

Ownership Concentration and Performance of Deteriorating Syndicated Loans*

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Abstract

Regulation and capital constraints may force banks and collateralized loan obligations (CLOs) to sell deteriorating loans, potentially hampering renegotiation and amplifying the initial negative shock to the borrower. We show that banks and collateralized loan obligations (CLOs) sell downgraded loans to mutual funds and hedge funds. The reallocation of loan shares favors the syndicate's concentration increasing lenders' incentives to renegotiate. However, syndicates remain less concentrated when potential buyers experience financial constraints and subsequently loans are less likely to be amended and more likely to be downgraded even further. Our findings indicate that existing regulations may amplify shocks to credit quality during periods of generalized distress in the financial system.

JEL Classification: G21

Keywords: Debtor Concentration; Credit Quality; Leveraged Lending.

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1 Introduction

Following the Covid-19 shock, policymakers’ and academics’ concerns about the stability of the secondary loan market have focused on how financial frictions, arising from regulation and capital constraints of banks and collateralized loan obligations (CLOs), may cause shocks to spread across borrowers and lenders ([Financial Stability Board 2019](#); [Kothari et al. 2020](#)). It has been somewhat neglected that the same frictions could amplify the effects of negative shocks to credit quality further undermining the resilience of the credit market to negative shocks.

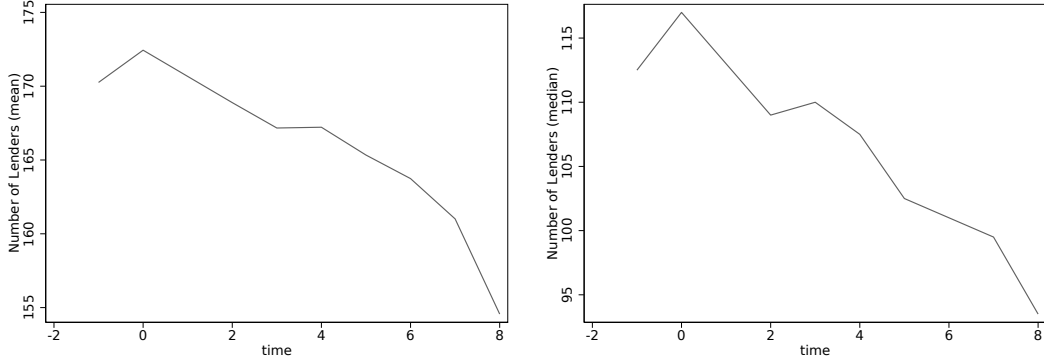
The reason is that loans are typically renegotiated multiple times following changes in borrowers’ financial health or increased uncertainty on their credit quality ([Roberts 2015](#); [Roberts and Sufi 2009](#)). Renegotiation is particularly important when negative shocks occur and borrower credit quality deteriorates because covenants, which are set very tightly ex ante, are renegotiated ex post to avoid further deterioration in the borrowers’ performance ([Chava and Roberts 2008](#)). Renegotiation may be particularly important for loans that are traded in the secondary market, which have been shown to impose particularly restrictive ex ante conditions on borrowers ([Drucker and Puri 2008](#)) and is believed to be typically led by banks ([Beyhaghi, Nguyen, and Wald 2019](#)). Unfortunately, banks and CLOs, which hold over half of the outstanding syndicated loans, have regulatory incentives to sell deteriorating loans rather than engaging with the borrowers. This can potentially amplify the initial shock to the borrower’s credit quality if the new buyers lack the skills and incentives to renegotiate and monitor the loan. Understanding how the financial system deals with deteriorating loans is therefore crucial.

Existing literature provides limited evidence on how the syndicate structure evolves following negative shocks to credit quality and which lenders purchase deteriorating loans in the secondary market. Documenting under what conditions initial shocks to credit quality are amplified is important to understand the resilience of the secondary loan market. Identifying the buyers of deteriorating loans, whether they have incentives to renegotiate, and the extent to which they also face financial frictions are necessary first steps in this direction.

We explore how the ownership structure of syndicated loans evolves following their regulatory ratings’ downgrades. We find that mutual funds and hedge funds replace

Figure 1: Concentration Changes after Downgrades

This figure shows the evolution of the mean and median number of lenders in loans after a downgrade to “Substandard”, which occurs well before to default.



banks and CLOs when the quality of the loan deteriorates. These intermediaries appear to be specialized in holding claims of borrowers with relatively low credit quality and purchase the claims from many sellers.

In principle, being unregulated, mutual funds and hedge funds could simply profit from purchasing at fire sales prices from intermediaries subject to capital and other regulatory constraints. By holding diversified portfolios, they could profit from the undervaluation of the distressed assets they purchase, even if the initial shock to the borrower’s credit quality is amplified.

We find that while a few mutual funds and hedge funds enter the syndicate, others increase their existing loan shares. Ultimately, the syndicate’s concentration increases after a regulatory downgrade, as shown in Figure 1. Creditor concentration in turn is expected to give lenders stronger incentives to renegotiate efficiently, because any negative externalities are more likely to be internalized, as suggested by the theory of [Bolton and Scharfstein \(1996\)](#) in the context of bankruptcy.

We investigate whether a concentrated structure indeed favors renegotiation and results in better loan outcomes. However, establishing causality is challenging because shadow intermediaries are likely to anticipate loan outcomes and to be unwilling to become too exposed to borrowers with worse outlooks.

To establish the direction of causality, we exploit exogenous variation in intermediaries’ financial constraints arising from shocks to parts of these intermediaries’ portfolios

in industries that are unrelated to the specific loan we consider. The intuition is that in periods of distress in unrelated industries there are many loan shares for sales. Not only can intermediaries specialized in distressed loans be choosy on which loans to purchase, but having experienced the deterioration of other portfolio loans, they may face redemptions and not have the capacity to deal with a large number of loans in distress. Put differently, intermediaries that typically purchase deteriorating loans may have limited financial capacity to purchase more shares of deteriorating loans and to concentrate their ownership. Thus, the syndicated loans of borrowers whose quality deteriorates remain less concentrated when potential buyers experience large negative shocks to other parts of their portfolios.

We provide evidence supporting the identifying assumption that shocks to unrelated industries' loans in the portfolios of potential buyers do not predict the outcomes of other loans that are not downgraded and whose future performance does not depend on the creditor concentration, after controlling for macroeconomic and lender specific shocks using high-dimensional fixed effects. We can thus exploit shocks to unrelated industries to generate exogenous variation in potential buyers' ability to concentrate the loan due to financial constraints. We show that loans with more disperse ownership are less likely to be amended and that subsequently borrowers' quality is more likely to further worsen.

