Bankruptcy and Restructuring Outcomes of CLO-held Loans:

The Role of CLO-Bank Relationships

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On the Benefit of CLO-Bank Relationships: Evidence from Bankruptcy and Restructuring Outcomes of CLO-held Loans

Abstract

Loans held by CLOs are often originated by banks with whom CLO managers have past trading relationships. Consistent with CLOs obtaining valuable private information with the help of these relationships, we find that firms whose loans are initially purchased by bank-related CLOs are less likely to experience negative credit events in the next one to three years, compared to other similarly risky firms. Borrowers of loans held by bank-related CLOs are more likely to successfully restructure using prepackaged Chapter 11 filings in the event of subsequent bankruptcy. The benefits of CLO-bank relationships incentivize CLOs to further develop such relationships through repeated transactions.

1. Introduction

The rapid growth in the market for Collateralized Loan Obligations (CLOs) has come to characterize the U.S. debt market since the financial crisis of 2008-09. At a very broad level, CLOs, are securitizations of (approx. 150-200) leveraged commercial loans. The returns on equity and the various tranches of debt securities issued by CLOs are supported by cash flows on the underlying loan collateral held by the CLOs. While CLOs are not a recent invention (they have been around since the early 1980s), the recent decade has witnessed an astounding growth in this market in the U.S. and Europe. For example, the U.S. CLO market grew from approximately $260 billion in CLOs outstanding at the end of 2012 to over $600 billion in January 2019.[1] CLOs hold roughly half of the $1.2 trillion leveraged (or high risk) commercial loans outstanding in the U.S.[2]

The dramatic growth in these securitizations of leveraged commercial loans has drawn parallels with securitizations and re-securitizations of risky subprime mortgages during the pre-crisis era and has attracted regulatory and policy-making attention. For example, in a September 2019 letter to the Securities Exchange Commission, Senator Elizabeth Warren stated (emphasis added):

> "*I am especially concerned about collateralized loan obligations (CLOs), given the rapid growth of CLOs and the lack of appropriate responses from federal agencies, including the SEC. These securitizations have helped enable increased leveraged loans that are generally* ***poorly underwritten*** *and include few protections for lenders and investors, which creates significant risk to the financial system and the American economy.*"

Similar sentiments were echoed by banking regulators in the U.S. and Europe.[3] Academic research based on the pre-crisis[4] CLO market has also provided supportive evidence. For example, Wang and Xia (2014) find that active CLO arrangers impose less restrictive loan covenants and are more lenient after covenant violations. Bozanic et al.

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[1] https://www.lexology.com/library/detail.aspx?g=1581bdcc-7b4e-4fce-ada8-364f2e0abff6
[2] The global leveraged loan market stood at $1.4 trillion in 2019, more than double in size in 2007 (Valladares, 2019).
[3] https://www.bloomberg.com/news/articles/2019-06-11/regulators-alarmed-by-risky-loans-but-don-t-know-who-holds-them
[4] Throughout this paper, "crisis" refers to the financial crisis period of 2008-09.

(2018) show that CLOs tend to use standardized covenants instead of tailored ones. Regarding CLO portfolio construction, Benmelech et al. (2012) find no link between CLO participation and default risk in originate-to-distribute (OTD) loan syndication.[5]

We first document a remarkable trend that an increasing proportion of loans in CLO portfolios are originated by lead banks with whom CLO managers have had a prior trading relationship. In the post-crisis period, more than 85% of loans in the average CLO portfolio come from lead banks with whom CLO managers have traded within the past five years. This aligns with the literature on long-run relationships, suggesting that such relationships incentivize both CLOs and lead banks to consider future purchases and share private information about loan fundamentals (Sharpe, 1990; Boot et al., 1993; Boot and Thakor, 1994; Srinivasan, 2014). Therefore, we propose that the establishment of relationships between CLOs and banks serves as an evolving market mechanism to address adverse selection and moral hazard concerns. This mechanism allows for mutual building of trust and facilitates the sharing of valuable private information about borrowers.

To test this hypothesis, we analyze two key aspects of CLOs' investment and trading behavior: 1) CLOs' loan selection process and, 2) the restructuring outcomes for loans held by CLOs, as CLO performance depends on both the quality of the corporate loans chosen and their approach to managing loan workouts. Our primary focus is on whether CLOs can effectively leverage their relationships with banks and benefit from banks' private information. This information sharing has the potential to provide CLOs with an advantage in identifying loan quality beyond what is reflected in publicly observable signals. In loan workouts, CLOs are compelled to engage in costly renegotiations, thereby highlighting the significance of their relationship with lead banks.

We first focus on the likelihood of negative credit events occurring within one year for loans selected by CLOs with strong preexisting relationships with lead arrangers.[6] To

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[5] Practioners in this market argue that CLOs, unlike CDOs, have a long track record of success, are actively managed, and have various built-in triggers and safeguards that act as a safety mechanism against widespread default and contagion across tranches (LSTA, 2019). See https://www.lsta.org/news-resources/u-s-risk-retention-is-it-still-safe/

[6] We focus on initial purchases of loans by CLOs (i..e, the first trading decision made by a CLO concerning a loan). We argue that the due diligence and screening effort by CLOs is likely to be most prominent when loans are first selected and purchased, and not for subsequent purchases when the loan has already entered the portfolio (as a result, the CLO is already familiar with the loan). Similarly, subsequent sales decisions may be mechanically tethered to ratings- and performance-based thresholds, and thus may not reflect

isolate the effect of private information sharing, we control for publicly observable signals about loan fundamentals in our analyses. This approach differs from that of Benmelech et al. (2012) and Wang and Xia (2014), as our objective is to identify the effects of private information sharing between lead arrangers and CLOs, rather than solely relying on publicly observable distance-to-default information.

Our results suggest that between 2005 and 2019, borrowers whose loans are initially purchased by CLOs are less likely to file for bankruptcy or experience credit rating downgrades to CCC and below over the next one-year period, compared to syndicated loan borrowers with *similar market perceived default risk*. We show consistent results using two- and three-year ahead windows. However, during the pre-crisis period, we observe an insignificant relationship between CLO initial purchases and future credit event incidence, which aligns with the findings of Benmelech et al. (2012). The positive effect is only evident during the post-crisis period, supporting the notion of evolving mechanisms in the CLO market in recent years, particularly with regard to the increasing significance of CLO-lead arranger relationships.

We directly examine the role of relationships between CLOs and banks in accessing private information about loan fundamentals from lead banks. Consistent with this expectation, our findings show that strong pre-existing relationships with lead arrangers with access to private information improve the ability of initial CLO investments to predict the likelihood of borrowers experiencing future financial distress (measured by bankruptcy filings and downgrades to CCC credit rating or below) over the next one-year period. As a falsification test, we investigate whether CLOs directly private information obtain from borrowers by repeatedly purchasing loans issued to the same borrower. We find no evidence of superior selection in this test, suggesting that valuable information is shared by lead banks, rather than collected directly from the borrower by CLOs.

We further establish a link between the beneficial effect of relationships with lead banks and the information environment of borrowers, as outlined in previous research (Ball et al., 2008; Ivashina, 2009). We find that the advantageous impact of CLO-bank

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intensive monitoring by CLOs. In subsequent analyses, we report findings consistent with this argument.

relationships is stronger when banks possess more private information, and when borrowers' accounting information reflects lower debt contracting value (Ball et al. 2008).[7]

We thus shift our attention to the relationship between CLO holdings and ex-post restructuring outcomes, conditional on a Chapter 11 bankruptcy filing by the borrower. Extending Demiroglu and James (2015), we contrast prepackaged filings (prepacks) with traditional Chapter 11 fillings. Prepacks involve negotiating and finalizing a reorganization plan with creditors prior to the bankruptcy filing, resulting in a shorter and potentially lower-cost bankruptcy process (Hotchkiss et al., 2008). However, prepacks require greater coordination among creditors, and are more likely to occur when information frictions are lower. On the other hand, traditional Chapter 11 filings rely relatively more on the court system for monitoring.

Our findings reveal that borrowers whose loans are held by CLOs are more inclined to restructure through prepackaged Chapter 11 filings, leading to successful emergence from the Chapter 11 process. This effect is particularly pronounced for loans held by CLOs with strong pre-existing relationships with the lead arranger. These results suggest that CLO-lead bank relationships enhance the efficiency of renegotiation and coordination during the bankruptcy process, ultimately contributing to debtors' successful emergence from Chapter 11. Admittedly, the relationship between CLO holding and restructuring through prepackaged filings can be endogenous. Thus, we utilize the adoption (removal) of a risk retention rule that reduced (increased) the likelihood of securitizing loans via CLOs as a plausible exogenous shock. Our findings are consistent with the notion that CLO ownership of loans leads to a higher likelihood of prepacks and successful emergence.

Finally, to shed light on equilibrium effects, we posit that CLOs have incentives to repeatedly purchase loans from their relationship arrangers to further reinforce the existing relationship. Our results show that CLOs are more inclined to purchase loans from arrangers with strong relationships, particularly after the financial crisis, especially when

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[7] We rule out superior ex-post monitoring by CLOs as an alternative explanation. We find no significant association between subsequent trading activity by CLOs and future distress likelihood, consistent with the loan amount-driven fee structure of CLO managers and diffused property rights in CLOs that reduce investors' monitoring efforts (Demiroglu and James, 2015). It is important to note that this argument differs from the result in Loumioti and Vasvari (2019), where CLOs engage in opportunistic trading and rebalancing to meet performance test thresholds. Instead, our findings indicate that CLOs' portfolio behavior is a suboptimal outcome resulting from ex-ante structural constraints, rather than active monitoring through available contractual tools such as covenants (Wang and Xia, 2014).

the loans are perceived as riskier.

Our study contributes to the nascent but growing literature on the effects of the dramatic rise of CLOs in the credit markets. Our examination of CLOs' information-based loan selection is related to the literature on lax screening of banks/CLOs, but has different focuses. While studies such as Wang and Xia (2014), Bozanic et al. (2018), and Benmelech et al. (2012) have examined various aspects of securitized loans and CLO participation, they primarily focus on publicly observable signals and their effects on monitoring incentives, covenant structure, and default risk. In contrast, our study delves into the unobservable private information shared by banks and its implications. Moreover, we take concerns surrounding adverse selection and moral hazard in the pre-crisis CLO market, as highlighted by Wang and Xia (2014) and Benmelech et al. (2012) as pre-existing frictions. Our contribution lies in investigating whether relationship-building between CLOs and banks can effectively mitigate these concerns. By exploring these relationships, we aim to provide insights into the role of relationship building in addressing the challenges observed in the pre-crisis CLO market and add to the literature by showing that this mechanism contributes to the track record of success of CLOs in the past decade.[8]

A parallel study by Blickle et al. (2020) reports that loans that are retained by lead banks exhibit worse ex-post performance compared to loans that are sold in the secondary market to institutional investors. Blickle et al. (2020) attribute this finding to "warehousing risk" – the sale of a nonperforming loan poses reputational consequences for the lead bank and the possibility that astute institutional buyers are unwilling to absorb loans that are likely to become nonperforming in the future. Contrary to our paper, Blickle et al. (2020) find that bad loans are more likely to be offloaded to institutional investors who have extensive past relationships with the lead bank. We attempt to reconcile our results with Blickle et al. (2020) by documenting a weaker effect for banks with higher "warehousing

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[8] Unlike the focus of Benmelech et al. (2012) on the pre-crisis period, post-financial crisis CLO purchases of loan tranches during the origination phase are relatively infrequent, representing less than 10% of CLOS' total initial investments. This shift reflects the increasing trend of CLOs acquiring investments from the secondary market, rather than participating in the loan syndication process. Related to our study, Peristiani and Santos (2019) highlight the use of informational advantages by bank-affiliated CLOs in selling loans prior to default events. While Peristiani and Santos (2019) focus on information flows within organizations, we examine information sharing across organizations through repeated contracts. It is worth noting that the proportion of bank-affiliated CLOs is low (5.2%); that said, we control for bank affiliation in our tests.

risk".[9]

Our findings concerning restructuring outcomes build upon the results of Demiroglu and James (2015), who find that firms with loans held by CLOs are less likely to pursue out-of-court workouts. However, our study makes distinct contributions: First, we specifically focus on prior contractual relationships between CLOs and lead arrangers. Our findings demonstrate that such relationships facilitate efficient renegotiation and coordination, resulting in a higher likelihood of successful emergence from the Chapter 11 process for debtors with loans held by CLOs. Second, we contrast prepacks with traditional Chapter 11 filings. Overall, our findings highlight the significance of enduring relationships between CLOs and lead arrangers in influencing formal restructuring outcomes.

