

Sponsor-Underwriter Affiliation and the Performance of Non-Agency Mortgage-Backed Securities¹

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Abstract

Securitization of mortgage loans involves multiple financial intermediaries. Among them, loan originators, deal sponsors, and security underwriters are the key economic players. Using data on non-agency mortgage-backed securities, we find that i) deals in which underwriters and sponsors are affiliated (vertically integrated) have higher delinquency rates than those in which they are unaffiliated, and ii) the poorer performance of vertical integration is true both when investment banks act as sponsors and when sponsors/lenders act as underwriters. The effect is robust to controlling for security level characteristics, suggesting that the poorer performance is beyond what is observable or priced in the deal. The results are also robust to the inclusion of underwriter fixed effects, suggesting it is the incentive effect that drives the result. In addition, the results are robust to the inclusion of the relation between sponsors and originators. This evidence is inconsistent with the information advantage associated with vertical integration and points to poorer incentives associated with vertical integration. While the literature documents that securitization weakens lenders' screening incentives, our findings suggest that an important factor affecting the performance of mortgage backed securities is the moral hazard on the part of sponsors and underwriters.

Keywords: Mortgage, Securitization, Information Asymmetry, Moral Hazard, Vertical Integration, Financial Intermediary.

JEL codes: D2, D8, G2, L4.

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1 Introduction

The recent financial crisis and the ensuing economic recession have highlighted the critical role of securitization in mortgage finance. Along the market expansion of structured financial products such as mortgage backed securities (MBS), the U.S. mortgage financing market has shifted from the traditional originate-and-hold model to an originate-to-distribute model (Mian and Sufi 2009, Downing, Jaffee and Wallace, 2009, Purnanandam 2011). Accompanying this transition, there are two important changes in financial markets. The first is that financial intermediaries are more connected than ever before. A modern securitization production process involves multiple entities such as the originators, the servicers, the trustee, the sponsor, the underwriters and etc. Secondly, private institutions play more and more important role in securitization market, which is evidenced by the rise and collapse of the non-agency MBS products. The non-agency MBS, also called private label MBS products have become the largest MBS type in 2006 (Agarwal, Chang, and Yavas, 2012, Ashcraft and Schuermann, 2008).³ We study the relationship between the difference organizational structure and the MBS performance in the non-agency markets. Among the multiple financial institutions involved in the non-agency securitization production, the key economic participants are the deal underwriters, the sponsor (also called the issuer), and the loan originator. The sponsor is an entity that “organizes and initiates an asset-backed securities transaction by selling or transferring assets, either directly or indirectly, including through an affiliate, to the issuing entity” (SEC Regulation AB).⁴ The underwriter is responsible for analyzing investor demand and

³ Ashcraft and Schuermann (2008) document that in 2006, the non-agency production of \$1.480 trillion was more than 45 percent larger than agency production, and non-agency issuance of \$1.033 trillion was larger than agency issuance of \$905 billion. Our paper focuses on non-agency, that is, private label, mortgage securitization market. The agency market operates via a different mechanism, and consists of deals securitized by Government Sponsored Enterprises (GSEs), which are Fannie Mae and Freddie Mac, and those by Ginnie Mae. For an insightful analysis of the difference of the agency and non-agency mortgage securitization markets, see Agarwal et al. (2012).

⁴ The issuing entity is bankruptcy-risk-remote in that even if the underlying sponsor goes bankrupt, the issuing entity is still present to pay investors using the principal and interest payments from underlying mortgages (Cetorelli and Peristiani, 2012).

designing the structure of the security tranches accordingly.⁵ A loan originator in the case of MBS is essentially the mortgage lender on the primary mortgage market.

There exists a growing literature on how securitization should be most efficiently organized. Demarzo and Duffie (1999) show theoretically the importance of the sponsor holding the equity tranche to “signal” the asset quality.⁶ Begley and Purnanandam (2013) look at the equity holding by sponsors and find that securities in which sponsors hold a higher equity tranche perform better, providing empirical support to Demarzo and Duffie (1999). Hartman-Glaser, Piskorski, and Tchisty (2012) recognize the moral hazard problem in securitization market and propose an optimal contract design. Few works examine the industrial organization aspect of mortgage securitization. One exception is Demiroglu and James (2012), who examine the relation between sponsors and originators. However, there is little work examining the relation between sponsors and underwriters, and whether the affiliation affects the behavior of each institution and eventually the performance of deals they securitized. In this paper we aim to fill this void.