To the best of our knowledge, this is the first paper to explore the secondary market for deteriorating loans before a borrower enters bankruptcy. Existing literature documents that lead banks retain larger shares in loans to informationally opaque borrowers ([Sufi 2007](#)). We show that negative shocks to credit quality are also associated with an increase in syndicate concentration. Some of the mechanisms we highlight have parallels with the changes in debt ownership of borrowers in distressed restructuring. Existing literature highlights that the outcome of bankruptcy is typically better if vulture funds become involved in management ([Hotchkiss and Mooradian 1997](#)) or if hedge funds participate in the Chapter 11 process ([Jiang, Li, and Wang 2012](#)). [Ivashina, Iverson, and Smith \(2016\)](#) document that claims of companies in chapter 11 become more concentrated even though this process does not appear to improve distressed borrowers' outcomes. By considering deteriorating loans, which are not yet distressed, we examine a much larger sample of borrowers and show that syndicate concentration limits further deterioration

of loans in early phases of distress. We also highlight how specialized lenders’ financial constraints may lead to worse loan outcomes.

We also complement a growing literature exploring the consequences of asset sales by financial intermediaries. A strand of this literature studies the sales of loan shares by banks ([Irani and Meisenzahl 2017](#); [Irani et al. forthcoming](#)), and CLOs (e.g., [Loumioti and Vasvari \(2019\)](#); [Elkamhi and Nozawa \(2020\)](#)) in the secondary loan market. While existing studies focus on the financing conditions of these highly regulated intermediaries, we consider how changes in loan health affect syndicate composition and how the latter is related to the subsequent performance of the loan. By highlighting the positive role of mutual funds and hedge funds in curing shocks to credit quality, our paper highlights that existing regulations may have negative effects on borrowers only if periods of generalized distress in the financial system. This partially mitigates concerns of instability in the secondary loan market.

Finally, our results have implications for how the health of financial intermediaries affects loan outcomes. In this respect, our findings are related to [Chodorow-Reich and Falato \(forthcoming\)](#) who find that unhealthy banks use covenant violation to contract their credit supply. We show that not only can negative shocks increase the tightness of banks and CLOs regulatory constraints, but they may also impair hedge funds’ and mutual funds’ ability to purchase loan shares, worsening loan outcomes.

2 Data

Overview We use a quarterly confidential regulatory credit register, the Shared National Credit Program (SNC), maintained by the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation (FDIC), the Office of the Comptroller of the Currency, and, before 2011, the now-defunct Office of Thrift Supervision. Starting in 1997, regulators reviewed credits with minimum aggregate loan commitments totalling \$20 million or more that were shared by two or more regulated financial institutions (banks) through annual surveys of administrative agent banks. In 1998, the minimum number of regulated financial institutions was increased from two to three and in 2018, the minimum aggregate loan commitment threshold was increased to

\$100 million.¹ Following the 2007-08 Financial Crisis, the surveys are conducted quarterly.

The SNC provides loan-level information on the borrower’s identity, the date of origination and maturity, loan type (i.e., credit line or term loan), and a regulatory classification of loan quality that we describe in detail below. Most importantly, the data break out the loan syndicate membership, including nonbank lenders on a quarterly basis. Thus, over our sample period, we essentially observe the universe of loan shares, lenders, and any changes in ownership. We use this information to construct measures of loan ownership concentration and secondary market trading behavior.

Our sample includes 12,013 loans held by at least 3 supervised institutions in the U.S. between 2009Q4 and 2019Q4. We classify lenders as banks, CLOs, Hedge Funds, Mutual Funds, and other financial institutions based on the lender’s name using the algorithm described in [Cohen et al. \(2018\)](#).

Table 1 summarizes the main variables we use in the analysis.

Regulatory Ratings Since banks’ capital regulation relies on regulatory measures of credit quality, in our empirical analysis, we rely predominantly on regulatory ratings. Specifically, we use the following five regulatory ratings:²

- **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

¹The SNC data include loan packages containing two or more facilities (e.g., a term loan and a line of credit) issued by a borrower on the same date where the sum exceeds \$100 million. For annual regulatory reports, see <https://www.federalreserve.gov/supervisionreg/snc.htm>.

²For more details and definitions, see <https://www.federalreserve.gov/newsevents/pressreleases/files/bcreg20151105a1.pdf>

Table 1
Summary Statistics

This table presents the summary statistics for all variables used in the analysis.

	N	Mean	SD	25p	median	p.75
Lender Share Variables						
Bank Buy	666543	0.04	0.20	0	0	0
CLO Buy	666543	0.43	0.49	0	0	1
Mutual Fund Buy	666543	0.35	0.48	0	0	1
Hedge Fund Buy	666543	0.01	0.07	0	0	0
Special Mention	666543	0.09	0.29	0	0	0
Substandard	666543	0.10	0.30	0	0	0
Doubtful	666543	0.01	0.10	0	0	0
Loss	666543	0.01	0.03	0	0	0
Sale	8674486	0.09	0.29	0	0	0
Bank	8674486	0.06	0.23	0	0	0
CLO	8674486	0.35	0.48	0	0	0
Mutual Fund	8674486	0.36	0.32	0	0	0
Hedge Fund	8674486	0.00	0.05	0	0	0
Loan-Level Variables						
Number of Lenders	118119	72.07	151.74	4	8	62
Log Amount	118119	18.56	1.57	17.69	18.68	19.58
Maximum Share	118119	0.29	0.21	0.11	0.24	0.43
Top 10 Share	118119	0.80	0.29	0.58	1	1
Lender HHI	118119	2166.10	1927.98	519.69	1621.49	3400
Refinance	118119	0.01	0.11	0	0	0
Amendment	118119	0.04	0.18	0	0	0
Amount Adjustment	118119	0.15	0.36	0	0	0
Downgrade	35022	0.07	0.25	0	0	0
Notches Downgraded	35022	0.12	1.13	0	0	0
60 Days Past Due	118119	0.01	0.06	0	0	0
Special Mention	118119	0.06	0.24	0	0	0
Substandard	118119	0.07	0.26	0	0	0
Doubtful	118119	0.01	0.07	0	0	0
Loss	118119	0.01	0.07	0	0	0
Downgrade Share-other Lenders (SP and Sub)	118118	0.20	0.05	0.17	0.20	0.23
Downgrade Share-other Lenders (Any)	118118	0.21	0.06	0.18	0.21	0.24
Downgrade Share-Industry Lenders (SP and Sub)	118118	0.06	0.07	0.01	0.04	0.09
Downgrade Share-Industry Lenders (Any)	118118	0.06	0.07	0.01	0.04	0.10
MF/HF Downgrade Share (SP and Sub)	118118	0.21	0.06	0.16	0.22	0.24
MF/HF Downgrade Share (Any)	118118	0.22	0.06	0.19	0.22	0.25
MF Downgrade Share(SP and Sub)	118118	0.21	0.06	0.17	0.22	0.25
MF Downgrade Share (Any)	118118	0.22	0.06	0.20	0.23	0.5

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.

