Does Securitization Impair Bank Lending Relationship?

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Abstract

We study whether and how corporate loan securitization through collateralized loan obligations (CLOs) has changed the nature of bank lending relationship. We use a large dataset of CLO collaterals to identify securitized loans and the relationship lenders. We show that even if a relationship lender securitizes a past loan, it continues to gain future lending business from the same borrower. The new loans from this securitization-funded relationship lender, when compared to loans from a traditional relationship lender, have fewer covenants, smaller amount of revolvers at higher costs, and larger amount of institutional term loans at lower costs. In addition, the new loans from these lenders are also more likely to be securitized. Our results suggest that lending relationship is impaired as securitization weakens monitoring efforts and reduces the information advantage of relationship banks. Yet, these lenders seem to be able to keep their relationship borrowers with their access to structured credit markets. Overall, our findings indicate that benefits of securitization coexist with its costs in relationship lending.

1. Introduction

The securitization market has been quiet since the financial crisis of 2008-2009. The only exception is collateral loan obligations (CLOs). Since 2011, CLO issuance in the U.S. has picked up and reached a peak of $124 billion in 2014, even higher than the past record of $107 billion set in 2006 (see Figure 1 Panel A). CLOs' big comeback is in sharp contrast to the weakness of other segments of securitization markets, for example, non-agency RMBS (see Figure 1 Panel B). The blossom of CLO in such a difficult time for securitization demonstrates its solid incentive designs and its value to investors and corporations.

With an active CLO market, banks can fund their corporate loans by selling them in pieces to CLOs. This raises important questions: whether and how securitization through CLOs changes the traditional bank-borrower relationship. Relationship lending is the foundation of banks' role as financial intermediation. In the presence of the CLO market, lenders could act more like underwriters instead of creditors. Without sufficient credit risk exposures, it could be difficult to incentivize banks to produce information of the borrowers and invest in lending relationships (Pennacchi, 1988; Gorton and Pennacchi, 1995; Boot, 2000). This paper aims to understand the impact of securitization on lending relationships. In particular, we ask the questions: 1) *Do banks preserve lending relationships with borrowers even if their loans are securitized?* 2) *To what extent securitization reshapes relationship-based lending?*

Prior studies fail to examine these questions perhaps due to lack of large and reliable data source to identify individual loans held by CLOs.[1] In this paper, we utilize a new and comprehensive dataset on CLO collateral holdings from Creditflux to identify securitized loans. We manually match the data to DealScan and construct a sample of 4,620 loan facilities granted to non-investment grade firms during 2006 to August 2016. We focus on non-investment grade firms because this is the market segment that CLOs normally invest in. These firms, compared to their investment-grade peers, rely more on relationship lending due to their informational opaqueness and limited access to the public debt market. Hence, it is more important to understand the impact on their relationship with lenders.

In the sample, we identify 1,233 facilities arranged by relationship lenders who securitize past loans of the same borrowers. We refer to these lenders as securitization-funded relationship lenders. We show that securitizing does not hurt these lenders in gaining future lending business from the same borrower. To the contrary, they are slightly more likely to be retained as the lead arranger in the new loan, compared to other relationship lenders who do not fund the borrower's past loans through CLOs. This result, at first sight, seems against the "*relationship impairment*" argument that securitization discourages information production, leading to weakened bonding with borrowers.

However, the inferences change when we examine the contract terms of the new loans arranged by the securitization-funded relationship banks. They charge

[1] Two recent papers use individual loan lvel data to identify securitization. Nadauld and Weisbach (2012) utilize CLO collateral holding data from Moody's but it is only a snapshot took in 2009. Benmelech et al. (2012) collect a small sample of securitized loans from corporate filings.

higher interest than other relationship banks who do not securitized previous loans of the same borrower. The premium that they charge is large enough to wipe out all the interest savings from relationship lending. More importantly, this result is driven by facilities typically held by banks (i.e., revolvers and term loans A). In sharp contrast, the interest rate is lower on institutional term loans (e.g., term loans B) from the securitization-funded relationship lenders. These lenders seem to have an advantage in providing institutional facilities probably due to their access to credit in the securitization market, from which they can fund these facilities. This "*credit improvement*" effect of securitization helps explain the higher retention rate of these banks in future lending: they gain more lending business from their relationship borrowers due to their access to the structured credit, not reflecting a closer relationship with these borrower. In fact, the higher interest rate on revolvers and term loans A they charge suggests a "*relationship impairment*" effect as they provide no cost advantage as in traditional relationship lending.

Our result on loan covenants provides further evidence for the "*relationship impairment*" effect. We find that securitization-funded relationship lenders are less likely to put a covenant in the new loans than other traditional relationship lenders. Considering that covenants represent banks' commitment to monitoring (Rajan and Winton, 1995), this result further confirms that securitization weakens banks' role as intermediaries.

On loan volume, we find that securitization-funded relationship lenders, compared to other relationship lenders, grant larger amount of term loans but smaller amount of revolvers in new lending. Note that, compared to revolvers,

term loans (especially term loans B) are much more likely to be funded by CLOs (Nadauld and Weisbach, 2012). Hence, it is consistent with the "*credit improvement*" argument that the access to the credit supply from CLOs helps these lenders to gain repeated lending business from their borrowers. Indeed, we find that the new loan arranged by a securitization-funded relationship lender is more likely to be sold to CLOs, compared to a loan arranged by other relationship lenders. In contrast, banks often retain the revolvers in their balance sheet. The reduction in the volume of revolvers indicates securitization-funded lenders' passive risk-management strategic. This effect is consistent with the "*relationship impairment"* effect.

One concern over our inferences is that banks may select loans to securitize based on some metrics not observable to us. Thus the contractual differences in future loans that we document simply reflect such unobservable characteristics of the borrowers and are not a result of impairments on the traditional lending relationship. It is worth noting that this conjecture is not supported by Benmelech, Dlugosz, and Ivashina (2012), who find no adverse selection in the securitization of corporate loans. Nevertheless, we employ two strategies to alleviate this concern. First, we include firm fixed effects to control for time-invariant firm unobservables in a sample of firms with multiple loans from different types of lenders. We confirm our results in this sample.

Second, we employ a semi-instrumental variable approach. We would need an instrument that is highly correlated with the propensity of a past loan from a relationship lender being securitized but has no impact on the contract terms of the new loan to the same borrower. Since term loans B are associated with a higher

probability of being securitized (Nadauld and Weisbach, 2012), we argue that having term loans B in a past loan would indicate a higher probability of funding this loan through securitization and hence generating securitization-funded relationship. There is, however, no theoretical foundation for a direct link between having term loans B in the past and the pricing or covenants in the current new loan. Hence, the indicator of having term loan B in the relationship loan in the past three years can serve as a valid instrument. We use this indicator to replace the potentially endogenous securitization measures in the regressions and find consistent results.

In sum, our results suggest that a bank continues to engage in repeated lending to its existing borrowers even the previous loans to these borrowers are securitized. In this case, however, the relationship banks may engage less in information production, but their access to credit from the securitization market put them at an advantageous position in gaining future lending business from these borrowers. From the perspectives of these borrowers whose past loans are securitized, they pay higher prices for new revolvers and term loans A from their securitization-funded relationship lenders. In exchange, they enjoy fewer covenants and loose monitoring. They also gain access to the credit from CLOs through these lenders by borrowing more term loans B at lower costs. To some extent, securitization seems to prolong the lending relationship due to its positive effect on the availability of credit but at the same time, weakens the information content of this relationship. Hence, it moves relationship lending towards a transaction-based lending, which is based on passive risk-management via loan pricing (Parlour and Plantin, 2008).

Our paper is perhaps the first one that utilizes a large and comprehensive CLO portfolio data to examine the effects of corporate loan securitization on relationship lending. We document a co-existence of beneficial and detrimental effects of securitization on relationship banking. On one hand, our results show that securitization can prolong the lending relationship via enhancing the credit availability ("*credit improvement*"). This finding is in line with Drucker and Puri (2009) that loan sales produce a more long-lasting lending relationship. It is also consistent with Nadauld and Weisbach (2012) and Shivdasani and Wang (2011). On the other hand, we find that securitization results in less covenants and higher cost of revolvers available at smaller amount ("*relationship impairment"*). This effect is consistent with banks' reduced monitoring effort as a result of securitization, shown in Wang and Xia (2014).

Our results point out that "*credit improvement"* effect can coexist with "*relationship impairment"* effect. In some sense, a prolonged lending relationship needs not come with a stronger bonding through monitoring and information production. Access to the new source of credit may also give lenders advantages in keeping relationship borrowers. In this respect, our paper contributes to the literature on traditional banking relationship (e.g., Diamond, 1984; Fama, 1985; Drucker and Puri, 2005; Bharath et al. 2007, 2011; Srinivasan, 2014).

The rest of the paper proceeds as follows. Section 2 reviews the literature and develops hypotheses. Section 3 describes the data and our sample. Section 4 discusses the results. We check robustness and address endogeneity concerns in Section 5. Section 6 summarizes and concludes.

2. Literature Review

The financial crisis of 2008-2009 drew researchers' attention to the economic consequences of securitization. Studies of mortgage loans consistently show the detrimental effect of securitization on banks' screening incentives. For example, Mian and Sufi (2009) show that US high latent demand zip codes experienced an increase in mortgages origination despite a lower income and employment growth. Keys et al. (2011) show that securitization practices adversely affect the screening incentives of subprime lenders. Purnanandam (2011) find that banks with high involvement in originate to distribute (OTD) model before the financial crisis originated excessive poor-quality mortgages. These findings are consistent with Parlour and Plantin (2008)'s theoretical prediction that securitization distort banks' screening and monitoring incentives.

The studies on corporate loan securitization document different impact on incentives. Using 398 securitized corporate loans, Benmelech et al. (2012) find no evidence for the adverse selection argument that banks pick risky loans to securitize. Shivdasani and Wang (2011) show that the credit supplied by banks active in securitization fueled the boom of leveraged buyouts (LBOs) in the years leading to the recent financial crisis. However, the LBO deals funded by the structured credit did not seem to perform badly. Both studies suggest that some mechanisms are probably in place in securitization of corporate loans to ensure the quality of underlying assets, unlike that of mortgages. One mechanism could be the syndicated loan market, where banks have reputation concerns and there exist other lenders.

On banks' monitoring incentives after loan origination, Wang and Xia (2014) find evidence that borrowers take on more risk after their loans being securitized, pointing to reduced monitoring incentives as a result of securitization of corporate loans. Li, Saunders, and Shao (2015) find consistent results from a broader sample of tradable loans. Using European data, Marques-Ibanez (2016) further confirms that corporate loan securitization weakens monitoring incentives *ex post* but does not create adverse selection *ex ante*. All these results raise questions about the implications to relationship lending since banks' effort in monitoring after granting loans is essential to maintain a beneficial lending relationship. Our study directly addresses this question.

A few papers investigate the impact of securitization on contractual terms of corporate loans and are closely related to our study. Most notably, Nadauld and Weisbach (2012) show that loan facilities that are subsequently securitized have lower spread. Using a snapshot of collateral holdings of CLOs, they also show that term loans B are more likely to be securitized. Our results are consistent with their finding. In our setting, when a relationship lender has securitized a borrower's prior loans, it charges lower spread in later institutional term loans granted to this borrower and these term loans are more likely to be securitized again. Their study focuses on the impact of the loans being securitized. Our focus, however, is on the impact of past securitization on future loan contracts and we find the price effect reverse in revolvers and term loans A lent to the same borrower. Bozanic, Loumioti, and Vasvari (2016) show that covenants are being standardized as a result of securitization. We examine the number of covenants while they focus on how the covenants are formulated in loan contract.

