Skewed Servicing and Monitoring for Securitized Commercial Mortgages*

LUIS A. LOPEZ†

November 12, 2018

ABSTRACT

I empirically examine the role of trustees in financial markets within the framework of commercial mortgage-backed securities (CMBS). Using a natural experiment around mergers that result in servicers and trustees falling under the same institutional umbrella, I present evidence that affiliation is associated with excessive advances on delinquent loans, which throttles information to bondholders. Furthermore, I find that a servicer-trustee affiliation causes distortions to the cash flows to bondholders and a decrease in the average recovery rate of a delinquent commercial mortgage by up to $0.07 per dollar of outstanding debt, accounting for an economic impact of about $4.53 billion in market-wide liquidation losses.

JEL Classification: G2.

Keywords: Securitization, Commercial Mortgages, Financial Intermediaries, Mergers.

---

*I thank Brent W. Ambrose, my dissertation committee chair, for his tutelage in this paper. I am also grateful to Walter D'Lima, Austin J. Jaffe, Sanket Korgaonkar, Gary L. Lilien, Liang Peng, Timothy T. Simin, and Jiro Yoshida for their excellent insights, comments, and discussions. I also thank the participants at the 2018 PhD Conference in Real Estate and Housing at the Ohio State University, the Doctoral Session at the 2018 American Real Estate Society Annual Meeting, the PhD Student Consortium at the 2018 Financial Management Association, and the Brown Bag Seminars at Penn State University for their invaluable comments. Lastly, I thank the Institute for Real Estate Studies at Penn State for providing access to the Trepp database. I affirm that I have no material financial interests related to this research.

†Smeal College of Business, The Pennsylvania State University, 360A Business Building, University Park, PA 16802 (e-mail: luis.lopez@psu.edu).

I. Introduction

Trustees play an important role in the financial industry. Besides providing custodial services for financial securities, they oversee and enforce the rights of bondholders by monitoring bond indentures. However, recent litigation has brought to light Great Depression-era concerns about the efficacy and incentive structure of trustees. Of particular interest is a series of lawsuits filed by mortgage-backed security investors alleging breach of duty by trustees. These lawsuits resemble early litigation in the corporate bond market.[1] This paper presents novel evidence of the role of trustees in the securitization process and elucidates the effects of varying incentives on servicer-related outcomes.

This paper focuses on the role of the trustee as an independent monitor by studying servicers' decisions regarding "advances," or revolving credit lines designed to provide short-term liquidity for shortfalls in insurance and principal cash flows. While advances support the continuation of payments to bondholders when underlying assets underperform, a drawback of advances is that they can mislead bondholders to believe that the underlying assets are performing better than in reality.[2] In principle, servicers determine the level of advances based on costly effort while trustees act as monitors. However, a trustee's incentive to monitor the servicer may be skewed and subsequently influence the level of advancement, and thus, delay performance information to bondholders. This paper capitalizes on a unique natural experiment around mergers to test the effect of skewed trustee incentives on the level of advancement.

Using data on conduit United States' (U.S.) commercial mortgage-backed securities (CMBS) from 1998 to 2016, I observe how long it takes to suspend advances on loans that engender losses to the collateral pool. I call this time frame the "duration of advances." I then examine how the duration of advances varies depending on whether there is an affiliation between the trustee and the mortgage servicer that administer the CMBS collateral. Since I observe information on the trustees and mortgage servicers for various deals over

[1] See the article by Al Yoon (dated June 18, 2014 and located at `www.wsj.com/articles/blackrock-pimco-sue-deutsche-bank-u-s-bank-over-trustee-roles-1403124442`) for details on the recent litigation involving mortgage-backed securities, and see Posner (1928, 1937) for historical examples.

[2] For example, in *MBIA Ins Corp v. Royal Indemnity Co* (2009), Royal alleged that the advances (or "forbearance payments") by the servicer on delinquent and defaulting loans created the illusion that the securitized loans were performing normally. The misunderstanding of the loans' true state prevented Royal from taking defensive action.

time, I am able to define two forms of affiliations: (1) when the trustee and servicer are the same firm and (2) when the trustee and servicer are co-dealers (i.e., work as trustees for each other across deals). For example, if Bank of America is the servicer and Wells Fargo is the trustee for one CMBS deal and they reverse roles in another CMBS deal, then the two banks are said to be co-dealing. In either case, the servicer-trustee affiliation can undermine the system of checks and balances on advances.

To test the impact of these affiliations, I use a "natural experiment" arising from mergers in the retail banking sector that led to affiliations in deals in which the banks were initially performing as independent servicers or trustees. These mergers are the purchases of LaSalle by Bank of America and Wachovia by Wells Fargo. Bank of America took over LaSalle's trustee position in approximately $350 billion dollars' worth of CMBS deals, or 40 percent of the U.S. CMBS debt, as of the third quarter of 2007.[3] During the following year, Wells Fargo bought Wachovia, the mortgage servicer for about 20 percent of all the CMBS deals securitized between 1994 and 2008. Consequently, the consolidation of the securitization market resulted in affiliations between the servicers and trustees across several existing deals. Although regulations generally prohibit a direct servicer-trustee affiliation, with failure to comply potentially resulting in severe penalties and tax liabilities, these deals were exempted.[4]

The primary findings suggest that affiliation leads to different servicer-related economic outcomes. First, I find that mortgage servicers delay suspending advances by at least five months in the event of a servicer-trustee affiliation. The results remain statistically significant when controlling for loan, property, and deal attributes along with a rich set of fixed effects including the loan's origination year, transfer to special servicing month-year, property's location, and CMBS deal. They even remain statistically significant when examining only those loans in deals affected by the mergers. Finally, these results are robust to alternative explanations including transition delays, coordination difficulties, and heavy workloads.

Second, loans in CMBS deals where the mortgage servicer is also the trustee incur, on average, a statistically significant increase in the loss rate of $0.04 per dollar of outstanding

[3]The $350 billion figure comes from summing the outstanding balance of commercial loans in which Bank of America or LaSalle is reported as the trustee in the Trepp data set as of November 1, 2007.

[4]See the notice of the prohibited transactions exception involving Bank of America at `https://www.gpo.gov/fdsys/granule/FR-2008-03-13/E8-4980` or Wells Fargo at `https://www.gpo.gov/fdsys/pkg/FR-2009-11-16/pdf/E9-27405.pdf`.

debt at the 10 percent level relative to similar loans with a trustee at arm's length. Thus, the average delinquent commercial loan with $9.2 million outstanding incurs approximately $368,000 more in losses if the mortgage servicer merges with the trustee. Similarly, if the servicer and trustee co-deal, the marginal effect of an indirect affiliation on the loss rate is $0.07 per dollar of outstanding debt at the 1 percent level. A back-of-envelope calculation suggests that the additional market-wide losses due to affiliation account for about $4.53 billion, or 24 percent of the total losses for loans with affiliated servicers and trustees.

Third, using a panel of bond tranche-level returns, I find that affiliation shuffles the cash flows of bondholders. In the event of an affiliation, the average junior or senior bondholder experiences shortfalls while the average mezzanine bondholder enjoys higher positive returns. These results are fostered by the impact of affiliation on the duration of advances and the classical waterfall payment structure of private CMBS deals.

Overall, these three findings present an initial view of the economic effects produced by varying forms of affiliation between servicers and trustees. While past work has focused on market participants including originators (Keys et al., 2010; Purnanandam, 2010; Titman and Tsyplakov, 2010; Demiroglu and James, 2012), mortgage servicers (Piskorski, Seru and Vig, 2010; Agarwal et al., 2011; Adelino, Gerardi and Willen, 2013; Eberly and Krishnamurthy, 2014; Agarwal et al., 2017), and special servicers (Gan and Mayer, 2007; Liu and Quan, 2013; Ambrose, Sanders and Yavas, 2016; Wong, 2016), scholars have yet to focus on the role of trustees. This paper helps to fill this gap by presenting a view of the independent monitoring of advances, in doing so characterizing different incentives stemming from trustees and servicers being the same firm or having a co-dealing affiliation. Thus, I am able to emphasize the importance of an independent trustee in the securitized mortgage market. Although the focus is on trustees for CMBS, the underlying principles guiding these findings may be generalized to the broader bond market, including asset-backed securities for trade receivables, equipment leasing, operating assets, and small business loans. Corporate bonds also have a structure similar to that of trusteeships.

The findings in this paper also have policy implications. Following the Great Depression, the Securities Exchange Commission (SEC) stressed the importance of employing trustees that do not have conflicts of interest and that look out for the rights of bondholders, especially in the event of default (Jones, 1936). Over time Congress enacted laws such as the Trustee Indenture Act of 1939, which adopts several of the SEC's views on trustees, and

sister regulations such as the Internal Revenue Code (Tax Code) of 1986 that strengthen enforcement. The Tax Code, for instance, allows CMBS to obtain a Real Estate Mortgage Investment Conduits (REMIC) tax classification that grants tax deductions in exchange for meeting a set of rules, including the holding of a trustee at arm's length.[5]. Yet the monitoring role of the trustee has increasingly been viewed as anachronistic and redundant in modern finance.[6] By exploiting unforeseen mergers and subsequent exceptions to federal regulations, this paper provides evidence that an arms-length trustee plays an instrumental role in the oversight of bondholder rights.

The passage of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 brought sweeping changes to the securitization market. An outcome of this law was the creation of the risk retention provision, a rule designed to align the incentives between servicers and investors such that the banks securitizing (and often servicing) the underlying loans must retain at least 5 percent of the credit risk.[7] That is, the banks must maintain ownership of a piece of the profits or losses of the underlying loans. While risk retention theoretically addresses adverse selection concerns and screening efforts surrounding securitization,[8] the new rule does not address the ex post moral hazard by the servicers delegated

[5]For further details on the laws and regulations governing affiliations, see American Bar Association (1979) and `https://www.law.cornell.edu/uscode/text/26/4975`

[6]For example, in *MBIA Ins Corp v. Royal Indemnity Co* (2009), the court ruled that the trustee (Wells Fargo) did not have "the contractual obligation to analyze data [from servicers] using certain financial accounting principles and to detect anomalies" even though the pooling and servicing agreement requires the trustee to "perform rote comparison between that data and data contained in various other sources, and to report any numerical inconsistencies." The monitoring role of the trustee, however, continues to be debated in court (e.g., *BlackRock Core Bond Portfolio et al. v. US Bank National Association*, number 654285/2018). See Schwarcs and Sergi (2007) for further details about the legal view on the monitoring role of trustees.

[7]For further information on risk retention rules, see Section 24 CFR Part 267, available at `https://www.gpo.gov/fdsys/pkg/FR-2014-12-24/pdf/2014-29256.pdf`.

[8]Adverse selection in this context refers to the information asymmetry concern of investors that the banks with more knowledge about securitized loans sell CMBS bonds that are truly riskier than advertised. DeMarzo and Duffie (1999) show that holding on to an ownership share in a project (i.e., risk retention) acts as a costly and thus legitimate signal of the project's quality. DeMarzo (2005) apply this concept to the asset-backed security market. Supporting this concept empirically, Keys et al. (2010) find that the ease securitization reduces screening incentives by the bank originating or underwriting the loans, Purnanandam (2010) shows that banks practicing an originate-to-distribute model face strong incentives to issue low-quality loans, and Keys, Seru and Vig (2012) demonstrate that securitized loans tend to be much riskier than counterfactual loans held in portfolios. Other key papers in this area include Ambrose, LaCour-Little and Sanders (2005), Chari, Shourideh and Zetlin-Jones (2014), Hartman-Glaser, Piskorski and Tchistyi (2012), Bubb and Kaufman (2014), and Griffin and Maturana (2015).

to administer the underlying loans (Mooradian and Pichler, 2017). Although residual ownership of the profits can motivate an agent (i.e., servicer) to perform or exert optimal effort (DeMarzo and Sannikov, 2006), the residual piece is often sold off to a collateralized debt obligation (Ashcraft, Gooriah and Kermani, 2014). Servicing contracts may thus include specific covenants coupled with penalties to motivate optimal behavior. As Piskorski and Westerfield (2016) show, a contract using random audits at the proper frequency with an adequate penalty can replace the need for residual ownership to motivate optimal behavior by the agent. Nonetheless, monitoring by an independent party is necessary to legitimize such penalties and yield the desired outcome (e.g., Tirole, 1986). This paper, emphasizing the role of the trustee as an independent monitor for asset-backed securities, is consistent with this view.

The paper proceeds as follows. Section II provides background on the CMBS market and describes a simple principal-agency model to conceptualize the importance of a trustee. Section III introduces the empirical platform; this is followed by primary analyses of the effect of affiliation on related economic outcomes in Section IV. I present robustness checks of the findings in Section V and the economic significance of the results in Section VI. In Section VII, I examine the impact of affiliation on the return of bonds in the senior, mezzanine, and junior tranches. Finally, in Section VIII, I offer some broader implications of the findings and a discussion of potential future work.

II. Conceptual Framework

To understand the potential impact of a servicer-trustee affiliation on the duration of advances, it is first necessary to understand the institutional details of the standard conduit CMBS. In this section, therefore, I discuss CMBS deals while highlighting the CMBS participants and their incentives with respect to advances for delinquent loans. I then borrow a simple three-tier agency conceptual framework to construct testable hypotheses.

A. Background

In the typical conduit CMBS, a firm sponsors a special-purpose vehicle that buys assets (i.e., mortgages) and places them into a pool.[9] Simultaneously, the special-purpose vehicle sells senior, mezzanine, and junior bond certificates that correspond to tranches featuring a waterfall payment structure. The various tranches allow investors to select bonds that meet their particular risk preferences. The sponsoring firm next contracts financial intermediaries including a mortgage servicer and trustee to manage the underlying loans in exchange for monthly fees proportional to the balance of the underlying collateral pool.

If an underlying loan becomes delinquent on debt service payments, the mortgage servicer transfers the loan to a financial institution known as the special servicer. The special servicer is appointed by the most junior bondholder(s) in a first loss position to govern the loss mitigation negotiations with the troubled borrower (Fabozzi, Jacob et al., 1998). The mortgage servicer, meanwhile, begins to advance the missing payments to the trustee, who in turn remits coupon payments to the bondholders. The special servicer periodically appraises the property and uses "debt-to-equity ratio" rules to advise the mortgage servicer on how much to advance missing payments.[10] Nonetheless, the mortgage servicer may continue or discontinue advances if the mortgage servicer considers it in the best interest of the bondholders.[11] A general rule of thumb is to avoid advancing on underperforming assets that are unlikely to generate future cash flows that cover the outstanding advances.