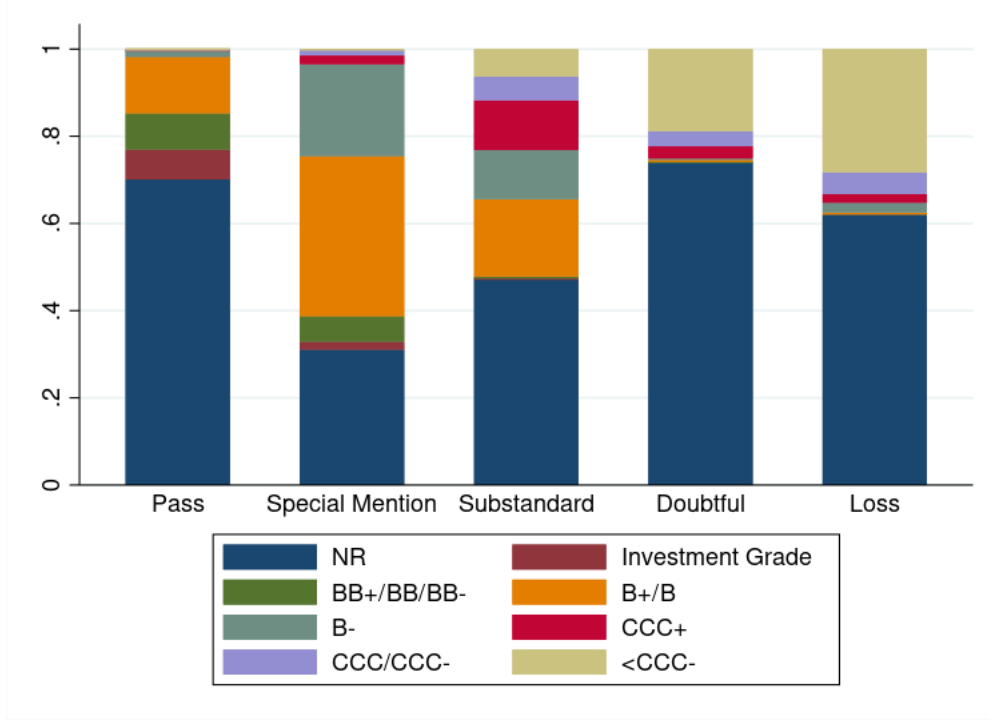
Banks with credits rated Substandard or worse are required to make loan-loss reserves of the following amounts: 20% (Substandard), 50% (Doubtful), and 100% (Loss) of the loan utilized exposure amount. Moreover, adverse ratings lead to higher probability of review in subsequent exams and heightened supervisory monitoring.³ These provisions eat in the banks' capital buffers and increase a bank's cost of holding the loan on its balance sheets. For this reason, we expect banks to be inclined to sell loans that have been rated Substandard or worse; banks may also sell Special Mention loans to avoid fire sale prices in case of further deterioration.

Even though they are not subject to as stringent capital requirements as banks, CLOs are also subject to regulations that limit their ability to hold onto deteriorating loans. These intermediaries are bankruptcy-remote special-purpose vehicles that facilitate the securitization of corporate loans by purchasing tranches of primarily senior secured leveraged loans and using these loans' cash flows as collateral to back the issuance of new securities (see [Loumioti and Vasvari \(2019\)](#)) for a more detailed description). CLOs are believed to add value by exploiting regulatory frictions and purchasing the tranches of loans that capital constrained banks sell ([Cordell, Roberts, and Schwert 2021](#)). However, they have to pass overcollateralization and interest rate coverage tests to cover, respectively, the principal and interest payments of the notes they issue. CLOs also face constraints aiming to ensure a certain portfolio quality. These tests are standardized across CLOs and are strongly influenced by credit rating agencies that require that the constraints are satisfied to provide certain target ratings for the CLO notes. The con-

³For details on the supervisory process and consequences, see [Ivanov and Wang \(2019\)](#).

Figure 2: Regulatory and Credit Agency Ratings

This figure shows the S&P rating distribution by regulatory rating.

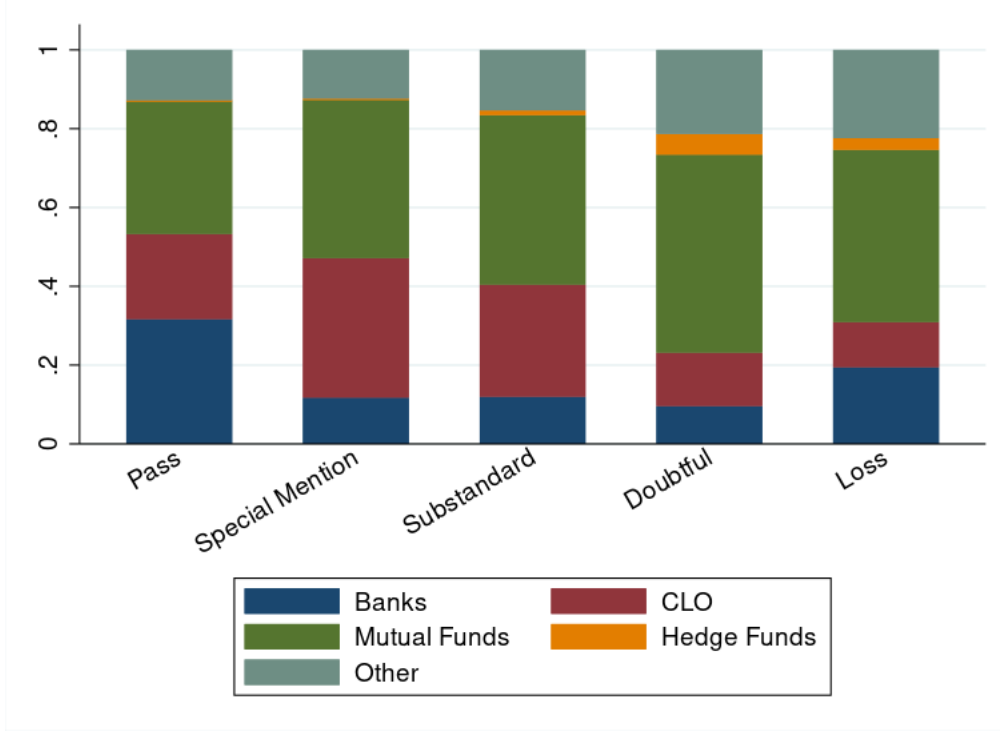


straints imposed on CLOs' portfolios have been shown to affect CLOs' trading behavior and to lead to fire sales. Since they have to mark to market defaulted loans and loans with an agency rating of CCC or worse, instead of using historical values as for loans with better ratings, CLOs preventively sell deteriorating loans to avoid being affected by further downgrades (Elkamhi and Nozawa 2020). The constraints faced by CLOs are tied to agency ratings, not to regulatory ratings. However, there exists a close correspondence between the agency and regulatory ratings, as shown in Figure 2. In addition, as we show below exploring loan outcomes, regulatory downgrades appear to predict (further) agency downgrades. Therefore, CLOs may sell in anticipation after regulatory downgrades.

We document that less regulated entities, such as mutual funds and hedge funds, buy deteriorating loans and ask whether they favor changes in the composition of the syndicate that may favor renegotiation.