Our paper also makes important contribution to the literature on banking relationship. Prior studies have demonstrated the beneficial effects stemming from a long run banking relationship (Boot, 2000; Gorton and Winton, 2003; Cole, Goldberg and White, 2004; Srinivasan, 2014). These benefits, from banks' perspective, can be in the form of an informational scale of economy and a higher probability to win future banking business (Drucker and Puri, 2005; Bharath et al., 2007). For example, Drucker and Puri (2005) show that banks can collect proprietary information from borrowers via lending relationship and use it for multiple purposes such as competing for underwriting business. Bharath et al. (2007) find that the likelihood of securing a future loan mandate is ten times larger for a bank with a pre-existing relationship relative to the one without a relationship. From borrowers' perspective, the benefits of a long-lasting banking relationship can be in the form of cheaper financing (Bharath et al., 2011), an increase in the availability of credit (Peterson and Rajan, 1994), and a lower sensitivity to external shocks (Hoshi, Kashyap and Scharfstein, 1991). For example, Bharath et al. (2011) show that prior lending relationships result in a reduction in the interest rate and a decrease in the collateral. Hoshi, Kashyap, and Scharfstein (1991) show that the investments of a firm are less sensitive to external shocks if the firm has a long-lasting relationship with a bank (e.g., main bank).

Most of these studies are based on the data in the late 1990s and early 2000s when the banking relationships are very persistent (e.g., Srinivasan, 2014). For example, a notable paper by Bharath et al. (2007) investigates the U.S syndicated loans from 1989 to 2001. The sample period of Bharath et al. (2011) spans from

1986 to 2003. However, during the past decade, the banking industry has undergone a number of significant changes that have potentially changed the role of the bank as intermediaries between borrowers and depositors. The development in securitization and underwriting help push funding to the financial markets and potentially tilt the comparative advantage to the transaction-oriented banking (Boot and Marinc, 2008). Given these changes in the banking industry, Boot and Marinc (2008) ask "*what is the future of relationship-based bank lending*?" Note that, without sufficient understanding of the effects of new developments on traditional relationship banking, one can hardly give an answer to Boot and Marinc (2008)'s question. This paper, to best of our knowledge, is the first one that provides large-sample evidence on the impacts of securitization on traditional relationship banking. [2]

3. Data and Methodology

3.1. The Loan Sample and Definition of Bank Relationship

We construct our loan sample using Loan Pricing Corporation (LPC) DealScan. Specifically, we start with all loan facilities originated in the U.S. from 2006 to August 2016. We then link each facility to its borrower in Compustat using the linking table provided by Chava and Roberts (2008)[3]. We then restrict to non-finance and non-utility companies located in North America (U.S. and Canada) and with financial information available in Compustat. Finally, we restrict to the

[2] A related paper by Shan et al (2016) examines the effect of CDS on cost of bank loan and that on the borrower's choice between public debt and bank debt.

[3] We thank Michael Roberts for providing the Dealscan-Compustat linking data. For data link facilities in Dealscan to Compustat from 1983 to August 2012. For facilities originated after August 2012, we use the latest gvkey at borrower company level in the linking file to identify the company. We lose companies which are not in DealScan before 2012 but borrow multiple loans after it.

borrowers that have non-investment ratings by S&P at the time of loan origination since investment-grade loans are rarely securitized in CLOs and are less likely to be affected by securitization (Nadauld and Weisbach, 2012; Wang and Xia, 2014).

Based on this loan sample, we identify relationship lenders and calculate measures of lending relationship with these banks, following Bharath et al. (2007). For each loan in this sample ("current loan"), we look back up to three years from the loan origination date in DealScan (denoted as *t*) and obtain all other loans ("past loans") that were lent to the same firm in the past three years[4]. We take all the lead arrangers in the past loans as relationship lender. We assign a lender as a lead arranger if "Lead Arranger Credit" in DealScan takes a value of "Yes" or if the lender's role is "Sole lender." We examine only the lead banks but not other syndicate members because the lead banks have direct contact with the borrowers and are responsible for due diligence and monitoring (Sufi, 2007).

For any bank (say bank *m*) who were the lead arranger in a loan to firm *i* in the past three years, we define three measures to capture the lending relationship: (1) A dummy variable $Rel\_Dum_{i,m}$, which equals one; (2) A continuous measure $Rel\_Amt_{i,m}$, which is the total dollar amount of past loans that bank *m* arranged to firm *i* in the three years prior to date *t* as a fraction of the total dollar amount of all past loans borrowed by firm *i* in the same time window; (3) A continues measure $Rel\_Num_{i,m}$, which is the number of past loans that bank *m* arranged to firm *i* in the three-year window as a fraction of the total number of past loans borrowed by firm *i* in the same time window. All the three measures take a value

[4] Bharath et al (2007) look at a five-year window to identify past relationship. We choose a shorter window of three years because we only have about ten years of data for loan securitization when we look at whether a relationship bank has securitized the previous loans.

of zero if a bank has never acted as a lead arranger in any past loans to firm *i* in the previous three years. The two continuous relationship measures capture the importance of bank *m* to firm *i* as a lender over the past five-year period and reflect the relative strength in the business tie between them. We mostly use the dummy variable and use the continuous variables in robustness checks as our focus is on securitization but not the relationship itself.

3.2. Securitization: CLO-i Database

We identify securitized loans using CLO-i database provided by Creditflux. CreditFlux is one of the leading information sources for credit and investing and structured credit. We rely on the information on collateral assets in each CLO to identify securitized loans. Creditflux collects such information from monthly trustee report submitted by CLO managers.

The coverage in CLO-i starts in early 2000 and is significantly improved since 2008. Figure 2 shows annual total amount and number of USD-denominated CLO issues covered in Creditflux. By comparing the amounts to those in Figure 1a, we can see that Creditflux covers virtually all CLO issues after the crisis but the coverage is much worse before 2008. We believe that the poor coverage in the early years would bias against finding our results as it leads us to misclassify securitized loans to the counterfactual group. On CLO market activities, both figures show that CLO new issues rose sharply prior to the financial crisis of 2008-2009, almost stopped right after the crisis, and have fully recovered since 2012. The recovery of the CLO market is very strong. For example, the new CLOs issuance in 2014 has reached $124 billion in a total of 238 issues. The issuance activities have slowed down facing the uncertainties of the new regulation in Dodd-Frank since 2016 (in

particular, the Volcker rule). Both the big come-back and the hot debated Volcker rule invite more research to understand the cost and benefit of corporate loan securitization.

A crucial step of our analysis is to identify whether a past relationship loan is securitized. Here, we rely on collateral assets of CLOs reported in CLO-i. For each collateral asset, CLO-i reports the issuer name, security type, security description, principal amount, coupon rate, maturity date, rating, etc. We take all USD-denominated collateral assets and exclude "Bond," "Equity" or "DIP" to focus on corporate loans. We then match these loans to DealScan loan facilities. Since no common identifier can link the two databases, we employ a matching strategy that is based on both computer algorithm and manual checking. We first match by the borrowers' name, loan type, and maturity date and. We require the difference in the maturity dates reported in the two datasets not greater than 15 days. If a DealScan loan facility is matched to a collateral loan, then this facility is classified as securitized. Using this strategy, we match 4,154 facilities to DealScan. Hence, these facilities in DealScan are classified as being securitized. These matched loan facilities accounts for about 50% of the total principal amount of the loan collaterals reported in Creditflux.

The collateral data in Creditflux allow us to assess the size of loan securitization. If only a trivial portion of a loan is securitized and the rest is still held by banks, then we may not expect an important impact of securitization on banks' lending policies. For each identified facility and each month, we aggregate the principle amount reported in all collateral pools covered by Creditflux and then divide it by the total origination amount of the facility reported in DealScan. Since December

2008 when the coverage of Creditflux was improved, we find on average about 15% of the dollar amount of a facility is sold to CLOs, and the median is about 10%[5]. Although the majority of a loan is not securitized, this fraction, to us, is sizable and could generate important implications on the incentive designs in bank lending.

3.3. Securitization-funded Relationship

A key measure in our analysis is whether any past loan that build the relationship between bank *m* and firm *i* has being securitized. If so, we define this relationship between bank *m* and firm *i* as securitization-funded relationship. We construct this variable for all the relationship lenders in the DealScan sample discussed in Section 3.1. We again look back three years and check if any of this borrower's past loans are in the sample of securitized loans discussed in Section 3.2. If so, we define its relationship with any lead arranger of the securitized loans as securitization impaired. Figure 3 illustrates our methodology. For example, a sample loan is issued by Company ABC at Jan 1st, 2009. We look at a 3-year window prior to this loan, i.e. from Jan 1st, 2006 to Dec. 31, 2008. Suppose there are two loans from Company ABC in this three-year window. One is led by Citibank which is later securitized and sold to a CLO, while the other is led by JP Morgan which is never securitized. In the case, to analyze the current loan originated on Jan 1st, 2009, we classify Company ABC as having relationships with both Citibank and JP Morgan, whereas it has a securitization-funded relationship with Citibank. Note that there could be more than one bank having a

[5] We exclude revolvers and term loan A in this calculation since they rarely securitized.

securitization-funded relationship due to either multiple lead arrangers in one securitized loans or multiple securitized loans from different banks.

Formally, we define a dummy variable $CLO\_Dum_{i,m}$, which equals one if any past loans within the three-year window between bank m and firm i is securitized, and zero otherwise. In addition, we propose two continuous measures following banking relationship literature to factor in the securitization intensity. $CLO\_Amt_{i,m}$ equals the total securitized dollar volume of loans originated in the past three years by bank m to firm i divided by the total dollar volume of loans between bank m and firm i over the same time period. Similarly, $CLO\_Num_{i,m}$ equals the total number of loans between bank m and firm i that are securitized divided by the total number of loans between them over the same time period.

3.4. Sample Description

Our final sample consists of 4,620 facilities (i.e., current loans) originated from 2006 to August 2016 for U.S. non-financial and non-utility public firms with non-investment grade ratings. Since one facility can have multiple lead banks, our relationship measures are calculated on facility-bank pairs. We then define a facility as a relationship loan if any of its lead arrangers is a relationship bank (i.e., *Rel_Dum* equals to one). Table 1 Panel A shows that among the 4,620 facilities, 3,252 are relationship loans (the sum of columns (2) and (3)) while 1,368 are from banks without a pre-existing relationship. Among the relationship loans, 1,233 have associated with securitization of the past loans from relationship lenders (column (3)). Our main inferences rely on comparing column (2) to (3), but we also include non-relationship loans in column (1) as another benchmark. The distribution of these facilities during our sample period is also reported. Panel B

of Table 1 reports the numbers of revolvers, term loan A, and term loan B (unspecified term loans are grouped in "term loan"). Revolvers consist the majority of our sample with a count of 2,562, followed by 1,302 term loans B. It is noteworthy that a distinct difference between revolver and term loan B in their distributions across our three defined groups based on relationship and past securitization.

