameter and inconsistency issues. Errors are clustered by time.

- Why nonbanks would want floors in syndication?
  - They are yield-oriented investors a la Hanson and Stein (2015)
  - They require a minimum total return in a low interest rate environment
  - They have to cover overhead costs associated with managing investments
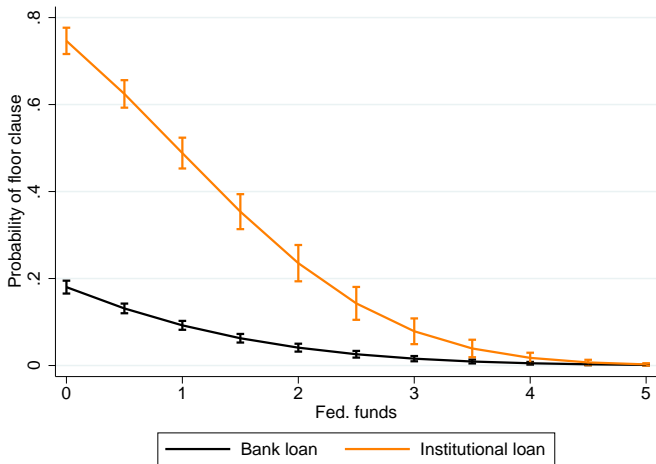
- Nonbanks also associated with the presence of Original Issue Discounts (OIDs)

# Floating rate channel of **U.S.** monetary policy: Ineffective?

- Theory: Borrowers have floating rate liabilities, expansionary policy eases debt servicing burden
- ZLB reality: Floors bind at origination; min. number of years that floors are expected to bind for loans made in 2006-15
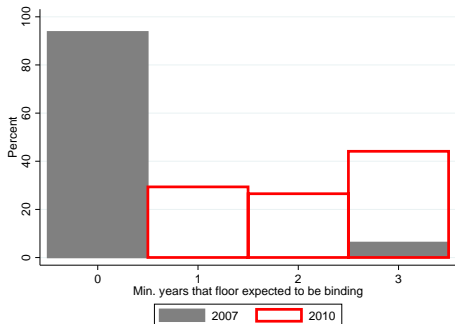


Note: Out of 2693 loans in '07 and of 1408 loans in '10, 16 loans and 460 loans, respectively, have floors.

# U.S. pass-through from policy rates to borrowing cost

- **U.S.** syndicated term loans made in 1996-2015

$$Cost_l = \underbrace{max(benchmark_l, floor_l) + annualized\ fees_l}_{'base'} + \underbrace{spread_l}_{credit\ risk\ price}$$

- Two 10-year rolling window regressions: One for loans without floors, one for loans with floors

$$Cost_{l,b,t} = \alpha_b + \beta PR_t + \epsilon_{l,b,t}$$

- $\beta$ is the pass-through from the federal funds rate
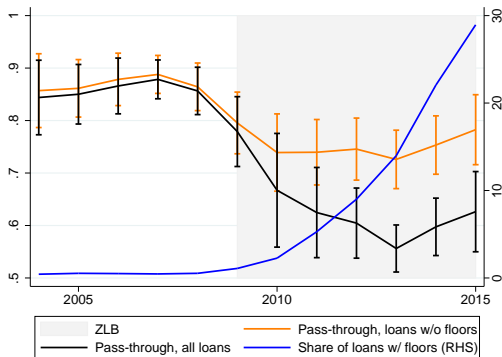


Note: 95 percent confidence intervals shown.

# Borrowing cost of **U.S.** syndicated term loans, '96-05

- In a more complex model, estimate the same coefficient on the fed. funds rate $\beta$

$$Cost_{l,b,t} = \alpha_b + \beta PR_t + \theta PR_t \times Nonbank/Inst.loan_{l,b,t}...$$

- $\beta$s in col. (1) and (2) are imperfect but similar—nonbank participation has only marginal effects
- Floors may increase credit risk but recent interaction may decrease it, col. (4)

| | Cost (1) | Cost (2) | Base (3) | Spread (4) |
|---|---|---|---|---|
| Fed. funds | 0.831*** | 0.869*** | 1.004*** | −0.134*** |
| Nonbank lender | | 0.248*** | 0.029** | 0.222*** |
| Inst. loan type | | 0.174 | −0.017** | 0.189 |
| Floor clause | | 2.994*** | 1.036*** | 1.999*** |
| Amend./refin. loan | | −0.092* | 0.022 | −0.114** |
| Borrower controls | ... | ... | ... | ... |
| Num. of observations | 14191 | 14191 | 14191 | 14182 |
| Num. of clusters | 40 | 40 | 40 | 40 |
| Adj. R-sq. | 0.75 | 0.76 | 0.98 | 0.45 |

$t$ statistics in parentheses * $p < .1$, ** $p < .05$, *** $p < .01$
Note: Interest rates are in percent. Borrower fixed effects included. Errors are clustered by time.