Figure 3: Lender Type by Rating

This figure shows the holders of syndicated loan shares by financial institution type and regulatory rating. The best regulatory rating is “pass”, indicating no issues with the loan, followed by “Special Mention”, “Substandard”, “Doubtful”, and “Loss”.



3 Syndicate Ownership and Loan quality

Our objective is to explore how the structure of syndicated loans varies following changes in the loans’ regulatory ratings. We start exploring who owns shares in loans with different regulatory ratings. This gives an initial idea of the dynamics because at issuance all loans can be presumed to be in good standing. We categorize lenders as banks, CLOs, mutual funds, and hedge funds. All remaining types of lenders, including pension funds, insurance companies, finance companies (e.g. “loan funding LLCs”), are classified in the category “other”. Figure 3 shows that different regulatory ratings are associated with ownership by different types of lenders. Mutual funds and hedge funds hold larger shares of lower rated loans, while banks and CLOs are more likely to own shares of loans with strong regulatory ratings. Consistent with the different regulatory constraints that become binding only for non-investment-grade loans, CLOs tend to hold a large share of Special Mention loans in their portfolios.

This evidence suggests that there may be considerable turnover in syndicates as the loan quality deteriorates. To provide more direct evidence, we examine the secondary market behavior of different types of lenders. Specifically, we study which types of lenders sell and which others enter in the syndicate by purchasing loan shares after a downgrade.

Sellers of Deteriorating Loans We investigate whether specific types of institutions are more likely to dismiss loans of different quality and whether sales are consistent with our priors on the effects of regulatory constraints. We estimate the following regression at the loan share level:

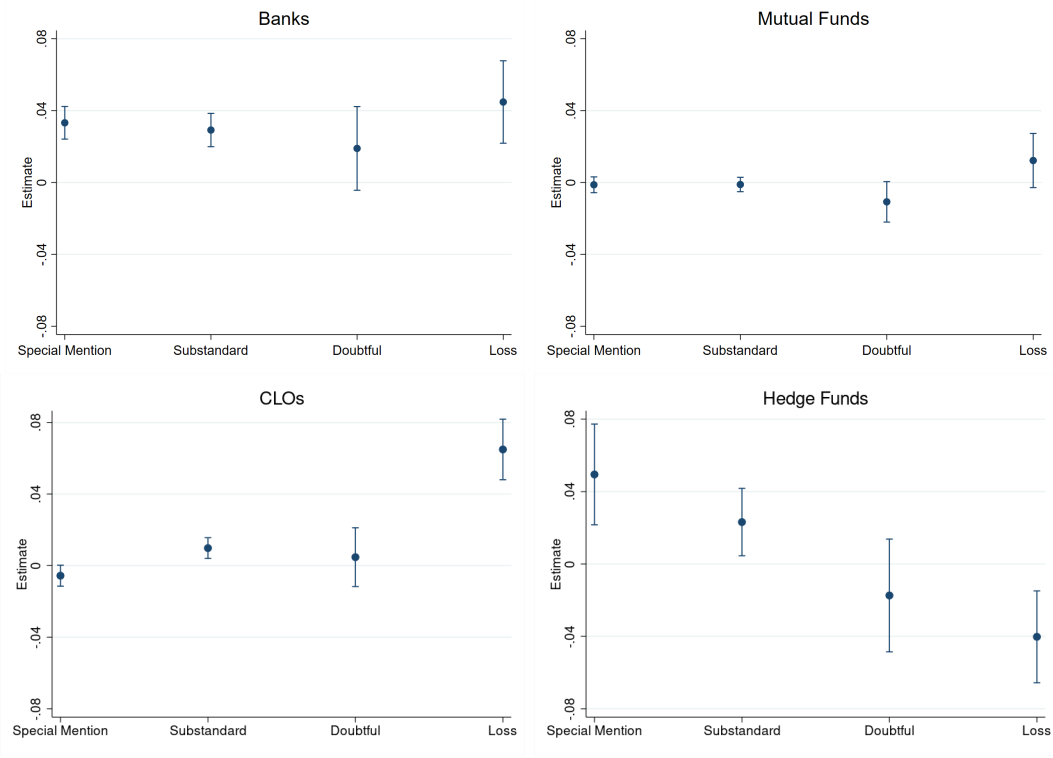
$$Sale_{ijt} = \alpha_{it} + \sum_{\substack{Rating_{it-1} \in \{Pass_{it-1}, \\ Special\ Mention_{it-1}, \\ Substandard_{it-1}, \\ Doubtful_{it-1}, \\ Loss_{it-1}\}}} \sum_{\substack{Lendertype_j \in \{Bank, \\ CLO, \\ Mutual\ Fund, \\ Hedge\ Fund\}}} \beta_{Lender, Rating} Lendertype_j \times Rating_{it-1} + \mathbf{X} + \epsilon_{ijt}, \quad (1)$$

where $Sale_{ijt}$ is an indicator variable that is equal to 1 if financial institution j in quarter t sells part or all of its share in loan i and takes value zero if the institution owned shares in the loan at $t - 1$ and does not alter its ownership share; $Lendertype_j$ is a dummy variable capturing the type of institution j . The matrix \mathbf{X} includes interactions of loan and quarter fixed effects (α_{it}), which absorbs all loan specific characteristics in a given quarter. In particular, α_{it} allow us to control non-parametrically for the loan quality. It also controls for the loan's lifecycle and the fact that the original lenders may want to divest in the years following the origination.

Figure 4 plots the estimated coefficients and confidence intervals of the interaction terms for non-pass ratings of equation 1. It is evident that banks sell deteriorating loans, with sales concentrated on Special Mention, Substandard, and Loss ratings. CLOs also sell loans with Substandard and Loss ratings. CLOs are about 1 percentage points more likely to sell Substandard loans, an economically significant magnitude compared to the 9.6 percent average probability of any lender selling loans with a Substandard regulatory rating. The probability of sale by a CLO increases by an additional 2.2 percentage points for Doubtful loans, which have a 12.5 percent average probability of being sold by any lender. In contrast, mutual funds do not reduce their holdings of deteriorating loans; hedge funds are less likely to sell their shares in Loss-rated loans. Overall, Figure 4

Figure 4: Sales by Institution Type and Rating

This figure plots the point estimates and confidence intervals of the interaction terms resulting from estimating equation 1.



confirms that because of the regulatory constraints they face, banks and CLOs are more likely to dismiss deteriorating loans than other intermediaries.

