

# Loan ownership and liquidity in the secondary loan market

**João Santos**

Federal Reserve Bank of New York & Nova School of Business and Economics  
and

**Pei Shao**

University of Lethbridge

The views stated herein are those of the authors and are not necessarily the views of the Federal Reserve Bank of New York, or the Federal Reserve System

# Motivation (1)

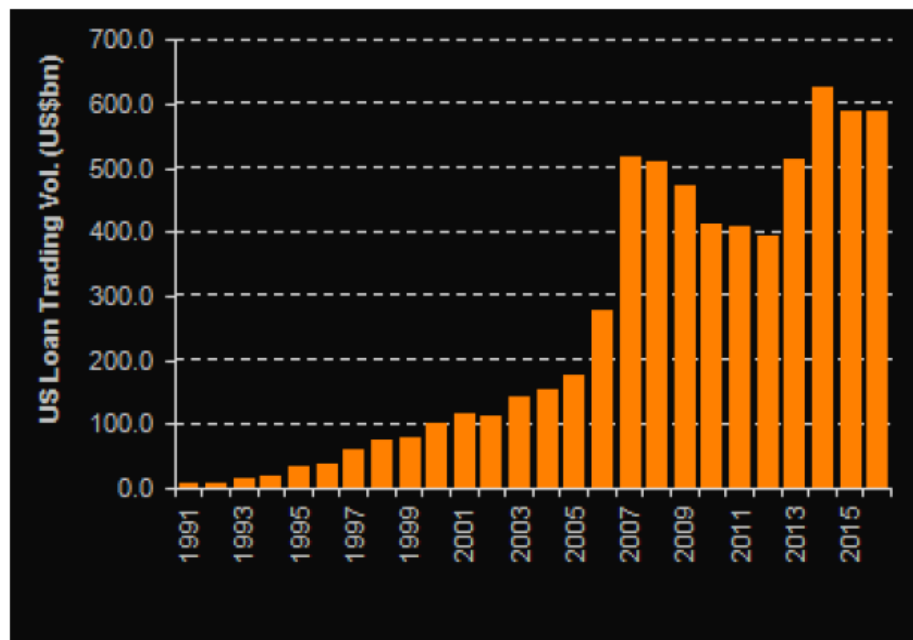
- A large body of literature on the impact of equity ownership on stocks' liquidity. Focus on the impact of informed investors such as insider, and institutional investors. (Chiang and Venkatesh, 1988; Sarin et.al., 2000; Denis and Weston, 2001; Liu, 2013, etc.)
- Growing literature on the impact of bond ownership on liquidity (Kedia and Zhou, 2009; Manconi and Massa, 2009).
- Lack of study on the loan market.

## Motivation (2)

- Data limitations precluded researchers from investigating issues related to the ownership structure of loans.
- We take advantage of a regulatory database, SNC (Shared National Credit) to capture the changes of the composite of syndicated lenders for loans that are traded on the secondary loan market in each year.

## Motivation (3)

- U.S. secondary loan market has been growing dramatically since 1990s. Trading volume increased from \$8 billion in 1991 to \$628 billion in 2014, representing a compound annual growth rate of 20.82%.



- Secondary loan market provides unique opportunity to investigate issues related to the liquidity impact of the ownership structure.

# Main Objectives

- We capitalize on the secondary loan market setting and the data from Shared National Credit (SNC) program to investigate:
  - Impact of informed investors on loan liquidity
  - Impact of investor diversity on loan liquidity

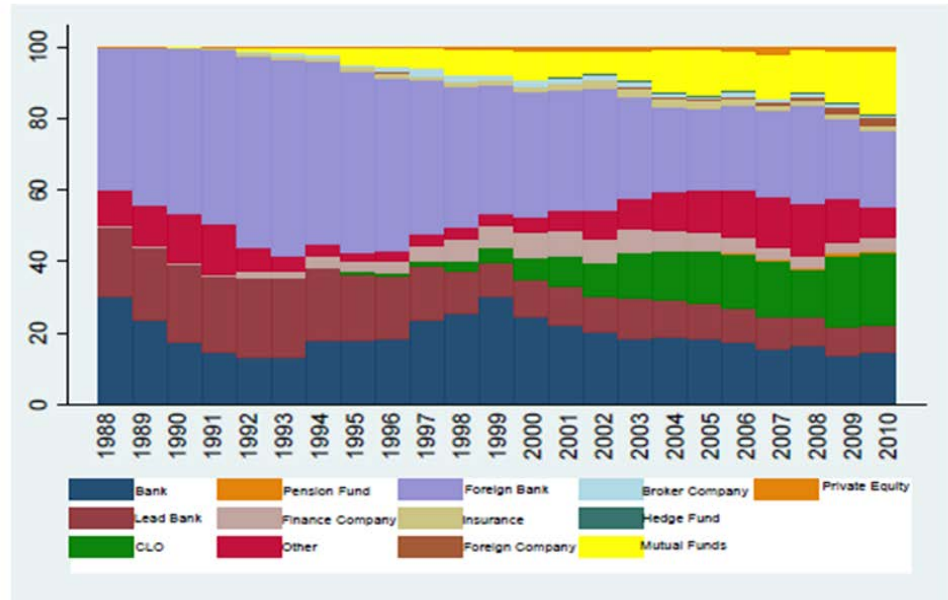
# Informed Investors and Loan Liquidity (Theory)

