Ownership Concentration and Performance of Deteriorating Syndicated Loans[1]

Mariassunta Giannetti Stockholm School of Economics, CEPR & ECGI
Ralf R. Meisenzahl Federal Reserve Bank of Chicago

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[1] The views expressed here are those of the author and do not necessarily reflect the views of the Board of Governors, Federal Reserve Bank of Chicago, or staff of the Federal Reserve System.

Motivation I

After the global financial crisis, regulations have shifted credit risk from banks to institutional investors (e.g., IMF, 2020)

Concerns about secondary credit markets have focused on frictions arising from regulation and capital constraints on banks and collateralized loan obligations (CLOs) (Financial Stability Board 2019; Kothari et al. 2020)

- Forced sales caused by regulation can spread across *financial intermediaries* and generate contagion
- as well as illiquidity and price drops in secondary credit markets

Motivation II

Do new owners have incentives and skills to cure the loans after sales prompted by regulation?

The possibility that initial shocks to credit quality may be amplified has been neglected

Potentially important

- Loans are renegotiated multiple times especially following shocks to the borrower's financial health (Roberts 2015; Roberts and Sufi 2009)
- Renegotiation positively affects the subsequent performance of the borrower (Chava and Roberts 2008; Chodorow-Reich and Falato, 2021)

This Paper

How does the syndicate structure evolve following negative shocks to credit quality?

- Do regulated intermediaries sell?
- Who buys?

Any effects on ownership concentration?

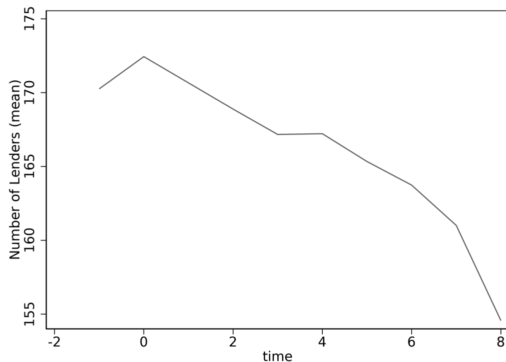
- More concentrate ownership of the outstanding debt would give creditors stronger incentives for efficient renegotiation (Bolton and Scharfstein, 1996)

Does the structure of the syndicate affect the loan subsequent performance?

- Exploiting (exogenous) financial constraints of the new specialized buyers

The Paper's Findings in a Figure

Figure: Concentration Changes after Downgrades



Main Findings

- Banks and CLOs sell loans that have been downgraded–as is consistent with the regulations they are subject to
- Mutual funds and hedge funds are the most likely buyers of loans especially at early stage of distress
- The concentration of loans in distress increases if potential buyers are not subject to financial constraints
- Higher concentration is related to better loan outcomes ex post

Related Literature I

Secondary loan markets and unintended consequences of regulatory constraints

- Banks exited syndicates when their wholesale funding dried up (Irani and Meisenzahl, 2017) and in general sell when they are short of capital (Irani, Iyer, Meisenzahl Peydro, 2021)
- CLOs also experience regulatory constraints and are forced to sell after downgrades or in the anticipation of downgrades (Loumioti and Vasvari, 2019)
- Evidence of fire sales in the secondary loan market (Elkamhi and Nozawa, 2020; Kundu, 2020; Nicolai, 2020)

Related Literature II

Creditor types and creditor concentration in bankruptcy

- **Theory** Bolton and Scharfstein (1996)
- **Empirics** Vulture funds (Hotchkiss and Mooradian, 1997); Hedge funds (Jiang, Li, and Wang, 2012); Creditor concentration (Ivashina, Iverson, Smith, 2016)
  - Much smaller samples
  - No evidence that creditor concentration leads to more efficient outcomes
  - Most borrowers in our sample are still far from bankruptcy

Loan renegotiation

- Banks' inability to renegotiate hurts borrowers (Chava and Roberts, 2008; Chodorow-Reich and Falato, 2021)
- Focus on banks and their health

Our paper: What happens when banks exit?