Buyers of Deteriorating Loans We also explore which types of institutions purchase loan shares in the secondary market and how their behavior varies with the quality of the loan. We limit the sample to institutions that purchase shares in loan i at any time during our sample period and test whether institutions of a given type are more likely to buy shares of loans with different regulatory ratings. In particular, we estimate the following regression:

$$\begin{aligned} \text{Institution Purchase}_{ijt} = & \alpha_i + \theta_t + \beta_1 \text{Special Mention}_{it-1} + \beta_2 \text{Substandard}_{it-1} \\ & + \beta_3 \text{Doubtful}_{it-1} + \beta_4 \text{Loss}_{it-1} + \gamma X_{it} + \epsilon_{ijt}, \end{aligned} \quad (2)$$

where $\text{Institution Purchase}_{ijt}j \in \{Bank, CLO, Mutual Fund, Hedge Fund\}$ 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, $-j$. In practice, we test whether new entrants are more or less likely to be a bank, a CLO, a mutual fund, or a hedge fund relative to other buyers of the same loan in a given quarter. We include loan fixed effects (α_i) to absorb loan unobserved heterogeneity and time fixed effects (θ_t) to control for macroeconomic factors, including aggregate funding conditions.⁴ The vector of controls X_{it} also includes interactions of lead arranger and year and of the borrower’s industry and year fixed effects. In this way, we control for syndicate quality and shocks to the quality of the loans arranged by a given lender as well as industry shocks affecting the loan performance.

Table 2 shows the estimates of equation 2. Banks are less likely to purchase Special Mention loans; similarly, CLOs are less likely to purchase Special Mention and Substandard loans. This evidence supports the notion that regulated lenders have incentives not to hold deteriorating loans. Mutual funds instead increase their participation in the syndicate of loans with a Special Mention or Substandard regulatory rating; also hedge funds increase their participation in Substandard loans. These effects are not only statistically, but also economically significant. For instance, in column 1 of Panel A, the average probability that a mutual fund is the buyer of a loan share is 34.8 percent. This probability increases by 2.2 percentage points (6.3 percent) for Special Mention loans and by 3.2 percentage points (9.2 percent) for Substandard loans.

Panel B of Table 2 focuses on current syndicate members and asks which one increase their shares. It is apparent that mutual funds that are already in the syndicate increase their shares, while the purchases of hedge funds are largely driven by newcomers.

Overall, we observe less churning in Doubtful and Loss loans. This finding suggests that it is hard to find new buyers for the lowest quality loans.

Concentration Measures and Ratings Having shown that regulatory rating downgrades of syndicated loans lead to a reallocation of the shares between different types

⁴Since we observe too few new buyers in the syndicate in a give quarter, we are unable to include interactions of loan and time fixed effects, as we do in the sales regressions.

Table 2
Regression Results: Loan Share Purchases and Increases

This table presents fixed effect panel regressions for loan share purchases. The dependent variable is a purchase dummy for loan i by institution j at time t that takes value equal to one if a given institution of the type indicated on top of each column purchase a loan share; the dummy is set equal to zero for other institutions of different types that purchase shares in the loan at time t . All independent variables are lagged one period. We include time, arranger-year, industry-year and loan fixed effects. Standard errors in parentheses are clustered by loan and industry-quarter. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	Bank (1)	Mutual Fund (2)	CLO (3)	Hedge Fund (4)
Panel A: Loan Share Purchases				
Special Mention	-0.00312** (0.00142)	0.0217*** (0.00583)	-0.0286*** (0.00649)	0.000880 (0.000742)
Substandard	-0.0000881 (0.00170)	0.0320*** (0.00725)	-0.0504*** (0.00832)	0.00285** (0.00118)
Doubtful	0.00640 (0.00432)	-0.00601 (0.0204)	-0.0125 (0.0278)	0.000567 (0.00540)
Loss	-0.00944 (0.0268)	-0.0353 (0.0362)	0.0218 (0.0353)	0.0104 (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
Panel B: Loan Share Increases				
Special Mention	-0.00687** (0.00288)	0.0206* (0.0107)	-0.0157 (0.0109)	-0.000375 (0.00161)
Substandard	0.00133 (0.00359)	0.0434*** (0.0117)	-0.0560*** (0.0123)	0.00215 (0.00258)
Doubtful	0.0130 (0.0111)	0.0320 (0.0265)	-0.106*** (0.0244)	0.0143 (0.00885)
Loss	-0.000792 (0.0189)	0.0658 (0.0547)	-0.162*** (0.0458)	-0.000975 (0.0306)
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	193284	193284	193284	193284
R^2	0.242	0.176	0.236	0.130

of lenders, we ask whether the syndicate structure changes in a way that may hamper or favor renegotiation. In particular, mutual funds and hedge funds may not have skills and resources needed for the loan renegotiation. In this case, we would expect them to purchase small shares in deteriorating, and possibly undervalued, loans in order to diversify their portfolios and to take advantage of banks and CLOs that are forced to liquidate because of regulatory constraints. The arrival of hedge funds and mutual funds may also make renegotiation more difficult if the loan ownership becomes more dispersed because lenders would internalize externalities on other lenders to a lower extent.

On the other hand the new syndicate lender could have stronger incentives to renegotiate than previous owners if at least some participants in the syndicate accumulate shares leading to a more concentrated loan ownership.

To explore how the reallocation of the loan shares affects the ownership structure of the loan, we estimate the following regression on the loan-quarter level:

$$\begin{aligned} \text{Concentration Measure}_{it} = & \alpha_i + \theta_t + \beta_1 \text{Special Mention}_{it-1} + \beta_2 \text{Substandard}_{it-1} \\ & + \beta_3 \text{Doubtful}_{it-1} + \beta_4 \text{Loss}_{it-1} + \gamma X_{it} + \epsilon_{it}, \end{aligned} \quad (3)$$

where $\text{Concentration Measure}_{it}$ is either a dummy for the type of lender with the largest share, the number of lenders, the total share held by the largest 10 lenders, the largest loan share, or the HHI of loan shares in loan i in quarter t . We include loan fixed effects (α_i) and time fixed effects (θ_t). The vector of controls X_{it} contains interactions of lead arranger and year and of borrower industry and year fixed effects. The coefficients on the different regulatory ratings dummies allow us to test how the ownership structure of the loan varies as its credit quality deteriorates.

Tables 3 and 4 present the estimates of equation (3) with different dependent variables. Table 3 shows that it is very relevant to investigate how the ownership structure of distressed loans changes and whether the new owners may amplify the initial shocks. As a consequence of their sales, banks that are generally expected to monitor and renegotiate with the borrowers are less likely to be the largest owners of Substandard and Doubtful loans. Mutual funds tend to have the largest share of Substandard loans and should be the ones with stronger incentives to attempt to cure the loan. These incentives may however be too weak, especially if the loan ownership becomes more dispersed.

Table 4 shows that loans appear to become more concentrated as their quality deteriorates according to all our concentration proxies. For instance, in column 1, a downgrade to Doubtful reduces the number of lenders by 5.8 lenders or by 8 percent, relative to the mean number of lenders, which is 72.

This suggests that the reallocation of shares does not necessarily hamper renegotiation. Since the syndicate concentration increases, the new owners are likely to have incentives to internalize externalities and to attempt to cure the loan. To investigate whether this is the case, and under what conditions shocks to credit quality are amplified, in the next section, we explore how the syndicate concentration affects loan outcomes.