2. Related Literature
Due Diligence During the CLO Arranging Phase

As discussed earlier, the popular and regulatory debates concerning the consequences of the growth in CLOs are suggestive of demand from CLOs encouraging loose underwriting standards for leveraged commercial loans. Indeed, some empirical evidence seems to corroborate these regulatory concerns. For example, Wang and Xia (2014) find that securitization via CLOs weakens the monitoring incentives of the arranging banks, resulting in less restrictive loan covenants and a relaxed attitude towards restructuring after covenant violations. Similarly, Bozanic et al. (2018) suggest that CLOs hold pieces in a couple of hundred loans simultaneously, and thus have limited incentives and ability to rigorously monitor on a per loan basis. Thus, to lower their information processing costs, CLO-held loans feature more standardized, rather than customized covenants.

However, it isn't clear whether this evidence can be extrapolated to suggest poor underwriting influenced by CLOs. For example, observers such as LSTA (2019) point towards CLOs' long track record of success, which would be inconsistent with

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[9] We note, however, that Blickle et al. (2020) contrast loans that are entirely sold off by the lead arranger with those that are not, and attribute the differential performance of these loans to pipeline risk. We instead highlight that the repeated business between CLOs and lead banks encourages information sharing, contributing to the better performance of CLO-held loans. Our findings echo the arguments in the traditional banking literature which emphasizes the beneficial effects of long-run contractual relationships (Sharpe, 1990; Boot et al., 1993; Boot and Thakor, 1994).

systematically lax underwriting induced by demand from CLOs.[10] Further, much of the popular debate conflates passively-managed asset-backed securities that were at the forefront of the 2008-09 crisis with CLOs that are actively managed by sophisticated players such as banks, private equity firms, and hedge funds. Thus, it is unclear why seemingly sophisticated players such as CLO managers knowingly accept investments that are at a greater risk of a credit event. In addition to investor sophistication, Loumioti and Vasvari (2019) point toward other features of CLO managers such as active management, receipt of private information from loan syndicates, and in the case of PE firm CLOs, the potential ability to draw on experience with the investment on the equity side (see also, Liebscher and Mählmann, 2017). In other words, the characteristics of CLOs may imply a superior ability to screen out risky loans during the initial portfolio-building phase, especially post crisis.

However, the mechanisms that enable CLOs' superior screening ability are less understood. Unlike banks, typical CLOs do not have abundant resources to invest in due diligence and screening infrastructure like banks. We thus propose that the loan screening ability of CLOs is enhanced for CLOs with significant past contractual relationships with the lead arranger. Prior literature (e.g., Sufi, 2007; Bharath et al., 2007) suggests that lead arrangers exhibit superior ability and incentives to acquire relevant borrower information. We consider the possibility that related CLOs obtain such private information about borrowers from lead arrangers. For banks, information sharing is beneficial in the long run as it acts as a mechanism to attract future transactions with CLOs. For CLOs, information sharing not only allows better loan screening, but also reduces the likelihood that banks sell underperforming loans to CLOs.

To identify this effect, we focus on the first time that CLOs invest in a particular loan since the first transaction is associated with greater information frictions (e.g., Baron, 1982; Loughran and Ritter, 2002). Second, CLOs do not trade loans frequently. Most of the loans in the CLO's portfolio are traded only once. As such, focusing on the initial buy is a natural empirical choice. We predict that initial buys of CLOs with a strong pre-existing relationship with the lead banks are more informative of default risk, leading to a greater

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inverse relationship between CLO initial buys and the future incidence of negative credit events.

CLO and Restructuring Outcomes

The evidence in Demiroglu and James (2015) is rather conclusive in that CLO-held loans are less likely to be restructured out-of-court. These results are attributable, among other things, to renegotiation and coordination costs between widely-held CLOs and other creditors. Legal scholars such as Levitin (2015) also highlight several other CLO characteristics that have a potential bearing on restructuring outcomes: First, CLOs may be loath to accept restructurings with maturity profiles that do not match the maturity of their own debt. Second, CLOs whose reinvestment period has ended, or CLOs who have breached or are likely to breach important provisions such as the over-collateralization and interest coverage triggers are unlikely to have the funds for amount-increasing renegotiations. Consequently, CLOs are unlikely to be able to support restructurings that require an infusion of additional liquidity. Overall, anecdotal legal arguments, as well as empirical evidence in Demiroglu and James (2015), suggest that CLO-held loans are unlikely to be restructured successfully in an out-of-court setting that requires the consent of all renegotiating parties. Thus, instead of examining out-of-court efforts (that are likely to be frustrated), we focus on formal restructuring efforts under the Chapter 11 bankruptcy process.[11]

Despite evidence that securitization weakens monitoring incentives, banks still have a theoretical comparative advantage in monitoring borrowers (Diamond, 1984), due to their unique informational advantages that stem from contractual relationships (Diamond, 1984; Drucker and Puri, 2005; Wang and Xia, 2014). Therefore, delegating the monitoring effort to the arranging bank is likely to be more efficient for CLOs who own tranches of the same loan package, but lack the resources or contractual ability to directly engage in loan renegotiations. Further, due to a repeated game between arranging banks and CLOs, banks

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[11] A recent Chapter 11 case highlights some of the complexities involved in workouts of loans held by CLOs: Deluxe Entertainment, which had its loan held by CLOs, was in the process of implementing a "stapled" prepack (i.e., an out-of-court restructuring with a prepack backstop in case the debtor is unable to garner unanimous consent). However, while in the midst of restructuring, it was downgraded to "CCC" rating by S&P, triggering an automatic trigger in certain CLOs that restricted their holdings in "CCC" rated instruments. Thus, Deluxe was not able to obtain the additional funding required as a part of the restructuring and had to go through a longer prepackaged Chapter 11 process than it had originally planned. See: https://www.lexology.com/library/detail.aspx?g=1581bdcc-7b4e-4fce-ada8-364f2e0abff6

are more likely to renegotiate and coordinate with CLOs rather than rent-extract.[12] Maintaining and coordinating a conflict-free relationship with CLO managers is important for banks in maintaining lucrative access to the CLO funding market.[13] Thus, lead banks are unlikely to engage in actions that will impair their relationship with CLO managers. Such bank incentives help develop mutual trust with CLOs and potentially foster collaboration during adverse credit events. In other words, repeated contractual relationships allow CLOs to establish mutual trust with lead arrangers, in turn potentially reducing coordination frictions. CLOs might even delegate their monitoring and renegotiation efforts to lead banks during restructuring exercises. This possibility can change the trade-offs between traditional Chapter 11 and prepackaged Chapter 11. In particular, prepackaged Chapter 11 is a hybrid plan, wherein a reorganization plan is negotiated and finalized with creditors prior to bankruptcy, and filed concurrently with the bankruptcy petition. Prepacks allow firms to exit bankruptcy within a short period, and are therefore expected to have lower direct costs than lengthier traditional bankruptcy proceedings (Hotchkiss et al., 2008). However, prepacks also require extensive renegotiation and coordination among creditors, and therefore are more likely to occur when coordination frictions are lower. In contrast, traditional Chapter 11 partially delegates the monitoring effort to the court system, and may require less creditor coordination due to the possibility of "cram down" by the court.

When CLOs can establish mutual trust with the lead arrangers via repeated contractual relationships, take advantage of these lead banks' unique informational and monitoring advantage, and even delegate their monitoring effort during restructurings to banks, a prepackaged Chapter 11 bankruptcy, as opposed to a traditional Chapter 11 process, is more feasible. Thus, we predict that CLO holdings are associated with a greater likelihood of prepackaged vs. traditional Chapter 11 filings.

3. Data and Sample

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[12] The number of CLO managers is limited. Between 1997 to 2019, we found only 233 unique CLO managers.
[13] Banks with access to credit in the securitization market have an advantage in providing institutional facilities and they can charge an interest premium from securitization (Boot and Marinč, 2008; Lin et al., 2017). Further, banks benefit from fees they collect during loan origination and CLO underwriting (Wang and Xia, 2014).

To test whether CLOs have private information about corporate loan fundamentals, we utilize data from several publicly available databases: CRSP-Compustat Merged database, Creditflux 'CLO-i' database, Thomson Reuters Dealscan database, Capital IQ, and the New Generation Research (NGR) bankruptcy research database (bankruptcydata.com). Our sample period spans January 2005 to September 2019.

3.1. Leveraged Firms in CRSP-Compustat Merged database

Following Nadauld and Weisbach (2012), our analyses focus on leveraged borrowers (i.e., firms with speculative-grade credit ratings) due to two important reasons. First, CLOs mainly invest in leveraged loans. Second, debt contracting theory suggests that creditors have stronger incentives to acquire information when firms are closer to default (Holmström, 2009; Pagano and Volpin, 2012).[14] We obtain firms' credit rating information from Capital IQ and constrain our sample to firms with non-investment grade ratings (i.e., BB+ or lower). We extrapolate the leveraged sample from an annual to a firm-month level, as our CLO portfolio and trading information is reported monthly. We also exclude observations with missing control variables and observations without outstanding Dealscan facilities. This process leaves us with 70,757 observations from 1,062 unique firms. To identify future negative credit events, we link the speculative-grade firm sample to the New Generation Research NGR bankruptcy dataset and Capital IQ, which provide information about bankruptcy filings and credit rating downgrades, respectively.

3.2. CLO Transaction Data: CLO-i Database

We obtain CLO transaction information from the CLO-i database provided by Creditflux. Creditflux gathers information from CLOs' monthly trustee reports submitted by the CLO managers. We obtain each CLO's portfolio information including loan type, security name, maturity date, Moody's and Standard and Poor's credit ratings, the issuers' name, and the principal balance held by the CLO. We then restrict our sample to USD-denominated collateral assets. We focus on corporate leveraged loan collateral, and exclude "Bond," "Equity," and "DIP" collateral.

We then employ a fuzzy matching algorithm to match each loan in CLOs' portfolios to DealScan loan facilities. In particular, we match these two databases by the issuer's

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[14] Similar arguments are provided by the costly state verification theory in Townsend (1979) and Gale and Hellwig (1985).

name, loan type, and maturity date. We require the difference in the maturity dates reported in the two datasets to be no more than 15 days. We then manually check to ensure that the issuer name and loan characteristics are consistent across the two databases. Next, we match the data with the CRSP-Compustat Merged database using the extended Chava and Roberts (2008) link file to identify the borrowers of loan facilities. Using this strategy, we match 4,459 facilities of 1,373 firms in the DealScan database to the CRSP-Compustat Merged database.

As discussed before, the first transaction is often associated with greater information friction. In addition, it is likely that a CLO trades a loan only once during the entire reinvestment period. As such, focusing on the initial buy decision is a natural empirical choice. To this end, we seek to identify the timing when a loan enters into a CLO portfolio for the first time. Thus, we obtain monthly CLO portfolio information from the CLO-i database and identify the timing when a CLO j includes a firm f's facilities in its loan portfolio for the first time. We thus create an indicator variable "*CLO initial buys$_{f,m}$*" which takes the value 1 for year-month m when a CLO j includes a firm f's facilities in its loan portfolio for the first time. The initial purchase amount is the sum of the principal balance of loans of a particular borrower purchased by a CLO at month m when a CLO j includes a firm f's facilities into $j's$ loan portfolio for the first time. We specifically focus on initial purchases by CLOs because the degree of due diligence and information acquisition is greatest during the initial purchase period. Note that firm f can have multiple facilities and different CLOs may select different facilities at different points of time. We thus aggregate the initial purchase amount by each CLO in each month to the firm-month level in our empirical tests.

3.3. CLO Performance

We obtain CLO portfolio data, including loan type, loan amount held by the CLO, and Moody's and Standard & Poor's credit ratings from the CLO-i database. We further manually collect information about CLO tests including the senior Over-collateralization (OC) test and junior OC test from the Creditflux database. The CLO performance sample begins with 68,946 monthly reports of 2,291 CLOs from January 2005 to September 2019. We exclude CLOs that do not report senior OC scores, junior OC scores, Weighted Average Rating Factors (WARF) results, CCC bucket, and defaulted bucket in both the current

month and future 12 months (24,340 monthly reports and 520 CLOs). We also exclude CLOs without information on portfolio size and weighted average rating information (1,838 monthly reports and 76 CLOs). Our final sample for these tests comprises 42,768 monthly reports of 1,695 CLOs.

3.4. CLO-Lead Bank Relationship

A primary construct in our analyses is the pre-existing relationship between CLOs and facilities' lead banks. Following prior studies, we define a lender as the lead bank if it is identified as a "Lead Arranger" or "Sole lender" in the DealScan database. We focus only on the lead arrangers, but not on other syndicate participants, because as a practical matter, lead arrangers primarily conduct loan due diligence and have a more direct interface with the borrowers, and thus have an informational advantage concerning borrowing firms' default risk (e.g., Sufi, 2007). Following prior literature (e.g., Bharath et al., 2007), we construct the CLO-lead bank relationship measure based on their previous transactions. We define the CLO manager-lead bank as related if the CLO manager traded repeatedly with the lead bank in the past five years. However, as shown in Panel D of Table 1, over 74% of the CLO initial purchases are made to firms whose lead banks CLO managers had traded within the past 5 years. This leads to the fact that over 90% of firm-months with CLO initial purchases are those with initial purchases made by related CLO managers. To construct a more balanced definition of the relationship between CLO managers and lead banks, we use the aggregated transaction between CLO managers and lead banks within five years before the initial purchase to measure the strength of the relationship between CLO managers and lead banks. Specifically, we regard a CLO manager as having a strong relationship with a lead bank if the CLO manager had transactions with the lead bank in the past five years and the total purchases minus the total sales of the CLO manager from the lead bank over the past five years, scaled by the lead bank's total securitized loan amount outstanding, is larger than the yearly median for all CLO manager-lead bank pairs.[15][16]

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[15] In untabulated tests, we find that our results are robust if we define related CLO managers based on whether the CLO manager traded repeatedly with a lead bank in the past five years.