Table 2 summarizes facility level characteristics for the three groups separately. Securitization-funded relationship loans appear to be the largest among the three groups. Compared to relationship loans without past securitization, they pay higher spread and have less number of covenants. This indicates a different nature of their relationship.

To see if the borrowers having past securitized loans are different, we report the borrowers' characteristics in Table 3. We count borrowers at loan package level but not facility level, to avoid repeated sampling with multiple facilities in one loan package. Borrowers of relationships loans with past securitization are larger in size than the other two groups, consistent with the larger facility size documented in Table 2. Moreover, these borrowers have higher leverage, lower interest coverage, and higher default risk (measured in Z-score) than the other two groups. This is consistent with Nadauld and Weisbach (2012), who find that B-rated firms are more likely to be securitized than BB-rated firms. In our later analysis, we control for leverage, default risk, and credit ratings.

4. How does Securitization Affect Future Lending?

4.1. Impact on the likelihood of future lending.

We first examine whether securitization would harm the business ties between banks and relationship borrowers. We start from bank side instead of borrower side because to securitize a loan is a strategic choice of the bank. On the one hand, securitization allows banks to convert illiquid loans into more liquid assets and release capital to their relationship borrowers for future lending (i.e., *credit improvement effect*). One the other hand, securitization may discourage banks from monitoring the borrowers (i.e., *relationship impairment effect*) since it creates a longer distance between the loan originator and the actual bearer of the credit risk (Petersen and Rajan, 2002; Wang and Xia, 2014). In this regard, banks may not as eagerly in producing proprietary information, resulting in failure to secure future lending business with the same borrower (Bharath et al. 2007).

To examine the net effect of these two implications, we test whether securitization reduces the likelihood of a relationship lender to gain future lending business from the borrower. Following Bharath et al. (2007), for each current loan in our sample, we create a set of banks that can be the potential choice of lenders to the borrower. This set of banks includes the top 20 banks in terms of total loan origination volume in the U.S. in the previous year[6], and other banks which arranged loans to the borrower over the past three years prior to the current loan origination date. Hence, one facility can be linked to more than 20 banks if the borrower has a relationship bank that is not among the top 20 banks. We then construct lending relationship measures for all the facility-bank pairs as discussed in Section 3.1. Specifically, *Rel_Dum* takes the value of one if the bank arranged

[6] In calculating loan origination volume, we include all loans granted to U.S. firms denominated in U.S. dollar in DealScan and credit a loan equally among all lead banks. In the case of bank merger, we credit the loans arranged by the acquired bank to the acquiring bank after the merger effective year.

a loan to the firm in the past three years, and zero otherwise. Further, if this loan is found in CLOs, we assign *CLO_Dum* to be equal to one and it take the value of zero otherwise. We also calculate *CLO_Amt* and *CLO_Num* as defined in Section 3.3, to capture the degree of securitization.

We then employ OLS regressions to estimate the following equation (1):

$$Chosen_{i,m,f,t} = \beta_0 + \beta_1 Rel\_Dum_{i,m,t} + \beta_2 Rel\_Dum_{i,m,t} \times CLO\_Dum_{i,m,t} + Controls + \varepsilon_{i,m,f,t} \quad (1)$$

where $Chosen_{i,m,f,t}$ is an indicator variable equals one if bank m is chosen as the lead arranger for firm i's facility f at time t. $Rel\_Dum_{i,m,t}$ indicates if bank m arranged any loan to firm i in the three years prior to time t. $CLO\_Dum_{i,m,t}$ equals one if any of the loans from bank m to firm i originated in the three years prior to time t are sold to CLOs, and zero if none of the loans were securitized. We also use two continuous measures $CLO\_Amt_{i,m,t}$ and $CLO\_Num_{i,m,t}$ to replace the dummy variable $CLO\_Dum_{i,m,t}$. We include facility, borrower, and bank characteristics as well as industry and year fixed effects to control for other forces that may drive the choice of lenders. The standard errors are clustered at facility level to account for the correlation of the multiple observations generated out of the same facility.

The sensitivity of *Chosen* to *Rel_Dum* captures the advantage of relationship lenders as information producer on securing new lending business. Along the same line, the coefficient on the interaction term between *Rel_Dum* and the *CLO_Dum* reflects the change in such benefit due to securitization.

The estimated results are reported in Table 4 Panel A. Column 1 shows a positive and significant coefficient on the interaction term between *CLO_Dum* and *Rel_Dum* (0.07, *se* = 0.01). In terms of economic magnitude, it can be translated

into a 7% increase in probability for the relationship bank to be chosen as the lead bank in the new loan when its past loan to this same borrower is securitized. This increase is on top of the 50% chance for being a relationship lender. It appears that securitization helps the relationship lender to gain even more lending business. In columns 2 and 3, where we use *CLO_Amt* and *CLO_Num* as proxies for a fraction of past loans that have been purchased by CLOs respectively, we find qualitatively similar results (0.19, *se* = 0.04 in column 2; 0.18, *se* = 0.05 in column 3).

We note that a loan package can consist of multiple facilities. In this regard, the regression in Panel A would give a higher weight to packages with a large number of facilities. To avoid this bias, we compress the data into package level and calculate the relationship and securitization measures for each lead bank of the package. We do not lose much information since it is most common that the same lead arrangers present in all facilities in one package. We then re-estimate the model in equation (1). The results are reported in Panel B of Table 4. Other control variables are similar to those in Panel A and omitted in reporting. We again confirm the benefit of the securitization in winning future lending business, although the economic magnitude is slightly smaller.

So far, our result shows that a bank does not lose its relationship borrower by securitizing its past loans. Rather, securitizing a loan actually helps the bank gain even more future lending business from the same borrower. It appears that securitization leads to a closer lending relationship that is based on ongoing communication and monitoring, probably because of the extra quality controls placed by CLOs. Such effect of securitization would be similar to that of loan sales, which Drucker and Puri (2009) and Gande and Saunders (2012) argue can go hand

in hand with relationship lending. This inference suggests a relationship improvement effect, against "*relationship impairment"* argument. However, the advantage of securitization for banks to win new lending business could be merely driven by the supply of structured credit (Shivdasani and Wang, 2011; Nadauld and Weisbach, 2012), consistent with the "*credit improvement"* argument. To further disentangle the two effects, we investigate contract terms of the new loans.

4.2. *Impact on loan spread*

We first examine loan pricing. If there is relationship improvement effect, one should see a further reduction in the cost of the loans granted by the secuirtization- funded lender. This is because prior studies show that banks would share a part of the value stemming from informational scale of economy with relationship clients via a lower loan spread (e.g., Drucker and Puri, 2005; Bharath et al. 2011). The "*credit improvement hypothesis*" has the same prediction. The reason is because these banks are able to provide credit at a lower cost due to their access to structured credit (Nadauld and Weisbach, 2012; Shivdasani and Wang, 2011). To test this, we employ the following model:

$$Loan\ Spread_{i,m,f,t} = \beta_0 + \beta_1 Rel\_Dum_{i,m,t} + \beta_2 Rel\_Dum_{i,m,t} \times CLO\_Dum_{i,m,t} + Controls + \varepsilon_{i,m,f,t} \quad (2)$$

where $Loan\ Spread_{i,m,f,t}$ is the logarithm of all-in-drawn spread over LIBOR of facility *f* that is originated by bank *m* to firm *i* in time *t*. For each facility, we take all the lead arrangers and generate facility-bank pairs, on which we define *Rel_Dum* and *CLO_Dum* the same way as in equation (1), to reflect the lending activities between the borrower and each lead arranger in the previous three years and the securitization status of the past loans. We control for facility, firm, and

bank level characteristics and include year, industry, bank, rating, loan purpose, and loan type fixed effects. The standard errors are clustered at firm level in all tables from now on.

The estimated coefficients are reported in Table 5. We find a positive and significant coefficient on the interaction term between *CLO_Dum* and *Rel_Dum* (0.04, *se* = 0.02). If we use the sample mean spread (275 bps) over LIBOR as a benchmark, this coefficient can be translated into 11 basis points increase in the spread. This effect is large. It wipes out all the interest savings from relationship lending, which is about 8 basis points indicated in the coefficient on *Rel_Dum*. In columns 2 and 3, we use *CLO_Amt* and *CLO_Num* as proxies for securitization and find consistent results (0.11, *se* = 0.04 in column 2; 0.15, *se* = 0.05 in column 3). Hence, securitization leads to an increase rather than a reduction in the cost of loans from the relationship lender, supporting the "*relationship impairment*" argument. It is not, at first sight, consistent with the "*credit improvement"* effect.

The "*credit improvement"* effect, however, only predicts lower costs for institutional term loans, as they can be funded by the structured credit provided by CLOs (Nadauld and Weisbach, 2012). Pro rata facilities, including revolvers and term loans A, are often held by banks and rarely sold to CLOs, and hence do not benefit from the access to structured credit. Therefore, separating the two types of facilities can help us disentangle the effect of "*credit improvement*". Columns 4 and 5 of Table 5 report the regressions on spread of pro rata facilities (revolver and term loan A) and institutional facilities ("term loan B", include also term loan C and D). Indeed, we find a reduction in loan spread of term loans B only (-0.04, *se* = 0.02 in column 5). This effect is economically large and statistically

significant at 10% level. Considering the average spread of term loan B of 335 basis points, the coefficient is translated into a reduction of 13 basis points. This is consistent with the "*credit improvement*" argument. As for pro rata facilities, column 4 confirms the increase in the loan spreads when the past loans from the relationship bank to the same borrower are securitized (0.06, *se* = 0.02). Compared to column 1, the economic magnitude is much larger. It indicates an increase of 15 basis points on the average spread of 235. Such a large increase in costs of bank-held loans from securitization-funded relationship banks provide stronger support for the "*relationship impairment*" argument.

4.3. *Impact on loan covenants*

To further see if lending relationship is weakened due to securitization, we examine the effect of securitization of past loans on covenant design in the new loans. In the banking literature, covenant design is the key mechanism for lenders to commit to information production and monitoring (Rajan and Winton, 1995). Empirically, Drucker and Puri (2009) show that more restrictive covenants are associated with loan sales and argue that lending relationship persist in loan sales. In our setting, if securitization discourage the bank from investing in producing information and tightening relationship with the borrower, the bank may require less covenants in the new loans to reduce the cost of continued monitoring. Hence, we test this prediction using the following model:

$$Cov\_Num_{i,m,f,t} = \beta_0 + \beta_1 Rel\_Dum_{i,m,t} + \beta_2 Rel\_Dum_{i,m,t} \times CLO\_Dum_{i,m,t} + Controls + \varepsilon_{i,m,f,t,.} \quad (3)$$

where $Cov\_Num_{i,m,f}$ is number of covenants of facility f originated by bank m to firm i in time t. Alternatively, we also use an indicator variable *Cov_Dum* that equals to 1 if there is any covenant, and zero otherwise.