The concern is that the special servicer faces an incentive to prolong foreclosure, and thus advances; meanwhile, the mortgage servicer may make little effort to override bad advice. Liu and Quan (2013) point out that besides a monthly servicing fee, the special servicer receives a share of the advances when holding the most junior bond (or "B-piece"). According to Gan and Mayer (2007), in over half of CMBS deals, the special servicer owns the most junior bond. To continue receiving coupon payments, therefore, the special servicer has little incentive to recommend suspending advances. A special servicer without ownership

[9] See Gorton and Souleles (2007) for further details on special-purpose vehicles.

[10] In the CMBS market, these deterministic rules are commonly referred to as the Appraisal Reduction Amount and the Appraisal Subordinate Entitlement Reduction. For further details from industry professionals, see Mattingly, Jones and Sargent (2009).

[11] For precise details regarding this servicer responsibility, see in the appendix the excerpt of Section 4.03 covering a pooling and servicing agreement (PSA) for a CMBS deal arranged by Bank of America and that exemplifies the servicer's responsibilities.

of the most junior bond could also find a long duration of advances beneficial, however, since growth in outstanding advances increases the option value of delaying foreclosure, which in turn increases the compensation in monthly servicing fees (Liu and Quan, 2013).

In principle, the mortgage servicers' discretion to suspend advances should limit advances. But suspending advances requires costly effort that could accelerate foreclosure and shorten the servicers' marginal compensation. The typical servicing agreement, outlines a compensation package for the mortgage servicer that makes delays attractive. For example, according to Section 3.11 of the PSA in the appendix, the compensation promised to the mortgage servicer for a loan that is delinquent (or in a real estate-owned status) continues to accrue until the mortgage is liquidated. Furthermore, overriding a special servicer on advances requires substantial effort on part of the mortgage servicer. As Section 4.03 (c) of the PSA in the appendix notes, a decision on limiting advances must have supporting documentation such as an appraisal of the underlying collateral.

In practice, incentives to perform in the best interest of the bondholders as a collective whole come from the threat of disciplinary action for failing to abide by the covenants in the PSA. Section 7.01(a)(i) of the PSA in the appendix, for example, suggests that failing to deposit advances could constitute a default event. Simultaneously Section 7.01(a)(viii) suggests that failing to limit advances can constitute default if the action adversely affects the interest of a particular group of bondholders. The typical PSA also includes language that guides the trustee on how to act in the event of a default by one of the financial intermediaries (e.g., Section 7.01(b) of the PSA in the appendix). The action often begins with the trustee informing the bondholders about the breach of the indentures, and may end with legal intervention.

As Section 8.01 of the PSA in the appendix exemplifies, the duties of the trustee include a fiduciary responsibility to the bondholder. The trustee is bound by the "prudent man" standard, a covenant that commissions CMBS participants to make decisions as if they held the security in their own portfolio (Schwarcs and Sergi, 2007). This oversight responsibility, moreover, is set forth in Section 8.01(a), just prior to the description of the trustee's administrative responsibility in Section 8.01(b). Thus, in this case, if an action by the mortgage servicer constitutes a default, the trustee may, at the direction of the bondholders who collectively hold at least 51 percent of the voting rights, replace the servicer. The PSA for other deals provide similar instructions. For example, according to an excerpt from the Wachovia

Bank Commercial Mortgage Trust (WBCMT 2003-C7) prospectus supplement, if an action taken by the mortgage servicer constitutes a default on the servicing agreement, the trustee must notify the servicer of the incident. If the servicer does not correct the default, then the trustee must notify the investors with related bond holdings. Investors who collectively hold at least 25 percent of the voting rights may then request the trustee to remove and replace the servicer. The investors may further request that the trustee file a lawsuit against the servicer to recover damages.

B. The Optimal Contract and Hypotheses

To develop hypotheses regarding how the servicer-trustee affiliation may impact the duration of advances on a delinquent loan, consider the simple three-tier principal-agency model by Tirole (1986). The servicer is the agent, the trustee is the supervisor, and the bondholders are the principals. An agent managing a project (e.g., a delinquent commercial loan) on behalf of the principals generates the following output

$$x = \theta + e \tag{1}$$

that depends on the productivity parameter $\theta \in \{\underline{\theta}, \overline{\theta}\}$ where $0 < \underline{\theta} < \overline{\theta}$; and the effort e that the agent exerts at a cost of $g(e)$, which is strictly convex and twice differentiable. The productivity, effort, and cost of effort are privately observed by the agent. In exchange, the principals compensate the agent with schedule W but also hire a supervisor to monitor the agent for a fixed fee S_0.

By monitoring the agent, the supervisor has the chance to observe the true productivity parameter. Thus, there are four possible states:

1. the agent and supervisor observe $\underline{\theta}$,
2. the agent observes $\underline{\theta}$ while the supervisor observes nothing,
3. the agent observes $\overline{\theta}$ while the supervisor observes nothing, and
4. the agent and supervisor observe $\overline{\theta}$.

The likelihood of each state is p_i, where $i \in \{1, 2, 3, 4\}$. The supervisor can subsequently provide the principals a verifiable report on the true state. Since an honest supervisor has no incentive to lie, the principal effectively "buy" from the supervisor her information set at

a cost of S_0, given that this amount exceeds her reservation wage. The principals therefore face the following expected profit objective function:

$$\max_{W;e} \sum p_i(\theta_i + e_i - w_i) \tag{2}$$

subject to the agent's individual rationality constraint

$$\sum p_i(w_i - g(e_i)) \geq u, \tag{2a}$$

and the agent's incentive compatibility constraint

$$w_3 - g(e_3) \geq w_2 - g(e_2 - \Delta\theta), \tag{2b}$$

which is the binding constraint that motivates the agent to truthfully reveal the state (e.g., suspend advances). Note that u is the agent's reservation wage, and the supervision fee S_0 does not enter the principals' objective function because it is a sunk cost. The parameter $\Delta\theta \equiv \overline{\theta} - \underline{\theta}$ is the differences between the "good" and "bad" state of productivity (e.g., outstanding advances). Tirole (1986) proves that in the optimal contract, the principal will choose the compensation structure W^* (or $w_3 > w_4 = w_1 > w_2$) that motivates the agent to exert high effort ($e^* = e_3 = e_4 = e_1 > e_2$) and report the true state of productivity ($\Delta\theta = 0$).

If there is a possibility of collusion between the agent and supervisor, then the principals will need to discourage the two from side-contracting. Tirole (1986) shows that the principals can achieve a collusion-proof contract by maximizing the following objective function:

$$\max_{S,W;e} \sum p_i(\theta_i + e_i - w_i - s_i) \tag{3}$$

subject to the agent's and supervisor's individual rationality constraints:

$$\sum p_i(w_i - g(e_i)) \geq u \tag{3a}$$

and

$$\sum p_i V(s_i) \geq v, \tag{3b}$$

respectively, where $V(\cdot)$ stands for the supervisor's indirect utility function, s_i stands for the

supervisor's state-contingent fee, and v is the supervisor's reservation wage. An additional constraint includes the agent's incentive compatibility constraint:

$$w_3 - g(e_3) \geq w_2 - g(e_2 - \Delta\theta), \tag{3c}$$

and the following coalition incentive constraints:

$$s_1 + w_1 - g(e_1) \geq s_2 + w_2 - g(e_2), \tag{3d}$$

$$s_4 + w_4 - g(e_4) \geq s_3 + w_3 - g(e_3), \tag{3e}$$

$$s_3 \geq s_2. \tag{3f}$$

Intuitively, when the supervisor observes the true state of productivity, the agent encounters the opportunity to side-contract with the supervisor at the expense of the principals. However, the coalition incentive constraints require a state-contingent compensation structure for each participant that ultimately removes incentives to collude or form a coalition. Specifically, constraints 3d and 3e discourage the supervisor and agent from concealing the true state of productivity by paying them more when they both observe the true state than if they did otherwise. Constraint 3f discourages the supervisor from "bribing" the agent to behave as if the state is 2 and not 3.[12]

Tirole (1986) shows that the solution to the optimization program depicted by equation 3 features the following characteristics:

a. $s_4 > s_1 > s_2 = s_3$
b. $w_3 - g(e_3) > w_4 - g(e_4) > w_1 - g(e_1) > w_2 - g(e_2)$
c. $s_4 + w_4 = s_3 + w_3$
d. $e^* = e_1 = e_3 = e_4 > e_2$.

The main takeaway from this solution is that the agent exerts the same amount of effort in the collusion-proof contract and the collusion-free contract. Moreover, in the case of the supervisor being risk-neutral, the principals can ensure the same profit by making the supervisor the residual claimant.[13]

[12] Other constraints not reported are non-binding.
[13] See the proof for proposition 3 in Tirole (1986).

For the purposes of this paper, the results of the collusion-free and collusion-proof contracts, as depicted in Tirole (1986), can be interpreted as follows: If a trustee that is affiliated with the servicer implies a skewed-incentives environment, then a contract that aligns incentives will motivate the agent (servicer) to exert effort in suspending advances on delinquent loans despite the ex ante incentives to delay suspending advances. However, if the possibility of skewed incentives from, say, merger activity between the servicer and the trustee enters into the arrangement, the initial aligned-incentives environment implied contract may fail to motivate the truthful suspension of advances.

The model suggests that in order to motivate both the trustee and servicer to exert high effort, the contract must be adjusted such that the trustee becomes the residual claimant of the CMBS. This would be equivalent to making the trustee the owner of the most subordinate bond in the CMBS deal. However, in practice, it is unlikely that the trustee would become the most junior bondholder. Hence, if the current pooling and servicing agreement that governs the responsibilities of servicers and trustees does not account for the possibility of collusion, the trustees and servicers may encounter an incentive to exert little effort in suspending advances. Given that the duration of advances relates inversely to the mortgage servicer's effort, a short duration of advances reveals high effort while a long duration of advances reveals low effort, holding all else constant. Thus, the following null and alternative hypotheses arise:

H_0: A servicer-trustee affiliation that develops ex-post contracting does not affect the duration of advances.

H_1: A servicer-trustee affiliation that develops ex-post contracting prolongs the duration of advances.

Evidence supporting the alternative hypothesis H_1 will imply that an arms-length trustee serves a key role in aligning the incentives between the mortgage servicer and bondholders. A lack of evidence will fail to support the monitoring role of the trustee.

III. Data

This section presents the data, defines the sample of interest, and describes identification of an affiliation between mortgage servicers and trustees. This section also provides summary

statistics for the loans in the sample.

A. Sample Selection

I use data from the Trepp database on CMBS that feeds the "CMBSTrepp" web-based platform that credit agencies, servicers, trustees, and institutional investors use to keep track of the CMBS market.[14] The data include loan-level and deal-level performance records on 111,691 private loans originated nationwide that underlay 855 conduit CMBS deals. Conduit deals consist of loans that were originated with the intention of securitization. Of particular interest are several characteristics of the loan, property, and CMBS deal. Table I displays these variables along with definitions. Note that I supplement the data with the ten-year constant maturity rate from the Center for Research in Security Prices' database of U.S. Treasury and Inflation Indexes to calculate the spread on the contract rate for each loan.

Following Wong (2016), I focus on over 17,000 loans that became were transferred to the special servicer between 2000 and 2016 for missing at least 60 days of debt service payments. Figure 1 plots the frequency of loans that become troubled and transferred to the special servicer by year from 2000 to 2016. As Figure 1 shows, the frequency of transfers peaked in 2009 at about 3,000. Figure 2 shows, that of these loans over 10,000 were liquidated with losses; the frequency of liquidations peaked two years later in 2011 at about 2,023. Approximately 86 percent of the liquidations took place through the foreclosure process, while the rest went through a non-foreclosure avenue such as a discounted payoff in which the loan was sold to the borrower for an amount below the outstanding balance.

For the principal analysis, I set the time-variant fields such as the loan-to-value (LTV) and the debt-service coverage ratio (DSCR) to the month that the loan entered special servicing to account for changes in the economic environment.[15] I then identify and exclude each loan with a spread above 13 percent or below -11 percent, an LTV above 200 percent or below 25 percent, and a DSCR above 2.6 or below 0. The constraints represent the 1 percent tails and remove observations with obviously incorrect values. Lastly, I remove loans with missing fields, as well as loans that appear in multiple deals. The sample of interest totals

[14]For further details about this data source, visit the following website: `www.trepp.com`.

[15]The LTV is measured as the outstanding balance on the loan over the appraised value of the collateral; the DSCR is measured as the annual net operating income over the debt service.

17,384 CMBS loans, representing 635 CMBS deals.[16]

To gauge the representativeness of the sample, Table II compares and contrasts the summary statistics of the collected variables (set at the securitization date) according to whether the loans appear in the sample. The selected loans tend to display attributes similar to those of the other conduit loans in the Trepp dataset. Although the mean difference in the attributes between the two groups tend to be statistically significant, the differences appear to be economically meaningless. A couple of exceptions are (1) the LTV and (2) the loan balance. Table II reveals that at securitization, the sample of liquidated loans had a higher average LTV ratio, and a higher loan amount, than in the complement sample. This is not surprising. Epperson et al. (1985) and Ambrose and Sanders (2003) show that the value of a borrower's option to default increases with the LTV. Therefore, the sample this paper focuses on is representative of the population of private conduit U.S. CMBS loans.

B. Servicer-Trustee Affiliations

I use the deal-level records to determine whether the mortgage servicer and trustee administering the loan's deal are the same institution or are co-dealers. The Trepp database periodically updates the fields for the financial intermediaries administering the loans. Additionally, I adjust the data to reflect three events: when LaSalle became a Bank of America subsidiary in October 2007, when Wachovia became a Wells Fargo subsidiary in December 2008, and when Bank of America sold its trusteeship business to U.S. Bank at the end of the third quarter of 2011. I then construct two dummy variables: Same and Co-dealing. If the mortgage servicer and trustee are the same institution while the loan is delinquent (i.e., in special servicing), then the Same dummy variable has a value of one; it is zero otherwise. If

[16]Variable Construction Disclosure: Some data fields in the monthly loan performance records are missing. For example, the origination date may be missing for November but not for October or December. In such cases, I impute the missing field by taking the previously reported non-missing value. I use this imputation method on static variables that should not change from one month to the next such as the loan origination date, the contract rate (for fixed-rate mortgages), the loan amortization type, the property type, the total months in the lockout provision, and an indicator for the presence of yield maintenance provisions. If the field for the remaining term is missing, I impute it by taking the previously reported remaining term and subtracting from the value the number of months that have passed. The loan age is calculated as the number of months between the individual loan's origination and securitization date. I compute the LTV as the most recently reported appraised value over the beginning loan balance. I compute the DSCR as the most recently reported annual net operating income over the annual debt service. If the net operating income is missing, I use the most recently reported net cash flow instead.

the mortgage servicer and the trustee are working together on another loan but with reverse roles during the loan's delinquency, then the Co-dealing dummy variable has a value of one; it is zero otherwise.[17]

For context, Table III tabulates the CMBS deals by the servicers that LaSalle initially oversaw in Panel A and the trustees that initially oversaw Wachovia in Panel B. As Table III shows, 268 deals had LaSalle as the trustee at securitization, while 146 deals had Wachovia as the mortgage servicer at securitization out of the 855 private CMBS deals in the Trepp dataset. LaSalle does not operate as a mortgage servicer and Wachovia does not operate as a trustee. As a result, these deals initially held no servicer-trustee affiliations. However, among the LaSalle CMBS deals, 12 were initially serviced by Bank of America, 46 by Wachovia, and 65 by Wells Fargo. Meanwhile, among the Wachovia CMBS deals, 46 were initially overseen by LaSalle, and 51 by Wells Fargo. Consequently, after the mergers, servicer-trustee affiliations developed across a total of 174 CMBS deals.