[16] In further unreported analyses, we find that our results remain robust if we use the overall median during our sample period to infer strong CLO-bank relationships. Hereafter, we refer to related CLO manager-lead bank pairs as those with prior transactions over the past five years, and define strong related CLO manager-lead bank pairs by further conditioning on the importance of the relationship to the lead banks (i.e., the total

4. Main Empirical Results

4.1. Descriptive Analyses

Our final sample comprises 70,757 leveraged firm-month observations from January 2005 to September 2019. Table 1 Panel A summarizes the sample selection procedure described above. In Table 1 Panel B, we report the distribution of *Distress* and *CLO initial buys* across industries (based on firm-month observations). Our results show that industries with a high probability of being held by CLOs, such as Agriculture, Forestry, and Fishing (SIC=00-09), Transportation, Communications, Electric, Gas, and Sanitary service (SIC=40-49), and Services (SIC=70-89), have a relatively low probability of experiencing negative credit events in next 12 months. Further, we compare the probability of negative credit events in the next 12 months between firm-months initially selected by CLOs and other distressed firm-months in Columns (3) and (5). Except in the Manufacturing industry (SIC=20-39), Retail Trade industry (SIC=52-59), and Public Administration industry (SIC=91-99), firms initially selected by the CLOs are less likely to go bankrupt or experience a downgrade to CCC or below in the next 12 months. On average, the proportion of negative credit events in the next 12 months is 2.72% for issuers of loans initially purchased by the CLOs, whereas this proportion is 3.97% for other observations.

Table 1 Panel C reports the distribution of *Distress* and *CLO initial buys* across years. The probability of bankruptcy and downgrade to CCC or below in the next 12 months peaks during the financial crisis in 2008 (10.80%). In general, we observe that firms initially selected by the CLOs are less likely to experience negative credit events in the next 12 months. In Column (7), we test the differences between the distress likelihood of firms with CLO initial purchases and without CLO initial purchases. Overall, the distress likelihood of firms initially bought by the CLOs (2.72%) is lower than that of other firms (3.97%). This difference is statistically significant with a t-statistic of 5.72. Before and during the financial crisis, differences in the distress likelihood are not statistically significant. However, after the financial crisis, firms initially bought by the CLOs are significantly less likely to become distressed, reflecting the evolution of the CLO market.

Panel D of Table 1 reports the fraction of loans purchased from the lead banks that

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purchases minus the total sales of the CLO manager from the lead bank over the past five years, scaled by the lead bank's total securitized loans outstanding).

CLO managers transact with repeatedly (i.e., banks that have transactions with the CLO manager in the past five-year window). The descriptive statistics show that the fraction increases sharply since the financial crisis (2008-2009). For an average CLO, the proportion of loans purchased from lead banks with which CLO managers traded in the past five years increased from 62% in the pre-crisis period to 86% in the post-crisis period. For initial purchases made by an average CLO, the likelihood of purchasing from lead banks that have prior transactions with CLO managers increases from 46% in pre-crisis to 76% in post-crisis. Taken together, these results suggest that CLOs have tightened their relationships with banks since the crisis.

Table 2 summarizes the dependent variables, firm characteristics, and CLO performance. The average probability of a firm experiencing negative credit events in the next 12 months is 3.81%. Firm-month observations identified as *CLO initial buys* constitute 12.56% of the sample. Within the *CLO initial buys* sample, about 78.66% (=9.88/12.56%) relate to CLO managers that have a strong pre-existing relationship with the lead banks. The average (median) size of CLO portfolios is 18.14 (17.99) or about $75.53 ($65.01) million. Regarding CLO portfolio performance, the mean proportion of CCC-rated loans in CLOs' portfolios is 4%, and the proportion of defaulted loans is about 1% for an average CLO. As for the test score results, the mean senior test score is 131.63 points (4.88, expressed as a natural logarithm) and the mean junior test score is 107.77 points (4.68, expressed as a natural logarithm). The mean S&P loan credit rating in a CLO portfolio is about 13.80, or between BB- rated and B+ rated. This is consistent with the fact that CLOs mainly invest in leveraged loans. Within the bankruptcy sub-sample, 13.84% of the bankruptcies are prepackaged, while 40.88% of the bankrupt firms emerge from bankruptcy. On average, 6.35% of the bankruptcy sub-sample firms are held by the CLOs at some point during four quarters before filing for bankruptcy, and about 87.2% (5.54%/6.35%) of these firms are held by the CLOs having strong relationships with lead banks.

4.2. Multivariate Analyses: CLO initial buys and Future Probability

We first examine whether *CLO initial buys* are associated with the distress likelihood of loan issuers over the next 12 months. We test this prediction using the following regression model:[17]

$$Distress_{f,(m+1,m+12)} = \beta_0 + \beta_1 \text{ } CLO \text{ } initial \text{ } buys_{f,m} + \beta_2 \text{ } EDF + Controls + Firm \text{ } FE + Year$$
$$Month \text{ } FE + \varepsilon_{f,m} \tag{1}$$

where $Distress_{f,(m+1,m+12)}$ is an indicator variable that equals 1 if the firm f files for bankruptcy or experiences a downgrade to CCC or below in the following 12 months, and 0 otherwise. The independent variable measures *CLO initial buys* of the firm $f's$ loan facilities in month m. We use both the indicator variable *CLO initial buys$_{f,m}$* (which takes on a value of 1 for month m when a CLO j includes a firm $f's$ facilities into $j's$ loan portfolio for the first time, and zero otherwise), and a continuous variable *Log CLO initial buys$_{f,m}$* that equals the natural logarithm of one plus the sum of the principal balance of loans of a particular borrower purchased by a CLO at month m when a CLO j includes a firm $f's$ facilities into $j's$ loan portfolio for the first time.

Unlike Wang and Xia (2014) and Benmelech et al. (2012) that examine the risk profile of borrowers and therefore focus on publicly observable Expected Default Frequency (EDF), we specifically focus on the realized credit events and infer the effects of CLOs' access to private information. Thus, we estimate the Expected Default Frequency (EDF) calculated based on Moody's KMV implementation of Merton (1974) model and control for it directly in the specification. Arguably, EDF is a summary of all publicly available information about the firm's credit risk. When publicly available information has been controlled for, the coefficient on *CLO initial buys* would thus capture the private information acquired by CLOs. We further control for other firm characteristics that may be correlated with default risk as well as investments by CLOs. *Industry× Year* fixed effects and lead bank fixed effects are also included in some specifications.[18] Detailed variable definitions are provided in Appendix A.[19]

In Panel A of Table 3, we report our main results. In Columns (1) and (2), we only include *CLO initial buys* and control variables. In Columns (3) and (4), we add

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[17] We use a linear probability model to alleviate the incidental parameter problem. Our results are robust to using a logistic regression approach.

[18] If the firm has multiple lead banks, we use the bank with the largest loan market share.

[19] We also include initial buys by bank-affiliated CLOs in our regressions (e.g., Peristiani and Santos, 2019).

Industry×Year and lead bank fixed effects. Consistent with our expectations, in all columns, we find statistically significant negative coefficients on *CLO initial buys* (-0.988, *se*=0.464 in Column 1; -0.061, *se*=0.030 in Column 2; -1.462, *se*=0.444 in Column 3; -0.097, *se*=0.030 in Column 4). The significant coefficients on *CLO initial buys* suggest that CLOs' initial purchases contain forward-looking information over and above other publicly observable signals. The magnitude of the coefficient in Column (3) suggests that the future distress probability of firms with *CLO initial buys* is about 1.46% (38.32% of the mean distress probability) lower than other leveraged firms, after controlling for firm characteristics, industry-year fixed effects, and lead bank fixed effects.

The financial crisis of 2008 had a profound impact on the securitization market, leading to significant changes and developments. To capture and analyze this evolution within the CLO market, in Panel B, we divide our full sample period into three distinct sub-periods: Pre-crisis (covering the years 2005-2007), Crisis (encompassing the years 2008-2009), and Post-crisis (spanning the years 2010-2019). This breakdown allows us to examine the specific dynamics and trends that emerged before, during, and after the crisis, providing valuable insights into the evolution of the CLO market over time. We re-estimate equation (1) in each sub-sample, respectively.

Overall, the results shown in Table 3 indicate that the coefficients on CLO initial buys are not statistically significant before and during the crisis, aligning with the evidence in Benmelech et al. (2012). However, in the post-crisis period, these coefficients become negative and significant, suggesting consequential changes in the loan securitization market. We hypothesize that an evolved relationship between CLOs and lead arrangers contributes to this positive effect as we observe an increase in repeated transactions between CLO managers and lead banks post-crisis. As shown in Panel D of Table 1, the majority of loans in CLOs' holding portfolios are arranged by lead banks that trade with CLO managers repeatedly. This economically strong relationship may place CLOs in a better position to gain access to lead banks' private information about loan fundamentals.[20] While bank-affiliated CLOs may utilize their informational advantage (Peristiani and

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[20] A strong relationship with the lead bank comes with a cost that the CLO's loan portfolio may be under-diversified. In other words, the CLO portfolio may be overexposed to the idiosyncratic risk of loans originated by specific lead banks.

Santos, 2019), they represent only 5.2% of our sample. Thus, the enduring business relationship with the lead bank, rather than bank affiliation, appears to be more prevalent, increasingly important, and a potential explanation for CLO performance trends. In the following section, we extensively examine whether these relationships and the associated valuable private information sharing indeed contribute to CLO performance.

5. Information Sharing with Related Lead Banks

5.1. CLO-bank relationships.

In the post-crisis CLO market, an important development is the repeated purchase of loans by CLOs from the same lead banks over time and across different loans. This ongoing business relationship encourages lead banks to share private information about loan fundamentals with CLOs in order to maintain or strengthen this relationship (Sharpe, 1990; Boot et al., 1993; Boot and Thakor, 1994). Therefore, we propose that when a CLO and a bank have an established long-term relationship, the bank has the incentive to share its private information about loan fundamentals with the CLO, thereby enabling the CLO to make better loan selection decisions for its portfolio.

We examine the effect of CLOs' relationship with lead banks based on the proportion of lead banks' securitized facilities held in the CLO managers' portfolios. We predict that *CLO initial buys* made by CLOs with a strong pre-existing relationship with lead banks are more informative of distress risk, leading to a more negative relationship between *CLO initial buys* and future incidence of negative credit events.

We note that the majority of the initial buys by CLOs are from banks with past transactions in the past five years. Therefore, we rely on a density measure to separate stronger CLO-bank relationships from weaker ones. This relationship density is measured using net loan purchases by a CLO from a bank in the past five years, scaled by the total loans sold by the bank. Based on the yearly sample median level, we define two indicators, *Strong Related* and *Not Srong Related*, to separate the full sample into two groups based on whether the CLO manager has a strong pre-existing relationship with the originating lead bank. We expect the association between CLO initial purchases and probability of negative credit events to be stronger for *Strong Related* CLOs. The following model is employed to test our prediction:

$$Distress_{f,(m+1,m+12)} = \beta_0 + \beta_1 \; CLO \; initial \; buys_{f,m} \times Strong \; Related_{f,m} + \beta_2 \; CLO \; initial$$
$$buys_{f,m} \times Not \; Strong \; related_{f,m} + \beta_3 \; EDF + Controls + Firm \; FE + Year \; Month$$
$$FE + \varepsilon_{f,m}$$

$$(2)$$

where $Distress_{f,(m+1,m+12)}$ is an indicator variable that equals 1 if the firm f files for bankruptcy or experiences a downgrade to CCC and below in the following 12 months, and 0 otherwise. A CLO manager j is regarded as related to the lead bank b if the proportion of the lead bank b's securitized facilities held by the CLO manager j is larger than the yearly median proportion of all CLO manager-lead bank pairs. Indicator variable $Strong$ $Related_{f,m}$ equals one if the facilities of firm f are initially bought by a CLO whose manager has strong pre-existing relationships with the majority of lead banks of firm f before the initial purchase in month m; $Not \; Strong \; Related_{f,m}$ equals 1 if the facilities of firm f are initially bought by a CLO whose manager does not have strong pre-existing relationships with the majority lead banks of firm f before the initial purchase in month m.[21] To rule out the effect of bank-affiliated CLOs, we control for the $CLO \; initial \; buys$ made by bank-affiliated CLOs.