The results are reported in Table 6. Columns 1 to 3 use the number of covenants as the dependent variable and show negative and significant coefficients on the interaction of *Rel_Dum* and the measures of past securitization (-0.31, *se* = 0.09 in column 1; -0.60, *se* = 0.21 in column 2; -0.67, *se* = 0.26 in column 3). Column 1 shows that securitization of past loans is associated with a 0.31 reduction in the number of covenants. This effect is so large that it overturns the positive effect of a traditional lending relationship. In columns 4 to 6, where we use the indicator variable to capture the usage of covenants, we find a qualitatively similar result (-0.15, *se* = 0.04 in column 4; -0.30, *se* = 0.08 in column 5; -0.33, *se* = 0.10 in column 6). Specifically, column 4 indicates that the likelihood of imposing covenants in the new loans reduces by 15% if the past loans led by the same bank to the current borrower have been securitized. This result implies a negative impact of securitization on lending relationship and further supports the "*relationship impairment"* argument.

Our findings so far reveal a complex role of securitization in the relationship lending framework. If a bank securitizes a past loan of a borrower by selling it to CLOs, it would invest less in the relationship with this borrower afterwards. Despite the weakened relationship, the bank is still at an advantage of gaining future lending business due to its access to the structured credit from CLO investors. This source of credit gives the bank a comparative advantage in prodiving institutional term loans. It shares the cost savings with borrowrs and

charge lower spreads on insitutional term loans. However, it does not have comparative advantage in providing revolvers and term loans A, which are not commonly securitized. In providing these pro rata facilities, this bank would charge higher interest rate than another relationiship bank which does not securitize the borrower's previous loans, because it does not possess as much proprietary information to lower the cost of credit. In sum, our results indicate that the "*credit improvement"* effect works together with the "*relationship impairment*" effect when securitization is involved in a lending relationship.

4.4. *Impact on loan volume*

We further examine the effect of securitization on loan volume. Revolvers are only committed line of credit and are often not fully drawn while term loans are loans that firms take at the time of origination. Hence, the volume of revolvers and term loans have different meanings. To account for this differences, we calculate loan volume for revolvers and term loans separately. Note that we now classify term loans A in the same group as term loan B, which is different from the grouping in section 4.2 on pricing. To account for multiple lead banks in one loan, we divide the loan amount equally among all lead banks.

We estimate the following model:

$$Loan\_Volume_{i,m,p,t} = \beta_0 + \beta_1 Rel\_Dum_{i,m,t} + \beta_2 Rel\_Dum_{i,m,t} \times CLO\_Dum_{i,m,t} + Controls + \varepsilon_{i,m,p,t,.} \quad (4)$$

where $Loan\_Volume_{i,m,p,t}$ is logarithm of the share of bank m's amount of revolver (or term loans) in its loan package p to firm i originated at time t. The results are reported in Table 7. Columns 1 to 3 show negative and significant coefficients on the interaction term between *Rel_Dum* and the measures of securitizing past loans

(-0.21, *se* = 0.06 in column 1; -0.33, *se* = 0.17 in column 2; -0.44, *se* = 0.13 in column 3). This evidence implies that banks reduce the line of credit provided to the same borrower in the new loans if the borrower's past loans are securitized.

In contrast, for term loans in columns 4 to 6, we find positive and significant coefficients on the interaction term between *Rel_Dum* and the measures of securitizing past loans (0.14, *se* = 0.05 in column 4; 0.82, *se* = 0.20 in column 5; 0.87, *se* = 0.15 in column 6). That is, the securitization-funded relationship lenders increase the amount of term loans to the relationship borrowers in their new loans. Since most of the term loans are term loans B (see Table 1 Panel B), this result further indicates the comparative advantage of this type of relationship lenders in providing term loans due to their access to structured credit. It is consistent with Drucker and Puri (2009) who argue that off-loading borrowers' credit risk would lead to an increase in loan volume to the borrower.

In sum, the opposite effects of a pre-existing securitized loan on new revolvers and new term loans are consistent with the contrasting effects on pricings we show in Section 4.2. On one hand, securitization weakens the relationship banks' comparative advantage in providing line of credit. The underlying rationale is that securitization discourages lenders from monitoring and producing information. As a result, lending relationship is weakened and borrowers may take on more risk. Given that banks often keep revolvers and cannot sell them to CLOs, they would adopt a passive contracting strategic to manage the risk. That is, banks would increase the spread of the new revolver, and to reduce its volume to diversify the risk. This explains the higher spread and lower amount in revolvers from these banks. On the other hand, securitization

enhances their comparative advantage in providing term loans due to the credit supply from CLOs. Hence, these banks lend more term loans as most term loans can be sold to CLOs. They share their cost advantage with their borrowers by reducing credit spread on the institutional term loans. This argument implies that these lenders would likely to securitize the new loan and continue to sell it to CLOs. We test this conjecture in the next subsection.

4.5. *Impact on future securitization activities*

Here we test whether the relationship lenders who securitize a past loan to a borrower are more likely to securitize the current loan to the same borrower than other relationship lenders. To test this, we use the following model:

$$F\_CLO_{i,m,f,t} = \beta_0 + \beta_1 Rel\_Dum_{i,m,t} + \beta_2 Rel\_Dum_{i,m,t} \times CLO\_Dum_{i,m,t} + Controls + \varepsilon_{i,m,f,t,.} \quad (5)$$

Where $F\_CLO_{i,m,f,t}$ is an indicator variable which equals one if the current facility f arranged by bank m to firm i at time t is sold to CLOs. We use OLS to estimate this model given the large number of fixed effects in our regressions.

Table 8 columns 1 to 3 report the results. We find positive and significant coefficients on the interaction term between *Rel_Dum* and the securitization measures. The economic magnitude is sizable. For example, column 1 indicates that if the lender securitized a past loan of the borrower, the chance for this lender to securitize the current loan is increased by 7%. This is a large effect considering the unconditional probability of 27%. The result confirms that the likelihood for a bank to securitize new loans would increase if the bank has securitized past loans made to the same borrower. Interestingly, we find negative and significant coefficients on the *Rel_Dum*, suggesting that a typical relationship bank would be

less likely to securitize the new loan if there is no pre-existing securitized loan. This finding is also consistent with our argument that securitization markets provide the participating relationship lenders a new source of capital and give it an advantage in supplying certain types of credit.

5. Robustness Checks and the Selection Problem

5.1. Robustness Checks

In our main tests, we estimate the equations using units based on facility-bank since one facility can have multiple banks and be associated with multiple pre-existing lending relationships. The advantage of this approach lies in that we can control for bank characteristics and bank fixed effects. Hence, our results are within bank variations. However, one drawback of this approach is that we count one facility multiple times and therefore effectively give a higher weight to facilities with a larger number of lead banks. To reduce this bias, we run the models at facility level.

Notice that the relationship measures are defined at facility-bank level. To consolidate to the facility level, we take the maximum values of these measures among all the lead banks in the facility. Effectively, we assume that a facility is a relationship facility if any bank in the facility has a pre-existing relationship with the borrower, and the relationship is securitization impaired if the facility is sold to CLOs. Using this alternative sample, we estimate the effect on loan pricing and covenant as in equations (2) and (3) and report the estimated coefficients on key variables in Table 9. All our results still hold with similar economic magnitude.

Table 8 columns 4 to 6 show the facility level regressions of the likelihood of securitization of the new loans as in equation (5) and the results again remain.

In all these analysis, we use the indicator variable *Rel_Dum* to capture relationship and use various variable to measure securitization, as our focus is on the effect of securitization. We check our results using the alternative measures of relationship, i.e., *Rel_Amt* and *Rel_Num*, and find similar results. To conserve space, we do not report these results.

5.2. The Selection Problem

One empirical challenge in our inferences above is that pre-existing securitized loans could reflect un-modeled borrower characteristics which in turn affect the contract terms of new loans. For example, one may concern that past loans made to riskier borrowers may be more likely to be securitized. Thus, these borrowers are expected to pay a higher risk premium for a new loan. The un-modeled borrower default risk would lead to an overestimation on the increase in loan spread due to securitization.

Prior studies, however, fail to support this adverse selection conjecture. In contrast, they point out that banks have incentive to securitize better loans and keep riskier ones in their portfolios (Gorton and Pennacchi, 1995; DeMarzo, 2005; Benmelech et al. 2012). For example, Gorton and Pennacchi (1995) articulate that selling banks should retain a fraction of riskier loans as to signal quality. In line with this prediction, Benmelech et al. (2012) show that banks do not select risky loans to securitize.

We nevertheless employ two approaches to address the concern over this selection bias. The first approach is to control for firm fixed effect. The prerequisite

lies in that the selection bias is driven by time-invariant firm characteristics. In our setting, this is not a totally unreasonable assumption. Our securitization measure, by design, is an event happen in the past. If it captures unobservables that can have an impact on the new loans originated to this borrower later, the unobservables should be persistent.

We run the regression in equations (2)-(4) about loan pricing, covenants, and volume and include firm fixed effects. The results are reported in Table 10. Column 1 confirms higher cost to obtain revolvers and term loans A from a securitization-funded relationship lender even after accounting for unobservable time-invariant risk nature of borrowers. This result further supports our argument that relationship is impaired as a result of securitization. In column 2, the regression of term loan B spread, we still see a negative effect of past securitization as in Table 5 and Table 9 but the effect is not statistically significant. This could be due to lack of power in testing within-firm variation since we only have 302 observations for 90 firms. The effect on covenants remains, as shown in columns 3 and 4, although with smaller magnitude. Overall, this set of firm fixed effects regressions further support our inferences.

Our second approach to address the selection concern is based on the idea from Nadauld and Weisbach (2012). To deal with endogeneity issues with their securitization dummy, they use "securitization-friendly" loan characteristics to replace securitization dummy in their regressions. As they show that term loans B are "securitization-friendly", we use the existence of term loan B in the past loans of the relationship bank to proxy for securitization of past loans. The idea is that if there is term loan B in the loans originated in the past three years, the

probability for us to see securitization of the past loans is higher (i.e., *CLO_Dum* to take value of 1). On the other hand, it is unlikely that having a pre-existing term loan B would affect contract terms of the new loans. Hence, a pre-existing term loan B from a relationship lender serves the purpose as an instrument for the securitization-funded relationship measure. Using it to replace *CLO_Dum*, we estimate the following equation:

$$Loan\_terms_{i,m,f,t} = \beta_0 + \beta_1 Rel\_Dum_{i,m,t} + \beta_2 Rel\_Dum \times Past\_TLB_{i,m,t} + Controls + \varepsilon_{i,m,f,t,}. \quad (6)$$

Where $Past\_TLB_{i,m,t}$ is an indicator variable which equals one if bank m has arranged any term loan B (or C or D) to firm i in the three years prior to time t. We run the regression for loan spreads and covenants and report the results in Table 11. Columns 1 and 2 show consistent results that a pre-existing term loan B from the relationship lender leads to an increase in spreads on new revolvers and term loans A made to the same borrower, whereas it reduces spreads on term loans B made to the same borrower. Regarding to covenants, a pre-existing term loan B leads to a reduction in the number of covenants, as shown in columns 3 and 4. These results further confirm our inferences that about the complex roles of securitization in lending relationship.

6. Conclusion

In this paper, we endeavor to examine the effects of securitization on traditional relationship banking by using a large dataset of CLO collaterals to identify securitized loans and the relationship lenders. Our results show that even if a relationship lender securitizes a past loan, it continues to gain future lending

business from the same borrower. This, however, does not mean that lending relationship is strengthened due to securitization. In fact, when examining the contract terms of the new loans, we find that the new loans from this securitization-funded relationship lender, when compared to loans from a traditional relationship lender, have fewer covenants and smaller amount of revolvers at higher costs. These results support the "*relationship impairment"* effect of securitization as securitization weakens relationship lenders' incentive to monitor and produce information of the borrowers. As a result, securitization-funded relationship lenders lose their advantage as information-based lenders.