Table IV tabulates the troubled loans in the sample according to the type of affiliation between the mortgage servicer and trustee. Focusing on the loans that initially had LaSalle as the trustee or Wachovia as the mortgage servicer, Panel A suggests that almost 60 percent of the liquidated loans were affected by the LaSalle or Wachovia acquisition. Note that 10,412 loans initially had LaSalle as the trustee or Wachovia as the mortgage servicer at securitization. Among these loans, 2,512 ex post securitization loans had a single firm serving as the mortgage servicer and trustee while delinquent. Similarly, 2,705 loans had co-dealing institutions while delinquent. Panels B and C of Table IV tabulate the loans by holding constant the mortgage servicer or the trustee assigned during the loans' period of delinquency. Panel B shows that Bank of America and Wells Fargo served as the mortgage servicer for 44 percent of the sample, while Panel C shows that they also served as the trustee for 71 percent of the sample. These two banks seem to drive the variation in servicer-trustee affiliations among loans in the sample.

Figure 3 graphs the sample of loans by transfer year, segmenting the proportion of loans by the servicer-trustee affiliation type. Notably, most loans with servicer-trustee affiliations were transferred to special servicing after 2008; after the acquisitions of LaSalle and Wa-

[17]For 395 loans with a servicer-trustee affiliation, the servicer-trustee affiliation changed during the time that the loan was delinquent. The main results do not rely on this set of loans. Removing these loans from consideration does not significantly affect the analyses presented in Sections IV or VI.

chovia. A large portion of the loans that were transferred in 2009 through 2011 exhibit either a direct (Same) or indirect (Co-dealing) servicer-trustee affiliation while the rest have an arms-length trustee. The goal of the analysis to follow in Section IV will be to compare the outcome of loans with a direct or indirect servicer-trustee affiliation to comparable loans with arms-length trustees, conditioning on observable qualities.

C. Summary Statistics

Table V reports summary statistics for the full sample of troubled loans according to the type of affiliation between the mortgage servicer and trustee. On the date that a loan entered special servicing, the typical mortgage had a remaining term of 57 out of 120 months and an outstanding balance of $11.3 million, which is about 4.2 percent below the average outstanding balance at securitization. The average DSCR at the transfer date was 0.75, or half its average at securitization (as shown in Table II). Meanwhile, the average LTV was 70 percent, implying the availability of positive equity on the collateral. Together, the statistics suggest that the average loan likely fell delinquent on payments as the operating cash flows from the underlying collateral fell below the debt service due.

Slight differences exist among the loans according to servicer-trustee affiliation. For instance, loans with an affiliated trustee had lower DSCR than loans with a trustee held at arm's length. Moreover, the average CMBS deal with an affiliated trustee seems to have included rather large loans relative to CMBS deals with a trustee held at arm's length. The average CMBS deal with a single firm acting as both the mortgage servicer and trustee held over $2.5 billion in volume. In contrast, the average CMBS deal with a trustee at arm's length held over $1.4 billion in volume. In fact, at the loan-level, the average balance for loans with a trustee at arm's length was about $9.3 million, while it was $17 million when the mortgage servicer was also the trustee. Since the loans that underlie deals across server-trustee affiliation type vary in their attributes, a multivariate analysis is necessary to understand the impact of servicer-trustee affiliation on the duration of advances.

IV. Empirical Analysis

This section examines the impact of servicer-trustee affiliation on the duration of advances. I begin by examining the duration of advances on loans with liquidation losses using univariate statistics. I then discuss the baseline regression model for the duration of advances. Finally, I present results showing that the duration of advances tends to be longer if an affiliation between the mortgage servicer and trustee exists.

A. Descriptive Analysis

For each delinquent loan, I observe when the loan first enters special servicing and count the months until advances are suspended, the loan is transferred back to the mortgage servicer, or the loan reaches liquidation.[18] Table VI displays differences in the summary statistics for the duration of advances, outstanding advances, and losses according to the relationship between the mortgage servicer and trustee. Among the sampled loans, the average duration of advances lasted about two years if the trustee was affiliated with the mortgage servicer. If the two banks were at arm's length, the average duration of advances was about five months shorter. Given a delay in suspending advances, the outstanding advances grow naturally. Hence, consistent with a lengthy duration of advances, the average outstanding advances at liquidation were approximately $649 thousand if the mortgage servicer and trustee were the same or $550 thousand if they were co-dealing. In contrast, the average outstanding advances if a trustee was held at arm's length were $410 thousand at liquidation. Overall, the univariate statistics reveal a positive correlation between servicer-trustee affiliation and the timing of suspending advances.

B. Baseline Regression

I compare the duration of advances on loans that feature a servicer-trustee affiliation during their period of delinquency (the treatment group) to that of loans with an independent trustee throughout their entire time delinquent (the control group). Since observable

[18] I use Trepp's "nonrecover" and "prepayment code" fields to identify when advances are suspended. When a loan is classified as having "non-recoverable" advances, the subsequent advances are reduced or suspended completely. I provide further details about this process in Section VI. For simplicity, the sample excludes observations of re-defaults.

differences exist among the two groups, the model must account for those differences by only using attributes that achieve a value at the same time or before the assignment of the treatment variable(s). In this way, the "bad control" problem can be avoided (Angrist and Pischke, 2008).

Hence, I estimate at the loan level the impact of servicer-trustee affiliations on the duration of advances using an ordinary least-squares (OLS) regression. The baseline model takes the following form:

$$\text{Duration of Advances}_i = \delta_1 \text{Same}_{Td} + \delta_2 \text{Co-dealing}_{Td} + X_{it}\beta + \tau_t + \kappa_d + \varepsilon_i \tag{4}$$

where ε_i is a an error term corrected for heteroskedasticity using robust standard errors clustered according to CMBS deals for loan i. The parameters τ_t and κ_d stand for fixed effects for the year-month (t) that the loan is transferred to special servicing and the loan's CMBS deal (d), respectively. Meanwhile, Same_{Td} and Co-dealing_{Td} are the dummy variables of interest; the δ_1 and δ_2 coefficients represent the point estimates of interest, as they reveal whether a delay in suspending advances forms when the loan lacks an arm's-length trustee. Since the dummies of interest (i.e., Same/Codealing) depend on the delinquency window of the loan and changes to the servicer-trustee affiliation status, the dummies of interest vary within time and deal. The parameter β is a vector of coefficients that corresponds to the matrix of time-varying baseline controls represented by X_{it}. The baseline controls account for factors that may impact the expected liquidation value or timing of the mortgage including loan, property, and deal characteristics.

Specifically, the loan characteristics include the outstanding balance, remaining term, and spread between the contract rate and the ten-year Treasury constant maturity rate at the time of transfer. This category also includes indicators of whether the loan features interest-only debt service payments, a balloon payment, or a full amortization schedule. It also includes the loan's vintage (or age in months from origination to securitization), the LTV ratio, and the DSCR at the time of transfer. Note that I let the vintage be non-linear by adding a squared version of the vintage to equation 4. According to Agarwal et al. (2017), the vintage helps control for the adverse selection concern about loan quality at securitization. I also include a categorical variable to account for the loan's origination year.

As in Ambrose, Sanders and Yavas (2016), I include prepayment penalty characteristics

such as the lockout length provision in months, as well as an indicator for a yield maintenance prepayment penalty covenant in the mortgage note.[19] Property characteristics include the number of properties that collateralize the loan, the leading property type, and the property location or state fixed effects. The CMBS deal characteristics include the current outstanding balance of the deal at the loan's transfer date and deal fixed effects. The deal characteristics control for the resources available to the mortgage servicer for the continuation of advances. An over-collateralized pool, for instance, produces interest cash flows that exceed the coupon cash flows that could function as a sinking fund to support advances on a non-performing loan without taxing the proceeds of the collateral pool. The deal fixed effects capture observable and unobservable time-invariant attributes specific to the loan's CMBS deal.

Since the identification of deals that feature a servicer-trustee affiliation arises from merger activity, a concern is that the merger activity itself may influence the coefficient estimates for the average treatment effect of the Same or Co-dealing dummy. As discussed in Section IV, Bank of America took over LaSalle, the trustee for 44 percent of the full sample. Meanwhile, Wells Fargo took over Wachovia as the mortgage servicer. Hence, I restrict the sample to loans that were affected by the LaSalle or Wachovia acquisition. The identification assumption is that delinquent loans are overseen by a trustee with a randomly chosen affiliation status, once conditioning on the baseline controls.

C. Results

Table VII presents point estimates that correspond to equation 4. The first column shows a positive relation between the duration of advances and each type of servicer-trustee affiliation (i.e., Same and Co-dealing). The advances on missing payments for delinquent loans last about five months longer for deals that have the same mortgage servicer and trustee than for loans in deals with a trustee at arm's length. Likewise, co-dealing activity between the two banks prolong advances by about five months. Columns (2) to (6) incorporate the baseline controls, which include loan, property, and deal characteristics, as well as fixed effects

[19]The lockout provision indicates the number of months that the borrower may not prepay/liquidate a loan. The yield maintenance is a prepayment penalty that requires the borrower to pay the bondholders the foregone interest payments due to prepayment. For further background about these two variables, see Fabozzi, Jacob et al. (1998).

for the loan's transfer month-year.[20] Columns (3) to (5) incrementally incorporate fixed effects for the special servicer, the mortgage servicer, and the trustee appointed at the loan's securitization date, respectively. Finally, column (6) replaces the fixed effects for the financial intermediaries with fixed effects for the CMBS deal.[21] With each specification, the point estimates of interest remain positive and significant. Using the full baseline specifications, they reveal a coefficient for the Same or Co-dealing dummy of 5.9 months or 1.4 months, respectively.[22]

Table VIII provides estimates of equation 4 for the two subsamples (not mutually exclusive) that compare loans within observably similar deals. The goal is to exploit the variation in affiliation types among deals that were affected by the same acquisition activity. Column (1) uses loans in deals that initially employed LaSalle as the trustee. Column (2), on the other hand, uses loans that initially employed Wachovia as the mortgage servicer. However, the conclusions remain unchanged across each subsample as the point estimates for Same and Co-dealing tend to remain positive and significant. In fact, the coefficient estimates are slightly larger than estimated using the baseline specifications. For example, the point estimates suggest that a direct servicer-trustee affiliation delays advances by up to ten months on loans affected by the Wachovia acquisition. The previously reported baseline estimates in Column (6) of Table VII, therefore, provide conservative estimates of the effect of affiliation on the duration of advances.

[20] In unreported regressions, I use fixed effects for the metropolitan statistical area (MSA) instead of state fixed effects to control for property location. Though I obtain similar results, I use state fixed effects for the rest of the analysis since the MSA field is less populated than the State field.

[21] Perfect collinearity exists between the fixed effects for the deal and the financial intermediaries and thus cannot keep the fixed effects for both the financial intermediaries and deal.

[22] Though it is not reported here, I ran the column (6) regression using robust standard errors with a two-way cluster accounting for the loan's deal and the loan's quarter-year transfer date. The significance of the dummies of interest (Same/Co-dealing) remained unchanged. I also find similar results when estimating them while excluding loans that became delinquent on or before 2006 when little or no servicer-trustee affiliations are observable.

V. What explains increases in the Duration of Advances?

Section IV finds strong and positive coefficients, implying that long durations of advances are permitted if the trusteeship is held by the mortgage servicer or if the trustee fosters an indirect affiliation with the mortgage servicer. The results remain even when incorporating constant time-sensitive controls including loan, property, and deal characteristics, as well as a rich set of fixed effects for the time of transfer, the financial intermediaries administering the loans, and CMBS deals. They also hold when I compare advances on missing payments for delinquent loans affected by the same acquisition. However, the OLS model imposes a linearity assumption between affiliations and the duration of advances. Thus, I examine in this section alternative specifications that relax the linearity assumption. The robustness checks include the use of propensity score matching and hazard modeling. I also examine plausible causal mechanisms affecting the duration of advances, including transition delays, coordination difficulties, and the heterogeneity in the workloads of the banks.

A. Propensity Score Matching

Since loans are not randomly assigned to deals with or without trustees at arm's length, I implement propensity score matching to compare observably similar loans to each other as a way to reduce concerns of endogeneity. To do so, I construct a treatment dummy that takes the value of one if an affiliation between the mortgage servicer and trustee exists (i.e., Co-dealing, Same), and zero otherwise. For every loan in a deal affected by the LaSalle (or Wachovia) acquisition with an affiliated trustee, I identify an observably similar loan in another deal affected by the LaSalle (or Wachovia) acquisition that instead has a trustee at arm's length. I use propensity score matching to find counter-factual observations. According to Rosenbaum and Rubin (1985), matching on propensity scores mimics random sampling, which theoretically eliminates selection bias. Upon matching, the implicit assumption is that loans enter deals with an affiliated trustee at random, conditional on observable loan attributes. Demiroglu and James (2012), adopting a similar approach to assess the quality of residential loans, point out that this assumption is consistent with the observations by Gorton and Souleles (2007).

To obtain propensity scores, I fit the likelihood that a loan belongs to the treatment group using the following probit regression

$$Pr(\text{Treatment}_i = 1|Z_{it}, \eta_t) = \Phi(Z_{it}\gamma + \zeta_t + \epsilon_i) \tag{5}$$

where Φ is the cumulative density function, ϵ_i is an error term, and Z_{it} is a matrix of loan- and property-level attributes.[23] The controls in Z_{it} also include fixed effects for the property's state, as well as the loan's origination year. The parameter ζ_t stands for the loan's transfer month-year. Note that equation 5 does not include fixed effects for the deal since they perfectly predict treatment once controlling for time. Column (1) of Table IX reports the probit estimates using the sample of loans affected by the LaSalle acquisition, while column (2) reports the probit estimates using the sample of loans affected by the Wachovia acquisition.