In Column (1) of Table 4 Panel A, we find a negative and significant coefficient on the $CLO \; initial \; buys_{f,m} \times Strong \; Related_{f,m}$ (-1.421, se=0.381). The coefficient on $CLO \; initial$ $buys_{f,m} \times Not \; Strong \; Related_{f,m}$ is also significant but the magnitude is much smaller (-0.662, se=0.315). The difference between the two coefficients is not only statistically significant (f-value=4.41, p-value=0.037), but also economically significant. The future distress probability of firms with strong related CLO initial buys is about 0.76% (19.92% of the mean distress probability)) lower than firms with not strong related CLO initial buys. This finding is generally consistent with the notion that having strong pre-existing relationships with lead banks enables CLOs to obtain private information about borrowers' default risk.[22]

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[21] The primary dependent variable is at firm-month level. Thus, our analyses are at the firm-month level, rather than the facility-month level to avoid overweighting firms with multiple facilities outstanding. In Online Appendix A, we reconduct the analyses using facility-month level sample and find similar results.

[22] Our findings may be influenced by lead banks' warehousing risk and their preference to transfer better loans to affiliated CLOs without sharing private information. To address this, we partition CLO initial buys into two subgroups based on lead banks' market share. We find that both the initial buys of facilities arranged by small banks and large banks are predictive of future negative credit events, indicating that warehousing risk alone does explain away our results.

In Columns (2) to (4), we examine the evolution of CLO-bank relationship effects by separating samples into three time periods. We find that the incremental beneficial effect of having a strong pre-existing relationship is concentrated in the post-financial crisis period. Such an increasing trend in the beneficial effect of the CLO-bank relationship coincides with the trend that CLOs increase the fraction of loans from lead banks with repeated transactions to CLO managers in their portfolio after the financial crisis. This finding provides another piece of evidence to support that a strong relationship with lead banks allows CLOs to access private information about loan fundamentals from such related banks.[23]

An alternative explanation is that CLO managers may also obtain useful private information directly from the borrowers by repeatedly purchasing loans from the same borrowers. To test this possibility, we partition CLO initial purchases into two groups based on whether CLO managers initially purchased syndicated loans issued by the same borrowers in the past five years. We construct two indicators, *RelatedBorrower*$_{f,m}$, which equals one if the facilities of firm *f* are initially bought by a CLO whose manager purchased syndicated loans issued by firm *f* in the five years before month *m*, and *UnrelatedBorrower*$_{f,m}$, which equals 1 if the facilities of firm *f* are initially bought by a CLO whose manager did not purchase syndicated loans issued by firm *f* in five years before month *m*. As shown in Table 4 Panel B, there is no significant difference between the predictive ability of initial purchases made to related borrowers and those made to unrelated borrowers, indicating that CLOs are not directly obtaining private information from borrowers.

5.2. Banks' private information and the beneficial effect of CLO-bank relationship.

If CLOs' superior screening ability is attributed to shared private information from lead banks, we would expect to find a more pronounced beneficial effect of CLO-bank relationships when banks have more private information about the borrower. To test this heterogeneity, we partition the full sample based on the extent of banks' information about

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[23] Our discussion and analyses above pertain to CLOs – but can arguably extend to other institutional lenders such as loan mutual funds as well. To test whether the effect of CLOs is incremental to these other participants, in untabulated analyses, we replicate the analyses in Tables 3A and 4 by constraining the sample to facilities that involved at least one institutional lender at origination. Our results are unaffected by this sampling procedure.

borrowers. Following Ivashina (2009), we first regress realized loan spreads on a set of observable loan and borrower characteristics using a five-year rolling window and then calculate the regression residuals. The absolute value of residuals obtained from the regression potentially reflects a loan spread component that is not explained by the publicly observable information, and therefore reflects banks' private information (Sharpe, 1990; Ivashina, 2009). We then partition the sample based on the median value of private information and re-estimate Eq (2) in each sub-sample. The results shown in Table 5 Panel A suggest that the beneficial effect of CLO-bank relationship is more pronounced when banks potentially have more private information about the borrowers.

Furthermore, following Ball et al. (2008), we calculate the debt-contracting value (DCV) of accounting information, to proxy for banks' private information. Summary accounting information for publicly-held borrowers is available to all external stakeholders. Accordingly, as the relevance of such widely available information (i.e., DCV) increases, we expect the relative value of banks' private information to be lower. Thus, we partition the sample according to the median value of debt-contracting value and re-estimate Eq (2) in each sub-sample. As shown in Table 5 Panel B, the beneficial effect of CLO-bank relationships is more pronounced for borrowers with low DCV of accounting information.

Altogether, the findings in this section support the argument that long-run CLO-bank relationships give CLOs access to banks' private information about borrower fundamentals, thereby contributing to the superior ability of CLOs in selecting loans.[24]

6. Additional Analyses

6.1. Predictive ability of CLO initial purchases over longer horizons

One concern with our findings is that loans purchased by CLOs do not underperform immediately but their performance may deteriorate over a longer horizon. To address this

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[24] Results reported in Online Appendix F show significant and positive coefficients on measures of CLO-bank relationship on CLO performance. For example, we show that the future proportion of CCC-rated loans is 0.8% lower for CLOs that initially purchased facilities from related lead banks, compared to CLOs who did not initially purchase facilities from related lead banks. Given that the mean proportion of CCC-rated loans in CLOs' portfolios is around 4%, this effect is economically significant. Similarly, the coefficient in Column (3) suggests a 0.1% lower proportion of defaulted loans for CLO buying loans from related lead banks. Overall, the results collectively support the argument that having close pre-existing relationships with lead banks allows CLOs to gain access to banks' private information about loan fundamentals and improves CLO portfolio performance.

concern, we examine the association between CLO initial purchases and the likelihood of negative credit events in the next two to three years. As reported in Table 6 Panel A, we find that the relation between CLO initial buys and the future negative credit events remains significantly negative over the two- and three-year horizons, suggesting that the CLO initial buys reflect forward-looking information about borrower default risk.

6.2. Alternative sample

Despite employing a battery of control variables, an empirical identification challenge with this study is that loans held by CLOs may be fundamentally different from loans that are not CLO-held. As mentioned earlier, we confront this challenge by the *ex-ante* sampling of leveraged firms (see Gilson, 1989,1990; Gilson et al., 1990; Demiroglu and James, 2015, for similar approaches). However, due to the long-standing discussion on what qualifies as "leveraged" and the lack of a perfect definition, one might be concerned that our results are driven by the subjective sample selection and the fundamental difference between firms with CLO holdings and firms without CLO holdings.[25] To mitigate this concern, we conduct several robustness tests. First, we employ an entropy balancing approach to achieve covariate balance across the first and second moments of loan characteristics and borrower characteristics (Hainmueller, 2012).[26] This helps mitigate concerns that the documented lower future distress probability is driven by systematic differences between loans held by CLOs and loans that are not CLO-held. We re-run the baseline analysis using the entropy-balanced sample and find statistically negative coefficients on *CLO initial buys* in Columns (1) and (2) of Table 6 Panel B, consistent with our baseline results. Second, we use an alternative sample to address the concern that our results are driven by subjective sample selection. We re-estimate equation (1) using a full sample without constraining the analyses to firms with speculative-grade credit ratings. The negative coefficients on *CLO initial buys* indicate that our baseline results are not driven by the sample selection. Furthermore, we restrict attention to a leveraged sample with institutional lenders to investigate whether CLOs exhibit superior ex-ante screening ability compared to other institutional investors in the primary loan market. The negative coefficients in Columns (5)

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[25] https://www.spglobal.com/marketintelligence/en/pages/toc-primer/lcd-primer#sec1a

[26] In the Online Appendix B, we show the summary statistics of control variables after the entropy balancing.

and (6) suggest that CLO initial purchases contain additional forward-looking information, compared to those investments made by other institutional participants.

6.3. Purchases at origination versus secondary purchases

In this subsection, we follow Benmelech et al. (2012) and separate *CLO initial buys* during the loan origination phase from *CLO initial buys* during the post origination phase. In Columns (1) and (2) of Table 6 Panel C, we show that there is no significant correlation between CLO initial buys during the loan origination and future distress probability. In Columns (3) and (4), we show that the effect is significant only for *CLO initial buys* during the post origination phase. However, we note that around 90% of the *CLO initial buys* take place in the post-origination or secondary trading phase. An important reason is the potential tax benefits associated with such trading behavior. In particular, loan transactions in the post origination phase are typically conducted via SPVs in tax haven jurisdictions, allowing both buyers and sellers to reduce their tax burden. As such, CLOs prefer purchasing loans in the post origination phase (see also Blickle et al., 2020). Thus, the insignificant effect of *CLO initial buy*s during the loan origination phase might be a result of low statistical power.[27]

6.4. Ex-ante screening vs. Ex-post monitoring

An alternative explanation for our primary finding is that the lower credit risk of loans held by CLOs is due to effective ex-post monitoring by CLOs. We note that CLOs only hold a small fraction of specific loan facilities, making it very costly for them to assert their control rights and monitor the firms directly. We conduct two tests to investigate whether the observed negative relationship between *CLO initial buys* and the future probability of negative credit events is driven by ex-post monitoring.

We first test whether the subsequent trading behavior of CLOs can predict the future incidence of negative credit events. If CLOs proactively monitor firms after initial purchases, then they should be able to acquire new information about firm fundamentals

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[27] Another alternative explanation is that CLOs are more likely to invest in firms with newly originated facilities, and negative credit events are less likely to occur shortly after a facility is originated. To alleviate this concern, we partition our sample into two subsamples: firms with facilities originated in the past 12 months and firms without facilities originated in past 12 months. The results shown in Online Appendix C indicate that our results are not driven by proximity to loan origination.

and utilize this information to facilitate their trading activities. Accordingly, the subsequent trading behavior of CLOs should have a similar predictive ability for negative credit events.

The results are reported in Panel D of Table 6. The coefficients on subsequent buys or subsequent sales are not significant, while the coefficients on *CLO initial buys* are negative and significant. Therefore, subsequent buys or subsequent sales do not appear to contain statistically discernable forward-looking information about the incidence of financial distress in the near future. One possible explanation is that the subsequent buying and selling activities may simply reflect CLOs' compulsory/passive responses to credit events (e.g., breach of rating thresholds or over-collateralization tests). Loumioti and Vasvari (2019) also find that subsequent trades could be driven by opportunistic behavior related to over-collateralization test benchmarks. These confounding factors may result in insignificant coefficients observed in our tests.[28]

Second, if ex-post monitoring plays a significant role, then we should expect a more pronounced inverse relationship between *CLO initial buys* and future distress probability if the initial transaction is made to facilities with financial covenants. Therefore, in our second test, we partition the *CLO initial buys* into two groups: initial buys of facilities with covenants and initial buys of covenant-lite facilities. The results are reported in Column (1) of Table 6 Panel E. We find that CLO initial purchase of covenant-lite facilities has a similar negative correlation with the probability of future distress. We further constrain our sample to firms with covenant-lite facilities to mitigate the concern that our results are driven by ex-post monitoring. As shown in Columns (2) and (3) of Table 6 Panel E, we find an inverse relationship between CLO initial buys and future distress probability, with a similar magnitude and significant level to the baseline results.

6.5. CLO experience

Another alternative explanation for our results is that CLO managers who repeatedly trade with lead banks also gain greater experience in selecting loans. To alleviate this concern, we directly examine the beneficial effect of CLO experience. We construct two indicator variables, *Experienced$_{f,m}$*, that equals one if the facilities of firm *f* are initially

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[28] Note further that our arguments and tests suggest that subsequent CLO purchases do not contain additional *incremental* information about borrowers' default risk beyond *CLO initial buys*. We do not suggest that subsequent trades contain *no* information.

bought by a CLO whose manager has higher than median years of experience in the CLO market before the initial purchase in month m, and $Inexperienced_{f,m}$, that equals one if facilities of firm f are initially bought by a CLO whose manager has lower than median years of experience in the CLO market before the initial purchase in month m. Results are shown in Table 6 Panel F. The coefficients on *CLO initial buys* are similar for both experienced and inexperienced CLO managers.[29]

6.6. Alternative negative outcome events

In Panel G of Table 6, we reconduct our analysis using alternative negative outcome events. In Columns (1) and (2), we use the incidence of delisting as a dependent variable. We further use general credit rating downgrades as the outcome events in Columns (3) and (4). We find results that are consistent with those reported in our main analyses.

7. CLO Holdings and Restructuring Outcomes

7.1. Prepacks v.s. traditional Chapter 11

The analyses in previous sections show that CLOs utilize their ex-ante screening ability and private information from the lead banks to select loans with lower default risk. We next investigate the actions taken by CLOs when loan default occurs despite the on-average superior loan selection by CLOs.

We directly examine whether CLO holdings enhance or reduce the efficiency of the restructuring process. Given the CLO funds' sizeable share of the leveraged loan market, this question has become increasingly important from a macro-regulatory point of view. However, the answer to this question is ex-ante unclear. On the one hand, CLOs may not have any incentive to exercise their control rights and contribute to the restructuring process. On the other hand, it is precisely due to this lack of monitoring incentive that CLOs may delegate their control rights to lead banks, especially to those having a long-run relationship with the CLO, thereby mitigating coordination problems and improving restructuring efficiency.