On the other hand, we find that securitization-funded relationship lenders provide larger amount of institutional term loans at lower costs. We also show that the new loans from these lenders are more likely to be securitized. This set of results is consistent with the "*credit improvement"* effect: the relationship lender gains the access to structured credit after securitizing past loans of the borrower and hence has the advantage in providing institutional term loans. Overall, our results show the complex impact of securitization. Both cost and benefit of securitization coexist in a lending relationship.

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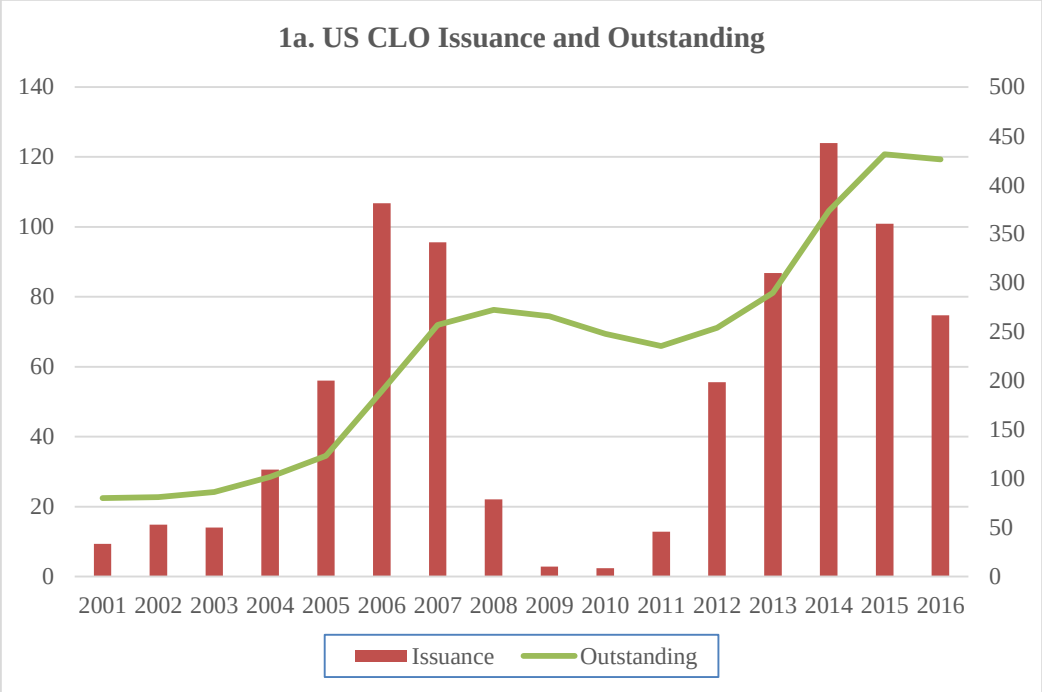
Appendix I Variable Definition

Variable	Definition
Panel A: Relationship variables and instrument variable	
CLO_Dum	A dummy variable equals one if any loan that bank *m* originated in the past 3 years to firm *i* is sold to CLOs, and zero otherwise.
CLO_Amt	Total amount of securitized loans from bank *m* to firm *i* originated the past 3 years divided by total amount of all loans from bank *m* to firm *i* originated over the same time period.
CLO_Num	Total number of securitized loans from bank *m* to firm *i* originated in the past 3 years divided by total number of loans from from bank *m* to firm *i* originated over the same time period.
Rel_Dum	A dummy variable equals one if bank *m* arranger any loan to firm *i* in the past 3 years prior to the current loan origination date, and zero otherwise.
Past_TLB	A dummy variable equals one if there is any term loan B originated by bank *m* to firm *i* in the past 3 year prior to the current loan origination date, and zero otherwise.
Panel B: Loan characteristics	
Log(F_size)	Logarithm of facility amount plus one. Obtained from Dealscan.
Log(P_size/num_lead)	Logarithm of the total amount of all facilities in a loan package divided by the number of lead arrangers in the package. Obtained from Dealscan
Log(maturity)	Logarithm of number of months between maturity date and origination date. Obtained from Dealscan.
Log(all-in-drawn)	Logarithm of all in drawn spread over LIBOR. Obtained from Dealscan.
Num_lead	Number of lead arrangers in a loan syndication. Calculated from Dealscan.
Num_lenders	Number of all lenders in a loan syndication. Calculated from Dealscan
F_CLO	A dummy variable if the current loan is securitized and sold to CLO, and zero otherwise. Identified from Creditflux and Dealscan.
P_CLO	A dummy variable if any facilities in a loan package is securitized and sold to CLO, and zero otherwise. Identified from Creditflux and Dealscan.
Cov_num	Number of covenants in a loan. Obtained from Dealscan.
Cov_dum	A dummy variable equal to one if there is any covenant, and zero otherwise. Obtained from Dealscan
Local	A dummy variable equal to one if the bank is in the same state as the borrower, and zero otherwise.
Prc_grid	A dummy variable equals one if a price grid is included in the contract, and zero otherwise. Obtained from Dealscan.
Secure	A dummy variable equals one if the facility is secured by collateral and zero otherwise. Obtained from Dealscan.
Panel C: Financial characteristics	
Log(AT)	Calculated as log(at+1) from Compustat.
Log(Sales)	Calculated as log(sale) from Compustat
M/B	Market to book ratio. Calculated as (at-ceq-txdb+prcc_f*csho)/at from Compustat.
IntCov, Log(Int)	Interest coverage ratio (ebitda/xint+1) and its logrithm. Calculated from Compustat.
Lev	Book leverage. Calculated as (dltt+dlc)/at from Compustat.
PM	Profit margin. Calculated as (ebitda/sale) from Compustat.
Tang	Tangibility. Calculated as (ppent/at) from Compustat.
R&D/AT	Calculated as (xrd/at) from Compustat.
WCR	Calculated as (act/lct) from Compustat.
Z-score	Calculated as 3.3*(ebit/at)+1*(sale/at)+1.4*(re/at)+1.2*(wcap/at)+0.6*(mve/lt) from compustat
Industry classification	Fama-French 48 Industry.
Panel D: Bank characteristics	
Bank_mkt_sh	Loan market share refers to a bank's market share in arranging loans. It is calculated as the newly arranged loan of bank m in year t over all the newly arranged loans in the market over the same time period.

Figure 1 Total US Issuance and Outstanding of CLO and RMBS

Figure 1a shows the CLO issuance and outstanding in the US market from 2001 to 2016. US CLO Issuance data is from Asset-Backed Alert and outstanding data is from SIMFA. Figure 1b shows the US non-Agency RMBS Issuance and outstanding from 2001 to 2016. US non-agency RMBS issuance and outstanding are both from SIMFA. In both figures, issuance amount uses the left scale and outstanding amount uses the right scale. Both values are in USD Billions.



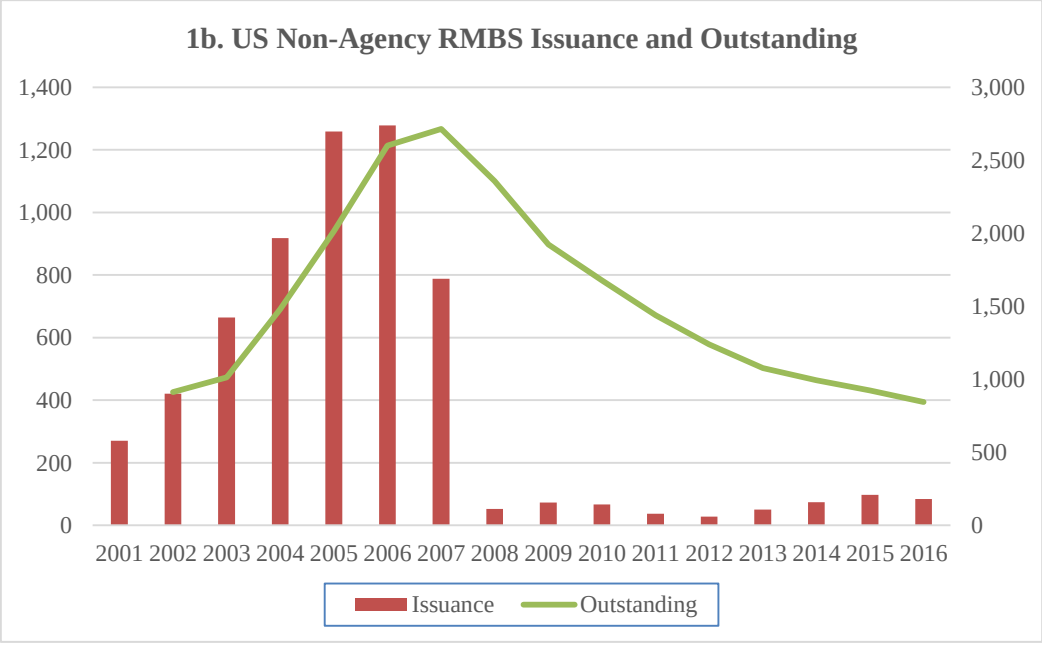


Figure 2 CLOs Covered in Creditflux

This figure below illustrates the coverage of Creditflux on CLOs. Only CLO denominated in USD are considered. The histogram using the left axis shows the total amount in USD billions of new CLO issued each year from 1999 to September 2016. The line using the right axis show the total number of new CLOs issued each year from 1999 to September 2016.