For each treatment loan, the counter-factual loan is the nearest neighbor that holds the closest propensity score value. I allow matching to take place with replacement. Table X displays the summary statistics of the covariates in equation 5, revealing balanced treatment and control groups in which the treatment group includes loans with an affiliated trustee and the control group includes counter-factual loans with a trustee at arm's length. As shown by Panels A and B in Table X, the majority of the loan and property characteristics across the treatment and control groups are statistically similar to each other irrespective of the acquisition under consideration. Next, using the balanced treatment and control groups, I re-estimate the baseline regression (equation 4).

Table XI provides the results for the LaSalle acquisition in column (1) and for the Wachovia acquisition in column (2). Both trials reveal results consistent with the earlier findings. In fact, the coefficients of the treatment variables (i.e., Same or Co-dealing) imply that the marginal impact of an affiliation between the mortgage servicer and trustee causes a longer duration of advances than previously estimated.

B. Hazard Modeling

Mortgage servicers likely consider the time that a loan has been delinquent before making a decision regarding whether to suspend advances supporting its missing payments. Hence,

[23] To implement the matching procedure, I use the PSMATCH2 command in STATA.

to account for the delinquency time, this section estimates the *hazard* that the mortgage servicer suspends advances. A hazard function specifies the risk that the mortgage servicer suspends advances during the next infinitesimally small period given the time the loan has been delinquent. Specifically, the hazard function, conditional on the loan's time delinquent t, takes the form

$$h_i(t) = b_i(t) \exp(\lambda_1 \text{Same}_{Td} + \lambda_2 \text{Co-dealing}_{Td} + X_{it}\beta_0 + \tau_t + \kappa_d) \tag{6}$$

where $b_i(t)$ stands for the baseline hazard rate of loan i, X_{it} stands for a matrix of the baseline controls, and Same and Co-dealing represent the dummy variables of interest. According to equation 6, an affiliation between the mortgage servicer and the trustee represents a proportional change of size λ_1 or λ_2 in the hazard of suspending advances.

To prevent economic outcomes from influencing the results, I consider the hazard of suspending advances within $h \in \{12, 24, 36, 48\}$ months. This approach is similar in spirit to those of studies that focus on foreclosure or modification decisions taken by mortgage servicers (e.g. Piskorski, Seru and Vig, 2010; Agarwal et al., 2011; Adelino, Gerardi and Willen, 2013). Thus, using the terminology of hazard modeling, a loan "fails" if the servicer suspends advances within h months; otherwise, the loan "survives" and is treated as censored.

Table XII reports the λ_k coefficient estimates of the hazard function according to censorship window using the Cox Proportional Hazard model, where $k \in \{1, 2\}$.[24] The marginal hazard ratio can be derived by taking the exponent of the lambda coefficient estimate. The coefficient estimates for each censorship window are negative for both affiliation dummies (Same/Co-dealing). Thus, the hazard ratios for both dummies fall below one, indicating that the likelihood of suspending advances decreases if a servicer-trustee affiliation forms during the time that a loan is delinquent. Overall, the results support the interpretations of the estimates reported in the Section IV.

C. Transition Delays and Coordination Difficulties

Column (1) in Table XIII includes two dummy variables that signal when multiple mortgage servicers or trustees participate in the deal. The Trepp data report up to four mortgage

[24] Although the model includes the baseline controls, it does not use deal-level fixed effects because the high dimensional of more than 500 dummy variables does not allow the model to converge.

servicers, four special servicers, and two trustees per deal. Typically, one of the institutions is assigned as the principal institution for a specific role. Other institutions arrive from subcontracting with the principal institution. If the deal has multiple intermediaries for multiple roles, the chance that the deal realizes a confounding relation among the employed financial intermediaries increases. Moreover, having multiple participants may impact decisions on advances for loans. For example, multiple financial intermediaries could decentralize the management of the loans in deals by considering the particular expertise of institutions that allows the intermediaries to better meet the needs of certain loans. Alternatively, multiple financial intermediaries may impact the coordination among the institutions and cause delays in decisions about advances. However, as shown in column (1), the participation of multiple mortgage servicers or trustees does not significantly impact the duration of advances. Furthermore, the positive and significant correlations between the Same/Co-dealing dummies and advances persist.

Column (2) of Table XIII adds to the baseline regression indicators of whether the mortgage servicers and trustees are different from the ones assigned at securitization. Interruptions in the operational structure across mortgage-backed securities intuitively correlate with the presence of a trustee held at arm's length since the replacement of a mortgage servicer or trustee sets off observable relations between the two intermediaries. Having a new financial intermediary, moreover, may foster transition costs that impact how the mortgage servicer chooses to advance missing payments. Thus, such interruptions may explain the impact of the Same/Co-dealing dummies on the duration of advances. But as column (2) shows, transitions/interruptions do not seem to influence the duration of advances or the core interpretation of the baseline results.

D. Large Institutions and Workloads

Agarwal et al. (2017) find that intermediary-specific factors and preexisting organizational capabilities influence the decisions servicers make regarding delinquent loans. For example, small servicers might not have access to credit lines (or other resources) that support advances on missing payments and consequently suspend advances much sooner than large servicers would. Moreover, large servicers that work on many CMBS deals simultaneously could have limited attention to pay to individual loans. If the size, workload, or

other idiosyncrasies correlate with the likelihood that a mortgage servicer and trustee have an affiliation, then the differences in the advances could reflect idiosyncratic differences in the institutions administering the given loan.

Column (1) of Table XIV adds proxy variables representing the mortgage servicer's and trustee's workload. Specifically, the workload proxy variables represent the number of CMBS deals the servicer (or trustee) is working on as either a servicer or trustee at the time of the loan's transfer. The workload proxy variables vary across institutions and time. Bank of America, for example, was working on 44 deals in 2009, but it had 280 in 2010. Meanwhile, Wells Fargo was working on about 380 deals in 2007 and 435 in 2011. Column (1) shows that the duration of advances decreases by 0.006 months per deal that the servicer manages.

The trustee's workload similarly influences the mortgage servicer's decision to suspend advances. Nevertheless, the Same/Co-dealing dummies continue to correlate positively with the duration of advances and with larger coefficients that overcompensate for the marginal impact of the workloads. Column (2) interacts the workload variables with the dummy variables of interest, but this specification does not eradicate the effect of severing an arm's-length relation on the duration of advances.

VI. Liquidation Losses and Economic Implications

This section considers the economic impact of affiliation on actual losses that bondholders realize from troubled loans at liquidation. In particular, I examine the liquidation loss rate, which is calculated as the total liquidation losses over the outstanding loan balance in the month before liquidation. Troubled loans that cure or are liquidated with no losses have a loss rate of zero. Demiroglu and James (2012), in an analysis of how an affiliation between the mortgage servicer and the originator affects the quality of residential, use a similar measure. Wong (2016), in testing the impact of self-dealings by special servicers, also focuses on loss rates at liquidation.

Table VI reports the average nominal losses and the loss rate. As Table VI shows, the average losses when two institutions are affiliated total about \$3.1 to \$3.6 million; they are about \$2 million less when the trustee of the loan is held at arm's length. The loss rate per dollar of outstanding debt before liquidation translates to \$0.27 for Same, \$0.38 for Co-dealing, and \$0.22 for Arm's-Length. Figure 4 displays the annual volume of related

liquidation losses and outstanding advances at liquidation in billions. It shows that most losses were realized after 2009, when they often peaked at more than $6 billion per year with advances accounting for about 10 to 25 percent of the total losses.

To evaluate the marginal impact of severing the arm's-length trustee relation in a multivariate setting, I estimate the following model

$$\text{Loss Rate}_i = \gamma_1 \text{Same}_{Td} + \gamma_2 \text{Co-dealing}_{Td} + X_{it}^{*}\beta + \tau_t + \kappa_d + \epsilon_i \tag{7}$$

where ϵ_i is an error term and γ_k stands for the marginal loss rates attributed to an affiliation between the mortgage servicer and trustee. I use the same regressors for X_{it}^{*} as those in equation 4, though I exclude the log loan amount.

Table XV provides OLS regression estimates using the loss rate as the dependent variable and the Same/Co-dealing dummies as the independent variables of interest. Column (1) uses the full sample. Columns (2) and (3) examine the loss rate exclusively within loans affected by the LaSalle and Wachovia acquisitions, respectively. Finally, columns (4) and (5) repeat the previous two regressions but use the balanced subsamples that were constructed using propensity score matching in Section V.A.

Results in column (1) suggest that, on average, the loss rate on loans with a bank serving as both the mortgage servicer and trustee is about $0.04 per dollar of outstanding debt higher than the loss rate on loans with a trustee at arm's length, while the marginal impact is $0.07 when co-dealing. The coefficient on Same in column (3) reverses signs but it is not significant at the conventional levels. The loss in significance may be a power issue since the makeup of observations in the LaSalle sample where Bank of America is both the servicer and trustee constitute less than 4 percent (see Table IV). However, the results for co-dealing remain positive and significant at the 1 percent level within the acquisition-affected subsamples. Moreover, the predicted marginal impact of either an indirect affiliation on the loss rate among the Wachovia-affected loans is positive and significant whether using balanced samples found from propensity score matching in Section V.A. Column (3), for example, suggests that the loans affected by the Wachovia acquisition incur an increase in the loss rate of $0.09 per dollar of outstanding debt when the trustee affiliated with the mortgage servicer through co-dealing. Meanwhile, column (5) suggests that both affiliation types significantly influence the loss rate among the loans that initially had Wachovia as the

servicer.

Table XVI provides a real estate perspective on the losses by dividing the sample according to U.S. Census Region. The purpose is to track the impact of the servicer-trustee affiliations within the United States. The table suggests that loss rates are driven by loans with collateral in the Midwest or South. For instance, in the Midwest (column (2)), when the servicer is also the trustee, the loss rate increases by up to \$0.13 per dollar of outstanding debt, or \$0.11 if the institutions are co-dealing. Meanwhile, in the West (column (4)), only co-dealing servicer-trustee affiliations appear to influence the loss rate significantly. The strongest geographical influence coincides with the retail bank locations where LaSalle had a market presence prior to the merger activity: the Midwest.

To gauge the average economic impact of the marginal increase in the loss rate due to the lack of an arm's-length trustee relation, I use a back-of-envelope approach. First, I calculate the aggregate marginal losses from an affiliation between the mortgage servicer and trustee as follows:

$$
\begin{aligned}
&= \gamma_1 \times \overline{\text{Balance}}_1 \times \text{Loans}_1 + \gamma_2 \times \overline{\text{Balance}}_2 \times \text{Loans}_2 \\
&= 0.039 \times \$17,050 \text{ mil.} \times 2,512 + 0.72 \times \$14,694 \text{ mil.} \times 2,705 \\
&\approx \$4.53 \text{ Billion}
\end{aligned}
$$

where $\overline{\text{Balance}}_k$ stands for the average loan balance of loans with a type k affiliation, Loans_k stands for the number of loans with a type k affiliation, and γ_k stands for the marginal loss rate for a loan with a type k affiliation where $k \in \{1, 2\}$. A type 1 affiliation is where the mortgage servicer and trustee are the same firm. A type 2 affiliation is where the mortgage servicer is co-dealing with the trustee. According to this estimate, a direct or indirect affiliation accounts for nearly \$4.53 billion in losses, explaining approximately 24 percent of the total losses by loans affected by an affiliation between the trustee and mortgage servicer.[25]

[25] Using Tables V and VI, the total losses by affected loans can be inferred as follows:

$$
\begin{aligned}
&= \overline{\text{Losses}}_1 \times \text{Loans}_1 + \times \overline{\text{Losses}}_2 \times \text{Loans}_2 \\
&= \$3,092 \text{ mil.} \times 2,512 + \$3,648 \text{ mil.} \times 2,705 \\
&\approx \$19.1 \text{ Billion}
\end{aligned}
$$

where $\overline{\text{Losses}}_k$ stands for the average losses of a loan with a type k affiliation.

VII. Distortions in Bond Returns

Advances distinctly impact the cash flows to bondholders in differing tranches. While advances support the continuation of coupon payments to all the bondholders by using a credit line, the sale proceeds of the loan's collateral are netted of the outstanding advances along with interest on the advances due to the servicer at liquidation of a delinquent loan. Moreover, the remaining proceeds are used to pay off any accrued interest that has not been paid to the investors, including those in the most junior classes. In essence, all the expenditures associated with advances are paid off with priority over recovering the principal of the senior class. As a result, a lengthy duration of advances (across several loans) can create potential wealth transfers among the senior, mezzanine, and junior bond classes.[26]

Given that lengthy durations of advances potentially distort the cash flows to bondholders, I examine how the returns across bond tranches correlate with an affiliation between the servicer and trustee. I begin by using Trepp's data on CMBS bond tranches from 1998 to 2016. Although I do not observe the returns to individual bonds, the bond tranche data provide the aggregate cash flows to entire classes of bonds for each of the 855 conduit CMBS deals in the Trepp dataset on a monthly basis. A benefit of focusing on these data is that the returns on bond tranches reflect cash flows that originate not only from loans that became troubled and were sent to special servicing but also from loans that perform normally. In other words, the performance of the full population of conduit CMBS loans in the Trepp data is taken into account.

Table XVII reports the frequency of bond tranches in the Trepp data (that depend on private U.S. CMBS deals) by their initial standardized rating (score) at issuance. Since each tranche can have a rating from one or more credit rating agencies (i.e., Moody's, Standard & Poor's, or Fitch), each of which has a different rating scale, I find the top rating for each tranche and normalize the top rating as in Cheng and Neamtiu (2009). This approach yields 19 groups in which a score of 1 indicates the highest rating and a score of 19 indicates that the tranche is unrated. Most of the bond tranches either have the Highest Grade (5,765) or no rating (3,400). The bond tranches with the Highest grade represent the senior bond classes, the bond tranches with the unrated grade represent the junior bond classes, while the rest represent the mezzanine bond classes.

[26]For other bond payment schemes, see Fabozzi (2009).

Table XVIII reports descriptive statistics about the panel observations on bond tranches. The highly rated bond tranches have a mean coupon of around 3.86 percent, while the unrated bond tranches have a mean coupon of about 5.32. Moreover, the highly rated bond tranches account for an average balance of about $634.59 million, while the unrated bond tranches have an average balance of $226.16. The bond tranches, representing the mezzanine class, have average balances that range from $7.95 to $180.96 million.