Table 3
Largest Holders of Shares in the Syndicate

This table summarizes fixed effect panel regression results of loan-level regressions with an indicator variable that is equal to 1 if the largest share is held by a bank (column 1), a CLO (column 2), a mutual fund (column 3), or a hedge fund (column 4) for loan i at time t as the dependent variable. All independent variables are lagged one period. We include time, arranger-year, industry-year and loan fixed effects. Standard errors in parentheses are clustered by loan and industry-quarter. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	Bank (1)	CLO (2)	Mutual Fund (3)	Hedge Fund (4)
Special Mention	-0.00429 (0.00646)	0.00492 (0.00497)	-0.00450 (0.00920)	-0.00214 (0.00217)
Substandard	-0.0240*** (0.00771)	-0.00174 (0.00453)	0.0271*** (0.0103)	-0.00389 (0.00246)
Doubtful	-0.0503** (0.0222)	0.0133 (0.0110)	0.0202 (0.0205)	-0.00371 (0.00319)
Loss	0.0180 (0.0296)	-0.0284 (0.0256)	-0.0256 (0.0384)	-0.0166 (0.0154)
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	118119	118119	118119	118119
R^2	0.822	0.714	0.792	0.716

Table 4
Syndicate Concentration and Loan Regulatory Rating

This table summarizes fixed effect panel regression results of loan-level regressions with concentration measures for loan i at time t as the dependent variable. All independent variables are lagged one period. We include time, arranger-year, industry-year and loan fixed effects. Standard errors in parentheses are clustered by loan and industry-quarter.

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

	Number of Lenders		Top 10	Largest Share	Lender HHI
	(1)	(2)	(3)	(4)	(5)
Special Mention	-0.500 (0.943)	-0.724 (0.919)	-0.00306** (0.00150)	-0.000838 (0.00118)	-5.776 (9.400)
Substandard	-2.792* (1.470)	-2.470* (1.411)	0.00268 (0.00217)	0.000443 (0.00162)	-1.787 (12.73)
Doubtful	-5.766*** (2.204)	-5.368** (2.238)	0.0117*** (0.00379)	0.00937** (0.00421)	72.83* (37.77)
Loss	-5.490** (2.263)	-5.147** (2.382)	0.0225*** (0.00663)	0.0236*** (0.00878)	213.6*** (72.54)
Loan FE	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES
Arranger-Year FE	NO	YES	YES	YES	YES
Industry-Year FE	NO	YES	YES	YES	YES
Observations	121384	118110	118110	118110	118110
R^2	0.981	0.982	0.989	0.976	0.981

4 Syndicate Concentration and Loan Outcomes

Our objective is to explore how the changes in ownership structure we have documented so far affect future loan outcomes. To establish causality is challenging because only loans with better prospects may attract lenders that are willing to take large shares. We thus need to exploit exogenous variation in ownership concentration and study loan outcomes when potential lenders' ability to increase their loan shares is inhibited.

We conjecture that lenders that experience deterioration in the credit quality of unrelated parts of their loan portfolio are likely to face financing constraints and are therefore unable to purchase large shares of deteriorating loans, independently of the loans' future prospects. We capture the deterioration of credit quality in unrelated parts of a lender's portfolio by considering whether a lender's loans in other industries experienced a downgrade. Potential buyers that have already been hit by downgrades are likely to face financing constraints and fear redemptions. They may also be too busy in dealing with their problematic loans to engage with other borrowers. For these reasons, we view lenders with portfolio loans that have already been downgraded as unable to favor the syndicate concentration. We consider lenders that previously extended a loan to an industry as potential buyers.

We conjecture that the syndicate concentration is likely to be inhibited if a large share of lenders that previously lent to a particular industry, defined at the 2-digit NAICS-level, has experienced at least one downgrade of other portfolio loans to borrowers in unrelated industries. The portfolio size distribution is heavily skewed as many marginal investors in syndicated loans purchase loan shares as an addition to their portfolios: The average number of loans per lender-quarter is 19 and the median 4, while the largest portfolio has 1099 loan shares in a quarter. The number of loans in a lender's portfolio varies by lender type: for mutual funds, the mean (median) is 16 (4), for CLOs 43 (12), for banks 11 (2), and for hedge funds 3 (2).⁵ While the number of loans in a lender's portfolio may appear to be low, two factors must be taken into account. First, the SNC sample does not cover the universe of syndicated loans, but only those that are held by at least 3 supervised institutions. Second, many lenders diversity their portfolios across asset

⁵The respective maximum number of shares is 1099 (Mutual Funds), 640 (CLOs), 1006 (banks) ,and 224 (hedge funds).

classes and syndicated loans are only one of the asset classes they invest in.

In defining the share of lenders that previously lent to a particular industry and that experienced distress, we consider all lenders, not only mutual funds and hedge funds, which appear more inclined to purchase deteriorating loans. The reason is that distress in other industries may lead banks and CLOs to increase their loan sales. An increase in the number of loans being liquidated and financial constraints for potential buyers make the frictions we study even more relevant.⁶

Specifically, we study how the syndicate concentration of loan i to a borrower in industry l in quarter t varies after a downgrade when a large share of potential lenders experiences downgrades in other industries ($-l$). For this purpose, we measure the share of lenders in industry l affected by downgrades as

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

.

To assess whether financial constraints of potential buyers affect the syndicate concentration after regulatory rating downgrades, we then estimate the following equation:

$$\begin{aligned} \text{Number of Lenders}_{it} = & \alpha_i + \theta_t \\ & + \sum_{\substack{\text{Rating}_{it-1} \in \\ \{\text{Special Mention}_{it-1}, \\ \text{Substandard}_{it-1}, \\ \text{Doubtful}_{it-1}, \\ \text{Loss}_{it-1}\}}} \beta_{\text{Rating}} \text{Rating}_{it-1} \times \text{Share Lender Downgrade}_{lt} \\ & + \beta_1 \text{Special Mention}_{it-1} + \beta_2 \text{Substandard}_{it-1} + \beta_3 \text{Doubtful}_{it-1} \\ & + \beta_4 \text{Loss}_{it-1} + \beta_5 \text{Share Lender Downgrade}_{lt} + \gamma X_{it} + \epsilon_{it} \end{aligned} \quad (4)$$

We include loan fixed effects (α_i) and time fixed effects (θ_t). The matrix of controls X_{it} contains interactions of lead arranger and year and of borrower industry and year fixed effects.

We consider both the share of all lenders in the syndicated loan market experiencing

⁶As we show in the Internet Appendix, our conclusions are invariant if we consider only mutual funds and hedge funds in defining the share of lenders that previously lent to a particular industry and that experienced distress.

downgrades in industries different from the one of the loan and the share of industry lenders experiencing downgrades in other industries. The first variable allows us to consider that new buyers may enter an industry if all previous lenders to the industry experience financial constraints.