- $\beta$ in col. (1) is now much lower, but $\beta$ conditional on nonbank participation in col. (2) is not
- Floors may increase credit risk but recent interaction may decrease it, col. (4)

|  | Cost (1) | Cost (2) | Base (3) | Spread (4) |
|---|---|---|---|---|
| Fed. funds | $0.626^{***}$ | $0.835^{***}$ | $0.984^{***}$ | $-0.148^{***}$ |
| Nonbank lender |  | $0.059$ | $-0.008$ | $0.067$ |
| Inst. loan type |  | $-1.128^{***}$ | $-0.066^{***}$ | $-1.063^{***}$ |
| Floor clause |  | $1.985^{***}$ | $0.941^{***}$ | $1.043^{***}$ |
| OID present |  | $0.237^{*}$ | $0.099^{*}$ | $0.140$ |
| Amend./refin. loan |  | $-0.262^{***}$ | $-0.045^{*}$ | $-0.217^{***}$ |
| Borrower controls | ... | ... | ... | ... |
| Num. of observations | 20531 | 20531 | 20531 | 20523 |
| Num. of clusters | 40 | 40 | 40 | 40 |
| Adj. R-sq. | 0.66 | 0.73 | 0.97 | 0.57 |

$t$ statistics in parentheses. $^{*}$ $p < .1$, $^{**}$ $p < .05$, $^{***}$ $p < .01$
Note: Interest rates are in percent. Borrower fixed effects included. Errors are clustered by time.

- **U.S.** pass-through much lower than before the crisis
- **EU**: Weaker results than the **U.S.**', but nonbank participation still matters
- Good news for the transmission of monetary policy in **EU**

- Trade-off of a higher borrowing cost (b/c of floors and nonbank-related fees) and a larger loan size and a longer loan maturity
- Recall the earlier trade-off: Floors are associated with higher likelihood of cancelation fees but with covenant lite loans

| | US '06-15 | | EU '06-15 | |
| --- | --- | --- | --- | --- |
| | log(Size) | Maturity | log(Size) | Maturity |
| Policy rate | $-0.007$ | $2.615^{***}$ | $-0.001$ | $7.688^{***}$ |
| Nonbank lender | $0.114^{***}$ | $2.138^{***}$ | $0.084$ | $0.273$ |
| Inst. loan type | $0.469^{***}$ | $-0.963$ | $0.177^{**}$ | $7.956^{***}$ |
| Floor clause | $0.169^{***}$ | $6.288^{***}$ | $0.129$ | $7.500^{***}$ |
| OID present | $0.191^{***}$ | $6.768^{***}$ | $0.262^{*}$ | $3.261$ |
| Amend./refin. loan | $0.039$ | $-1.532^{*}$ | $0.181^{***}$ | $-4.076^{**}$ |
| Borrower controls | ... | ... | ... | ... |
| Num. of observations | 20531 | 19997 | 4440 | 4394 |
| Num. of clusters | 40 | 40 | 40 | 40 |
| Adj. R-sq. | 0.69 | 0.61 | 0.72 | 0.83 |

$t$ statistics in parentheses. $^{*}$ $p < .1$, $^{**}$ $p < .05$, $^{***}$ $p < .01$
Note: Size in millions, maturity in months. Borrower fixed effects included. Errors are clustered by time.

- Term loan features of importance to credit risk and financial stability

$$Pr(\text{leveraged loan or cancelation fee or cove lite}_{l,b,t} = 1|...) = \Phi(\alpha + \beta PR_t + ...)$$

|  | Lever. loan | Cancel. fee | Coven. lite |
|---|---|---|---|
| Floor clause | 1.499*** | 1.845*** | 1.369*** |
| Fed. funds | −0.118*** | 0.140*** | 0.072 |
| Fed. Funds*Nonbank lender | 0.049*** | 0.014 | 0.008 |
| Fed. Funds*Inst. loan | −0.142*** | −0.159*** | −0.052*** |
| Nonbank lender | 0.391*** | 0.036 | 0.224*** |
| Inst. loan type | 1.154*** | 0.641*** | 0.387*** |
| Amend./refin. loan | −0.076** | 0.226*** | 0.214*** |
| Borrower controls | ... | ... | ... |
| Num. of observations | 20531 | 20531 | 20531 |
| Num. of clusters | 40 | 40 | 40 |
| Pseudo R-sq. | 0.27 | 0.44 | 0.32 |

$t$ statistics in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$
Note: No fixed effects b/c of accidental parameter and inconsistency issues. Errors are clustered by time.
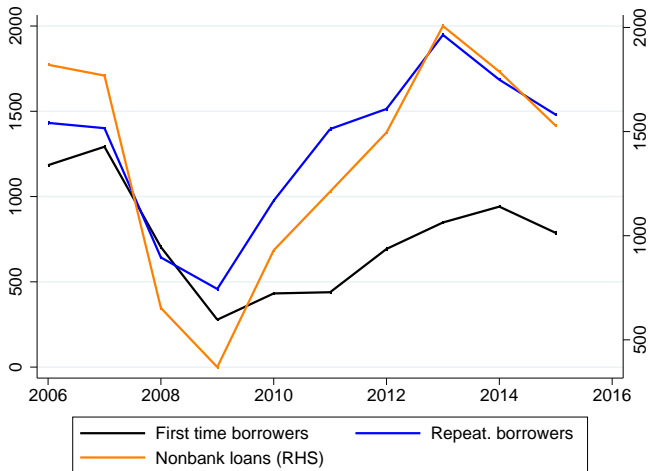
- **EU**: Weaker results than the **U.S.**', but floors, nonbank participation still matter