- Informed investors in loan syndicates: Lead arrangers.
- Bid-ask Spread theories
  - Copeland and Galai (1983) and Glosten and Milgrom (1985): presence of informed traders impairs liquidity.
  - Admati and Pfleiderer (1988) and Holden and Sbrahmanyam (1992): when multiple informed investors compete this improves liquidity.

# Investor Diversity and Loan Liquidity

- The syndicated loan market attracted a broad variety of investors, including CLOs, mutual funds, hedge funds, pension funds, brokers, pension funds, brokers, and private equity firms (Bord and Santos 2012).

Figure 1: Total Share of Lender Types in Term Loans



Note: This figure shows the percentage contribution of each lender type in the total term loan amount. We sum up the amount of all term loans originated by a given lender type per year and divide it by the total term loan amount (in %).

- These investors trade for a variety of reasons, when compared to the earlier market, where banks and insurance companies mostly tended to buy and hold the loans.

# Investor Diversity and Loan Liquidity (Theory)

- An accepted view in social sciences is that diverse teams win because they can draw from larger cognitive repertoires.
- In diverse markets, traders are more likely to scrutinize others' behavior and less likely to assume others' decisions are reasonable. (Hong and Page 2004)
- In homogeneous markets, traders place greater confidence in the actions of the others; they are more likely to accept their coethnics' decisions as reasonable, and therefore more likely to act alike. (Levine, et.al., 2014)



# Preview of the Main Results

- We find two important results:
  - Presence of the loan arranger among its investors is associated with a higher bid-ask spread.
  - Higher diversity among loan investors is associated with lower bid-ask spreads.
- These results are quite robust.
- However, while our result on investor diversity is robust to borrower-year fixed effects (accounting for loan selection issue), our finding on the presence of the arranger among loan investors is not.
- Not all investors contribute to the liquidity of term loans.
  - hedge funds and pension funds have a positive effect on liquidity
  - banks and insurance companies have the opposite effect.

# Data Sources

- We use LSTA/LPC to identify syndicated loans that are traded and to get mark-to-market pricing on these loans.
- We use the SNC database to identify the portfolio of investors for each loan and to track changes in this portfolio on an annual basis.
- We use Moody's Structured Finance Default Risk Service Database, the Intex Agency CDO deal library, and Standard and Poor's Capital IQ to identify CLOs.
- We use Capital IQ database to identify private equity firms, hedge funds, and mutual funds among the syndicate participants.
- We obtain firm loan-year panel data.

# Sample

- We start out with all **term loans** with the secondary loan market data in the LSTA/LPC database over the 1998-2014 time period.
- Next, we merge these loans with SNC.
- This leaves us with a sample of 3,044 term loans from 1,805 corporations for a total of 6,084 loan-year observations.
- 751 corporations have more than one loan trading at a given year.
- In about 65% of loan-year, lead arranger is present in the loan syndicate, the rest of the loan-year, there is no lead lender presence.

# Methodology and Measures (1)

$$\begin{aligned} & BID - ASK_{l,b,t} \\ & = \alpha ARRANGER_{l,b,t-1} + \beta ARRANGERSH_{l,b,t-1} \\ & + \gamma DIVERSITY_{l,b,t-1} + \delta SYNDICATES_{l,b,t-1} + \theta LOAN_{l,b,t} \\ & + \varphi BORROWER_{l,b,t-1} + Time\ Effects + \varepsilon_{l,b,t} \end{aligned}$$

## Informed Investors:

- **ARRANGER:** Dummy variable indicating whether the arranger retains a loan investment.
- **ARRANGERSH:** Loan share held by lead arranger.

# Methodology and Measures (2)

## Investor Diversity:

- LINVESTORS: log of total number of investors in the syndicate.
- LTURNOVER: log of total number of new investors that joined the loan syndicate.
- TYPES: number of different types of investors in the syndicate
- HHI: Herfindahl-Hirschman index of the sum of the squared loan shares for each lender type.