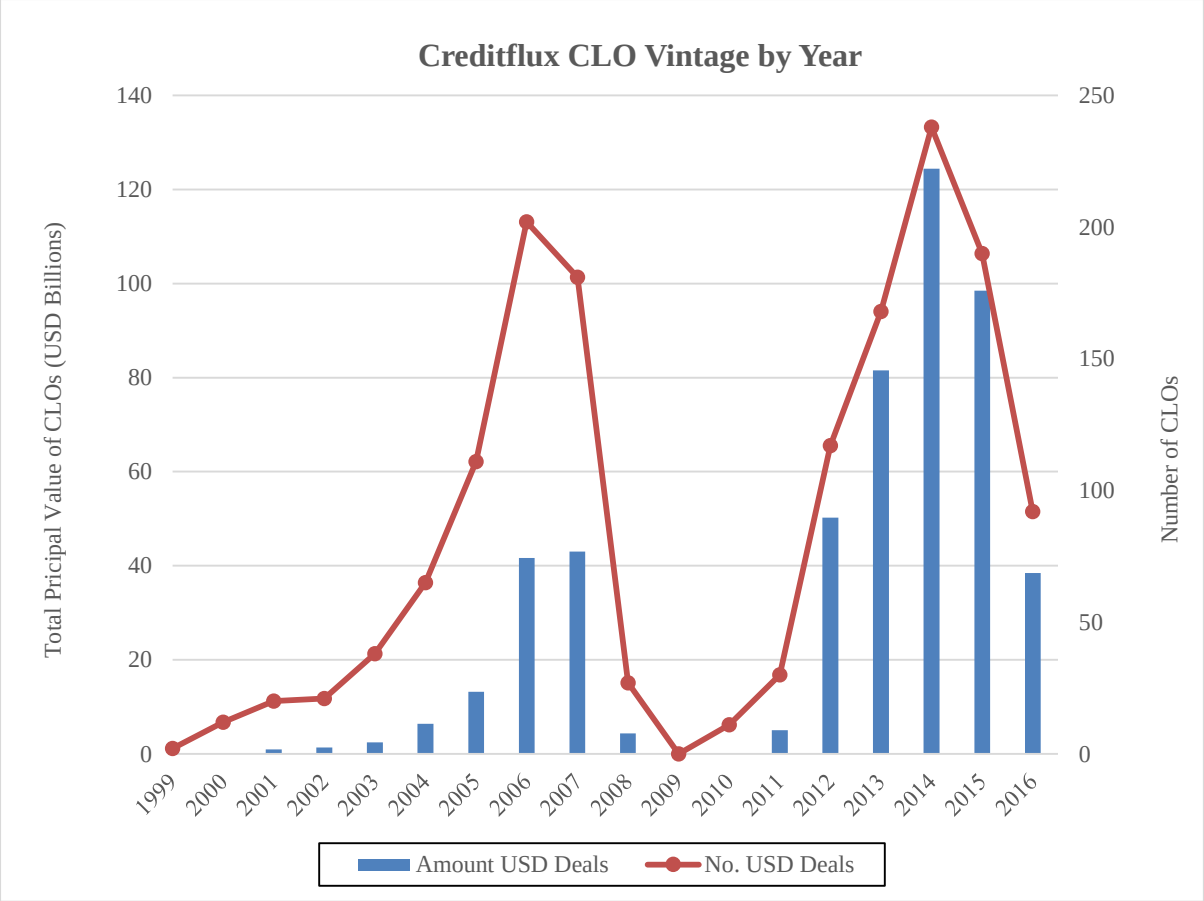
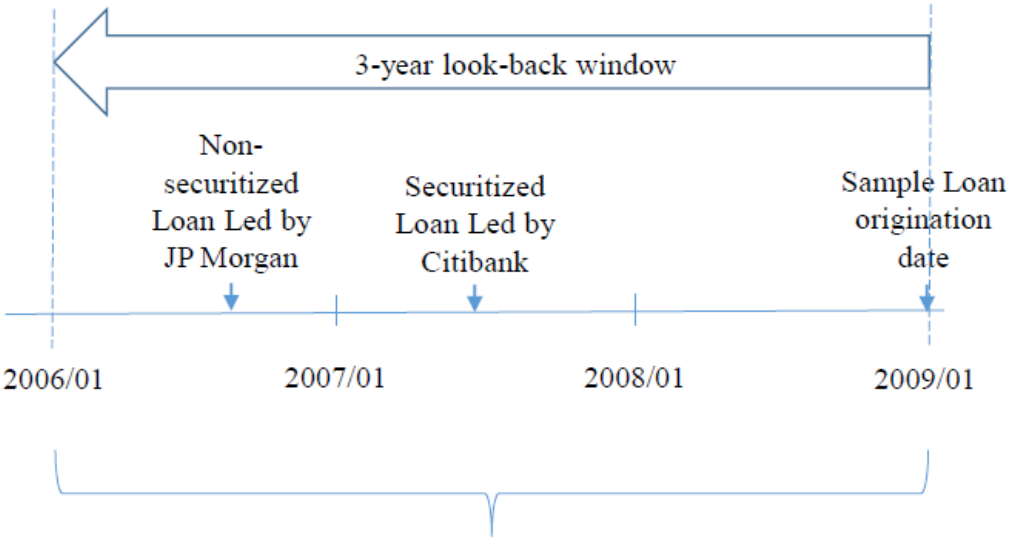


Figure 3 Securitization and Lending Relationship

This figure demonstrates how we calculate our relationship and securitization measures. For each sample loan, we look back three years from the loan origination date and search if there is any loan of the firm is securitized and sold into CLOs. If so, we classify the relationship with bank(s) who arranged the securitized loan to be securitization-funded relationship.



- Search if there is any loan securitized in the 3-year look-back window, and classify the bank led the securitized loan to have securitization relation with the firm of the discussed sample loan.

Table 1 Sample Descriptive Statistics

This table provides the descriptive statistics of our sample facilities. The sample period is from 2006 to August 2016. In Panel A, we report the yearly distribution of the sample facilities, and in Panel B, we report the distribution of the sample by facility type. Our sample is divided into 3 groups: (1) No relationship: none of the lead arrangers have prior lending relationship with the borrower; (2) relationship without past securitization: at least one lead bank has a prior lending relationship and arranged one or more loans to the same borrower in the past three years but none of the past loans is securitized; (3) relationship with past securitization: at least one lead bank has a prior lending relationship and arranged one or more loans to the same borrower in the past three years and at least one of the past loans is securitized.

Panel A: Sample yearly distribution

Year	(1) No relationship	(2) Relationship without past securitization	(3) Relationship with past securitization	**Total**
2006	186	357	130	673
2007	214	275	172	661
2008	62	119	26	207
2009	101	81	65	247
2010	215	110	54	379
2011	228	211	98	537
2012	138	162	142	442
2013	83	233	253	569
2014	45	214	146	405
2015	68	154	86	308
2016	28	103	61	192
Total	1,368	2,019	1,233	4,620

Panel B: Sample distribution by facility type

Facility type	(1) No relationship	(2) Relationship without past securitization	(3) Relationship with past securitization	**Total**
Revolver	783	1,292	487	2,562
Term loan A	101	216	137	454
Term loan B (or C, D)	368	386	548	1,302
Term loan (unspecified)	116	125	61	302
Total	1,368	2,019	1,233	4,620

Table 2 Summary Statistics of Facilities

This table provides summary statistics of facility level characteristics for our sample, divided into three groups as described in Table 1. Please refer to Appendix I for definition of variables.

Variables	N	Mean	Median	SD
Panel A Non-relationship				
F_Size (millions)	1,368	421.56	250.00	659.56
All-in-drawn (LIBOR)	1,273	307.18	275.00	154.39
All-in-drawn (Prime)	645	297.95	250.00	169.04
Cov_num	1,368	1.21	1.00	1.24
Cov_dum	1,368	0.57	1.00	0.50
Prc_grid	1,368	0.35	0.00	0.48
Secure	1,368	0.82	1.00	0.39
Num_lead	1,368	2.35	2.00	1.70
Num_lenders	1,368	7.21	6.00	6.35
Panel B Relationship without past securitization				
F_Size (millions)	2,019	538.71	310.00	697.87
All-in-drawn (LIBOR)	1,909	246.45	200.00	132.52
All-in-drawn (Prime)	889	243.00	200.00	146.15
Cov_num	2,019	1.34	1.00	1.24
Cov_dum	2,019	0.62	1.00	0.49
Prc_grid	2,019	0.75	1.00	0.43
Secure	2,019	0.36	0.00	0.48
Num_lead	2,019	2.56	2.00	1.76
Num_lenders	2,019	9.37	7.00	7.26
Panel C Relationship with past securitization				
F_Size (millions)	1,233	669.29	352.00	1019.44
All-in-drawn (LIBOR)	1,167	286.65	275.00	127.10
All-in-drawn (Prime)	447	275.75	250.00	126.15
Cov_num	1,233	1.05	0.00	1.23
Cov_dum	1,233	0.50	0.00	0.50
Prc_grid	1,233	0.89	1.00	0.32
Secure	1,233	0.29	0.00	0.45
Num_lead	1,233	3.59	2.00	2.81
Num_lenders	1,233	8.39	6.00	7.29

Table 3 Summary Statistics of Borrowers

This table provides summary statistics of financial characteristics of borrowers in each loan package separately for the 3 groups described in Table 1. The variables are defined in Appendix I.

Variables	N	Mean	Median	SD
Panel A Borrowers of no relationship loans				
Log(Sales)	792	7.22	7.12	1.15
Log(AT)	797	7.37	7.30	1.11
M/B	650	1.44	1.27	0.64
Lev	794	0.43	0.38	0.27
WCR	770	1.84	1.68	0.99
IntCov	781	4.23	2.17	6.25
PM	789	0.17	0.13	0.14
Tang	797	0.32	0.25	0.24
R&D/AT	797	0.01	0.00	0.03
Z-score	644	2.33	2.11	1.93
Panel B Borrowers of relationship loans and without past securitization				
Log(Sales)	1,362	7.44	7.41	1.17
Log(AT)	1,366	7.74	7.69	1.03
M/B	1,167	1.45	1.30	0.60
Lev	1,366	0.41	0.38	0.22
WCR	1,282	1.72	1.56	0.91
IntCov	1,339	4.04	2.65	5.45
PM	1,361	0.20	0.14	0.19
Tang	1,363	0.38	0.31	0.28
R&D/AT	1,366	0.01	0.00	0.02
Z-score	1,109	2.26	2.14	1.69
Panel C Borrowers with relationship loans and past securitization				
Log(Sales)	703	7.87	7.83	1.22
Log(AT)	706	8.18	8.10	1.21
M/B	497	1.46	1.33	0.59
Lev	704	0.56	0.52	0.28
WCR	683	1.54	1.43	0.81
IntCov	698	2.70	1.83	3.60
PM	703	0.18	0.16	0.11
Tang	703	0.30	0.24	0.23
R&D/AT	706	0.01	0.00	0.02
Z-score	493	1.62	1.63	1.40

Table 4 Securitization and Future Lending

This table reports the estimated coefficients of OLS regressions of the choice of lenders on relationship, past securitization measures and other control variables. Panel A runs the OLS regressions at the facility level. Each facility in our sample is paired with the top 20 banks in terms of loan market share in the US market in the previous year and any other banks who lent to the borrower in the three years prior to the origination date of the facility. The dependent variable is a binary variable, which equals one if the bank is one of the lead arrangers of the current loan, and zero otherwise. *Rel_Dum* is a dummy variable which equals one if the bank arranged any loan to the same borrower during three years prior to the origination date, and zero otherwise. *CLO_Dum* is a dummy variable which equals one if any relationship loan, which the bank arranged to the borrower in the past three years, is sold to CLO, and zero otherwise. *CLO_Amt* is the total amount of relationship loans that are securitized divided by the total amount of all relationship loans between the firm and the bank in the past three years. *CLO_Num* is the total number of relationship loans divided by the total number of all relationship loans between the firm and the bank in the past three years. Panel B runs the regression at the package level, where *Rel_Dum*, *CLO_Dum*, *CLO_Amt*, and *CLO_Num* are calculated for each lead bank of the package. Firm financial characteristics and bank characteristics are measured one year prior to the origination date of the loan. Detailed definitions of variables are in the Appendix I. Fixed effects on industry, year, rating, loan purpose (Panel A only), loan type (Panel A only) and bank are included in the regression. Robust standard errors corrected for heteroskedasticity and clustered at the level facility (Panel A) and package (Panel B) respectively are reported in the parentheses. ***, **, and * designate statistical significance at 1%, 5%, and 10% level, respectively. Constant term is omitted in reporting.