Using the time-series of these tranches, I compute the monthly return r_{bt} for each bond tranche b as the interest (INT_{bt}) and principal ($PRIN_{bt}$) cash flows plus the outstanding balance (BAL_{bt}) at time t over the outstanding balance in the previous month ($BAL_{b,t-1}$) minus one; that is, $r_{bt} = \frac{INT_{bt}+PRIN_{bt}+BAL_{bt}}{BAL_{b,t-1}} - 1$. The current outstanding balance reflects losses that the bond tranche realizes, while the interest or principal payments reflect advances on under-performing assets, if any. Using the bond return as the dependent variable, I then fit the following panel regression model

$$r_{bt} = \sum_{k=1}^{19} \theta_{1,k} \text{Same}_{dt} \times 1[k] + \sum_{k=1}^{19} \theta_{2,k} \text{Co-dealing}_{dt} \times 1[k] + W_{dt}\beta + \tau_t + \zeta_b + \epsilon_{bt} \qquad (8)$$

where ϵ_{bt} is an error term. The parameter τ_t stands for month-year fixed effects, and ζ_d stands for bond tranche fixed effects. This panel setting eliminates the effects of any unobservable bond tranche-specific or time-specific attributes. The bond tranche fixed effect, therefore, control for attributes such as the coupon and balance at issuance; the time fixed effects control for contemporaneous changes in the interest rate environment including the risk free rate and benchmark rates. To account for CMBS deal specific, time-varying, attributes, the matrix W_{dt} contains a rich set of deal-level controls that vary over time for each deal d. Specifically, the monthly deal-level controls include the log outstanding balance, current loan count, gross weighted average coupon, weighted average DSCR, weighted average LTV, share of loans with yield maintenance, share of loans in the lockout period, count of loans with a prepayment penalty, top share of collateral located in a single state, share of warehouse collateral, share of industrial collateral, share of office collateral, share of multifamily collateral, and share of other property type collateral.[27]

[27]I exclude observations with missing fields or a return that is above 100 percent or below -100 percent. I also exclude observations of bond tranches with a rating score of 17 or 18 due to their scarcity of panel observations. The sample consists of 15,019 unique bond tranches that extend to a panel dataset of 1,210,053

Finally, the independent variables of interest: Same and Co-dealing. Same_{dt} takes a value of one if the bond tranche's mortgage servicer and trustee for CMBS deal d are the same firm at time t; it is zero otherwise. Similarly, Co-dealing_{dt} takes a value of one if the bond tranche's mortgage servicer and trustee for CMBS deal d are co-dealing at time t; it is zero otherwise. These dummy variables are interacted with the initial rating of the bond tranche. The interactions allow for the average treatment effect of a servicer-trustee affiliation to vary according to the initial rating of the bond tranche. Note that Table XVII provides a key for the ratings according to the various credit rating agencies.

Table XIX reports the results. Note that the bond return is reported as a percentage. The results suggest that affiliation affects the return of various bond tranches differently. In particular, the results reveal a trade-off in returns across the bond tranches when the trustee becomes the servicer or when the servicer begins to co-deal with the trustee. The pattern suggests that affiliation significantly benefits bonds in the mezzanine tranches at the expense of the most senior bondholders or junior bondholders. For example, correlates positively with the return of medium-grade bond tranches but negatively with those for high- or low-grade bond tranches when the servicer and trustee are co-dealing. Most coefficients of the interaction terms are statistically significant at the conventional levels. A similar pattern emerges from the interactions when the servicer and trustee are the same firm. Overall, the results suggest that failure to hold a trustee at arm's length shuffles the returns that bondholders obtain.

VIII. Conclusion

This paper explores the effects of affiliation between a mortgage servicer and trustee on the duration of advances by using a dataset of securitized commercial loans. Using recent acquisitions by Bank of America and Wells Fargo to achieve identification, I find that when the mortgage servicer and trustee are the same or co-dealing—arrangements that undermine the system of checks and balances in the commercial foreclosure process—the duration of advances tends to lengthen.

For instance, a mortgage servicer with a direct affiliation can take an additional five months to suspend advances on a delinquent loan relative to cases in which the deal's trustee

observations.

is held at arm's length. The results also reveal that the average liquidated loan in a deal with a servicer-trustee affiliation incurs at least $368,000 in additional losses (a marginal loss rate of $0.04 per dollar of outstanding debt). In aggregate, marginal losses account for approximately $4.53 billion in capital losses from loans liquidated from 2001 to 2016. The losses explain approximately 24 percent of the total capital losses produced by loans that lack a trustee at arm's length. A model using tranche-level returns to bonds suggests that a servicer-trustee affiliation also correlates strongly with distortions to the returns for bondholders, primarily benefiting bondholders in the mezzanine tranches relative to bondholders in the senior or junior tranches. The results persist after controlling for loan, property, and deal characteristics along with a rich set of fixed effects. They also hold when accounting for various robustness checks, including propensity score matching and hazard modeling.

The findings imply that the trustee's independent monitoring role adds value to the securitized lending process. Furthermore, they provide a favorable view of federal regulations such as the Trustee Indenture Act of 1939 and the Tax Code of 1986 that generally require an independent trustee to oversee bondholder rights. Recent public debates have addressed the need to continue having an independent trustee, particularly since trustees are often passive in monitoring for infringements on bond indentures. Exceptions to regulations on having a trustee at arm's length resulted in unanticipated affiliations between the servicer and trustee in several deals during the period following the Great Recession. As a result, this paper is able to reveal the drawbacks of undermining the trustee's role as an independent monitor.

REFERENCES

Adelino, Manuel, Kristopher Gerardi, and Paul S Willen. 2013. "Why don't lenders renegotiate more home mortgages? Redefaults, self-cures and securitization." *Journal of monetary Economics*, 60(7): 835–853.

Agarwal, Sumit, Gene Amromin, Itzhak Ben-David, Souphala Chomsisengphet, and Douglas D Evanoff. 2011. "The role of securitization in mortgage renegotiation." *Journal of Financial Economics*, 102(3): 559–578.

Agarwal, Sumit, Gene Amromin, Itzhak Ben-David, Souphala Chomsisengphet, Tomasz Piskorski, and Amit Seru. 2017. "Policy intervention in debt renegotiation: Evidence from the home affordable modification program." *Journal of Political Economy*, 125(3): 654–712.

Ambrose, Brent W, and Anthony B Sanders. 2003. "Commercial mortgage-backed securities: prepayment and default." *The Journal of Real Estate Finance and Economics*, 26(2-3): 179–196.

Ambrose, Brent W, Anthony B Sanders, and Abdullah Yavas. 2016. "Servicers and Mortgage-Backed Securities Default: Theory and Evidence." *Real Estate Economics*, 44(2): 462–489.

Ambrose, Brent W, Michael LaCour-Little, and Anthony B Sanders. 2005. "Does regulatory capital arbitrage, reputation, or asymmetric information drive securitization?" *Journal of Financial Services Research*, 28(1-3): 113–133.

American Bar Association. 1979. "ERISA and the Investment Management and Brokerage Industries: Five Years Later." *The Business Lawyer*, 35(1): 189–294.

Angrist, Joshua D, and Jörn-Steffen Pischke. 2008. *Mostly harmless econometrics: An empiricist's companion.* Princeton university press.

Ashcraft, Adam B, Kunal Gooriah, and Amir Kermani. 2014. "Does Skin-in-the-Game Affect Security Performance?" *Working Paper*. Federal Reserve Bank of New York.

Bubb, Ryan, and Alex Kaufman. 2014. "Securitization and moral hazard: Evidence from credit score cutoff rules." *Journal of Monetary Economics*, 63: 1–18.

Chari, VV, Ali Shourideh, and Ariel Zetlin-Jones. 2014. "Reputation and persistence of adverse selection in secondary loan markets." *American Economic Review*, 104(12): 4027–70.

Cheng, Mei, and Monica Neamtiu. 2009. "An empirical analysis of changes in credit rating properties: Timeliness, accuracy and volatility." *Journal of Accounting and Economics*, 47(1-2): 108–130.

DeMarzo, Peter, and Darrell Duffie. 1999. "A liquidity-based model of security design." *Econometrica*, 67(1): 65–99.

DeMarzo, Peter M. 2005. "The Pooling and Tranching of Securities: A Model of Informed Intermediation." *Review of Financial Studies*, 18(1): 1–1.

DeMarzo, Peter M, and Yuliy Sannikov. 2006. "Optimal Security Design and Dynamic Capital Structure in a Continuous-Time Agency Model." *The Journal of Finance*, 61(6): 2681–2724.

Demiroglu, Cem, and Christopher James. 2012. "How important is having skin in the game? originator-sponsor affiliation and losses on mortgage-backed securities." *The Review of Financial Studies*, 25(11): 3217–3258.

Eberly, Janice, and Arvind Krishnamurthy. 2014. "Efficient credit policies in a housing debt crisis." *Brookings Papers on Economic Activity*, 2014(2): 73–136.

Epperson, James F, James B Kau, Donald C Keenan, and Walter J Muller. 1985. "Pricing default risk in mortgages." *Real Estate Economics*, 13(3): 261–272.

Fabozzi, Frank J. 2009. *Bond Markets, Analysis and Strategies.* . 6 ed., Prentice Hall.

Fabozzi, Frank J, David P Jacob, et al. 1998. *The Handbook of Commercial Mortgage-Backed Securities.* Vol. 45, John Wiley & Sons.

Gan, Yingjin, and Christopher Mayer. 2007. "Agency Conflicts, Asset Substitution, and Securitization." *NBER Working Paper*.

Gorton, Gary B, and Nicholas S Souleles. 2007. "Special purpose vehicles and securitization." In *The risks of financial institutions*. 549–602. University of Chicago Press.

Griffin, John M, and Gonzalo Maturana. 2015. "Who facilitated misreporting in securitized loans?" *The Journal of Finance*.

Hartman-Glaser, Barney, Tomasz Piskorski, and Alexei Tchistyi. 2012. "Optimal securitization with moral hazard." *Journal of Financial Economics*, 104(1): 186–202.

Jones, Carrie Maude. 1936. "Trustees under Real Estate Indentures." *Journal of Land and Public Utility Economics*, 12(3): 302–303.

Keys, Benjamin J, Amit Seru, and Vikrant Vig. 2012. "Lender screening and the role of securitization: evidence from prime and subprime mortgage markets." *The Review of Financial Studies*, 25(7): 2071–2108.

Keys, Benjamin J, Tanmoy Mukherjee, Amit Seru, and Vikrant Vig. 2010. "Did securitization lead to lax screening? Evidence from subprime loans." *The Quarterly journal of economics*, 125(1): 307–362.

Liu, Peng, and Daniel Quan. 2013. "Foreclosure of Securitized Commercial MortgagesA Model of the Special Servicer." *The Journal of Real Estate Finance and Economics*, 46(2): 321–338.

Mattingly, Brigid, Richard D. Jones, and Patrick C. Sargent. 2009. "CMBS 101: Pooling and Servicing Agreements." *http://www.crefc.org/uploadedfiles/cmbs101_psas_monday_1230pm.pdf*.

MBIA Ins Corp v. Royal Indemnity Co. 2009. Decicions. Paper 1555. Available at `https://www.courtlistener.com/pdf/2009/04/10/mbia_ins_corp_v._royal_indemnity_co.pdf`.

Mooradian, Robert M, and Pegaret Pichler. 2017. "Servicer Contracts and the Design of Mortgage-Backed Security Pools." *Real Estate Economics*.

Piskorski, Tomasz, Amit Seru, and Vikrant Vig. 2010. "Securitization and distressed loan renegotiation: Evidence from the subprime mortgage crisis." *Journal of Financial Economics*, 97(3): 369–397.

Piskorski, Tomasz, and Mark M Westerfield. 2016. "Optimal dynamic contracts with moral hazard and costly monitoring." *Journal of Economic Theory*, 166: 242–281.

Posner, Louis S. 1928. "Liability of Trustee Under the Corporate Indenture." *Harvard Law Review*, 42(2): 198–248.

Posner, Louis S. 1937. "The Trustee and the Trust Indenture: A Further Study." *Yale Law Journal*, 46(5): 737–800.

Purnanandam, Amiyatosh. 2010. "Originate-to-distribute model and the subprime mortgage crisis." *The Review of Financial Studies*, 24(6): 1881–1915.

Rosenbaum, Paul R., and Donald B. Rubin. 1985. "Constructing a Control Group Using Multivariate Matched Sampling Methods that Incorporate the Propensity Score." *The American Statistician*, 39(1): 33–38.

Schwarcs, Steven L, and Gregory M Sergi. 2007. "Bond Defaults and the Dilemma of the Indenture Trustee." *Ala. L. Rev.*, 59: 1037.

Tirole, Jean. 1986. "Hierarchies and bureaucracies: On the role of collusion in organizations." *Journal of Law, Economics, & Organization*, 2(2): 181–214.

Titman, Sheridan, and Sergey Tsyplakov. 2010. "Originator performance, CMBS structures, and the risk of commercial mortgages." *The Review of Financial Studies*, 23(9): 3558–3594.

Wong, Maisy. 2016. "CMBS and Conflicts of Interest: Evidence from Ownership Changes for Servicers." *Forthcoming at the Journal of Finance*.

Table I

Variables and Descriptions

Dependent Variables	
Spell of Advances	The number of months the master servicer does not suspend advances
Advances	The outstanding P&I advances at liquidation
Loss rate	The losses realized at liquidation divided by the outstanding balance before liquidation
Covariates of Interest	
Same	1 if the mortgage servicer and trustee are the same firm, and 0 otherwise
Co-dealing	1 if the mortgage servicer co-deals with the trustee, and 0 otherwise
Pool Controls	
Log pool balance	The remaining outstanding balance of the pool at default
Loan Controls	
Debt service credit ratio	The net operating income divided by the debt service at default
Loan-to-value	The loan amount outstanding divided by the appraised property value at default
Log balance	The natural log of the remaining loan balance at default
Remaining term	The remaining number of months in the mortgage term at default
Spread	The contract rate less the 10-year Treasury constant maturity rate at default
Full Amortization	1 if the loan has an amortization schedule, and 0 if it has a balloon payment
Interest only	1 if the loan is interest only payments, and 0 otherwise
Prepayment penalty	1 if the loan features a yield maintenance prepayment penalty, and 0 otherwise
Lockout months	The number of months in the lockout provision in the event of prepayment
Vintage	The age of the loan at securitization in months
Property Controls	
Multiple properties	1 if multiple properties serve as collateral for the loan, and 0 otherwise
Industrial	1 if the dominant collateral building type is Industrial, and 0 otherwise
Multifamily	1 if the dominant collateral building type is Multifamily, and 0 otherwise
Office	1 if the dominant collateral building type is Office, and 0 otherwise
Retail	1 if the dominant collateral building type is Retail, and 0 otherwise
Other	1 if the dominant collateral building type is Other, and 0 otherwise

This table presents the descriptions for the variables in this study.