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[29] To further mitigate the concern that the effect of relationship is driven by CLO life cycle, we partition the initial purchases into two groups based on whether the age of CLO is larger than the median age of all CLOs during our sample period. The results are reported in Online Appendix D. The coefficients on *CLO initial buys* are similar and statistically significant for both CLOs in early stage and late stage.

Next, we examine the role of CLOs in the restructuring process. We first use the incidence of prepackaged bankruptcy as a proxy for restructuring efficiency. As discussed before, we would find that CLO holdings are positively associated with the likelihood of prepackaged bankruptcy, conditional on filing for bankruptcy.[30] The underlying reason is that pre-packs are a hybrid where a reorganization plan is negotiated with creditors prior to bankruptcy and filed concurrently with the bankruptcy petition. Prepacks allow firms to exit bankruptcy within weeks, and are therefore expected to have lower direct costs than a lengthier bankruptcy proceeding (Hotchkiss et al., 2008). Furthermore, following Li et al. (2019), we use a dummy variable indicating emergence from bankruptcy as a measure of restructuring efficiency. The following model is used:

$$Prepack_f \text{ or } Recover_f = \beta_0 + \beta_1 \, CLOhold_f + Controls + Industry \, FE + \varepsilon_f. \quad (3)$$

We restrict our sample to the firms that filed for Chapter 11 bankruptcy. The dependent variable, $Prepack_f$ is a dummy variable that equals 1 for prepackaged Chapter 11 filings, and 0 for traditional Chapter 11 filings; $Recover_f$ is a dummy variable that equals 1 if the bankrupt firm f emerges successfully from Chapter 11, and 0 otherwise. $CLOhold_f$ is an indicator variable that equals 1 if the firm's loans are held in the CLOs' portfolio over the last four quarters, and 0 otherwise.

We report the results in Panel A of Table 7. We find positive and significant coefficients on $CLOhold_f$ in all columns. As for economic significance, the coefficient in Column (1) indicates that the likelihood of a firm having a prepackaged bankruptcy is about 12.6% higher if its loans are held by CLOs, conditioning on filing for Chapter 11 bankruptcy. The coefficient in Column (2) indicates that the probability of emergence is about 24.6% higher if the firm's loans are held by CLOs.

Further, we test whether strong pre-existing relationships between CLOs and lead banks influence the effect of CLO holding on restructuring efficiency. We argue that strong pre-existing relationships allow less costly renegotiation and coordination between CLOs and lead banks. It is more likely for CLOs to delegate their control rights to relationship

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[30] Demiroglu and James (2015) examine the effect of CLO on the likelihood of "prepack" vs. out-of-court restructuring. They find that it is more difficult to restructure loans held by CLOs outside of bankruptcy. Different from Demiroglu and James (2015), we examine if CLO holdings are associated with a greater likelihood of prepackaged vs. traditional Chapter 11 bankruptcy.

banks, thereby leading to a greater likelihood of a prepackaged Chapter 11 filing and successful emergence from Chapter 11. To test our prediction, we partition CLO holdings into two groups: Firms whose loans are held by strongly related CLOs before filing for bankruptcy and firms whose loans are held by those CLOs that are not strongly related before the bankruptcy filing. We estimate the following regression:

$$Prepack_f \text{ or } Recover_f = \beta_0 + \beta_1 \, CLOhold_f \times Strong \, Related_f + \beta_2 \, CLOhold_f \times Not \, Strong$$
$$Related_f + Controls + Industry \, FE + \varepsilon_f \qquad (4)$$

As shown in Column (2) of Table 7 Panel B, we document a positive and significant coefficient on $CLOhold_f \times Strong \, Related_f$ (0.296, se=0.134) while the coefficient on $CLOhold_f \times Not \, Strong \, Related_f$ is negative but not statistically significant (-0.141, se=0.111), indicating that firms held by strong related CLOs are more likely to file for prepackaged bankruptcy. Similarly, we find that CLOs with a strong relationship with the lead bank increase the likelihood of their invested firms emerging from bankruptcy. These findings are consistent with the notion that the repeated contractual relationships between CLO and lead banks are associated with renegotiation and coordination costs, thereby enhancing the efficiency of the restructuring process.

7.2. Endogeneity

In this section, we address concerns that our results are driven by unmodelled economic factors. For example, a change in funding costs can affect CLO holdings and restructuring outcomes simultaneously. We utilize the adoption of CLO risk retention requirements in December 2016 as a quasi-natural experiment that negatively affects the CLOs' activities. In particular, these risk retention rules require CLOs issued after December 2016 to fulfill certain risk retention obligations. To the extent that CLOs mainly invest in term loan B tranches, we expect that the securitization likelihood of term loan Bs is lower after 2016 (Nadauld and Weisbach, 2012). This identification assumption is validated in Online Appendix E. Next, relying on this assumption, we test how this risk retention rule affects restructuring outcomes. The following difference-in-difference (DiD) model is employed:

$$Prepack_f \text{ or } Recover_f = \beta_0 + \beta_1 Term \, Loan \, B_f + \beta_2 \, Term \, Loan \, B_f \times Year \, 2017_f + \beta_3$$
$$Year \, 2017_f + Controls + Industry \, FE + \varepsilon_f. \qquad (5)$$

We restrict the sample to firms with outstanding loans from 2015 to 2017. *Term Loan B_f*

is an indicator variable that equals one if the firm has outstanding term loan B tranches that are originated before the adoption of the risk retention rule. *Year 2017$_f$* is an indicator variable that takes a value of one if the reference firm files for bankruptcy in 2017. The coefficient on the interaction term captures the effect of exogenous variation in CLO holdings due to the adoption of the risk retention rule on restructuring outcomes. The results in Panel C indicate that firms with outstanding term loan B originated before the risk retention rule are less likely to file for prepackaged bankruptcy after the risk retention rule becomes effective for CLOs (that are less likely to hold term loan B after the risk retention rule adoption). We find a predicted negative but not significant effect on the likelihood of firms emerging from bankruptcy.

In February of 2018, the U.S. Court of Appeals for the District of Columbia Circuit ruled that CLO managers will no longer have to comply with the aforementioned 'skin in the game' rules designed to align interests between CLO managers and their investors. Therefore, this repeal can act as another exogenous shock to CLOs' demand for term loan B tranches. We use the following regression model to conduct another DiD estimation:

$$Prepack_f \text{ or } Recover_f = \beta_0 + \beta_1 \text{ Term Loan } B_f + \beta_2 \text{ Term Loan } B_f \times Post_f + \beta_3$$
$$Post_f + Controls + Industry FE + \varepsilon_f. \tag{6}$$

The sample consists of firms with outstanding loans from 2017 to 2019. Firms that have outstanding term loan B tranches originated before the repeal of risk retention rule for CLO in 2018 serve as the treatment group. *Post$_f$* is an indicator variable that equals one if the firm files for bankruptcy after February 2018. The results indicate that firms with outstanding term loan B tranches originated before February 2018 are more likely to file for prepackaged bankruptcy after the removal of the risk retention rule. The results in Panel D suggest that firms with outstanding term loan B tranches originated before the risk retention rule removal are more likely to file for prepackaged bankruptcy after the CLOs are *exempt* from risk retention requirements. We do not find statistically significant effects on the likelihood of firms emerging from bankruptcy.[31]

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[31] We also investigate CLOs' selling behavior related to bankrupt firm loans. We find CLOs that have a close pre-existing relationship with a firm's lead banks are less likely to sell these defaulted loans during the one-year period before and after the bankruptcy filing month. This finding is surprising given that most of CLOs face contractual constraints on holding default loans (see Online Appendix G). One explanation may be that, to establish a strong relationship with the lead bank and obtain private information, CLOs provide related lead banks with short-term price support when the borrowers are in trouble. Another explanation is that,

8. Strategic Development of Relationships with Lead Banks

Given the increased efficiency of ex-ante screening and ex-post restructuring through CLO-bank relationships, we propose that CLOs are more likely to purchase loans from affiliated lead banks due to the advantageous informational impact of long-term relationships. We further suggest that the incentive for CLOs to develop such relationships is heightened after the 2008 financial crisis. Moreover, this incentive is stronger when targeted loans carry higher risk and the beneficial effect of lead banks' private information is more pronounced (Holmström, 2009; Pagano and Volpin, 2012).

To test the above predictions, we follow the research design of Bharath et al. (2007). For each CLO initial buy, we pair it with lead banks ranked in the top 40 banks by their securitized amounts in the CLO market in the previous year.[32] In each year, we keep only CLO initial buys for which at least one of the lead banks of the facility was ranked in the top 40 list in the prior year. We conduct the following regression:

$$Chosen_{i,j,s,m} = \beta0 + \beta1\ Strong\ Related_{i,j,m} + \beta2\ Strong\ Related_{i,j,m} \times Default\ Risk_{s,m} + \\ \beta3\ Strong\ Related_{i,j,m} \times Post\text{-}Crisis_m + \beta4\ Default\ Risk_{s,m} + CLO \\ FE + Lead\ Bank\ FE + Firm\ FE + Year\ FE + \mathcal{E}_{i,j,s,m}$$
$$(7)$$

where $Chosen_{i,j,s,t}$ is an indicator variable that equals one if bank i is the lead bank for the loan s initially purchased by CLO j, and zero otherwise. $Strong\ Related_{i,j,t}$ is an indicator variable that equals one if bank i is related to CLO j at month m, and zero otherwise. Bank i and CLO j are considered related if the proportion of bank i's securitized facilities held in the portfolio of CLO j's manager exceeds the yearly median. $Post\text{-}Crisis_m$ is an indicator variable that equals one if the initial buy occurs in 2010-2019, the period after the financial crisis, and zero otherwise. To proxy for the default risk of securitized loans, we first construct an indicator variable based on credit ratings, $CCC\ Rating_{s,m}$, which equals one if the loan s is rated CCC or below by at least one of the credit rating agencies at month m. Since credit rating is a coarse measure of borrowers' default risk, we additionally use the

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compared with other CLOs, CLOs that have pre-existing relationships with lead banks have better performance, and therefore, are less likely affected by fire sale threats (Elkamhi and Nozawa, 2022).

[32] Restricting attention to Top 40 lead banks circumvents criticisms that certain banks are simply not very frequently active in the CLO market due to size or business model-related reasons; hence, establishing a long-run CLO trading relationship with them is not possible. Indeed, in our sample, these Top 40 lead banks account for 92% of CLO initial buys.

expected default frequency (EDF) based on the KMV-Merton model to assess borrowers' future default risk.

Table 8 reports the regression results. As shown in Column (1), CLOs are 2.3% more likely to purchase loans for their portfolios from strong related lead arrangers. This increase is economically significant, given that the average probability of purchasing loans from the Top 40 lead arrangers is 9.3%. In addition, in Columns (2) and (3), we show that the effect of the CLO-lead arranger relationship on CLO initial purchase choice is more pronounced in the post-crisis period, and for loans with higher default risk. Overall, these findings suggest that CLOs strategically retain their relationship with lead arrangers.

Collectively, these findings suggest that, anticipating the beneficial effects of the long-run CLO-lead arranger relationship, CLOs strategically purchase loans from the same lead arrangers. These findings also potentially reflect the equilibrium that related lead arrangers have incentives to share their private information about loan fundamentals with CLOs.

9. Conclusions

Recent years have witnessed a spirited debate on the pros and cons of the dramatic growth in the CLO market. On one hand, CLOs have enabled growth in the extension of credit to below-investment-grade borrowers. On the other hand, observers have argued that demand for leveraged loans from CLOs has led to an over-extension of credit to otherwise unqualified borrowers, potentially endangering the stability of the financial system.

We shed light on this debate by investigating the role of CLO-lead arranger relationships in influencing the credit outcomes of loans purchased by CLOs. We conduct several related analyses. First, we predict that CLOs exhibit a superior ability to screen out risky loans, especially when a long-run CLO-lead arranger relationship exists. Consistent with this argument, we find that firms whose loans are initially purchased by CLOs are less likely to file for bankruptcy or experience a downgrade to CCC and below over the next one-year period, compared to ex-ante similarly risky firms. Further analyses indicate that this superior screening ability is due to the possibility that CLOs have strong prior relationships with certain lead arrangers, and thus the access to valuable private information.

We further examine the influence of CLOs on restructuring outcomes, conditional on a bankruptcy filing by the borrower. Our results indicate that borrowers of loans held by CLOs are more likely to restructure via prepackaged Chapter 11 filings, and are more likely to emerge successfully from the Chapter 11 process. These findings are especially pronounced for loans held by CLOs that have a strong prior relationship with the lead arranger, reflecting low renegotiation and coordination costs between such CLOs and lead arrangers. Finally, we find that CLOs strategically develop long-run relationships with the same lead arrangers to take advantage of the beneficial information-sharing effects of such relationships.