We identify the sponsor and the underwriter as affiliated in a MBS deal, if the sponsor and the underwriter belong to the same financial conglomerate that has both commercial banking and investment banking businesses or an investment bank vertically integrates back and sets up an affiliated firm (entity) which then acts as a MBS sponsor. Conversely, the sponsor and the underwriter are unaffiliated if the two entities are entirely independent and matched up in the marketplace.

⁵ Pooling the mortgage loans and then slicing them into different tranches helps create bonds of different levels of risk to investors of different risk appetites. The “equity” and “mezzanine” tranches absorb the default risk while the remaining more senior tranches are thus able to enjoy credit enhancement and usually a rating of investment grade. Selling of the risky tranches is not always easy. To facilitate the transaction, investment banks often set up hedge funds to “fund” the purchase of such tranches. Using the tranches as collateral, the hedge funds borrow money. The hedge funds thus use their own money and borrowed money to buy up the risky tranches of MBS, facilitating the selling and thus more creation of MBS. More generally, the equity tranches are often purchased by Collateralized Debt Obligations (CDO), which buy equity or mezzanine tranches from different MBS and slice them into various tranches, and the sponsor of the CDO often retains the equity tranche (Financial Crisis Inquiry Report, 2011; Bernstein and Eisinger, 2010; the Economist, 2007; Eisinger and Bernstein, 2010). A sponsor that has an affiliated investment bank or an investment bank sponsoring via an affiliated entity can thus secure a buyer of the risky tranches and market MBS more easily. A sponsor that does not have an affiliated investment bank needs to find an underwriter and investors in its equity and mezzanine tranches. Of course, the investment bank can use its hedge funds to purchase the risky tranches in these MBS. This would then create incentives for the sponsor to better screen the loans it makes or purchases. Whereas if the sponsor and the underwriter are in one conglomerate (type 2) or are literally one party (type 1), the sponsor knows that the purchase of the risky tranches by the in-house investment bank (via hedge funds or CDO set up by the investment bank) is almost guaranteed.

⁶ Also see Kahn and Winton, 2004; Parlour and Plantin, 2008; Fender and Mitchell, 2009.

In the early years of residential mortgage securitization, the predominant form was one where originators that did not have an affiliated investment banks acted as sponsors and used unaffiliated investment banks as underwriters. Conglomerates took up greater market share in sponsoring deals over time. Deals sponsored by them involved both the case of the sponsor and underwriters being affiliated, if the commercial banks use the investment bank under the same conglomerates as their underwriter, and the case of the sponsor and underwriters being unaffiliated, if the commercial banks used outside investment banks as underwriters. Examples include Citibank, Bank of America, Countrywide, etc. The latest entrants are investment banks acting as sponsors; in this way, the investment banks vertically integrate back into the mortgage loan purchases and even originations. For these deals, the sponsors and underwriter are naturally affiliated. For example, in a security, "Bear Stearns Alt-A Trust 2006-8," the sponsor is EMC Mortgage Corporation, a wholly owned subsidiary corporation of the Bear Stearns Companies Inc., and the underwriter is Bear Stearns & Co. Other such players include Goldman Sachs, Lehman Brothers, and Merrill Lynch, etc.⁷

Ex-ante, we do not know whether securities in deals in which the sponsor and underwriter are affiliated would perform differently from those in deals in which the sponsor and underwriter are independent. If the information is symmetric and no-arbitrage condition holds true, we should not observe performance differences across differing organizational structures between sponsor and underwriters after controlling for risks. Even if we observe such differences in performance, it is not clear whether the deals issued by affiliated sponsors-underwriters would have better or worse performance than those issued by unaffiliated securitization participants. There are arguments that a sponsor and underwriter affiliation leads to better deal performance. First, theories of asymmetric information suggest that when the sponsor and underwriter are affiliated, there is better information sharing and transmission. Securitization is a complex process that involves multiple financial intermediaries. Each entity has its own comparative advantage. For example, the originators/sponsors know the risks of local borrowers better than other