Panel A Facility level regression

	Chosen=1, o.w.=0		
VARIABLES	(1)	(2)	(3)
Rel_Dum	0.50***	0.52***	0.52***
	(0.01)	(0.01)	(0.01)
Rel_Dum*CLO_Dum	**0.07*** **		
	(0.01)		
Rel_Dum*CLO_Amt		**0.19*** **	
		(0.04)	
Rel_Dum*CLO_Num			**0.18*** **
			(0.05)
F_CLO	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)
Bank_mkt_sh	0.39***	0.36***	0.35***
	(0.09)	(0.09)	(0.09)
Log(F_size)	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)
Log(maturity)	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)
Local	0.01	0.01	0.01
	(0.02)	(0.02)	(0.02)
Log(AT)	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)
M/B	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
Log(Int)	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
Lev	-0.02**	-0.02**	-0.02**
	(0.01)	(0.01)	(0.01)
PM	-0.01	-0.02	-0.02
	(0.01)	(0.01)	(0.01)

Tang	-0.02**	-0.02***	-0.02***
	(0.01)	(0.01)	(0.01)
R&D/AT	-0.07	-0.07	-0.07
	(0.05)	(0.05)	(0.05)
WCR	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)
Observations	69,458	69,458	69,458
Rating FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Type FE	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
Cluster at	Facility	Facility	Facility
Adj. R-square	0.39	0.38	0.38

Panel B Package level regression

	Chosen=1, o.w.=0		
VARIABLES	(1)	(2)	(3)
Rel_Dum	0.52***	0.52***	0.52***
	(0.01)	(0.01)	(0.01)
Rel_Dum*CLO_Dum	**0.04****		
	(0.02)		
Rel_Dum*CLO_Amt		**0.14****	
		(0.06)	
Rel_Dum*CLO_Num			**0.16*****
			(0.05)
Other controls	Yes	Yes	Yes
Observations	43,494	43,494	43,494
Rating FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
Cluster at	Package	Package	Package
Adj. R-square	0.39	0.39	0.39

Table 5 Securitization and Loan Spread

This table reports the estimated coefficients of OLS regressions of credit spread for each facility matched to each of the lead banks of the facility. The dependent variable is logarithm of all-in-drawn spread over LIBOR. *Rel_Dum* is a dummy variable which equals one if the bank arranged any loan to the same borrower during three years prior to the origination date, and zero otherwise. *CLO_Dum* is a dummy variable which equals one if any relationship loan, which the bank arranged to the borrower in the past three years, is sold to CLO, and zero otherwise. *CLO_Amt* is the total amount of relationship loans that are securitized divided by the total amount of all relationship loans between the firm and the bank in the past three years. *CLO_Num* is the total number of relationship loans divided by the total number of all relationship loans between the firm and the bank in the past three years. Columns 1-3 include all the facilities. Column 4 reports the regression for revolvers and term loans A while column 5 reports it for term loans B. Firm financial characteristics and bank characteristics are measured one year prior to the origination date of the loan. Detailed definitions of variables are in the Appendix I. Fixed effects on industry, year, rating, loan purpose, loan type and bank are included in the regression. Robust standard errors corrected for heteroskedasticity and clustered at firm level are reported in the parentheses. ***, **, and * designate statistical significance at 1%, 5%, and 10% level, respectively. Constant term is omitted in reporting.

	Log(All-in-drawn)				
VARIABLES	(1) Full sample	(2) Full sample	(3) Full sample	(4) Revolver & TLA	(5) TLB
Rel_Dum	-0.03**	-0.03**	-0.03**	-0.02*	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Rel_Dum*CLO_Dum	**0.04****			**0.06*****	**-0.04***
	(0.02)			(0.02)	(0.02)
Rel_Dum*CLO_Amt		**0.11*****			
		(0.04)			
Rel_Dum*CLO_Num			**0.15*****		
			(0.05)		
F_CLO	0.00	0.00	0.00	0.06**	-0.02
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
Bank_mkt_sh	0.05	0.03	0.02	-0.00	0.04
	(0.22)	(0.22)	(0.22)	(0.25)	(0.29)
Log(F_size)	-0.03***	-0.03***	-0.03***	-0.04***	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Log(maturity)	-0.05**	-0.05**	-0.05**	-0.08***	-0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
Local	0.12*	0.12*	0.12*	0.21***	0.09
	(0.07)	(0.07)	(0.07)	(0.08)	(0.07)
Num_lead	0.01***	0.01***	0.01***	0.02***	0.00
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Cov_Num	0.01**	0.01**	0.01**	0.03***	-0.01**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Prc_grid	-0.04***	-0.04**	-0.04**	-0.06***	-0.04
	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)
Secure	0.07***	0.07***	0.07***	0.04**	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.10)
Log(AT)	-0.02*	-0.02*	-0.02*	-0.01	-0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
M/B	-0.03**	-0.03**	-0.03**	-0.03*	-0.05***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Log(Int)	-0.02	-0.02	-0.02	-0.03*	-0.01
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)

Lev	0.04	0.05	0.05	0.05	-0.05
	(0.04)	(0.04)	(0.04)	(0.06)	(0.06)
PM	-0.23***	-0.24***	-0.24***	-0.25***	-0.21
	(0.08)	(0.08)	(0.08)	(0.09)	(0.13)
Tang	0.04	0.04	0.04	0.05	0.06
	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)
R&D/AT	0.95**	0.97**	0.97**	1.09**	0.38
	(0.41)	(0.41)	(0.41)	(0.44)	(0.54)
WCR	-0.01	-0.01	-0.01	-0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	8,105	8,105	8,105	5,828	2,277
Rating FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Type FE	Yes	Yes	Yes	Yes	No
Purpose FE	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Cluster at	Firm	Firm	Firm	Firm	Firm
Adj. R-square	0.64	0.64	0.64	0.62	0.66

Table 6 Securitization and Covenant

This table reports estimated coefficients of OLS regressions of loan covenants for each facility matched to each of the lead banks of the facility. The dependent variable is the number of covenants (in columns 1-3) and the covenant indicator (in columns 4-6), which equals to one if there is any covenant and zero otherwise. *Rel_Dum* is a dummy variable which equals one if the bank arranged any loan to the same borrower during three years prior to the origination date, and zero otherwise. *CLO_Dum* is a dummy variable which equals one if any relationship loan, which the bank arranged to the borrower in the past three years, is sold to CLO, and zero otherwise. *CLO_Amt* is the total amount of relationship loans that are securitized divided by the total amount of all relationship loans between the firm and the bank in the past three years. *CLO_Num* is the total number of relationship loans divided by the total number of all relationship loans between the firm and the bank in the past three years. Firm financial characteristics and bank characteristics are measured one year prior to the origination date of the loan. Detailed definitions of variables are in the Appendix I. Fixed effects on industry, year, rating, loan purpose, loan type and bank are included in the regression. Robust standard errors corrected for heteroskedasticity and clustered at firm level are reported in the parentheses. ***, **, and * designate statistical significance at 1%, 5%, and 10% level, respectively. Constant term is omitted in reporting.

	Cov_Num			Cov_Dum		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Rel_Dum	0.19***	0.13***	0.12***	0.07***	0.04**	0.04*
	(0.05)	(0.04)	(0.04)	(0.02)	(0.02)	(0.02)
Rel_Dum*CLO_Dum	**-0.31*** **			**-0.15*** **		
	(0.09)			(0.04)		
Rel_Dum*CLO_Amt		**-0.60*** **			**-0.30*** **	
		(0.21)			(0.08)	
Rel_Dum*CLO_Num			**-0.67** **			**-0.33*** **
			(0.26)			(0.10)
F_CLO	0.14*	0.14*	0.14*	0.09***	0.09***	0.09***
	(0.08)	(0.08)	(0.08)	(0.03)	(0.03)	(0.03)
Bank_mkt_sh	-0.31	-0.13	-0.11	0.09	0.17	0.18
	(0.85)	(0.85)	(0.85)	(0.31)	(0.31)	(0.31)
Log(F_Size)	0.01	0.01	0.01	0.02	0.02	0.02
	(0.03)	(0.03)	(0.03)	(0.01)	(0.01)	(0.01)
Log(all-in-drawn)	0.21**	0.21**	0.21**	0.07	0.06	0.06
	(0.09)	(0.09)	(0.09)	(0.04)	(0.04)	(0.04)
Log(maturity)	-0.17*	-0.16*	-0.16*	-0.08**	-0.08**	-0.08**
	(0.09)	(0.09)	(0.09)	(0.04)	(0.04)	(0.04)
Local	0.07	0.08	0.08	-0.00	0.01	0.01
	(0.53)	(0.52)	(0.52)	(0.30)	(0.29)	(0.29)
Num_lead	0.00	-0.00	-0.00	0.01	0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
Prc_grid	0.65***	0.65***	0.65***	0.29***	0.29***	0.29***
	(0.06)	(0.06)	(0.06)	(0.03)	(0.03)	(0.03)
Secure	0.66***	0.65***	0.65***	0.32***	0.31***	0.31***
	(0.08)	(0.08)	(0.08)	(0.04)	(0.04)	(0.04)
Log(AT)	-0.17***	-0.18***	-0.18***	-0.03	-0.03	-0.03
	(0.04)	(0.04)	(0.04)	(0.02)	(0.02)	(0.02)
M/B	-0.12*	-0.11*	-0.11*	0.01	0.01	0.01
	(0.07)	(0.06)	(0.06)	(0.03)	(0.03)	(0.03)
Log(Int)	-0.01	-0.01	-0.01	-0.03	-0.03	-0.03
	(0.06)	(0.06)	(0.06)	(0.03)	(0.03)	(0.03)
Lev	-0.07	-0.10	-0.11	-0.14*	-0.15*	-0.16*
	(0.19)	(0.19)	(0.19)	(0.08)	(0.08)	(0.08)

PM	-0.04	0.03	0.02	0.04	0.08	0.07
	(0.36)	(0.36)	(0.36)	(0.15)	(0.15)	(0.15)
Tang	-0.11	-0.10	-0.10	-0.18*	-0.18*	-0.17*
	(0.23)	(0.23)	(0.23)	(0.09)	(0.09)	(0.09)
R&D/AT	-0.39	-0.54	-0.58	-1.16	-1.24	-1.26
	(2.32)	(2.34)	(2.35)	(0.91)	(0.91)	(0.91)
WCR	-0.05	-0.05	-0.05	-0.03**	-0.03*	-0.03*
	(0.04)	(0.04)	(0.04)	(0.02)	(0.02)	(0.02)
Observations	8,105	8,105	8,105	8,105	8,105	8,105
Rating FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Type FE	Yes	Yes	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster at	Firm	Firm	Firm	Firm	Firm	Firm
Adj. R-square	0.31	0.31	0.31	0.31	0.30	0.30

Table 7 Securitization and Loan Volume

This table reports estimated coefficients of OLS regressions of the amount of revolvers and term loans in the current loan package. The dependent variable is logarithm of the amount of revolvers (in columns 1-3) or term loans (in columns 4-6) divided by the number of lead banks in the package. *Rel_Dum* is a dummy variable which equals one if the bank arranged any loan to the same borrower during three years prior to the origination date, and zero otherwise. *CLO_Dum* is a dummy variable which equals one if any relationship loan, which the bank arranged to the borrower in the past three years, is sold to CLO, and zero otherwise. *CLO_Amt* is the total amount of relationship loans that are securitized divided by the total amount of all relationship loans between the firm and the bank in the past three years. *CLO_Num* is the total number of relationship loans divided by the total number of all relationship loans between the firm and the bank in the past three years. Firm financial characteristics and bank characteristics are measured one year prior to the origination date of the loan. Detailed definitions of variables are in the Appendix I. Fixed effects on industry, year, rating, and bank are included in the regression. Robust standard errors corrected for heteroskedasticity and clustered at firm level are reported in the parentheses. ***, **, and * designate statistical significance at 1%, 5%, and 10% level, respectively. Constant term is omitted in reporting.