As of this writing, the world is dealing with the after-effects of a cataclysmic public health and economic crisis. How CLOs perform in the aftermath of this unprecedented period is beyond the scope of our paper and remains to be seen. Preliminary regulatory assessment seems to suggest that fears of CLOs contributing to systemic risk during an economic downturn have not materialized [yet]. For example, a report by the U.S. Government Accountability Office suggests (on p. 31) that "The credit profiles of CLO leveraged loan collateral deteriorated after the COVID-19 shock, resulting in negative credit rating actions for many nonsenior CLO securities…..However, senior CLO security tranches remained largely resilient to the turmoil in the leveraged loan market." Indeed, CLO performance and the role played by CLOs, if any, in propagating the effects of the post-covid macroeconomic uncertainty could emerge as a fertile area for future research.

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Table 1: Sample Selection and Distribution

Panel A: Sample Selection

Sample	# of obs.
Monthly Compustat-CRSP matched sample from Jan 2005 to Sep 2019	1,186,620
Minus: Observations without outstanding Dealscan facilities	722,197
Observations with missing control variables	203,028
Observations without S&P entity rating	139,583
Full sample from Jan 2005 to Sep 2019	121,812
Non-Investment Grade sample	70,757

Panel B: Number of Observations and Means by Industry and CLO initial buys

	Full Sample		CLO initial buys=0		CLO initial buys=1		(5) – (3)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SIC	Distress (%)	CLO initial buys (%)	Distress (%)	# of Obs	Distress (%)	# of Obs	t-stat
00-09	2.08	15.63	2.47	243	0.00	45	-1.06
10-14	9.51	3.74	9.65	8,526	5.74	331	-2.38**
15-17	2.50	0.52	2.52	954	0.00	5	-0.36
20-39	2.95	11.66	2.93	26,179	3.07	3,456	0.44
40-49	3.92	19.95	4.14	8,304	3.04	2,070	-2.30**
50-51	1.51	7.29	1.63	2,276	0.00	179	-1.72*
52-59	2.62	6.95	2.42	5,533	5.33	413	3.57***
70-89	2.67	19.60	3.02	9,760	1.22	2,379	-4.90***
91-99	25.00	5.77	23.47	98	50.00	6	1.46
Total	3.81	12.56	3.97	61,873	2.72	8,884	-5.72***

Panel C: Number of Observations and Means by Year and CLO initial buys

	Full Sample		CLO initial buys=0		CLO initial buys=1		(5) – (3)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Year	Distress (%)	CLO initial buys (%)	Distress (%)	# of Obs	Distress (%)	# of Obs	t-stat
2005	3.19	0.13	3.17	4,510	16.67	6	1.88*
2006	1.95	2.57	1.95	4,656	1.63	123	-0.26
2007	2.14	11.04	2.21	4,399	1.65	546	-0.85
2008	10.80	18.13	10.80	4,018	10.79	890	-0.01
2009	3.81	16.17	3.87	3,956	3.54	763	-0.43
2010	1.72	17.58	1.93	3,783	0.74	807	-2.35**
2011	2.62	12.86	2.96	4,019	0.34	593	-3.74***
2012	2.43	12.46	2.53	4,038	1.74	575	-1.15
2013	2.02	20.17	2.20	3,630	1.31	917	-1.72*
2014	4.48	23.38	5.45	3,764	1.31	1,149	-5.96***
2015	8.97	5.54	9.39	4,771	1.79	280	-4.34***
2016	2.09	7.65	2.26	4,645	0.00	385	-2.98***
2017	1.98	12.67	1.95	4,368	2.21	634	0.44
2018	3.78	14.27	3.83	4,313	3.48	718	-0.45
2019	4.91	14.22	5.13	3,003	3.61	498	-1.45
Total	3.81	12.56	3.97	61,873	2.72	8,884	-5.72***

Panel D: Proportion of Loans from Lead Banks Engaging in Repeated Trades with CLO Managers

	Holdings	Initial Buys

	Amount	Number	Amount	Number
2006	43.05%	41.94%	35.33%	35.05%
2007	65.68%	65.05%	51.04%	50.74%
2008	82.10%	81.55%	70.00%	69.36%
2009	89.60%	89.41%	91.95%	91.76%
2010	93.12%	92.87%	91.81%	92.19%
2011	95.39%	95.32%	95.15%	94.94%
2012	96.51%	96.18%	99.07%	98.67%
2013	96.68%	96.12%	96.76%	96.82%
2014	96.36%	96.13%	96.27%	96.13%
2015	80.77%	79.48%	63.07%	61.48%
2016	62.30%	60.87%	37.90%	39.56%
2017	73.74%	73.10%	65.59%	63.59%
2018	86.83%	86.93%	72.73%	73.26%
2019	93.24%	93.05%	83.30%	83.96%
Pre-Crisis	62.17%	61.50%	46.01%	45.97%
Crisis	87.68%	87.40%	75.06%	74.90%
Post-Crisis	86.08%	85.61%	76.59%	76.49%
Total	86.08%	85.62%	74.37%	74.33%

This table presents sample selection and the distribution of *Distress* and *CLO initial buys*. Panel A reports the sample selection process; Panel B reports the distribution of negative credit events (Bankruptcy filing and Downgrade to CCC or below) and *CLO initial buys* across industries (general industry classification by two-digit SIC) and compares the probability of future distress between firms that are initially bought by the CLOs and other leveraged firms across industries. Panel C reports the distribution of negative credit events and *CLO initial buys* across years and compares the probability of future negative credit events between firms that are initially bought by the CLOs and other leveraged firms across years. Panel D reports the proportion of loans purchased from banks with prior contractual relationships. ∗∗∗, ∗∗ and ∗ denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 2: Descriptive Statistics

	Mean	SD	Median	# Obs.
Dependent Variables				
Distress	3.81%	0.191	0.00%	70,757
Defaulted Bucket	0.01	0.062	0.00	42,768
CCC Bucket	0.04	0.102	0.00	42,768
Prepack	13.84%	0.346	0.00%	614
Recover	40.88%	0.492	0.00%	614
Independent Variables				
CLO initial buys	12.56%	0.331	0.00%	70,757
Log CLO initial buys	1.97	5.216	0.00	70,757
Strong Related	9.88%	0.298	0.00	70,757
Not Strong elated	8.54%	0.279	0.00	70,757
Strong Relationship	34.42%	0.475	0.00%	42,768
Strong Related Pct	0.30	0.443	0.00	42,768
CLOhold	6.35%	0.244	0.00%	614
Firm Characteristics				
Coverage Ratio	1.77	1.085	1.70	70,757
Current Ratio	1.86	1.094	1.67	70,757
Leverage	0.51	0.226	0.49	70,757
Total Asset	7.78	1.092	7.71	70,757
MTB	1.41	0.632	1.26	70,757
Profitability	0.13	0.897	0.14	70,757
Tangibility	0.34	0.255	0.27	70,757
Altman	2.54	5.717	2.09	70,757
EDF	0.08	0.204	0.00	70,757
Rep Arranger	0.39	0.487	0.00	70,757
Rel Arranger	0.39	0.488	0.00	70,757
Institution Lender	0.64	0.480	1.00	70,757
Bank Affiliated CLO	0.02	0.128	0.00	70,757
Revolver	0.95	0.211	1.00	70,757
CLO Performance				
WARF Slack	0.05	0.087	0.05	42,768
Junior OC	4.68	0.032	4.68	42,768
Senior OC	4.88	0.074	4.88	42,768
Portfolio Size	18.14	1.339	17.99	42,768
Avg Portfolio Rating	13.80	1.009	13.90	42,768

Table 3: *CLO Initial Buys* and Future Negative Credit Events: An Evolving Relationship

Panel A: Main Results

	(1)	(2)	(3)	(4)
	Distress	Distress	Distress	Distress
CLO initial buys	**-0.988****		**-1.462*****	
	(0.464)		**(0.444)**	
Log *CLO initial buys*		**-0.061****		**-0.097*****
		(0.030)		**(0.030)**
Coverage Ratio	-1.565***	-1.566***	-1.938***	-1.937***
	(0.377)	(0.377)	(0.478)	(0.478)
Current Ratio	-1.151***	-1.151***	-1.403***	-1.403***
	(0.239)	(0.239)	(0.387)	(0.387)
Leverage	-2.557	-2.559	-1.286	-1.277
	(1.579)	(1.580)	(2.006)	(2.006)
Total Asset	-1.011***	-1.009***	-1.036***	-1.032***
	(0.222)	(0.223)	(0.324)	(0.325)
MTB	0.182	0.182	0.459	0.458
	(0.302)	(0.302)	(0.378)	(0.378)
Profitability	-1.377**	-1.377**	-1.149**	-1.149**
	(0.650)	(0.650)	(0.478)	(0.478)
Tangibility	2.542**	2.543**	-1.739	-1.752
	(1.048)	(1.049)	(2.130)	(2.130)
EDF	33.992***	33.992***	25.983***	25.986***
	(3.094)	(3.095)	(2.400)	(2.399)
Rel Arranger	0.772*	0.777*	0.946**	0.943**
	(0.417)	(0.417)	(0.468)	(0.468)
Rep Arranger	0.156	0.157	0.099	0.100
	(0.420)	(0.420)	(0.570)	(0.570)
Institution Lender	-1.454***	-1.456***	-1.008*	-1.006*
	(0.432)	(0.432)	(0.551)	(0.551)
Bank Affiliated CLO	0.298	0.341	-0.346	-0.214
	(0.665)	(0.669)	(0.602)	(0.600)
Revolver	-1.979*	-1.979*	-0.994	-0.990
	(1.174)	(1.174)	(1.431)	(1.431)
Lead Bank FE	No	No	Yes	Yes
Ind-Year FE	No	No	Yes	Yes
Adj R²	0.178	0.178	0.427	0.427
N	70,757	70,757	70,757	70,757

Panel B: Time-Series Variation

	Pre-Crisis		Crisis (2008-2009)		Post-Crisis	
	(1)	(2)	(3)	(4)	(5)	(6)
	Distress	Distress	Distress	Distress	Distress	Distress
CLO initial buys	**0.165**		**-1.393**		**-1.346***	
	(0.391)		**(1.100)**		**(0.478)**	
Log *CLO initial buys*		**0.007**		**-0.084**		**-0.088***
		(0.031)		**(0.079)**		**(0.032)**
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.421	0.421	0.493	0.493	0.438	0.438
N	14,240	14,240	9,627	9,627	46,890	46,890

This table reports the relation between *CLO initial buys* and the probability of negative credit events in the next 12 months. In Panel A, we present the baseline results. In Columns (1) and (2), we do not include fixed effects. In Columns (3) and (4), we add lead bank and industry×year fixed effects. In Panel B, we report time-series variation by dividing the sample into three periods: Pre-Crisis (2005-2007), Crisis (2008-2009), and Post-Crisis (2010-2019). Industry-Year fixed effects and lead bank fixed effects are included. We report in parentheses two-way clustered standard errors clustered at the firm and year-month level. To make the results more readable, we multiply the dependent variable by 100 (percentage format). ∗∗∗, ∗∗ and ∗ denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 4: **Information Sharing with Lead Banks: CLO-Bank v.s CLO-Borrower**

Panel A: Relationship between CLO Managers and Lead Banks

	All periods	Pre-Crisis	Crisis (2008-2009)	Post-Crisis
	(1)	(2)	(3)	(4)
	Distress	Distress	Distress	Distress
CLO initial buys×Strong Related	-1.421***	-0.683	-1.154	-1.393***
	(0.381)	(0.765)	(0.921)	(0.387)
CLO initial buys×Not Strong Related	-0.662**	0.265	-0.916	-0.384
	(0.315)	(0.414)	(0.769)	(0.368)
F-test (*p-value*)	0.037**	0.341	0.770	0.020**
Control	Yes	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes	Yes
Adj R²	0.427	0.421	0.493	0.438
N	70,757	14,240	9,627	46,890

Panel B: Relationship between CLO Managers and Borrowers

	All periods	Pre-Crisis	Crisis (2008-2009)	Post-Crisis
	(1)	(2)	(3)	(4)
	Distress	Distress	Distress	Distress
CLO initial buys×RelatedBorrower	-0.807	-1.530	1.256	-0.950
	(0.587)	(1.188)	(1.639)	(0.624)
CLO initial buys×UnrelatedBorrower	-1.281***	0.304	-1.505	-1.101***
	(0.404)	(0.400)	(1.110)	(0.416)
F-test (*p-value*)	0.515	0.160	0.196	0.847
Control	Yes	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes	Yes
Adj R²	0.427	0.421	0.493	0.438
N	70,757	14,240	9,627	46,890

This table reports how the CLO-bank relationship affects the predictive ability of *CLO initial buys*. In panel A, we partition *CLO initial buys* into two groups: initial buys made by the CLOs having a strong pre-existing relationship with the majority of firms' lead banks, and other initial buys. We define a CLO manager *j* and a lead bank *b* as strong related if the CLO manager *j* had transactions with the lead bank *b* in the past five years and the total purchases minus the total sales of the CLO manager *j* from the lead bank *b* over the past five years, scaled by the lead bank *b*'s total securitized loan outstanding, is larger than the yearly median of all CLO manager-lead bank pairs; We also investigate the effect in different time periods. In Column (1) we show the results based on the full sample. In Columns (2) to (4), we report the results of the subsamples across time. In Panel B, we test the effect of CLO-borrower relationship and partition *CLO initial buys* into two groups based on whether CLO managers have previously purchased loans issued by the same borrower. Industry-Year and lead bank fixed effects are included. We report (in parentheses) two-way clustered standard errors clustered at the firm and year-month level. To make the results more readable, we multiply the dependent variable by 100 (percentage format). ∗∗∗, ∗∗ and ∗ denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 5: Banks' Private Information and Borrowers' Disclosures.