# Baseline Results: ownership and market liquidity

Table 2. Loan ownership and secondary market liquidity<sup>a</sup>

Variables	1	2	3	4	5
ARRANGER	0.083** (2.34)	0.088** (2.48)	0.069 (1.41)	0.078** (2.20)	0.088** (2.47)
ARRANGERSH	-0.322** (-2.51)	-0.665*** (-4.58)	-0.934*** (-4.58)	-0.595*** (-4.37)	-0.445*** (-3.18)
LINVESTORS		-0.112*** (-5.97)			
LTURNOVER			-0.192*** (-8.05)		
TYPES				-0.037*** (-6.38)	
HHI					0.266** (2.20)

In addition, we control for number of dealers, borrower credit rating, loan size, time to maturity, loan rating by lead arranger, loan purposes, and year fixed effects.

# Loan Ownership and Market Liquidity: when arrangers act as dealers

Table 3. Liquidity effects of arranger presence in the syndicate<sup>a</sup>

Variables	1	2	3	4
ARRANGER	0.083** (2.34)	0.070* (1.96)	0.094 (1.22)	0.010 (0.15)
ARRANGERSH	-0.322** (-2.51)	-0.335*** (-2.61)	-1.657*** (-2.81)	-1.077*** (-2.62)
NOTDEALER		0.232*** (3.44)	0.320** (1.97)	0.307* (1.77)
NOTDEALER x ARRANGER			-0.158 (-0.89)	-0.216 (-1.19)
NOTDEALER x ARRANGERSH			1.841*** (2.71)	1.150** (2.34)

# Additional tests: Account for Selection Issue (Borrower-Year Fixed Effects)

Panel C: Borrower-year fixed effects

ARRANGER	0.083 (1.30)	0.067 (1.04)	0.111 (1.29)	0.067 (1.05)	0.081 (1.24)
ARRANGERSH	0.217 (0.64)	0.035 (0.10)	0.126 (0.30)	0.140 (0.41)	0.178 (0.49)
LINVESTORS		-0.116** (-2.49)			
LTURNOVER			-0.023 (-0.36)		
TYPES				-0.023** (-2.18)	
HHI					0.165 (0.56)



# Additional tests

- Additional controls (loan price, distinguish young from old loans)
- Restrict sample to homogeneous term loan A subsample
- Control for the loan fixed effects.
- Control for arranger fixed effects
- Design a two-stage test using liquidity from the bond market
  - Control for the bond liquidity in the first stage
  - Investigate how investor diversity affects errors from first stage
- Account for Reverse Causality: Does investor diversity improve liquidity or does liquidity entice investor diversity?
- Two ways:
  - First, check if results hold throughout the life of the loan.
  - Second, put diversity on the left hand side and see if it is explained by prior liquidity.

# Are all investors liquidity friendly?

Variables	1	2	3	4
ARRANGER	0.068 (1.22)	0.074 (1.34)	0.076 (1.38)	0.069 (1.25)
ARRANGERSH	-0.682** (-2.32)	-0.749** (-2.51)	-0.728** (-2.43)	-0.722** (-2.43)
LINSTITUTIONAL	0.360*** (3.91)			
LASSETMAN	-0.098*** (-2.99)			
LBANKS		0.181** (2.24)	0.194** (2.43)	
LINSURANCE		0.176** (2.23)	0.191** (2.37)	0.190** (2.38)
LFINANCE		0.084 (1.45)	0.080 (1.36)	0.075 (1.29)
LBROKERS		-0.100 (-1.61)	-0.082 (-1.32)	-0.086 (-1.38)
LPRIVEQUITY		-0.019 (-0.27)	-0.031 (-0.45)	-0.034 (-0.50)
LFUNDS		-0.157** (-2.50)		
LCLOS		0.004 (0.08)	-0.015 (-0.30)	-0.015 (-0.31)
LMUTUAL			-0.098 (-1.59)	-0.094 (-1.54)
LPENSION			-0.109* (-1.65)	-0.111* (-1.71)
LHEDGE			-0.238*** (-2.82)	-0.234*** (-2.77)
LDBKS				0.160* (1.91)
LFBKS				0.081 (1.28)

# Final remarks (1)

- Some evidence that the presence of lead arranger negatively affects loan liquidity. When arranger is not dealer of the loan, the more the arranger holds, the less liquid the loan is.
- Strong supporting evidence that diversity among investors is beneficial to liquidity.
- Not all investors contribute positively to liquidity.
  - Asset managers vs. other institutions.

## Final remarks (2)

- Our finding on the liquidity effect of the presence of the arranger among loan investors highlights a novel tradeoff.
  - There is a widespread belief that bank monitoring of borrowers is valuable and it is critical for arrangers' monitoring incentives that these banks retain a portion of the loan throughout the life of the loan.
  - Our finding suggests that this mechanism may come at a cost of reducing the liquidity of that loan in the secondary market.
  - Deepening our understanding of this tradeoff would seem to be a fruitful area for future research.
- Our finding on the liquidity effect of investor diversity highlights a benefit of non-bank investors' increased participation in the loan market, but this may come at a cost (e.g. lower ability to renegotiate loans, Paligorova and Santos 2017).