Table 5 shows the results from estimating equation 4. It is apparent that loans that are downgraded to Special Mention and are consequently in the early stage of deterioration have more lenders when a large fraction of potential buyers has experienced other downgrades in unrelated industries. When an average fraction of potential buyers has experienced downgrades in unrelated industries, a downgrade to a Special Mention rating increases the number of lenders by 3, relative to a mean a 72 (median: 8). Increasing the fraction of potential buyers experiencing downgrades in unrelated industries by two standard deviations is associated to 2.3 (1.5) more lenders for Special Mention (Substandard) loans.

Table 5
Regression Results: Number of Lenders and Financial Constraints

This table summarizes fixed effect panel regression results with number of lenders in loan i at time t as the dependent variable. The explanatory variables are regulatory ratings, the share of potential lenders experiencing downgrades in unrelated industries, and the interaction of the ratings with the share of potential lenders experiencing downgrades in unrelated industries. All independent variables are lagged one period. We include time, arranger-year, industry-year, and loan fixed effects. Standard errors in parentheses are clustered by loan and industry-quarter. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	Share of Lenders Experiencing Downgrades in Other Industries			Share of Industry Lenders Experiencing Downgrades in Other Industries			
	Special Mention & Substandard (1)	(2)	(3)	Any Downgrade (4)	Special Mention & Substandard (5)	(6)	Any Downgrade (7) (8)
Share Lender Downgrade x Special Mention	16.33*** (6.227)	14.12*** (5.249)	15.81*** (5.384)	13.38*** (4.472)	16.45*** (5.878)	16.07*** (5.577)	11.50* (6.254)
Share Lender Downgrade x Substandard	7.144 (7.884)	3.366 (7.377)	13.73** (6.856)	10.28* (6.239)	10.95* (6.364)	9.127 (5.753)	14.62** (6.091)
Share Lender Downgrade x Doubtful	19.82* (11.95)	8.048 (11.80)	16.11 (10.08)	6.464 (9.865)	2.028 (8.565)	-5.488 (8.946)	6.214 (8.126)
Share Lender Downgrade x Loss	12.01 (7.613)	6.551 (10.47)	16.62** (8.047)	11.35 (9.324)	11.58 (8.372)	11.26 (8.253)	12.56 (8.835)
Share Lender Downgrade	-9.864 (14.33)	16.10*** (6.202)	-5.163 (14.89)	10.37*** (3.551)	-1.449 (1.495)	-3.089*** (0.989)	-1.803 (1.404)
Special Mention	-3.816** (1.517)	-3.571** (1.397)	-3.977*** (1.450)	-3.653*** (1.329)	-1.721* (0.999)	-1.904* (0.993)	-1.570 (0.963)
Substandard	-4.233* (2.334)	-3.142 (2.107)	-5.778** (2.297)	-4.715** (2.068)	-3.587** (1.589)	-3.121** (1.497)	-3.471** (1.472)
Doubtful	-9.842*** (3.369)	-7.013** (3.424)	-9.334*** (3.387)	-6.759** (3.442)	-5.953*** (2.268)	-4.989** (2.326)	-5.170** (2.418)
Loss	-8.000*** (2.578)	-6.466** (3.260)	-9.083*** (2.867)	-7.543** (3.376)	-6.371*** (2.320)	-5.907** (2.477)	-6.099** (2.474)
Loan FE	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES
Arranger-Year FE	NO	YES	NO	YES	NO	YES	YES
Industry-Year FE	NO	YES	NO	YES	NO	YES	YES
Observations	118118	118110	118118	118110	118118	118110	118118
R^2	0.981	0.982	0.981	0.982	0.981	0.982	0.981

Table 5 indicates that the financial constraints of potential lenders are indeed negatively associated with deteriorating syndicates concentration. We can thus use our proxy for financing constraints to generate exogenous variation in syndicate concentration and explore the causal effect of the latter on loan outcomes. The identification assumption is that distress in unrelated industries does not help to predict future loan outcomes once we control for aggregate shocks including time fixed effects.

Table 6 supports our identifying assumption by showing that distress in unrelated industries does not affect loan outcomes for Pass-rated loans. This implies that distress in an industry does not capture economic conditions in other closely related industries. It is therefore unlikely that potential buyers do not purchase large shares and fail to concentrate the syndicate because of negative expectations on the loans outcomes. Instead, downgrades in unrelated industries affect the syndicate concentration because potential buyers face financial constraints and can allocate a smaller than usual part of their portfolio to purchases in the secondary loan market. Put differently, variation in syndicate concentration due to financial constraints can be viewed as exogenous to deteriorating loans prospects.

We thus use the share of lenders experiencing downgrades as an instrument for the number of lenders in the first stage:

$$\text{Number of Lenders}_{it-1} = \gamma_1 \text{ Downgrade Share}_{it-2} + \gamma_2 \text{ Log (Size)}_{it-1} + \delta X_{it} + \epsilon_{it} \quad (5)$$

The matrix of controls X_{it} includes arranger, industry-year, loan age, and S&P rating fixed effects.

We then estimate the second stage using the share of lenders experiencing downgrades as an instrument for the number of lenders and estimate the following equation:

$$\text{Outcome}_{it} = \beta_1 \widehat{\text{Number of Lenders}}_{it-1} + \beta_2 \text{ Log (Size)}_{it-1} + \gamma X_{it} + \epsilon_{it} \quad (6)$$

where Outcomes_{it} is an outcome for loan i in quarter t . We consider the following loan outcomes: refinancing, amendments, amount changes, downgrades by S&P, notches downgraded by S&P, or whether the loan has becomes more than 60 days past due.

Table 6
Exclusion restriction test

This table summarizes fixed effect panel regression results with loan outcomes for loan i at time t as the dependent variable. The downgrade share is the share of industry lenders experiencing downgrades in other industries for Pass-rated loans. All independent variables are lagged one period. We include industry-year effects, arranger fixed effect, S&P ratings fixed effects and loan age fixed effects. Standard errors are clustered at the industry-quarter level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	Refinance (1)	Amendment (2)	Amount Change (3)	Downgrade (4)	Notches Downgraded (5)	60 Days Past Due (6)
Downgrade Share	0.00380 (0.00545)	0.00236 (0.0117)	0.0181 (0.0210)	0.0303 (0.0327)	-0.0332 (0.133)	0.00167 (0.00445)
Log Loan Size	0.000324 (0.000292)	-0.00104* (0.000597)	-0.0397*** (0.00200)	0.00206 (0.00156)	0.0136** (0.00546)	0.000400* (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

Our variable of interest is $\text{Number of Lenders}_{it-1}$. The vector X_{it} contains controls for regulatory ratings, loan age fixed effects, and time fixed effects. In particular, the time fixed effects capture negative shocks leading to the deterioration of all loans and allow us to exploit only cross-sectional differences in the financial constraints of financiers across loans over time.