Data

Shared National Credit Program (SNC)

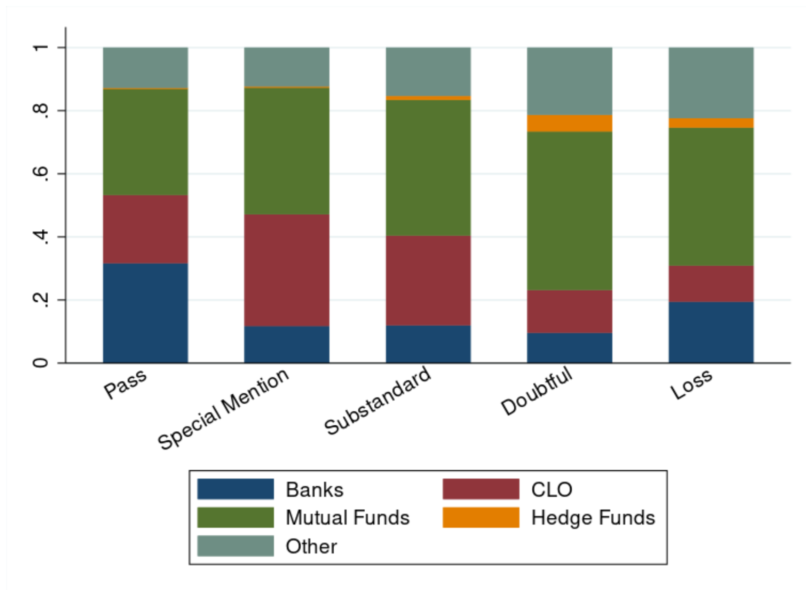
- Confidential regulatory register, maintained by the Federal Reserve System, the FDIC, and the OCC
- Loans over USD 100 million, extended by at least three regulated financial institutions (banks)
- Borrower's identity, date of origination, loan type
- Loan shares of different lenders and subsequent transactions, including non bank lenders at a quarterly frequency
- Our sample period 2009Q4-2019Q4; 12,013 loans

Regulatory Ratings

- **Pass**: The commitment is in good standing and is not criticized by supervisors in any way.
- **Special Mention**: The commitment has potential weaknesses that deserve the management's close attention. These potential weaknesses could result in further deterioration of the repayment prospects or of the institutions' credit position. However, the commitment does not expose institutions to sufficient risk to warrant an adverse rating.
- **Substandard**: The commitment is inadequately protected by the paying capacity of the obligor and/or of the collateral pledged. Substandard commitments have well-defined weaknesses that jeopardize the repayment of the debt and present the distinct possibility that the institution will sustain some loss if deficiencies are not addressed.
- **Doubtful**: The weaknesses make collection or liquidation in full, on the basis of available current information, highly questionable or improbable.
- **Loss**: Loan amounts should be promptly charged off. While this classification does not mean that there is no recovery or salvage value, it is not practical or desirable to defer writing off these commitments.

We also have (more detailed) agency ratings which we use to evaluate loans future performance

Credit Quality and Loan Ownership



Buyers of Deteriorating Loans

We estimate the following regression:

$$\begin{aligned} \text{Institution Purchase}_{ijt} =& \alpha_i + \theta_t + \beta_1 \text{ Special Mention}_{it-1} + \beta_2 \text{ Substandard}_{it-1} \\ &+ \beta_3 \text{ Doubtful}_{it-1} + \beta_4 \text{ Loss}_{it-1} + \gamma X_{it} + \epsilon_{ijt}, \end{aligned} \tag{1}$$

where Institution Purchase$_{ijt} j \in \{Bank, CLO, Mutual\ Fund, Hedge\ Fund\}$ is an indicator variable denoting the purchase of a share in loan i by institution j of a given type in quarter t; the dummy takes value equal to one if the institution of given type has increased its share of loan i at time t and is set equal to zero for buyers of other institution types, $-j$.

