

# Risk Taking and Low Longer-Term Interest Rates: Evidence from the U.S. Syndicated Loan Market

Sirio Aramonte

Seung Jung Lee

Viktors Stebunovs

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# Introduction

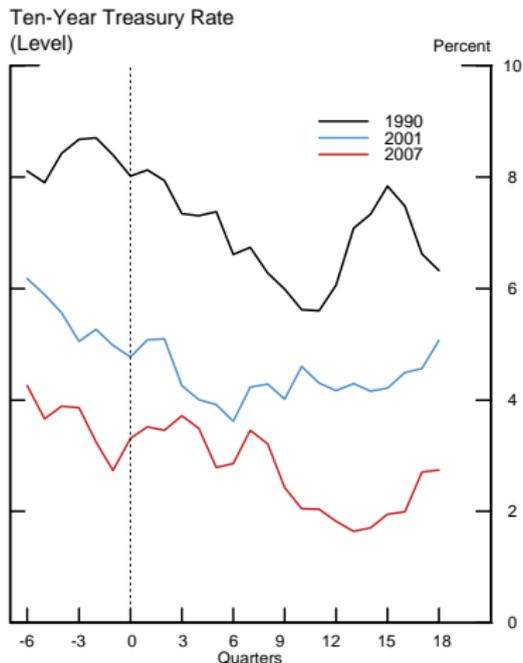
- We study ex ante credit risk taking by lenders of various types in the U.S. syndicated term loan market during the Zero Lower Bound (ZLB) period
- We contrast activities of banks with those of nonbank financial lenders to better distinguish between “search for yield when interest rates are low” and “banks’ advantage at screening when times are uncertain” hypotheses
- We find that nonbank lenders—investment banks and funds—acquire riskier credits in response to a decline in ten-year U.S. Treasury interest rates and to an increase in the expected severity of the ZLB period
- To the extent that the Federal Reserve contributed to interest rates being low, we point to a risk-taking channel of monetary policy which appears to operate through “search for yield”

# Distinguishing features of our approach

- We focus on **ex ante credit risk taking by bank and nonbank lenders** in the syndicated term loan markets in response to spot and forward interest rates
- We focus on **“returns on safer assets”** rather than “cost of funding” as a factor behind risk taking **over the ZLB period**
- We consolidate activities of immediate lenders to activities of **ultimate lenders** to address the “risk transfer issue”
- For each ultimate lender, we aggregate credits acquired in the primary and secondary markets into **gross additions** to mimic the “portfolio approach”
- We contrast activities of banks with those of nonbank lenders to better distinguish between **“search for yield”** and “banks’ advantage at screening” hypotheses

# The ongoing ZLB period—not a typical recovery

- Over the ZLB period, the ten-year U.S. Treasury rate has become a “target rate” and it has moved in a typically low range since the recession ended in 2009:Q2

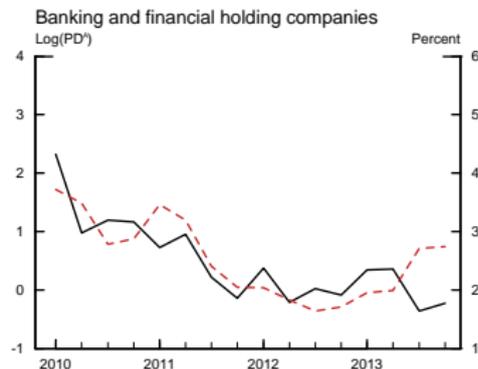
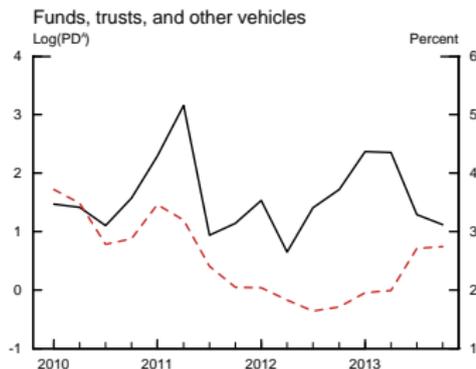
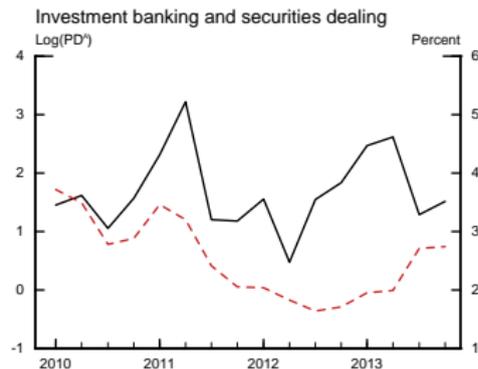
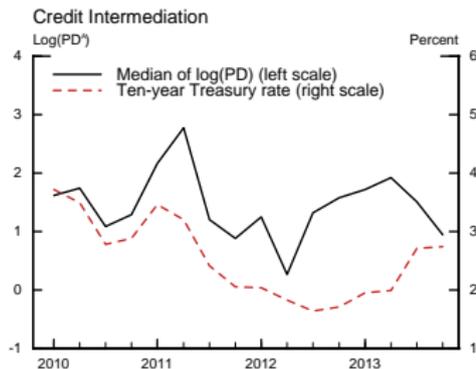