Table II

Summary Statistics: Complement Sample vs Selected Sample

Variables	Complement Sample	Selected Sample	Diff	p-value
Pool Balance in Millions ($)	1,563	2,015	-452	0.000
Loan-to-Value	0.68	0.76	-0.07	0.000
Debt Service Coverage Ratio	0.91	0.92	-0.01	0.226
Loan Balance in Thousands ($)	10,089	11,794	-1,705	0.000
Remaining Term	120	121	-1.10	0.004
Contract Rate	7.66	7.52	0.14	0.614
Full Amortization	0.04	0.05	-0.01	0.000
Interest Only	0.07	0.09	-0.02	0.000
Yield Maintenance	0.25	0.18	0.07	0.000
Lockout Months	91.66	93.33	-1.66	0.000
Vintage at Securitization	7.01	6.35	0.65	0.000
Multiple Properties	0.04	0.05	0.00	0.204
Industrial	0.13	0.09	0.04	0.000
Multifamily	0.37	0.36	0.02	0.000
Office	0.15	0.23	-0.08	0.000
Retail	0.03	0.02	0.01	0.000
Other	0.31	0.30	0.01	0.019
Loan Origination Year	2004	2003	0.95	0.000
Observations	86,081	17,384		

This table compares the summary statistics of the selected sample to the complement sample. The selected sample consists of loans liquidated with losses for a reason other than prepayment. The complement sample include the loans in the parent population but not in the selected sample. The variables are set to their values at the date of securitization. The observations in this table exclude those with missing observations or outliers.

Table III

Tabulation of LaSalle or Wachovia CMBS Deals

Panel A: Servicers that LaSalle Oversees		
Master Servicer	Freq.	Share
AMRESCO	4	1.49
Banc One	2	0.75
Bank of America	12	4.48
BNY	1	0.37
CAPMARK	2	0.75
First Union	14	5.22
GE Capital	4	1.49
GEMSA	2	0.75
GMAC	50	18.66
GREYSTONE	1	0.37
KEYCORP	8	2.99
MIDLAND	33	12.31
ORIX	7	2.61
Pacific Life	2	0.75
Principal Global Investors	1	0.37
Prudential	12	4.48
Wachovia	46	17.16
Washington Mutual	2	0.75
Wells Fargo	65	24.25
Total	268	100

Panel B: Trustees that Oversee Wachovia Deals		
Trustee	Freq.	Share
Bank of America	4	3.81
CHASE	2	1.9
LaSalle	46	43.81
US Bank	2	1.9
Wells Fargo	51	48.57
Total	146	100

This table tabulates the CMBS deals were LaSalle was assigned as the Trustee at securitization or Wachovia was assigned as the mortgage servicer at securitization.

Table IV

Tabulation of Liquidated Loans

Panel A: Loans by Assigned Intermediary at Securitization				
	Arms-length	Co-dealing	Same	Total
LaSalle	4,117	1,118	293	5,528
Wachovia	669	0	2,126	2,795
LaSalle and Wachovia	959	1,130	0	2,089
Other	6,422	457	93	6,972
Total	12,167	2,705	2,512	17,384
Panel B: Loans by Mortgage Servicer				
	Arms-length	Co-dealing	Same	Total
Bank of America	232	403	213	848
Wells Fargo	2,165	2,302	2,294	6,761
Other	9,770	0	5	9,775
Total	12,167	2,705	2,512	17,384
Panel C: Loans by Trustee				
	Arms-length	Co-dealing	Same	Total
Bank of America	1,451	2,302	213	3,966
Wells Fargo	5,739	403	2,294	8,436
Other	4,977	0	5	4,982
Total	12,167	2,705	2,512	17,384

Panel A tabulates the liquidated loans in the sample by the financial intermediary (i.e., trustee or mortgage servicer) assigned at securitization and the affiliation between the mortgage servicer and trustee during the loans' time delinquent. Panel B likewise tabulates the loans but holding constant the mortgage servicer while Panel C holds constant the trustee.

Table V

Summary Statistics

Variables	All	Arms-Length	Same	Co-deal
Pool Balance in Millions ($)	1,645	1,359	2,527	2,110
	(1,348)	(1,067)	(1,926)	(1,344)
Debt Service Coverage Ratio	0.79	0.82	0.75	0.72
	(0.50)	(0.52)	(0.44)	(0.44)
Loan-to-Value	0.7	0.7	0.7	0.69
	(0.18)	(0.19)	(0.16)	(0.12)
Loan Balance in Thousands ($)	11,288	9,342	17,050	14,694
	(24,712)	(19,656)	(35,261)	(31,200)
Remaining Term	57.43	60.92	42.04	56.02
	(64.12)	(71.86)	(34.60)	(42.50)
Spread	0.16	0.28	-0.27	0.02
	(5.39)	(5.54)	(5.46)	(4.59)
Full Amortization	0.05	0.07	0	0
	(0.22)	(0.26)	(0.05)	(0.04)
Interest Only	0.09	0.07	0.18	0.12
	(0.29)	(0.25)	(0.39)	(0.33)
Yield Maintenance	0.18	0.2	0.16	0.14
	(0.39)	(0.40)	(0.36)	(0.35)
Lockout Months	93.3	91.99	96.16	96.52
	(44.71)	(47.26)	(37.70)	(38.15)
Vintage at Securitization	6.36	7.37	4.09	3.92
	(11.63)	(13.05)	(7.75)	(5.67)
Multiple Properties	0.05	0.05	0.06	0.07
	(0.22)	(0.21)	(0.24)	(0.25)
Industrial	0.09	0.08	0.08	0.1
	(0.28)	(0.28)	(0.28)	(0.31)
Multifamily	0.36	0.38	0.29	0.3
	(0.48)	(0.49)	(0.45)	(0.46)
Office	0.22	0.21	0.27	0.22
	(0.41)	(0.41)	(0.44)	(0.42)
Retail	0.04	0.03	0.04	0.04
	(0.19)	(0.18)	(0.20)	(0.19)
Other	0.3	0.29	0.32	0.34
	(0.46)	(0.45)	(0.47)	(0.47)
Loan Origination Year	2003.35	2002.78	2004.68	2004.69
	(3.59)	(3.81)	(2.62)	(2.45)
Observations	17,384	12,167	2,512	2,705

This table displays the summary statistics of liquidated loans for all sample observations and by the relation between the mortgage servicer and trustee. Average values are reported without parentheses while standard deviations are reported in parentheses.

Table VI

Summary Statistics of Outcomes

Variables	All	Arms-Length	Same	Co-deal
Duration of Advances	18.4	16.93	21.8	21.86
	(14.05)	(13.18)	(16.08)	(14.69)
Outstanding Advances in Thousands ($)	381.48	307.22	624.23	490.06
	(969.03)	(699.62)	(1737.56)	(969.22)
Outstanding Advances Normalized	0.06	0.06	0.05	0.06
	(0.92)	(1.10)	(0.05)	(0.13)
Losses in Thousands ($)	2,106	1,560	3,092	3,648
	(6,409)	(4,969)	(9,246)	(8,305)
Loss Rate	0.25	0.22	0.27	0.38
	(0.33)	(0.32)	(0.33)	(0.36)
Observations	17,384	12,167	2,512	2,705

This table displays the summary statistics of liquidated loans for all sample observations and by the relation between the mortgage servicer and trustee. Average values are reported without parentheses while standard deviations are reported in parentheses.

Table VII

OLS Regressions for Duration of Advances

	(1)	(2)	(3)	(4)	(5)	(6)
Same	4.870***	2.404***	2.535***	2.743***	3.208***	5.867***
	(0.619)	(0.481)	(0.463)	(0.545)	(0.554)	(0.837)
Co-dealing	4.922***	1.061**	1.076**	1.385***	1.315**	1.380**
	(0.496)	(0.485)	(0.471)	(0.536)	(0.556)	(0.654)
Observations	17,384	17,384	17,384	17,384	17,384	17,384
R-squared	0.026	0.219	0.226	0.228	0.229	0.269
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Baseline Controls	No	Yes	Yes	Yes	Yes	Yes
Special Servicer FE	No	No	Yes	Yes	Yes	No
Mortgage Servicer FE	No	No	No	Yes	Yes	No
Trustee FE	No	No	No	No	Yes	No
Transfer Month-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Deal FE	No	No	No	No	No	Yes

This table reports OLS estimates using the full sample. The dependent variable is the Duration of Advances – the number of months before the mortgage servicer suspends advances on missing payments. Each reported covariate is a dummy variable that equals one when the mortgage servicer is not at arms-length with the trustee for the shown reason, and zero otherwise. Baseline controls include: loan, property, and pool characteristics along with fixed effects for the loan's origination year, transfer month-year, and property's state location. Robust standard errors clustered by CMBS deal are in parentheses. The stars ***, **, * denote statistical significance at the 1, 5, and 10 percent level, respectively.

Table VIII

OLS Regressions for Duration of Advances by Subsample

VARIABLES	(1) LaSalle Acquisition	(2) Wachovia Acquisition
Same	5.248**	10.683***
	(2.050)	(1.340)
Co-dealing	3.067***	4.235***
	(0.990)	(1.338)
Observations	7,617	4,884
R-squared	0.291	0.327
Constant	Yes	Yes
Baseline Controls	Yes	Yes
Transfer Year-Month FE	Yes	Yes
Deal FE	Yes	Yes

This table reports OLS estimates for each subsample named in the column headers. The dependent variable is the Duration of Advances – the number of months before the mortgage servicer suspends advances on missing payments. Each reported covariate is a dummy variable that equals one when the mortgage servicer is not at arms-length with the trustee for the shown reason, and zero otherwise. Baseline controls include: loan, property, and pool characteristics along with fixed effects for the loan's origination year, transfer month-year, and property's state location. Robust standard errors clustered by CMBS deal are in parentheses. The stars ***, **, * denote statistical significance at the 1, 5, and 10 percent level, respectively.

Table IX

Probit Regressions

VARIABLES	(1) LaSalle	(2) Wachovia
Debt Service Coverage Ratio	-0.356***	-0.200**
	(0.049)	(0.080)
Loan-to-Value	-0.010***	-0.000
	(0.002)	(0.002)
Log Loan Balance	0.041**	0.054**
	(0.018)	(0.021)
Log Remaining Term	0.053**	-0.037
	(0.023)	(0.032)
Spread	-0.251***	-0.153**
	(0.048)	(0.075)
Full Amortization	-0.724**	-0.065
	(0.323)	(0.542)
Interest Only	0.094	0.109
	(0.084)	(0.107)
Yield Maintenance	0.153*	0.040
	(0.083)	(0.132)
Log Lock-out Months	0.057*	0.082
	(0.033)	(0.054)
Cross-collateralized	0.154	-0.617***
	(0.100)	(0.149)
Vintage at Securitization	-0.009	0.018
	(0.007)	(0.012)
Squared Vintage at Securitization	0.000	-0.000**
	(0.000)	(0.000)
Multiple Collateral Properties	0.116	0.160
	(0.106)	(0.165)
Industrial	0.185**	0.034
	(0.080)	(0.132)
Office	0.088	0.057
	(0.062)	(0.094)
Retail	0.092	-0.003
	(0.057)	(0.088)
Other	0.379***	-0.067
	(0.131)	(0.183)
Observations	5,107	3,021
Constant	Yes	Yes
Baseline Controls	Yes	Yes
Origination Year FE	Yes	Yes
Property's State FE	Yes	Yes
Transfer Month-Year FE	Yes	Yes
Deal FE	No	No

This table reports Probit estimate of treatment. The dependent variable is the treatment dummy, which equals one if an affiliation exists between the mortgage servicer and trustee, and zero otherwise. Robust standard errors clustered by CMBS deal are in parentheses. The stars ***, **, * denote statistical significance at the 1, 5, and 10 percent level, respectively.

Table X

Balanced Samples: Control vs Treatment

Panel A: LaSalle Balanced Sample				
Variables	Control	Treatment	Diff	p-value
Debt Service Coverage Ratio	0.78	0.73	0.06	0.002
Loan-to-Value	0.73	0.69	0.04	0.000
Loan Balance in Thousands ($)	14,152	14,452	-300	0.803
Remaining Term	48	55	-6.70	0.000
Spread	-0.10	0.02	-0.12	0.510
Full Amortization	0.01	0.00	0.00	0.092
Interest Only	0.11	0.12	-0.01	0.458
Yield Maintenance	0.13	0.15	-0.02	0.173
Lockout Months	98.04	96.45	1.59	0.301
Vintage at Securitization	4.37	3.88	0.49	0.055
Multiple Properties	0.06	0.07	-0.01	0.594
Industrial	0.09	0.10	-0.01	0.297
Multifamily	0.31	0.29	0.02	0.240
Office	0.24	0.22	0.01	0.529
Retail	0.03	0.04	-0.01	0.290
Other	0.33	0.34	-0.01	0.552
Loan Origination Year	2004	2005	-0.55	0.000
Observations	821	2,539		
Panel B: Wachovia Balanced Sample				
Variables	Control	Treatment	Diff	p-value
Debt Service Coverage Ratio	0.72	0.74	-0.03	0.265
Loan-to-Value	0.70	0.70	-0.01	0.335
Loan Balance in Thousands ($)	15,203	15,804	-601	0.709
Remaining Term	32	43	-11.16	0.000
Spread	-0.86	-0.35	-0.51	0.103
Full Amortization	0.01	0.00	0.00	0.787
Interest Only	0.18	0.18	0.01	0.777
Yield Maintenance	0.15	0.13	0.03	0.103
Lockout Months	98.66	98.69	-0.02	0.991
Vintage at Securitization	4.43	3.62	0.81	0.043
Multiple Properties	0.05	0.07	-0.02	0.247
Industrial	0.08	0.08	0.00	0.928
Multifamily	0.25	0.30	-0.05	0.050
Office	0.27	0.27	0.00	0.918
Retail	0.03	0.04	-0.01	0.354
Other	0.38	0.32	0.06	0.027
Loan Origination Year	2005	2005	0.06	0.678
Observations	415	2,053		

This table compares the summary statistics of the control group to those of the treatment group balanced through propensity score matching. The treatment group consists loans that are in deals with an affiliated trustee while the control group consists loans that are in deals with a trustee at arm's length. Panel A reports the balanced samples from matching within loans affected by the LaSalle acquisition while Panel B reports the same statistics but for loans affected by the Wachovia acquisition.

Table XI

Propensity Score Matching and Ex-post regressions

VARIABLES	(1) LaSalle	(2) Wachovia
Same	13.628***	14.484***
	(3.646)	(2.059)
Co-dealing	14.914***	4.789**
	(3.038)	(1.985)
Observations	3,360	2,468
R-squared	0.255	0.352
Constant	Yes	Yes
Baseline Controls	Yes	Yes
Transfer Year-Month FE	Yes	Yes
Deal FE	Yes	Yes

This table reports OLS estimate using balanced samples from propensity score matches. The dependent variable is the Duration of Advances – the number of months before the mortgage servicer suspends advances on missing payments. The Same/Co-dealing variable is a dummy variable that equals one when the mortgage servicer is not at arms-length with the trustee, and zero otherwise. Baseline controls include: loan, property, and pool characteristics along with fixed effects for the loan's origination year, transfer month-year, and property's state location. Robust standard errors clustered by CMBS deal are in parentheses. The stars ***, **, * denote statistical significance at the 1, 5, and 10 percent level, respectively.