Buyers of Deteriorating Loans

	Bank (1)	Mutual Fund (2)	CLO (3)	Hedge Fund (4)
	Loan Share Purchases			
Special Mention	-0.00312**	0.0217***	-0.0286***	0.000880
	(0.00142)	(0.00583)	(0.00649)	(0.000742)
Substandard	-0.0000881	0.0320***	-0.0504***	0.00285**
	(0.00170)	(0.00725)	(0.00832)	(0.00118)
Doubtful	0.00640	-0.00601	-0.0125	0.000567
	(0.00432)	(0.0204)	(0.0278)	(0.00540)
Loss	-0.00944	-0.0353	0.0218	0.0104
	(0.0268)	(0.0362)	(0.0353)	(0.0152)
Loan FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
Arranger-Year FE	YES	YES	YES	YES
Industry-Year FE	YES	YES	YES	YES
Observations	666543	666543	666543	666543
R^2	0.285	0.119	0.116	0.045

Largest Owners

	(1) Bank	(2) CLO	(3) Mutual Fund	(4) Hedge Fund
Downgrade	-0.0101***	0.00177	0.00736**	0.000436
	(0.00274)	(0.00152)	(0.00317)	(0.000452)
Loan FE	Yes	Yes	Yes	Yes
Lead-Year FE	No	Yes	Yes	Yes
Industry-Year FE	No	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	118110	118110	118110	118110
R^2	0.846	0.719	0.811	0.729

Do new buyers have incentives to avoid further deterioration of the loan?

	(1)	(2)	(3)	(4)	(5)
	Log Number of Lenders		Top 10	Max Share	HHI
Downgrade	-0.0130***	-0.0149***	0.00347***	0.00277***	25.62***
	(0.00220)	(0.00214)	(0.000486)	(0.000481)	(4.015)
Loan FE	Yes	Yes	Yes	Yes	Yes
Lead-Year FE	No	Yes	Yes	Yes	Yes
Industry-Year FE	No	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
N	118119	118110	118110	118110	118110
R^2	0.99	0.99	0.98	0.98	0.98

Average number of syndicate members 72; median 8.

Loan Characteristics and Concentration Following Downgrades

Concentration appears to increase to a larger extent when bankruptcy costs and gains from renegotiations would be higher:

- Loans in industries with high cash flow volatility
- with low asset tangibility
- with high R&D
- low leverage

Concentration increases more when the lead bank's share (current or at origination) is lower

Syndicate Concentration and Loan Outcomes

- Does higher syndicate concentration improve loan outcomes?
- Under what conditions?
- Endogeneity problem: Lenders may be more inclined to concentrate the loan ownership if they expect favorable loan outcomes

Potential Lenders' Financial Constraints

Lenders that have experienced downgrades in unrelated parts of their portfolios are likely to be financially constrained

Instrument:

$$\text{Share Lender Downgrade}_{It} = \frac{\text{Number of Lenders with Downgrades}_{-It}}{\text{Total Number of Lenders}_t}$$

Unrelated parts of the portfolio: For a loan in industry I downgrades in other two-digit SIC industries $-I$

- Kempf, Manconi and Spalt (2017) use a similar instrument to study how institutions' ability to monitor affects performance.

Financial Constraints and the Secondary Syndicated Loan Market

Financial constraints limit the extent to which ownership is reallocated

	(1) Buy	(2) Increase	(3) Sale	(4) Decrease
Downgrade Share	-3.910***	-0.127**	-3.560***	0.00129
	(0.513)	(0.0580)	(0.364)	(0.0513)
Lead-Year FE	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	9603150	9603150	9603150	9603150
R^2	0.014	0.003	0.022	0.004

Does the Candidate Instrument Satisfy the Exclusion Restriction?