# Quarterly Shared National Credit (SNC) data

- We use data from the quarterly SNC program over the 2009:Q4-2013:Q4 period collected from “agent-arrangers”
- Nearly \$1 trillion in term loans outstanding
- For each credit, credit risk is measured by Basel II-consistent through-the-cycle probabilities of default (PDs) reported by “agent-arrangers”
- For each ultimate lender, we compute weighted-average PDs of gross additions

Lender Type (by NAICS codes)	Count	Pct of Loans	Median PDs	Gross additions \$bill. in '13:Q4
Nondepository intermediaries	765	8.6	3.89	20
Investment banking, sec. dealing	2537	12.7	4.52	10
Funds, trusts, and other vehicles	6930	36.5	4.04	30
Bank and financial holding comp.	1169	38.6	1.00	40
Other lenders	928	3.5	3.89	3

# Gross additions' PDs by lender type (most active lenders)



Note: Medians of gross additions'  $\log(pd_{i,t}^A)$  for each type shown

# Model #1: The specification

- For each ultimate lender ( $i$ ) in each quarter ( $t$ ), we model **the weighted-average PD of gross additions** ( $pd_{i,t}^A$ )

$$\log(pd_{i,t}^A) = \alpha_i + \sum_{j \in J} l_{i,j} \beta_j T_t + \sum_{j \in J} l_{i,j} X_t \gamma_j + q_{j,y} + \varepsilon_{i,t}$$

- $l_{i,j}$  an indicator for belonging to lender type  $j$  based on  $i$ 's NAICS code;  $T_t$  is **the ten-year U.S. Treasury rate**;  $X_t$  other macro/financial variables;  $\alpha_i$  is an  $i$ 's fixed effect and  $q_{j,y}$  is a lender type-year fixed effect
- $\beta_j$ s capture the **sensitivity of risk taking to changes in  $T_t$**
- A risk taking channel of monetary policy:  $H_0: \beta_j s < 0$

# Model #1: The results on an ultimate lender basis

	all lenders	most active
Nondepository intermediaries	-0.581**	-0.493
Investment banking, securities dealing	-0.642***	-0.917***
Funds, trusts, other vehicles	-0.533***	-0.678***
Bank and financial holding companies	-0.057	-0.165
Other lenders	-0.490**	-0.349
Error clustering	by quarter	by quarter
Num. of lenders	8161	300
R-sq. overall	0.53	0.41

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , other regressors not shown

- RHS variables not shown: high-yield CDX, the spread of EU sovereign yields, Variance Risk Premium, expected inflation
- Marginal effects: for funds, a one pp decrease in the interest rate results in a two pp increase in gross additions' PDs
- Same results for a sample of loans to foreign borrowers only

# Model #1: The results on an altern. ultimate lender basis

	all lenders	most active
U.S. nondepository intermediaries	-0.524*	-0.502
Foreign nondepository intermediaries	-0.796***	-0.455
U.S. investment banking, securities dealing	-0.617**	-0.974***
Offshore investment banking, securities dealing	-0.933***	-0.864**
Foreign investment banking, securities dealing	-0.367*	-0.485
U.S. funds, trusts, other vehicles	-0.537**	-0.637**
Offshore funds, trusts, other vehicles	-0.634***	-0.922***
Foreign funds, trusts, other vehicles	-0.297**	-0.382*
U.S. bank and financial holding companies	-0.243*	-0.577**
Foreign bank and financial holding companies	0.090	0.143
Error clustering	by quarter	by quarter
Num. of lenders	8161	300
R-sq. overall	0.53	0.41

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , other regressors not shown

- U.S. B&FHCs' risk-taking sensitivity to U.S. Treasury rates is likely due to sensitivities of their nonbank subsidiaries

## Model #2: The results for orthogonalized interest rates

- To address endogeneity concerns: regressions with interest rates orthogonal to macro and financial developments (think of residuals from a Taylor rule)

	all lenders	most active
Nondepository intermediaries	-0.846***	-0.909**
Investment banking, securities dealing	-0.803***	-1.151***
Funds, trusts, other vehicles	-0.790***	-0.981***
Bank and financial holding companies	-0.318	-0.410
Other lenders	-0.220	-0.413*
Error clustering	by quarter	by quarter
Num. of lenders	8161	300
R-sq. overall	0.50	0.32