# Pred. prob. of risk features in **U.S.** term loans, '06-15
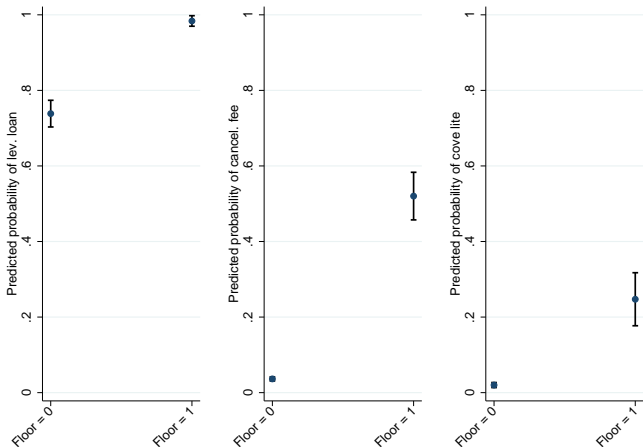


- When a floor clause present: A loan is more likely to be riskier & a borrower more likely to be locked in

# Nonbanks and first time borrowers, **U.S.** loans, 2006-15



First time borrowers — Repeat. borrowers — Nonbank loans (RHS)

Note: Nonbank loan—an institutional or nonbank loan.

# Nonbanks and first time borrowers

- First time borrowers at a parent level, **U.S.** and **EU** loans, 2006-15

$$Pr(First_{l,b,t} = 1|...) = \Phi(\alpha + \beta PR_t + ...)$$

|  | U.S. | EU |
|---|---|---|
| Policy rate | 0.086$^{***}$ | 0.035 |
|  | (7.226) | (1.135) |
| Policy rate*Nonbank lender | −0.012 | 0.022 |
|  | (−1.006) | (0.454) |
| Policy rate*Inst. loan | 0.026$^{**}$ | 0.053$^{*}$ |
|  | (2.011) | (1.956) |
| Nonbank lender | −0.077$^{***}$ | −0.438$^{***}$ |
|  | (−2.794) | (−3.998) |
| Inst. loan type | −0.393$^{***}$ | −0.336$^{***}$ |
|  | (−11.164) | (−3.728) |
| Borrower controls | ... | ... |
| Num. of observations | 20531 | 4453 |
| Num. of clusters | 40 | 40 |
| Pseudo R-sq. | 0.11 | 0.07 |

$t$ statistics in parentheses. $^{*}$ $p < .1$, $^{**}$ $p < .05$, $^{***}$ $p < .01$
Note: No fixed effects b/c of accidental parameter and inconsistency issues. Errors are clustered by time.

- Likelihood of first time borrower loan lower with nonbank participation and with a policy easing conditional on nonbank participation

# Further points

- Floors were introduced en masse in **US** syndicated term loans in anticipation of the ZLB
  - OIS rates which capture expectations about policy rates varied significantly in the ZLB period
- More on potential conflicts of monetary policy and financial stability goals
  - The real borrowing cost—a proxy for debt servicing burden—goes up in a low inflation environment with weak if not falling income
- Interest rate hedging: There is no good reason to pay a cost to hedge interest rate fluctuations in our setting
  - Small private firms unlikely to hedge; hedging among public ones is not that prevalent, see Ippolito, Ozdagli, and Perez (2016)
- **Brunnermeier and Koby (2016)'s "reversal interest rate"**: Reminiscent, but not quite that
  - The rate at which accommodative monetary policy "reverses" its effect and becomes contractionary
  - The dominant floor is 100 basis points, but signs of expansionary effects albeit at a higher cost
  - Risky borrowers might not have had access to term loans if it were not for nonbank lenders—evidence says it may not be the case

# Conclusions

- Findings: Nonbank participation and low interest rates may change monetary policy transmission in corporate loan term markets

- Implications for monetary policy: "Non-standard" transmission in the ZLB
  - An easing may lead to a higher borrowing cost for new loans...
  - ... and may result in repeat better-known risky borrowers getting loans of larger sizes at longer maturities
  - Floating rate channel may not work (in expectation) for a long time

- Implications for financial stability: Potentially higher risks
  - Riskier borrowers locked in costlier, larger loans with longer maturities and with fewer if any restrictions on collateral, debt issuance, payment terms
  - Nonbanks are interconnected through commonality of their exposures, their contagion risk and loss absorption capacity are not clear

- Caveat: Risky borrowers might not have had access to term loans if it were not for nonbank lenders