Consider loans that have not been downgraded:

- Lending concentration should matter less for non problematic loans' outcomes
- The exclusion restriction is satisfied if $DowngradeShare_{It}$ does not predict unproblematic loans' outcomes

	Refinance (1)	Amendment (2)	Amount Change (3)	Downgrade (4)	Notches Downgraded (5)	60 Days Past Due (6)
Downgrade Share	0.00380	0.00236	0.0181	0.0303	-0.0332	0.00167
	(0.00545)	(0.0117)	(0.0210)	(0.0327)	(0.133)	(0.00445)
Log Loan Size	0.000324	-0.00104*	-0.0397***	0.00206	0.0136**	0.000400*
	(0.000292)	(0.000597)	(0.00200)	(0.00156)	(0.00546)	(0.000225)
Arranger FE	YES	YES	YES	YES	YES	YES
Industry-Year FE	YES	YES	YES	YES	YES	YES
S&P Rating FE	YES	YES	YES	YES	YES	YES
Loan Age FE	YES	YES	YES	YES	YES	YES
Observations	100634	100634	100634	25075	25075	100634
R^2	0.444	0.083	0.081	0.262	0.688	0.026

Loan Ownership Concentration and Outcomes

	(1) Refinance	(2) Amendment	(3) Amount Change	(4) Pos. Amount Change	(5) Neg. Amount Change	(6) Downgrade	(7) Notches Downgraded	(8) No Further Reg Downgrade
Number of Lenders	-0.000962**	-0.00580**	0.00126	0.00471***	-0.00345**	0.00773**	0.0211**	-0.00372*
	(0.000453)	(0.00258)	(0.00167)	(0.00163)	(0.00155)	(0.00303)	(0.00922)	(0.00226)
Log Loan Size	0.0594**	0.365**	-0.102	-0.305***	0.202**	-0.525**	-1.453**	-0.241*
	(0.0291)	(0.166)	(0.107)	(0.104)	(0.0999)	(0.204)	(0.624)	(0.145)
First Stage								
Downgrade Share	24.464***	24.464***	24.464***	24.464***	24.464***	30.267***	30.247***	24.464***
	(6.252)	(6.252)	(6.252)	(6.252)	(6.252)	(11.107)	(11.107)	(6.252)
Log Loan Size	64.356***	64.356***	64.356***	64.356***	64.356***	67.926***	67.926***	64.356***
	(1.535)	(1.535)	(1.535)	(1.535)	(1.535)	(2.174)	(2.174)	(1.535)
Arranger FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry-Year FE	YES	YES	YES	YES	YES	YES	YES	YES
S&P Rating FE	YES	YES	YES	YES	YES	YES	YES	YES
Loan Age FE	YES	YES	YES	YES	YES	YES	YES	YES
F-Statistic	15.31	15.31	15.31	15.31	15.31	7.42	7.42	15.31
Observations	29030	29030	29030	29030	29030	13821	13821	29030

Ownership Concentration and Top Owners

	(1) Bank	(2) Not Bank
Number of Lenders	-0.000635	-0.000969*
	(0.000690)	(0.000502)
Log(Amount)	0.0197	0.0662*
	(0.0211)	(0.0361)
First Stage		
Downgrade Share	24.178***	25.703***
	(9.988)	(7.651)
Log Loan Size	30.542***	71.926***
	(2.229)	(1.734)
Arranger FE	Yes	Yes
Industry-Year FE	Yes	Yes
Rating FE	Yes	Yes
quarters	Yes	Yes
F-Statistic	5.86	11.29
Observations	6576	22439

Conclusion

The exit of banks and CLOs after regulatory downgrades does not necessarily imply an amplification of the initial shock to credit quality

If unregulated institutional investors, such as mutual funds and hedge funds, are not financially constrained, they contribute to the concentration of the loan shares, which in turn helps to achieve better loan outcomes

Concerns arise if financial constraints hit all participants in the syndicated loan market