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

- One cannot construct a true orthogonal interest rate

## Model #3: The results for latent credit risk factors

- To address endogeneity concerns: The PDs of outstanding portfolios act as controls for a latent credit risk factor
  - $pd_{i,t}^O$  is the average PD of a lender  $i$ 's existing portfolio
  - A change in  $pd_{i,t}^A/pd_{i,t}^O$ —a new LHS variable—indicates a change in investment strategy of a lender  $i$

	all lenders	most active
Nondepository intermediaries	-0.527***	-0.334
Investment banking, securities dealing	-0.663***	-0.824***
Funds, trusts, other vehicles	-0.581***	-0.655***
Bank and financial holding companies	0.054	-0.121
Other lenders	-0.398	-0.192
Error clustering	by quarter	by quarter
Num. of lenders	5586	290
R-sq. overall	0.35	0.29

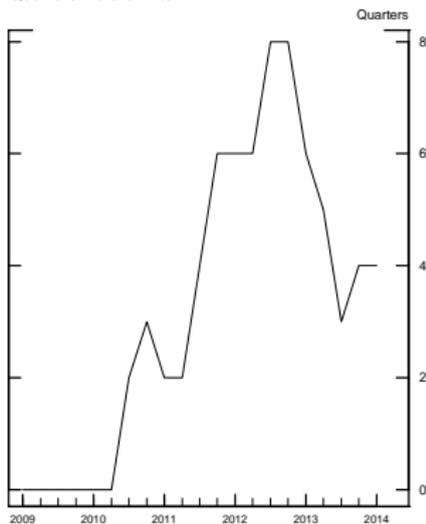
\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , other regressors not shown

- This setup also works for a “portfolio rebalancing” story

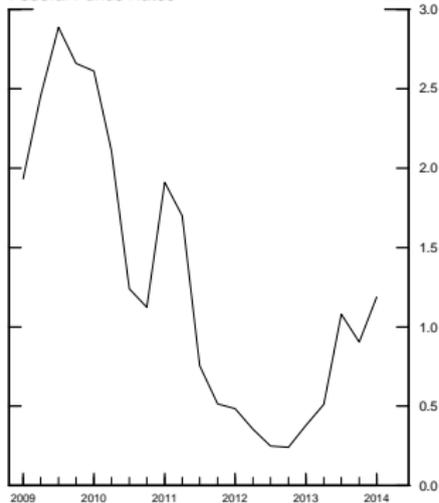
# Forward guidance and ex ante credit risk taking

- Longer-term rates =  $E(\text{string of short-term rates}) + \text{premia}$
- The Federal Reserve's policies are shown to affect rates' expectations, hence we examine risk-taking sensitivity to:
  - The three-year forward ten-year U.S. Treasury rates (skipped)
  - The expected time to the liftoff of the federal funds rate (left)
  - The steepness of the expected federal funds rate path (right)

Quarters Before Liftoff



Spread Between the Expected and Current Federal Funds Rates



# Model #1: The results for the time to the liftoff

- Model #1: The same LHS—average PD of gross additions,  $\log(pd_{i,t}^A)$ , but a new regressor—the market-expected time to the liftoff of the federal funds rate
- $\beta_j > 0$  indicates risk taking in response to the time to the liftoff

	all lenders	most active
Nondepository intermediaries	0.217**	0.187
Investment banking, securities dealing	0.213***	0.324***
Funds, trusts, other vehicles	0.153***	0.237***
Bank and financial holding companies	0.041	0.04
Other lenders	0.073**	0.121
Error clustering	by quarter	by quarter
Num. of lenders	8161	300
R-sq. overall	0.52	0.41

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , other regressors not shown

# Model #1: The results for the steepness of the rate path

- Model #1: The same LHS—average PD of gross additions,  $\log(pd_{i,t}^A)$ , but a new regressor—the steepness of the market-expected federal funds rate path
- $\beta_j < 0$  indicates risk taking in response to the steepness of the rate path

	all lenders	most active
Nondepository intermediaries	-0.342**	-0.275
Investment banking, securities dealing	-0.349**	-0.491**
Funds, trusts, other vehicles	-0.280**	-0.363**
Bank and financial holding companies	0.087	-0.007
Other lenders	-0.330*	-0.349*
Error clustering	by quarter	by quarter
Num. of lenders	8161	300
R-sq. overall	0.52	0.40

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , other regressors not shown

# Conclusions

- Nonbank lenders—investment banks and funds—acquire riskier credits in response to a decline in U.S. Treasury rates and to an increase in the expected severity of the ZLB period
- As the Federal Reserve contributed to interest rates being low, we point to a risk-taking channel of monetary policy which appears to operate through search for yield
  - Pressures to produce returns amid “fixed costs” matter
- Risk taking by larger, more sophisticated lenders is more sensitive to interest rates
- Generalization of the results is subject to caveats
  - For funds, true “ultimate ownership” is not known
  - Lenders may mitigate risk taken in the syndicated loan market
  - Favorable pricing of risky credits may help cushion losses
- Benefits of higher liquidity and provision of credit attributable to monetary policy have not been evaluated