Table 7 shows the instrumental variable estimates, which indicate a causal effect of loan concentration on loan outcomes. A higher number of lenders appears to decrease the probability of a loan amendment and to increase the probability of future loan downgrades. Figure 1 suggests that a syndicate shrinks by 5 lenders after a regulatory downgrade to Substandard. Without this reduction the estimated probability of an amendment decreases by 2.2 percentage points. This effect is economically large as the unconditional probability of an amendment is 4 percent. Similarly, without concentration (a reduction by 5 lenders after a downgrade), the probability of a future downgrade increases by 2.5 percentage points compared to an unconditional probability of 7 percent. Not only are loans more likely to be downgraded, but the downgrades are also more severe: We estimate 0.2 notches downgrades for loans that remain disperse compared to a conditional average of 0.12 rating notches.

5 Conclusion

We show that the exit of banks and CLOs from the syndicate of deteriorating loans does not necessarily imply an amplification of the initial shock to the loan’s credit quality. Other lenders in the secondary market for syndicated loans appear to have the skills and incentives to help curing loans in early phases of distress. In particular, mutual funds and hedge funds purchase shares in deteriorating loans that banks and CLOs sell for regulatory reasons. With their purchases, mutual funds and hedge funds contribute to increase the concentration of the syndicate. Concentration in turn appears to favor renegotiation. As a consequence, the loans are more likely to be amended and less likely to experience future downgrades.

We also show however that these stabilizing forces encounter obstacles in periods of widespread distress. Potential lenders that have already been exposed to distress because

Table 7
Regression Results: Number of Lenders, Financial Constraints, and Outcomes

This table summarizes fixed effect panel instrumental variable regression results with loan outcomes for loan i at time t as the dependent variable and the share of lenders having experienced a downgrade in their portfolio as instrument for the number of lenders. All independent variables are lagged one period. Standard errors in parentheses are clustered by industry-quarter. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	Refinance	Amendment	Amount Change	Downgrade	Notches	60 Days
	(1)	(2)	(3)	(4)	(5)	Past Due
Number of Lenders	-0.000474 (0.000468)	-0.00442*** (0.00163)	-0.00116 (0.0014)	0.00530*** (0.0017)	0.0436*** (0.00294)	0.000268 (0.000353)
Log Loan Size	0.0227 (0.0210)	0.212*** (0.0751)	0.0200 (0.0615)	-0.351*** (0.108)	-2.896*** (0.782)	-0.0130 (0.0101)
<i>First Stage</i>						
Downgrade Share	19.432*** (4.084)	19.432*** (4.084)	19.432*** (4.084)	33.628*** (8.603)	33.628*** (8.603)	19.432*** (4.084)
Log Loan Size	48.706*** (1.363)	48.706*** (1.363)	48.706*** (1.363)	66.106*** (1.923)	66.106*** (1.923)	48.706*** (1.363)
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
F-Statistic	22.63	22.63	22.63	15.28	15.28	22.63
Observations	105950	105950	105950	31585	31585	105950

of the downgrade of other loans are unable to engage in other syndicates of deteriorating loans or to buy as large shares. As a consequence, they buy smaller shares or some small lenders find it optimal not to exit the syndicate. Deteriorating syndicates remain more disperse and experience worse future performance.

Our paper has important implications to evaluate the consequences of bank capital requirements and CLOs' regulations on financial stability. It indicates that the financial strength of all participants in the syndicated loan market must be evaluated. Regulation-induced sales by banks and CLOs can have larger systemic effects if also the mutual funds and the hedge funds participating in this market are constrained.

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Appendices – For Online Publication

Table A1
Regression Results: Number of Lenders and Lender Type Financial Constraints

This table summarizes fixed effect panel regression results with number of lenders in loan i at time t as the dependent variable. The explanatory variations are regulatory ratings, the share of mutual/hedge funds experiencing downgrades in unrelated industries, and the interaction of the ratings with the share of mutual/hedge funds experiencing downgrades in unrelated industries. All independent variables are lagged one period. We include time, arranger-year, industry-year, and loan fixed effects. Standard errors in parentheses are clustered by loan and industry-quarter. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	Mutual/Hedge Fund Share		Mutual Fund Share	
	Experiencing Downgrades	Any	Experiencing Downgrades	Any
	Special Mention & Substandard	Downgrade	Special Mention & Substandard	Downgrade
	(1)	(2)	(3)	(4)
Share Lender Type Downgrade x Special Mention	8.546* (4.577)	8.172** (3.229)	8.702* (4.310)	8.136** (3.096)
Share Lender Type Downgrade x Substandard	-7.224 (9.529)	3.153 (8.988)	-5.334 (9.411)	3.717 (8.812)
Share Lender Type Downgrade x Doubtful	4.052 (12.38)	4.324 (9.953)	3.921 (11.88)	4.297 (9.665)
Share Lender Type Downgrade x Loss	6.675 (8.523)	11.62 (8.114)	7.695 (8.264)	12.05 (7.991)
Special Mention	-2.518* (1.335)	-2.615** (1.167)	-2.591* (1.300)	-2.635** (1.150)
Substandard	-0.949 (2.423)	-3.207 (2.604)	-1.324 (2.454)	-3.352 (2.614)
Doubtful	-6.233* (3.647)	-6.364* (3.684)	-6.225* (3.639)	-6.369* (3.672)
Loss	-6.590** (2.988)	-7.827** (3.209)	-6.833** (3.018)	-7.965** (3.238)
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	118110	118110	118110	118110
R^2	0.982	0.982	0.982	0.982

Table A2
Regression Results: Number of Lenders, Mutual/Hedge Fund Constraints, and Outcomes

This table summarizes fixed effect panel instrumental variable regression results with loan outcomes for loan i at time t as the dependent variable and the share of mutual and hedge funds having experienced a downgrade in their portfolio as instrument for the number of lenders in a loan. All independent variables are lagged one period. Standard errors in parentheses are clustered by loan and industry-quarter. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	Refinance	Amendment	Amount Change	Downgrade	Notches Downgraded	60 Days Past Due
	(1)	(2)	(3)	(4)	(5)	(6)
Number of Lenders	-0.000346 (0.000486)	-0.00441** (0.00172)	-0.000891 (0.00145)	0.00518*** (0.00179)	0.0448*** (0.0129)	0.000284 (0.000263)
Log Loan Size	0.0165 (0.0237)	0.212** (0.0834)	0.00676 (0.0706)	-0.343*** (0.116)	-2.976*** (0.842)	-0.0138 (0.0128)
<i>First Stage</i>						
Downgrade Share	14.772*** (3.717)	14.772*** (3.717)	14.772*** (3.717)	27.632*** (7.403)	27.632*** (7.403)	14.772*** (3.717)
Log Loan Size	48.706*** (1.363)	48.706*** (1.363)	48.706*** (1.363)	66.107*** (1.923)	66.107*** (1.923)	48.706*** (1.363)
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
F-Statistic	15.79	15.79	15.79	13.93	13.93	15.79
Observations	105950	105950	105950	31585	31585	105950
R^2	-0.149	-7.763	-0.087	-6.876	-25.127	-0.303