Panel A: Banks' Private Information — Loan Spread Residuals

	High Private Info			Low Private Info		
	(1)	(2)	(3)	(4)	(5)	(6)
	Distress	Distress	Distress	Distress	Distress	Distress
CLO initial buys	-1.548**			-0.256		
	(0.615)			(0.495)		
Log *CLO initial buys*		-0.106**			-0.015	
		(0.042)			(0.033)	
CLO initial buys×Strong Related			-1.495***			-0.251
			(0.536)			(0.462)
CLO initial buys×Not Strong Related			-0.862*			-0.158
			(0.501)			(0.351)
F-test (*p-value*)			0.240			0.862
Control	Yes	Yes	Yes	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.473	0.473	0.473	0.552	0.552	0.552
N	34,244	34,244	34,244	34,279	34,279	34,279

Panel B: Banks' Private Information — Debt-Contracting Value

	High Private Info (Low DCV)			Low Private Info (High DCV)		
	(1)	(2)	(3)	(4)	(5)	(6)
	Distress	Distress	Distress	Distress	Distress	Distress
CLO initial buys	-2.042***			-0.921		
	(0.631)			(0.719)		
Log *CLO initial buys*		-0.134***			-0.061	
		(0.043)			(0.049)	
CLO initial buys×Strong Related			-2.133***			-0.592
			(0.543)			(0.623)
CLO initial buys×Not Strong Related			-0.803*			-0.593
			(0.451)			(0.578)
F-test (*p-value*)			0.009***			0.999
Control	Yes	Yes	Yes	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.369	0.369	0.369	0.486	0.486	0.486
N	31,648	31,648	31,648	31,890	31,890	31,890

This table reports how information asymmetry interacts with the predictive ability of *CLO initial buys* and the effect of the CLO-lead bank relationships. In Panel A, we use loan spread residuals to infer lead banks' private information. We first regress the loan spreads on observable information using a five-year rolling window, such as contract characteristics, lead bank characteristics, and borrower characteristics. The control variables in the regression model are similar to Ivashina (2009), and we include firm and loan type fixed effects in the regression. Next, we predict the residuals from the regression and use the weighted average residuals to infer banks' private information about the firm. High (above-median) residual values imply that

lead banks potentially possess private information about the firm. In Panel B, we use the debt-contracting value of accounting information (DCV) to proxy for lead banks' private information. For firms with low (DCV), lead banks potentially have a higher information advantage. Industry-Year fixed and lead bank fixed effects are included. We report (in parentheses) two-way clustered standard errors clustered at the firm and year-month level. To make the results more readable, we multiply the dependent variable by 100 (percentage format). ∗∗∗, ∗∗ and ∗ denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 6: Additional Analysis and Robustness Tests

Panel A: CLO Initial Purchase over Longer Horizons

	Distress in Two Years		Distress in Three Years	
	(1)	(2)	(3)	(4)
	Distress	Distress	Distress	Distress
CLO initial buys	-2.086***		-2.411**	
	(-2.65)		(-2.47)	
Log *CLO initial buys*		-0.142***		-0.160**
		(-2.70)		(-2.44)
Lead Bank FE	Yes	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes	Yes
Adj R²	0.527	0.527	0.561	0.561
N	70,757	70,757	70,757	70,757

Panel B: Alternative Sample and Weighted Regression Using Entropy Balancing

	Weighted Regression		Full Rated Sample		With Institutional Lender	
	(1)	(2)	(3)	(4)	(5)	(6)
	Distress	Distress	Distress	Distress	Distress	Distress
CLO initial buys	-1.198**		-1.454***		-1.369***	
	(0.476)		(0.380)		(0.474)	
Log *CLO initial buys*		-0.079**		-0.096***		-0.091***
		(0.032)		(0.025)		(0.032)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R²	0.443	0.443	0.379	0.379	0.464	0.464
N	70,757	70,757	121,812	121,812	45,172	45,172

Panel C: Purchases at Origination Vs. Secondary Purchases

	(1)	(2)	(3)	(4)
	Distress	Distress	Distress	Distress
OTD *CLO initial buys*	0.229		0.534	
	(0.857)		(0.844)	
Log OTD *CLO initial buys*		0.015		0.031
		(0.053)		(0.052)
CLO initial buys			-1.376***	
			(0.430)	
Log *CLO initial buys*				-0.092***
				(0.029)
Controls	Yes	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes	Yes
Adj R²	0.427	0.427	0.427	0.357
N	70,757	70,757	70,757	70,757

Panel D: Initial buys Vs. Subsequent Trading

	(1)	(2)	(3)
	Distress	Distress	Distress
CLO initial buys	-1.375***	-1.220***	
	(0.386)	(0.346)	
Subsequent buys	-0.226		0.511
	(0.474)		(0.414)
Subsequent sells		-0.489	
		(0.416)	
Controls	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes
Adj R²	0.427	0.427	0.573
N	70,757	70,757	16,706

Panel E: Financial Covenants

	Covenant	With Cov-Lite Loans	
	(1)	(2)	(3)
	Distress	Distress	Distress
CLO initial buys×Cov Lite	-2.047***		
	(0.596)		
CLO initial buys×With Cov	-1.009*		
	(0.564)		
CLO initial buys		-1.493***	
		(0.438)	
Log *CLO initial buys*			-0.102***
			(0.030)
F-test (*p-value*)	0.193		
Controls	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes
Adj R²	0.427	0.439	0.439
N	70,757	54,142	54,142

Panel F: CLO Experience

	(1)
	Distress
CLO initial buys×Experienced	-1.033**
	(0.469)
CLO initial buys×Inexperienced	-1.025**
	(0.418)
F-test (*p-value*)	0.990
Control	Yes
Lead Bank FE	Yes
Ind-Year FE	Yes
Adj R²	0.427
N	70,757

Panel G: Alternative Dependent Variables

	(1) Delist	(2) Delist	(3) Downgrade	(4) Downgrade
CLO initial buys	**-0.695***		**-2.065****	
	(0.400)		**(0.924)**	
Log *CLO initial buys*		**-0.044***		**-0.144****
		(0.037)		**(0.061)**
Controls	Yes	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes	Yes
Adj R²	0.293	0.293	0.424	0.424
N	70,757	70,757	70,757	70,757

This table reports the results of additional analyses and robustness tests. Panel A presents the correlation between *CLO initial buys* and negative credit events in the future two years and three years. In Panel B, we use alternative samples to re-estimate our baseline results. In Panel B Columns (1) and (2), we conduct the weighted regression using entropy balancing. We use the full rated sample in Columns (3) and (4), and the non-investment grade sample with at least one institutional lender in Columns (5) and (6). In Panel C, we consider the timing of initial purchases by CLOs. In Columns (1) and (2), we investigate the effect of initial buys at origination. In Columns (3) and (4), we separate CLO initial buys into the initial buys made during the loan origination period and the initial buys after the loan origination period. Panel D and Panel E report the results of tests that distinguish the effect of ex-ante screening and ex-post monitoring. Panel D presents the relation between subsequent trading by CLOs and the probability of negative credit events (i.e., bankruptcy filing or downgrade to CCC or below) in the next 12 months. Panel E shows whether the financial covenants affect the relationship. In Column (1), we partition *CLO initial buys* into two groups: initial buys of covenant-lite facilities and initial buys of facilities with at least one financial covenant. In Columns (2) and (3), we constrain our sample to firms with outstanding covenant-lite facilities. In Panel F, we test the potential beneficial effects of CLO experience. We partition *CLO initial buys* into two groups based on whether the years of experience of CLO managers is larger than the median experience of all CLO managers during our sample period. In Panel G, we use alternative dependent variables. In Columns (1) and (2) we use delisting as a dependent variable. The dependent variable in Columns (3) and (4) is credit rating downgrade. Industry-Year and lead bank fixed effects are included. We report (in parentheses) two-way clustered standard errors clustered at the firm and year-month level. To make the results more readable, we multiply the dependent variable by 100 (percentage format). ∗∗∗, ∗∗ and ∗ denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 7: CLO Holdings and Chapter 11 Restructuring

Panel A: CLO Holdings and Restructuring Incentives

	Linear Regression		Logit Regression	
	(1)	(2)	(3)	(4)
	Prepack	Recover	Prepack	Recover
CLOhold	**0.126***	**0.246****	**0.759***	**1.037****
	(0.070)	**(0.093)**	**(0.398)**	**(0.422)**
Market Cap	-0.000	0.005	0.005	0.020
	(0.007)	(0.012)	(0.046)	(0.052)
Cashholding	-0.059	-0.105	0.156	-0.317
	(0.073)	(0.130)	(1.363)	(0.732)
Cashflow	-0.000	0.001***	0.071	0.047
	(0.000)	(0.000)	(0.149)	(0.056)
Tangibility	0.034	0.133	0.158	0.530
	(0.100)	(0.144)	(0.873)	(0.654)
Leverage	0.033	0.018	0.318**	0.089
	(0.021)	(0.030)	(0.144)	(0.122)
R&D	-0.000	0.005***	-3.996	-0.287
	(0.001)	(0.001)	(4.137)	(0.737)
Post2007	0.083**	0.019	1.253**	0.089
	(0.033)	(0.073)	(0.439)	(0.343)
Industry FE	Yes	Yes	Yes	Yes
Adj R^2	0.061	0.094	0.093	0.073
N	614	614	612	612

Panel B: CLO-Lead Bank Relation and Restructuring Incentives

	(1)	(2)	(3)	(4)
	Prepack	Prepack	Emerge	Emerge
CLOhold×Strong Related	**0.296****	**0.280****	**0.472****	**0.452****
	(0.134)	**(0.129)**	**(0.165)**	**(0.167)**
CLOhold×Not Strong Related	**-0.141**	**-0.146**	**-0.149**	**-0.140**
	(0.111)	**(0.112)**	**(0.136)**	**(0.129)**
Control	No	Yes	No	Yes
Industry FE	Yes	Yes	Yes	Yes
F-test (*p-value*)	**0.089***	**0.093***	**0.056***	**0.063***
Adj R^2	0.056	0.069	0.098	0.106
N	614	614	614	614

Panel C: Risk Retention Rule: CLO-Lead Bank Relation and Restructuring Incentives

	(1) Prepack	(2) Prepack	(3) Emerge	(4) Emerge
Term Loan B	0.177	0.167	0.150	0.150
	(0.113)	(0.121)	(0.122)	(0.165)
Term Loan B×Year 2017	**-0.511***	**-0.522***	**-0.240**	**-0.382**
	(0.136)	**(0.155)**	**(0.186)**	**(0.282)**
Year 2017	0.163**	0.167*	0.050	0.047
	(0.029)	(0.056)	(0.044)	(0.044)
Control	Yes	Yes	Yes	Yes
Industry FE	No	Yes	No	Yes
Adj R^2	0.026	0.017	0.100	0.160
N	150	150	150	150

Panel D: Removal of Risk Retention Rule: CLO-Lead Bank Relation and Restructuring Incentives

	(1) Prepack	(2) Prepack	(3) Emerge	(4) Emerge
Term Loan B	-0.410**	-0.419***	0.073	-0.002
	(0.067)	(0.008)	(0.211)	(0.296)
Term Loan B×Post	**0.268***	**0.223***	**-0.002**	**0.007**
	(0.060)	**(0.067)**	**(0.310)**	**(0.363)**
Post	-0.183	-0.169**	-0.056	-0.079
	(0.068)	(0.026)	(0.045)	(0.038)
Control	Yes	Yes	Yes	Yes
Industry FE	No	Yes	No	Yes
Adj R^2	0.113	0.266	0.088	0.267
N	109	109	109	109

In Panel A, we test the relationship between CLO holdings and restructuring efficiency. We use prepackaged Chapter 11 filings as the dependent variable in Columns (1) and (3). Emergence from Chapter 11 bankruptcy is the dependent variable in Columns (2) and (4). In Panel B, we partition CLO holdings by CLO-Lead bank relationship. We include the same set of control variables as in Panel A. Industry fixed effects are included. In Panel C and D, we use the adoption and the removal of CLO risk retention rules as quasi-natural experiments to address omitted variable concerns. We report (in parentheses) standard errors clustered at year level. ∗∗∗, ∗∗ and ∗ denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 8: CLOs' Strategic Relationship Retention