Table XII

Cox Hazard Model for Suspending Advances

VARIABLES	(1) 12 Months	(2) 24 Months	(3) 36 Months	(4) 48 Months
Same	-0.145***	-0.125***	-0.153***	-0.163***
	(0.039)	(0.029)	(0.026)	(0.025)
Co-dealing	-0.161***	-0.085***	-0.082***	-0.084***
	(0.043)	(0.030)	(0.027)	(0.026)
Observations	17,384	17,384	17,384	17,384
Constant	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
Transfer Year-Month FE	Yes	Yes	Yes	Yes

This table reports the coefficients for a Cox proportional hazard model by censorship window. The hazard denotes the likelihood that the mortgage servicer suspends the advancement of payments for delinquent loans within $h \in \{12, 24, 36, 48\}$ months. Each reported covariate is a dummy variable that equals one when the mortgage servicer is not at arms-length with the trustee for the shown reason, and zero otherwise. Baseline controls include: loan, property, and pool characteristics along with fixed effects for the loan's origination year, transfer month-year, and property's state location. Robust standard errors clustered by CMBS deal are in parentheses. The stars ***, **, * denote statistical significance at the 1, 5, and 10 percent level, respectively.

Table XIII

OLS Regressions for Duration of Advances by Coordination Difficulty Proxy

	(1)	(2)
Same	5.873***	5.890***
	(0.839)	(0.910)
Co-dealing	1.410**	1.379**
	(0.666)	(0.665)
Multiple Master Servicers	-0.220	
	(0.965)	
Multiple Trustees	-0.272	
	(0.719)	
Trustee is different from securitization		0.114
		(0.869)
Master servicer is different from securitization		0.147
		(0.572)
Observations	17,384	17,384
R-squared	0.269	0.269
Constant	Yes	Yes
Baseline Controls	Yes	Yes
Transfer Year-Month FE	Yes	Yes
Deal FE	Yes	Yes

This table reports OLS estimates using proxy variables for coordination deficiencies. The dependent variable is the Duration of Advances – the number of months before the mortgage servicer suspends advances on missing payments. Covariates A - C are dummy variables that equal one when true, and zero otherwise. Covaraite D is an interaction term between covariate A and C. Covariate E is an interaction term between covariates B and C. Multiple mortgage servicers (or trustees/special servicers) equals one when multiples mortgage servicers (or trustees/special servicers) administer the loans in the pool, and zero otherwise. New mortgage servicer (or trustee) is an indicator for whether the mortgage servicer (or trustee) is different from the institution assigned at securitization. Baseline controls include: loan, property, and pool characteristics along with fixed effects for the loan's origination year, transfer month-year, and property's state location. Robust standard errors clustered by CMBS deal are in parentheses. The stars ***, **, * denote statistical significance at the 1, 5, and 10 percent level, respectively.

Table XIV

OLS Regressions for Duration of Advances by Workload Proxy

	(1)	(2)
Same	7.752***	13.855***
	(0.947)	(1.962)
Co-dealing	1.813***	9.458***
	(0.671)	(2.774)
Master Servicer's workload	-0.006***	-0.002
	(0.002)	(0.002)
Trustee's workload	-0.005*	-0.000
	(0.003)	(0.003)
Same × Mortgage servicer's workload		-0.007*
		(0.004)
Same × Trustee's workload		-0.010**
		(0.005)
Co-dealing × Mortgage servicer's workload		-0.003
		(0.003)
Co-dealing × Trustee's workload		-0.017***
		(0.006)
Observations	17,384	17,384
R-squared	0.271	0.272
Constant	Yes	Yes
Baseline Controls	Yes	Yes
Transfer Year-Month FE	Yes	Yes
Deal FE	Yes	Yes

This table reports OLS estimates. The dependent variable is the Duration of Advances – the number of months before the mortgage servicer suspends advances on missing payments. Same equals one when the mortgage servicer is also the trustee. Co-dealing equals one when the mortgage servicer is co-dealing with the trustee. Mortgage servicer's workload is the number of pools that the mortgage servicer administers at the time of the loan's delinquency date. Trustee's workload is the number of pools that the trustee administers at the time of the loan's delinquency date. Baseline controls include: loan, property, and pool characteristics along with fixed effects for the loan's origination year, transfer month-year, and property's state location. Financial intermediary fixed effects include dummy variables for special servicers, mortgage servicers and trustees currently managing the pool. Robust standard errors clustered by CMBS deal are in parentheses. The stars ***, **, * denote statistical significance at the 1, 5, and 10 percent level, respectively.

Table XV

OLS Regressions for Loss Rate

	(1)	(2)	(3)	(4)	(5)
				Post-Matching	
VARIABLES	All	LaSalle	Wachovia	LaSalle	Wachovia
Same	0.039*	-0.007	0.118***	-0.009	0.283***
	(0.021)	(0.041)	(0.029)	(0.063)	(0.044)
Co-dealing	0.072***	0.099***	0.094***	0.279***	0.062*
	(0.013)	(0.019)	(0.024)	(0.073)	(0.034)
Observations	17,193	7,499	4,843	3,360	2,468
R-squared	0.267	0.301	0.283	0.286	0.340
Constant	Yes	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes	Yes
Transfer Year-Month FE	Yes	Yes	Yes	Yes	Yes
Deal FE	Yes	Yes	Yes	Yes	Yes

This table reports OLS estimates using loans with liquidation losses. The dependent variable is the loss rate, which is the liquidation losses divided by the outstanding balance a month before liquidation. Each reported covariate is a dummy variable that equals one when the mortgage servicer is not at arms-length with the trustee for the shown reason, and zero otherwise. Baseline controls include: loan, property, and pool characteristics along with fixed effects for the loan's origination year, transfer month-year, and property's state location. Robust standard errors clustered by CMBS deal are in parentheses. The stars ***, **, * denote statistical significance at the 1, 5, and 10 percent level, respectively.

Table XVI

OLS Regressions for Loss Rate by U.S. Census Region

VARIABLES	(1) Northeast	(2) Midwest	(3) South	(4) West
Same	0.073	0.125**	0.056**	0.009
	(0.073)	(0.053)	(0.028)	(0.041)
Co-dealing	0.140***	0.109***	0.056***	0.054**
	(0.043)	(0.033)	(0.019)	(0.027)
Observations	2,166	3,266	7,411	3,455
R-squared	0.475	0.420	0.315	0.411
Constant	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
Transfer Year-Month FE	Yes	Yes	Yes	Yes
Deal FE	Yes	Yes	Yes	Yes

This table reports OLS estimates using loans with liquidation losses. The dependent variable is the loss rate, which is the liquidation losses divided by the outstanding balance a month before liquidation. Each reported covariate is a dummy variable that equals one when the mortgage servicer is not at arms-length with the trustee for the shown reason, and zero otherwise. Baseline controls include: loan, property, and pool characteristics along with fixed effects for the loan's origination year, transfer month-year, and property's state location. Robust standard errors clustered by CMBS deal are in parentheses. The stars ***, **, * denote statistical significance at the 1, 5, and 10 percent level, respectively.

Table XVII

CMBS Bond Tranches by Credit Rating Scores

Credit Risk	Moody's	Standard & Poor's	Fitch's	Score	Frequency
Highest grade	Aaa	AAA	AAA	1	5,765
	Aa1	AA+	AA+	2	222
High grade	Aa2	AA	AA	3	673
	Aa3	AA-	AA-	4	580
	A1	A+	A+	5	181
Upper medium grade	A2	A	A	6	630
	A3	A-	A-	7	782
	Baa1	BBB+	BBB+	8	426
Medium grade	Baa2	BBB	BBB	9	606
	Baa3	BBB-	BBB-	10	870
	Ba1	BB+	BB+	11	449
Lower medium grade	Ba2	BB	BB	12	633
	Ba3	BB-	BB-	13	556
	B1	B+	B+	14	408
Low grade	B2	B	B	15	586
	B3	B-	B-	16	550
	Caa1	CCC	CCC+	17	5
	Caa2	C	CCC	18	37
Unrated	.	.	.	19	3,400

This table displays the ratings score of the credit ratings by Moody's S&P's and Fitch following Cheng and Neamtiu (2009). This table also reports the unique frequency count of bond tranches that correspond to private conduit CMBS deals in the Trepp dataset.

Table XVIII

Characteristics of CMBS Bond Tranches by Credit Rating Scores

		Coupon		Balance (in $mil.)	
Rating Score	Observations	Mean	SD	Mean	SD
1	394,945	3.86	2.23	455.65	634.59
2	15,011	5.38	1.16	67.69	180.96
3	63,459	5.83	0.99	41.14	23.92
4	43,114	5.20	1.04	27.06	30.36
5	14,937	5.64	0.81	26.19	31.78
6	65,562	5.92	1.02	35.62	27.32
7	60,714	5.70	1.17	26.46	33.91
8	45,704	5.79	0.68	21.16	13.78
9	64,069	6.26	0.96	25.58	24.83
10	71,149	6.24	1.23	22.40	18.84
11	49,543	5.52	0.81	15.60	21.91
12	62,007	5.61	1.08	15.12	16.47
13	49,221	5.39	1.11	11.86	28.76
14	41,740	5.46	0.78	7.32	9.70
15	54,517	5.56	1.04	10.08	11.40
16	47,180	5.53	0.95	6.97	7.92
Unrated	168,076	5.32	2.55	64.39	226.16

This table provides summary statistics on the coupon and outstanding balance of the bond tranches by rating score.

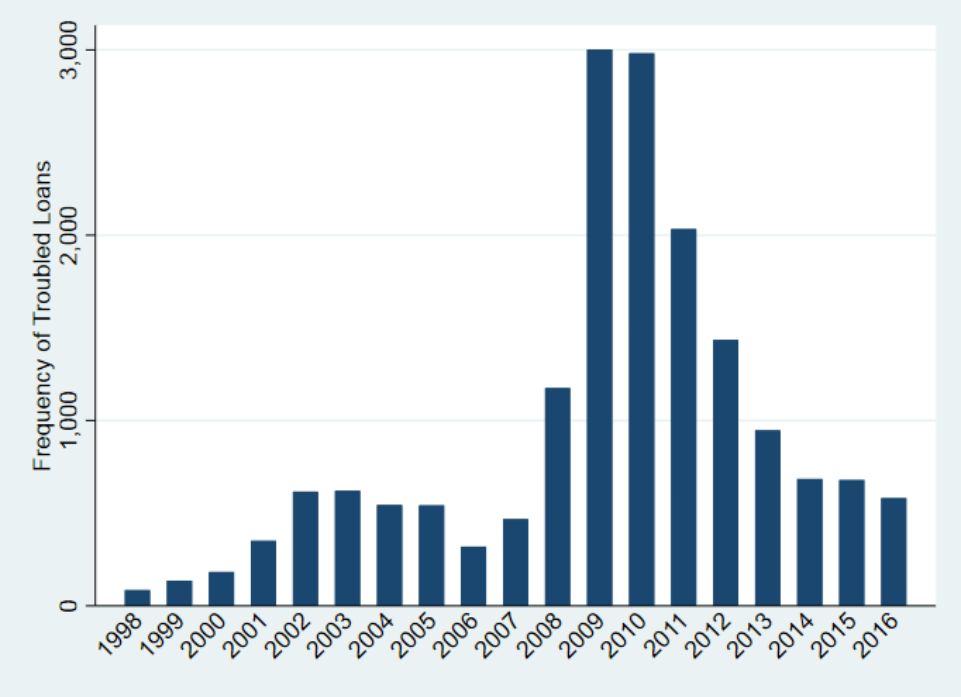
Table XIX

Fixed Effects Panel of Monthly Bond Returns

VARIABLES		VARIABLES (CONTINUED)	
Same × Max Rating of		Co-deal × Max Rating of	
1	0.008	1	-0.305***
	(0.106)		(0.061)
2	0.831***	2	-0.461***
	(0.258)		(0.105)
3	0.701***	3	-0.245***
	(0.109)		(0.076)
4	0.699***	4	-0.353***
	(0.122)		(0.089)
5	0.924***	5	-0.098
	(0.213)		(0.129)
6	0.793***	6	-0.090
	(0.110)		(0.081)
7	0.677***	7	0.078
	(0.138)		(0.098)
8	0.676***	8	0.239**
	(0.151)		(0.115)
9	0.702***	9	0.538***
	(0.129)		(0.121)
10	0.611***	10	0.774***
	(0.143)		(0.151)
11	0.586***	11	0.866***
	(0.167)		(0.162)
12	0.440**	12	0.795***
	(0.186)		(0.171)
13	0.249	13	0.913***
	(0.239)		(0.185)
14	0.015	14	0.727***
	(0.219)		(0.186)
15	-0.389	15	0.536**
	(0.270)		(0.221)
16	-1.162***	16	0.096
	(0.323)		(0.230)
unrated	-1.762***	unrated	-0.541**
	(0.379)		(0.210)
Observations	1,210,053		
Number of Bond Tranches	15,019		
R-squared	0.016		
Constant	Yes		
Deal Controls	Yes		
Bond Tranche FE	Yes		
Year-Month FE	Yes		

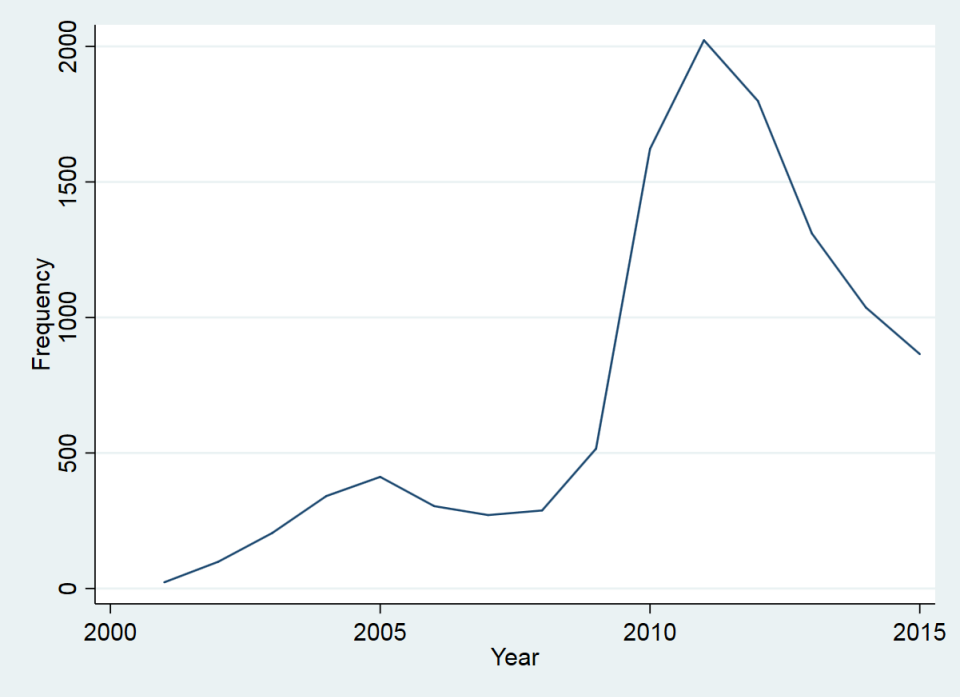
This table reports OLS estimates using a monthly panel on bond tranche returns. The dependent variable is the monthly return to the bond tranche, measured as a percent. Each reported coefficient corresponds to the interaction of the affiliation dummy (Same/Co-dealing) and the max rating of the tranche. Baseline controls include: deal characteristics along with fixed effects for the month-year and bond-deal tranche. Robust standard errors clustered by CMBS deal are in parentheses. The stars ***, **, * denote statistical significance at the 1, 5, and 10 percent level, respectively.