	Log (P_size/ Num_lead)					
	Revolvers			Term Loans		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Rel_Dum	0.13***	0.09**	0.10***	-0.14***	-0.16***	-0.18***
	(0.04)	(0.03)	(0.03)	(0.05)	(0.05)	(0.05)
Rel_Dum*CLO_Dum	**-0.21*** **			**0.14***		
	(0.06)			(0.07)		
Rel_Dum*CLO_Amt		**-0.33***			**0.82*** **	
		(0.17)			(0.20)	
Rel_Dum*CLO_Num			**-0.44*** **			**0.87*** **
			(0.13)			(0.15)
P_CLO	0.15	0.14	0.15	0.40***	0.39***	0.39***
	(0.13)	(0.13)	(0.13)	(0.07)	(0.08)	(0.07)
Bank_mkt_sh	-0.31	-0.26	-0.26	1.63*	1.46	1.50*
	(0.71)	(0.72)	(0.72)	(0.91)	(0.90)	(0.90)
Local	-0.16	-0.14	-0.15	-0.28	-0.28	-0.29
	(0.41)	(0.41)	(0.41)	(0.63)	(0.62)	(0.62)
Log(AT)	0.41***	0.40***	0.40***	0.33***	0.34***	0.35***
	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)
M/B	0.17***	0.17***	0.17***	0.18***	0.18***	0.18***
	(0.05)	(0.05)	(0.04)	(0.06)	(0.06)	(0.06)
Log(Int)	0.03	0.03	0.03	0.33***	0.33***	0.33***
	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)
Lev	-0.06	-0.10	-0.09	0.35	0.35*	0.33
	(0.17)	(0.17)	(0.17)	(0.21)	(0.21)	(0.20)
PM	0.27	0.30	0.30	0.63	0.59	0.56
	(0.26)	(0.27)	(0.27)	(0.49)	(0.49)	(0.49)
Tang	0.86***	0.88***	0.87***	-0.04	-0.04	-0.02
	(0.19)	(0.19)	(0.19)	(0.23)	(0.23)	(0.23)
R&D/AT	-1.93	-2.04*	-2.01*	-0.07	-0.14	-0.22
	(1.19)	(1.20)	(1.20)	(1.79)	(1.78)	(1.76)
WCR	-0.02	-0.02	-0.02	0.11**	0.10**	0.10**
	(0.03)	(0.03)	(0.03)	(0.05)	(0.04)	(0.04)
Observations	3,878	3,878	3,878	2,845	2,845	2,845
Rating FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster at	Firm	Firm	Firm	Firm	Firm	Firm
Adj. R-square	0.49	0.49	0.49	0.32	0.33	0.33

Table 8 Probability of Future Securitization

This table reports estimated coefficients of OLS regressions of the likelihood for the facility to be securitized. The dependent variable is a binary variable which equals to one if this facility is sold to CLOs and zero otherwise. *Rel_Dum* is a dummy variable which equals one if the bank arranged any loan to the same borrower during three years prior to the current loan origination date, and zero otherwise. *CLO_Dum* is a dummy variable which equals one if any relationship loan, which the bank arranged to the borrower in the past three years, is sold to CLO, and zero otherwise. *CLO_Amt* is the total amount of relationship loans that are securitized divided by the total amount of all relationship loans between the firm and the bank in the past three years. *CLO_Num* is the total number of relationship loans divided by the total number of all relationship loans between the firm and the bank in the past three years. The regressions in columns 1-3 are at the facility-bank level, where each facility is paired to each of the lead banks of the facility. The regressions in columns 4-6 are at facility level, where *Rel_Dum*, *CLO_Dum*, *CLO_Amt*, and *CLO_Num* take the maximum value across all the lead banks of the facility. Firm financial characteristics and bank characteristics are measured one year prior to the origination date of the loan. Detailed definitions of variables are in the Appendix I. Fixed effects industry, year, rating, loan purpose, loan type and bank are included in the regression. Robust standard errors corrected for heteroskedasticity and clustered at firm level are reported in the parentheses. ***, **, and * designate statistical significance at 1%, 5%, and 10% level, respectively. Constant term is omitted in reporting.

	F_CLO=1, o.w.=0					
	Facility-bank level			Facility level		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Rel_Dum	-0.04***	-0.04***	-0.04***	-0.03**	-0.04**	-0.04**
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Rel_Dum*CLO_Dum	**0.07*** **			**0.07*** **		
	(0.02)			(0.02)		
Rel_Dum*CLO_Amt		**0.36*** **			**0.29*** **	
		(0.07)			(0.07)	
Rel_Dum*CLO_Num			**0.28*** **			**0.22*** **
			(0.05)			(0.05)
Bank_mkt_sh	-0.15	-0.21	-0.20			
	(0.22)	(0.22)	(0.22)			
Log(F_Size)	0.04***	0.04***	0.04***	0.06***	0.06***	0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Log(maturity)	0.05*	0.05*	0.05*	0.07***	0.07***	0.07***
	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)
Local	0.10	0.10	0.10			
	(0.08)	(0.08)	(0.08)			
Num_lead	0.01*	0.01**	0.01**	0.01	0.01**	0.01**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Log(all-in-drawn)	0.01	0.00	0.00	0.01	0.01	0.01
	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)
Cov_Num	0.01*	0.01*	0.01*	0.01**	0.01**	0.01**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Prc_grid	0.01	0.01	0.01	-0.00	0.00	0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Secure	0.01	0.01	0.01	0.01	0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Log(AT)	-0.01	-0.00	-0.00	-0.02	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
M/B	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
Log(Int)	0.02	0.02	0.02	0.02*	0.02*	0.02*

	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
Lev	0.06	0.06	0.06	0.07	0.07	0.07
	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
PM	0.08	0.07	0.07	-0.00	-0.01	-0.02
	(0.08)	(0.08)	(0.08)	(0.08)	(0.07)	(0.07)
Tang	-0.06	-0.06	-0.06	-0.03	-0.03	-0.03
	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
R&D/AT	0.34	0.36	0.34	0.27	0.27	0.24
	(0.42)	(0.42)	(0.42)	(0.41)	(0.40)	(0.40)
WCR	-0.03***	-0.03***	-0.03***	-0.02*	-0.02**	-0.02**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	8,105	8,105	8,105	3,218	3,218	3,218
Rating FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Type FE	Yes	Yes	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	N/A	N/A	N/A
Cluster at	Firm	Firm	Firm	Firm	Firm	Firm
Adj. R-square	0.47	0.47	0.47	0.44	0.44	0.44

Table 9 Facility-Level Regressions

This table reports regressions of loan spread and covenant, similar to those in Table 5 and Table 6 but using facility level data instead of facility-bank level. For facilities with multiple lead banks, we take the maximum value of *Rel_Dum* and *CLO_Dum* among these banks. Facility and firm level control variables included in columns 1-2 are the same as in Table 5 and those in columns 3-4 are the same as in Table 6. There are no bank level controls or bank fixed effects because the lender is not specific in this setting. Fixed effects of industry, year, rating, loan purpose, and loan type are included in the regression. Robust standard errors corrected for heteroskedasticity and clustered at firm level are reported in the parentheses. ***, **, and * designate statistical significance at 1%, 5%, and 10% level, respectively. Constant term and control variables are omitted in reporting.

	Log(All-in-drawn)		Cov_Num	Cov_Dum
	(1)	(2)	(3)	(4)
VARIABLES	Revolver & TLA	TLB	Full sample	Full sample
Rel_Dum	-0.01	-0.03	0.17***	0.05**
	(0.02)	(0.03)	(0.06)	(0.02)
Rel_Dum*CLO_Dum	**0.04****	**-0.05****	**-0.25*****	**-0.12*****
	(0.02)	(0.02)	(0.08)	(0.03)
Facility level controls	Yes	Yes	Yes	Yes
Firm level controls	Yes	Yes	Yes	Yes
Observations	2,378	840	3,218	3,218
Rating FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Type FE	Yes	No	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes
Cluster at	Firm	Firm	Firm	Firm
Adj. R-square	0.62	0.64	0.27	0.30

Table 10 Firm Fixed Effects Regressions

This table provides the results of loan spread and covenant regressions similar to Table 9 but controlled for firm fixed effects. The sample here only includes firms that have multiple past loans and some relationship loans are securitized (i.e., variation in *Rel_Dum*CLO_Dum*). Facility and firm level control variables included in columns 1-2 are the same as in Table 5 and those in columns 3-4 are the same as in Table 6. Fixed effects of firm, year, rating, loan purpose, and loan type are included in the regression. Robust standard errors corrected for heteroskedasticity and clustered at firm level are reported in the parentheses. ***, **, and * designate statistical significance at 1%, 5%, and 10% level, respectively. Constant term and control variables are omitted in reporting.

	Log(All-in-drawn)		Cov_Num	Cov_Dum
	(1)	(2)	(3)	(4)
	Revolver			
VARIABLES	& TLA	TLB	Full sample	Full sample
Rel_Dum	-0.08*	-0.03	0.08	0.28*
	(0.05)	(0.09)	(0.06)	(0.16)
Rel_Dum*CLO_Dum	**0.07****	**-0.02**	**-0.15*****	**-0.21***
	(0.03)	(0.05)	(0.05)	(0.12)
Other controls	Yes	Yes	Yes	Yes
Observations	641	302	1,142	1,142
No. of Firms	135	90	173	173
Rating FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Type FE	Yes	No	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes
Cluster at	Firm	Firm	Firm	Firm
Adj. R-square	0.73	0.64	0.44	0.48

Table 11 Regressions Using Past Term Loan B as an Instrument

This table reports results of OLS regressions of loan spread and covenant on a past term loan B indicator, using the same settings as in Table 5 and Table 6. *Past_TLB* is an indicator variable which equals one if there is any term loan B originated by the bank to the firm in the three years prior to the current loan origination, and zero otherwise. All other control variables and fixed effects in columns 1-2 are the same as in Table 5 and those in columns 3-4 are the same as in Table 6. Robust standard errors corrected for heteroskedasticity and clustered at firm level are reported in the parentheses. ***, **, and * designate statistical significance at 1%, 5%, and 10% level, respectively. Control variables and constant term are omitted in reporting.

	Log(All-in-drawn)		Cov_Num	Cov_Dum
	(1)	(2)	(3)	(4)
VARIABLES	Revolver & TLA	TLB	Full sample	Full sample
Rel_Dum	-0.01	-0.01	0.16***	0.04*
	(0.01)	(0.02)	(0.05)	(0.02)
Rel_Dum*Past_TLB	**0.04****	**-0.04***	**-0.18****	**-0.06***
	(0.02)	(0.02)	(0.08)	(0.03)
Other controls	Yes	Yes	Yes	Yes
Observations	5,828	2,277	8,105	8,105
Rating FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Type FE	Yes	No	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Cluster at	Firm	Firm	Firm	Firm
Adj. R-square	0.62	0.65	0.31	0.30