	(1) Chosen	(2) Chosen	(3) Chosen
Strong Related	**0.023***	0.002**	0.005***
	(0.001)	(0.001)	(0.001)
Strong Related × CCC rating		**0.004**	
		(0.002)	
CCC rating		-0.003*	
		(0.001)	
Strong Related × EDF			**0.009***
			(0.002)
EDF			0.002**
			(0.001)
Strong Related × Post Crisis		**0.020***	**0.023***
		(0.001)	**(0.001)**
CLO FE	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Adj R^2	0.141	0.141	0.141
N	4,160,264	4,160,264	4,160,264

In this table, we examine whether CLOs strategically maintain their relationships with lead banks by repeatedly purchasing loans from them. Following Bharath et al. (2007), we pair each CLO initial buy with lead banks ranked in the top 40 list (based on their securitized amounts in the CLO market in the previous year), and keep only initial buys for which one of the lead banks of the facility was ranked in the top 40 list in the prior year. In Column (1), we present the effect of CLO-lead arranger relationships on the purchase decisions of CLOs. In Columns (2) and (3), we show how the financial crisis and borrowers' default risk interact with CLO-lead arranger relationships. We include CLO fixed effects, lead bank fixed effects, firm fixed effects, and year fixed effects. We report (in parentheses) standard errors clustered at the CLO level. ∗∗∗, ∗∗ and ∗ denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Appendix A: Variable Definitions
Dependent Variables:

Distress: An indicator variable that equals 1 if the firm files for bankruptcy or the firm's S&P credit rating decreases to CCC or below in the next 12 months, and 0 otherwise;

Delist: An indicator variable that equals 1 if the firm delists in the next 12 months, and 0 otherwise;

Downgrade: An indicator variable that equals 1 if the S&P credit rating of the firm deteriorates in the next 12 months, and 0 otherwise;

Prepack: An indicator variable that equals 1 for prepackaged bankruptcy filings, and 0 otherwise;

Recover: An indicator variable that equals 1 if the firm emerged from bankruptcy, and 0 otherwise;

Sell: An indicator variable that equals 1 if the CLO sells its holdings of loan facilities issued by a firm one year before (after) the firm files for bankruptcy;

Sell Pct: The percentage decrease in the amount of the CLO's holding of loan facilities issued by a firm over the one-year period before (after) the firm's bankruptcy filing;

Defaulted Bucket: The number of defaulted loans scaled by the total number of loans in a CLO portfolio;

CCC Bucket: The number of loans rated CCC or lower scaled by the total number of loans in a CLO portfolio;

Independent Variables:

CLO initial buys: An indicator variable that takes the value 1 for month m when a CLO j includes a firm f's loan facilities into CLO j's loan portfolio for the first time, and zero otherwise;

Log CLO initial buys: The natural logarithm of 1 plus the sum of the principal balance of loans of a particular borrower purchased by CLOs in month m for the first time;

Strong Related (Not Strong elated): An indicator variable that equals 1 if *CLO initial buys* are conducted by CLOs strongly related to the majority of the firm's lead banks, and 0 otherwise. A CLO manager is defined as strongly related to a lead bank if the CLO manager had transactions with the lead bank in the past five years and the total net purchases of loans from the lead bank over the past five years, scaled by the lead bank's total securitized loan outstanding, is larger than the yearly sample median.

RelatedBorrower (UnrelatedBorrower): An indicator variable that equals one if the facilities of firm f are initially bought by a CLO whose manager has (not) purchased syndicated loans issued by firm f in the past five years before month m, and zero otherwise;

CLOhold: An indicator variable that equals 1 if at least one CLO holds the facilities issued by the firm during the four quarters prior to the bankruptcy filing, and 0 otherwise;

Subsequent Buys: An indicator variable that equals 1 if at least one CLO increases its holdings of the loan facilities issued by the firm;

Subsequent Sell: An indicator variable that equals 1 if at least one CLO decreases its holdings of the loan facilities issued by the firm;

With Cov: An indicator variable that equals 1 in case of *CLO initial buys* of facilities with financial covenants, and 0 otherwise;

Cov Lite: An indicator variable that equals 1 in case of *CLO initial buys* of facilities without financial covenants, and 0 otherwise;

OTD CLO initial buys: An indicator variable that equals 1 if there is at least one CLO initially buys the facilities issued by the firm during the loan origination period;

Log OTD CLO initial buys: The natural logarithm of 1 plus the amount of money invested by the CLOs that initially buy the facilities issued by the firm during the loan origination period;

Experienced (Inexperienced): An indicator variable that equals one if the facilities of firm f are initially bought by a CLO whose manager has higher (lower) than median years of experience in the CLO market before the initial purchase in month m, and zero otherwise;

Control variables:

Altman: Altman Z-score as proposed by Altman (1968);

EDF: Expected default frequency, computed using the Moody's KMV implementation of Merton (1974) model;

Coverage Ratio: The natural logarithm of (1+EBITDA/interest expenses);

Current Ratio: The ratio of current assets to current liabilities;

Leverage: The ratio of the book value of total debt to the book value of assets;

Total Asset: The natural logarithm of the total assets of the borrower;

MTB: The ratio of (book value of assets – book value of equity + market value of equity) to book value of assets;

Profitability: The ratio of EBITDA to sales;

Tangibility: The ratio of property, plant, and equipment (PPE) to total assets;

Rep Arranger: An indicator variable that equals 1 if the majority ($\geqslant 50\%$) of a firm's outstanding syndicated loans are syndicated by a reputable arranger, zero otherwise; a loan is considered to be issued by a reputable arranger if the loan is syndicated by one of the top three arrangers, based on the arranger's average market share in the primary loan market. Market share is measured as the ratio of the amount of loans that the financial intermediary syndicated as a lead arranger, to the total amount of loans syndicated in the primary loan market over 2005 to 2019 period;

Rel Arranger: An indicator variable taking the value of one if the majority ($\geqslant 50\%$) of a

firm's traded syndicated loans are syndicated by a relationship lender, zero otherwise; a loan is considered to be issued by a relationship lender if at least one of the loan's lead arrangers had been a lead arranger of the borrower's previous loans over the five-year period preceding the loan's issuance date;

Junior OC: The natural logarithm of the CLO's junior over-collateralization score;

Senior OC: The natural logarithm of the CLO's senior over-collateralization score;

WARF Slack: –(WARF score – WARF threshold)/WARF threshold;

Portfolio Size: The natural logarithm of a CLO's loan portfolio total principal balance outstanding;

Avg Portfolio Rating: The average (Standard and Poor's or Moody's) credit rating of the loans in a CLO portfolio; A loan's credit rating is defined as a scale variable that equals 1 for AAA (or Aaa), 2 for AA+ (or Aa1), and so forth. For loans where Moody's and Standard and Poor's ratings differ, we use the most conservative rating;

Market Cap: The natural logarithm of the market value of a firm's outstanding equity;

Cashholding: The ratio of cash and short-term securities to total assets;

Cashflow: The ratio of operating income before depreciation to lagged total assets;

R&D: The ratio of annual R&D expense to lagged total assets;

Post2007: An indicator variable that equals 1 if it is after the year 2007, and 0 otherwise;

Institution Lender: An indicator variable that equals 1 if there is at least one institutional lender, other than CLO, for the outstanding loans at the origination period;

Bank Affiliated CLO: An indicator variable that equals 1 if there is at least one bank-affiliated CLO initially buys the facilities issued by the firm;

Revolver: An indicator variable that equals 1 if the firm has outstanding revolver loans.

Online Appendix

OAA: Facility Level Analysis

	(1) Distress	(2) Distress	(3) Distress
CLO initial buys	**-0.854****		
	(0.364)		
Log *CLO initial buys*		**-0.057****	
		(0.024)	
CLO initial buys×Strong Related			**-0.905*****
			(0.311)
CLO initial buys×Not Strong Related			**-0.254**
			(0.316)
F-test (*p-value*)			**0.075***
Control	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes
Adj R^2	0.474	0.474	0.474
N	365,851	365,851	365,851

OAB: Summary Statistics by *CLO initial buys* after Entropy Balancing

	CLO initial buys=0		CLO initial buys=1		Diff
	Mean	Variance	Mean	Variance	t-value
Coverage Ratio	1.676	1.021	1.676	1.021	0.00
Current Ratio	1.772	0.914	1.772	0.914	0.00
Leverage	0.598	0.052	0.598	0.052	0.00
Total Asset	7.984	1.326	7.984	1.326	0.00
MTB	1.421	0.301	1.421	0.301	0.00
Profitability	0.182	0.119	0.182	0.119	0.00
Tangibility	0.289	0.050	0.289	0.050	0.00
EDF	0.088	0.045	0.088	0.045	0.00
Rel Arranger	0.242	0.184	0.242	0.184	-0.01
Rep Arranger	0.408	0.242	0.408	0.242	-0.00
Institution Lender	0.723	0.200	0.723	0.200	0.01
Revolver	0.962	0.037	0.962	0.037	0.00

OAC: Loan Origination Timing

	With Facilities Originated in Past 12 Months		Without Facilities Originated in Past 12 Months	
	(1) Distress	(2) Distress	(3) Distress	(4) Distress
CLO initial buys	**-1.241*****		**-1.423****	
	(0.465)		**(0.585)**	
Log *CLO initial buys*		**-0.082****		**-0.098****
		(0.031)		**(0.040)**
Control	Yes	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes	Yes
Adj R^2	0.447	0.447	0.510	0.510
N	36,893	36,893	33,864	33,864

OAD: CLO Age

	(1)
	Distress
CLO initial buys×High Age	**-1.075****
	(0.347)
CLO initial buys×Low Age	**-1.216****
	(0.495)
F-test (*p-value*)	**0.792**
Control	Yes
Lead Bank FE	Yes
Ind-Year FE	Yes
Adj R²	0.427
N	70,757

OAE: Risk Retention Rule and Securitizations of Term Loan Bs

	(1)	(2)
	CLOhold	CLOhold
Term Loan B	0.143*	0.143*
	(0.039)	(0.038)
Term Loan B×Year 2017	**-0.142***	**-0.139***
	(0.045)	**(0.044)**
Year 2017	0.001	0.003
	(0.004)	(0.002)
Control	Yes	Yes
Industry FE	No	Yes
Adj R²	0.087	0.035
N	150	150

OAF: CLO-Bank Relationship and Future CLO Performance

	(1)	(2)	(3)	(4)
	CCC	CCC	Default	Default
	Bucket_{m+12}	Bucket_{m+12}	Bucket_{m+12}	Bucket_{m+12}
Stong Relationship	**-0.008*****		**-0.001***	
	(0.001)		**(0.000)**	
Strong Related Pct		**-0.008*****		**-0.001***
		(0.001)		**(0.000)**
Senior OC	0.073***	0.073***	0.009	0.009
	(0.026)	(0.026)	(0.007)	(0.007)
Junior OC	-0.180*	-0.181*	0.014	0.014
	(0.102)	(0.102)	(0.021)	(0.021)
WARF Slack	-0.026	-0.026	0.003	0.003
	(0.017)	(0.017)	(0.007)	(0.007)
Portfolio Size	0.002	0.002	0.001*	0.001*
	(0.003)	(0.003)	(0.001)	(0.001)
Avg Portfolio Rating	0.009***	0.009***	0.001	0.001
	(0.002)	(0.002)	(0.001)	(0.001)
CCC Bucket	0.273***	0.273***	0.057***	0.057***
	(0.070)	(0.069)	(0.016)	(0.016)
Defaulted Bucket	-0.270***	-0.270***	-0.026	-0.026

	(0.073)	(0.073)	(0.030)	(0.030)
Manager FE	Yes	Yes	Yes	Yes
Trustee FE	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes
Adj R²	0.378	0.378	0.150	0.150
N	42,768	42,768	42,768	42,768

OAG: Inter-temporal Assurance: Selling Activity around Bankruptcy Filings

	Before Bankruptcy		After Bankruptcy	
	(1)	(2)	(3)	(4)
	Sell	Sell Pct	Sell	Sell Pct
Strong Related	**-0.109***	**-0.143***	**-0.061**	**-0.028**
	(0.031)	**(0.038)**	**(0.029)**	**(0.047)**
CLO Characteristics	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Cluster	CLO	CLO	CLO	CLO
Adj R²	0.505	0.448	0.568	0.344
N	667	667	839	823

Note: High Age (Low Age): An indicator variable that equals one if the facilities of firm *f* are initially bought by a CLO whose age as of the initial purchase in month *m* is higher (lower) than the median age of all CLOs, and zero otherwise; *Strong Relationship:* An indicator variable that equals 1 if the CLO *j* purchases a facility originated by lead banks that have a strong pre-existing relationship with the CLO, and zero otherwise; *Strong Related Pct:* The amount of facilities originated by strongly related lead banks in the CLO *j*'s initial buys portfolio, over the total loan amount in CLO *j*'s initial buys portfolio at the end of month *m*;