Figure 1. Troubled Conduit CMBS Loans



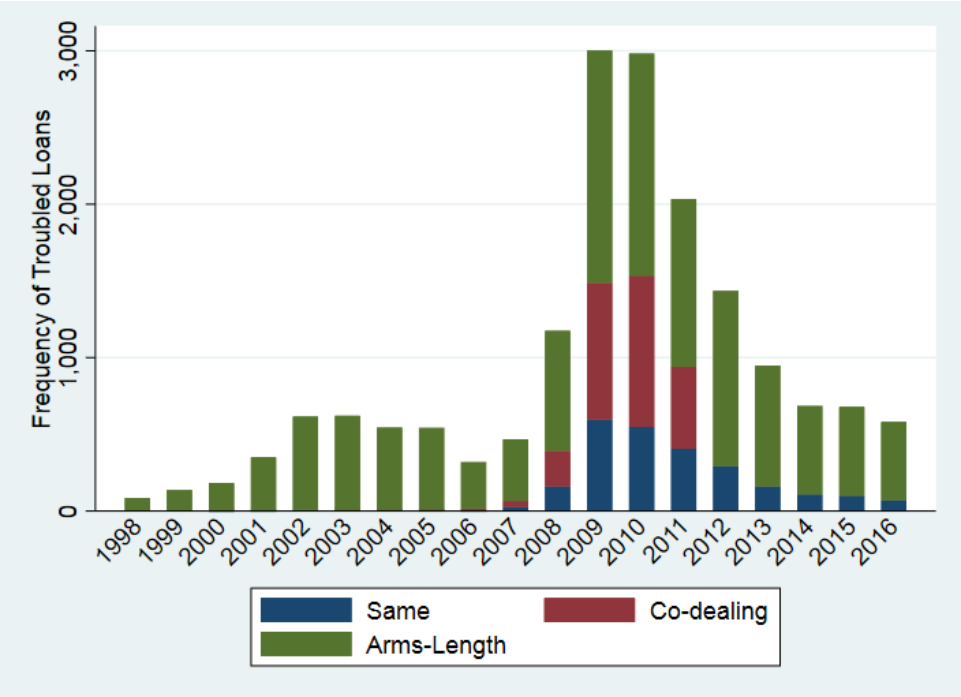
This figure presents the frequency of conduit CMBS loans transferred to the special servicer for missing at least 60 days of debt service payments by year. The data derive from Trepp.

Figure 2. Conduit CMBS Loans Liquidated with Losses



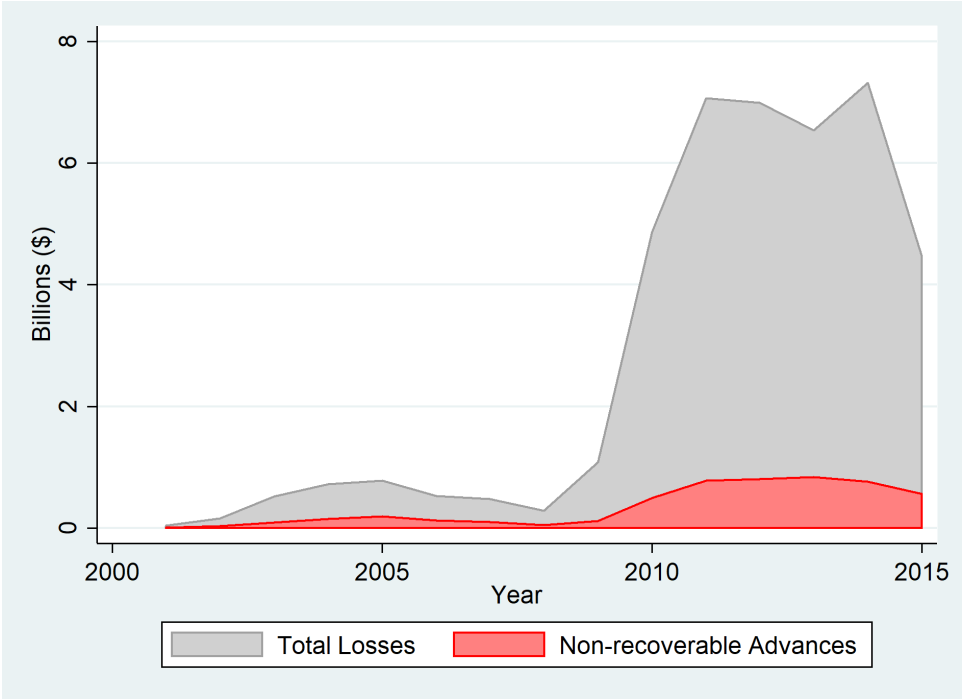
This figure presents the frequency of conduit CMBS loans liquidated with losses by year. The data derive from Trepp.

Figure 3. Troubled Conduit CMBS Loans by Affiliation Type



This figure presents by servicer-trustee affiliation type the frequency of conduit CMBS loans transferred to the special servicer for missing at least 60 days of debt service payments by year. Same stands for loans that have a single form operating as the mortgage servicer and trustee. Co-dealing stands for loans that have co-dealing mortgage servicers and trustees. Arm's length stands for loans that have a trustee that is at arm's length of the mortgage servicer. The data derive from Trepp.

Figure 4. Conduit CMBS Liquidation Losses and Non-Recoverable Advances



This figure plots the annual liquidation losses and the non-recoverable advances. The losses and non-recoverable advances are reported in $billions. The figure uses liquidated commercial loans that underlay conduit CMBS observable in the Trepp data.

Appendix A.
Excerpts from the Pooling and Servicing Agreement: Bank of America Commercial Mortgage Series 2005-3

This appendix provides excerpts from the pooling and servicing agreement (PSA) for the Bank of America Commercial Mortgage Series 2005-3 CMBS deal. The document is representative of CMBS deals that were affected by the LaSalle acquisition. Section 3.11(a) describes the compensation scheme for the mortgage servicer, referred to technically as the master servicer. This passage reveals that a mortgage servicer has an incentive to prolong the life of a delinquent loan: the monthly servicing fee accrues on a mortgage, even if delinquent, until its liquidation date. Section 4.03 explains the mortgage servicer's duty to advance missing payments and the consequences for failure to comply. Section 7.01 outlines a subset of events that constitute a default by the mortgage servicer or another agent of the trust. These default events imply a duty by the mortgage servicer to offer, albeit in limited quantities, advances on underperforming loans. Finally, Section 8.01 outlines the trustee's fiduciary duties to administer and oversee the CMBS deal to protect bondholders from default events.

Note that the following passages have been abbreviated from their original lengths to improve readability. The full passages can be found in the full pooling and servicing agreement, available online through platforms such as the Bloomberg Terminal or Trepp (www.trepp.com). The deal name is Bank of America Commercial Mortgage Series 2005-3 CMBS deal, and the corresponding internal Trepp ID is boa053.

Section 3.11: Servicing Compensation (page 157-158)

(a) As compensation for its activities hereunder, the Master Servicer shall be entitled to receive the Master Servicing Fee with respect to each Loan (including each Specially Serviced Loan) and each related REO [real estate owned] Loan. As to each such Loan and REO Loan..., the Master Servicing Fee shall accrue at the related Master Servicing Fee Rate on the same principal amount... The Master Servicing Fee with respect to any Loan or REO Loan shall cease to accrue if a Liquidation Event occurs in respect thereof. Master Servicing Fees earned with respect to any such Loan or REO Loan shall be payable monthly from payments of interest on such Loan or REO Revenues allocable as interest on such REO Loan, as the case may be. The Master Servicer shall be entitled to recover unpaid Master Servicing Fees in respect of any Loan or REO Loan out of the portion of any related Insurance Proceeds, Condemnation Proceeds or Liquidation Proceeds allocable as interest on such Loan or REO Loan, as the case may be.

Section 4.03: Principal and Interest (P&I) Advances (page 237-239)

(a) ...the Master Servicer shall in the case of all Mortgage Loans... either (i) deposit into the Distribution Account from its own funds an amount equal to the aggregate amount of P&I Advances, if any, to be made in respect of the related Distribution Date, (ii) apply amounts held in the Certificate Account for future distribution to Certificateholders in subsequent months in discharge of any such obligation to make P&I Advances, or (iii) make P&I Advances in the form of any combination of (i) and (ii) aggregating the total amount of P&I... [If] the Trustee does not receive the full amount of such P&I Advances by the close of business..., then (i) unless the Trustee or the Fiscal Agent determines that such Advance would be a Nonrecoverable P&I Advance if made, the Trustee or the Fiscal Agent shall make... the portion of such P&I Advances that was required to be, but was not, made by the Master Servicer... and (ii) such failure shall constitute an Event of Default on the part of the Master Servicer.

(b) The aggregate amount of P&I Advances to be made in respect of the Loans... and any REO Loans for any Distribution Date shall equal, subject to subsection (c) below, the aggregate of all Monthly Payments... net of related Master Servicing Fees payable hereunder, that were due or deemed due... and that were not paid by or on behalf of the related Mortgagors...

(c) ...no P&I Advance shall be required to be made hereunder if such P&I Advance would, if made, constitute a Nonrecoverable P&I Advance. In addition, with respect to the Mortgage Loans other than Mortgage Loans included in a Whole Loan, Nonrecoverable P&I Advances shall be reimbursable... The determination by the Master Servicer... that any proposed P&I Advance, if made, would constitute a Nonrecoverable P&I Advance, shall be evidenced by an Officers Certificate..., together with... a copy of an Appraisal of the related Mortgaged Property or REO Property... [and] any other information that the Master Servicer or the Special Servicer may have obtained that supports such determination.

Section 7.01: Events of Default (page 262-265)

(a) "Event of Default", wherever used herein, unless the context otherwise requires, means any one of the following events:

(i) any failure by the Master Servicer (A) to deposit into the Certificate Account or a Whole Loan Custodial Account any amount required to be so deposited...; or

(ii) any failure by the Special Servicer to deposit into, or to remit to the Master Servicer for deposit into, the Certificate Account or a Whole Loan Custodial Account or the applicable REO Account any amount required to be so deposited or remitted...

(iii) any failure by the Master Servicer to remit to the Trustee for deposit into the Distribution Account, on any Master Servicer Remittance Date, the full amount of P&I Advances required to be made....

(iv) any failure by the Master Servicer to timely make any Servicing Advance required to be made by it pursuant to this Agreement, which failure continues unremedied for a period of three Business Days following the date on which notice shall have been given to the Master Servicer by the Trustee...

(v) any failure by the Special Servicer to timely direct the Master Servicer to make any Servicing Advance (including any Emergency Advance) required to be made by the Master Servicer at its direction pursuant to this Agreement...

(vi) any failure on the part of the Master Servicer or the Special Servicer duly to observe or perform in any material respect any other of the covenants or agreements thereof contained in this Agreement...

(vii) any failure on the part of the REMIC Administrator duly to observe or perform in any material respect any of the covenants or agreements thereof contained in this Agreement...

(viii) any breach on the part of the Master Servicer, the Special Servicer or the REMIC Administrator of any representation or warranty thereof contained in this Agreement that materially and adversely affects the interests of any Class of Certificateholders...

b) If any Event of Default with respect to the Master Servicer or the Special Servicer... shall occur and be continuing, then, and in each and every such case, so long as the Event of Default shall not have been remedied, the Depositor or the Trustee may, and... at the written direction of the Holders of Certificates entitled to at least 51% of the Voting Rights..., the Trustee shall, terminate, by notice in writing to the Defaulting Party..., all of the rights and obligations... of the Defaulting Party under this Agreement...

Section 8.01: Duties of Trustee (page 270-272)

(a) The Trustee, prior to the occurrence of an Event of Default hereunder and after the curing or waiver of all such Events of Default and defaults that may have occurred, undertakes to perform such duties and only such duties as are specifically set forth in this Agreement; provided that it is herein acknowledged and agreed that the Trustee is at all times acting in a fiduciary capacity with respect to the Certificateholders. If an Event of Default hereunder occurs and is continuing, the Trustee shall exercise such of the rights and powers vested in it by this Agreement and applicable law, and use the same degree of care and skill in their exercise as a prudent man or the Trustee would exercise or use under the circumstances in the conduct of his or its own affairs (whichever standard would be higher). Any permissive right of the Trustee contained in this Agreement shall not be construed as a duty.

(b) The Trustee, upon receipt of all resolutions, certificates, statements, opinions, reports, documents, orders or other instruments furnished to the Trustee that are specifically required to be furnished pursuant to any provision of this Agreement..., shall examine them to determine whether they conform in form to the requirements of this Agreement. If any such instrument is found not to so conform to the requirements of this Agreement in a material manner, the Trustee shall take such action as it deems appropriate to have the instrument corrected. The Trustee shall not be responsible for, but may assume and rely upon, the accuracy and content of any resolution, certificate, statement, opinion, report, document, order or other instrument furnished by the Depositor, the Master Servicer, the Special Servicer or the REMIC Administrator and accepted by the Trustee in good faith, pursuant to this Agreement.

(c) No provision of this Agreement shall be construed to relieve the Trustee from liability for its own negligent action, its own negligent failure to act or its own willful misconduct;

(d) The Trustee hereby indemnifies and holds the Trust harmless for all losses, liabilities and damages incurred by the Trust by virtue of the Trustees negligence or fraud