⁷ In the years running up to the 2008 Credit Crisis, several investment banks acquired mortgage companies to ensure the supply of mortgage loans that went into mortgage backed securities, making loan origination-deal sponsoring securities underwriting fully vertically integrated.

capital market players. Underwriters know investors' preferences better from past or other underwriting business. When sponsors and underwriters are affiliated, the information on loan quality and investor's demand is shared. Therefore deals with affiliated sponsors and underwriters would be associated with better performance. The second benefit is that the sponsor-underwriter affiliation provides underwriters more control over what is to be included in the deal.⁸ Third, sponsor-underwriter affiliation is potentially associated with better risk-sharing. One major category of MBS deals where sponsor and underwriter are unaffiliated involves the originator acting as the sponsor, and thus often involves loans originated by or purchased from one lender only. Another category of MBS deals where sponsor and underwriter are affiliated involves an investment bank that is not only the underwriter but also the sponsor and often involves mortgages originated by a variety of lenders. Therefore, the sponsor-underwriter affiliation can potentially have better risk sharing from loan diversifications.

Alternatively, sponsor-underwriter affiliation can adversely affect the deals' performance. First, incentives to uphold underwriting standards are weaker when the sponsor and the underwriter are affiliated. In the early years of mortgage securitization practice, originators, sponsors, and underwriters interacted in a marketplace. Market competition enforces the securitization chain participants to maintain quality. However, when sponsors can use their affiliated investment bank arm to underwrite the MBS securities, their incentives decrease since a willing underwriter is there to underwrite securities put together by its affiliated sponsors. Similarly, when investment banks set up an entity to acquire the mortgages, incentives to maintain loan underwriting standards decrease because these loans have a ready underwriter in-house. So incentives for sponsors to uphold underwriting standards decrease with the integration of sponsors and underwriters. This is a classic argument of the downside of vertical integration (Gibbons, 2005 and references therein). The second downside of sponsor-underwriter affiliation is that the sponsor-underwriter integration allows the sponsor to off-load credit risk more easily. Under the traditional securitization process, the skin in the game for sponsors takes the form of the sponsor holding

⁸ But this benefit can be undermined if underwriter's incentive is missing in the first place. In particular, it may manifest itself in having better control of the volume or the quantity without regard for the quality of deals.

the equity stake in the MBS. However, with an affiliated underwriter, the sponsor can more easily trade these risky equity stakes away by selling the equity pieces to investors, using Credit Default Swap or re-packaging them into Collateralized Debt Obligation (CDO) deals, thus divesting the risk and weakening the associated incentives (Faltin-Traeger and Mayer 2012).

Ex-ante the sponsor-underwriter affiliated MBS performance thus depends on which factors dominate: the moral hazard effect or the risk-sharing effect. Our study shows that sponsor-underwriter affiliation is associated with poorer performance. Deals where sponsors and underwriters are affiliated contain riskier loans, such as lower average FICO scores, higher LTV, more use of interest only (IO) and negative amortization loans, more adjustable rate mortgages (ARM), and more low or no-doc loans. In addition to the observable deal risk characteristics, there are unobservable factors determining the poorer performance, and we find that controlling for these deal characteristics, the sponsor-underwriter affiliation is still associated with poorer performance. The effect is present for both an investment bank underwriter acting as the sponsor, and lenders/sponsors using affiliated in-house underwriters. These results are robust to inclusion of the underwriter and the sponsor fixed effects.

Demiroglu and James (2012) find that originator-sponsor affiliation is associated with lower delinquency rates, and attribute the improved performance to having more “skin in the game”. It is thus important to control for the originator-sponsor affiliation in our investigation of the underwriter-sponsor relationship. Using our sample, we are able to replicate and confirm the findings by Demiroglu and James (2012). However, once we include our sponsor-underwriter affiliation variable and a full list of deal characteristics, the coefficient on the originator-sponsor affiliation variable loses its significance and the coefficient on our sponsor-underwriter affiliation variable remains statistically significant⁹.

Our paper contributes to two strands of literature, one on mortgage securitization and the other on the effect of vertical integration. While the literature focuses on the weakened incentives by lenders (originators) due to securitization, this paper highlights the role of sponsors and underwriters in

⁹ It is important to note that we study the MBS deal performance while Demiroglu and James (2012) focus on the loan performance.

exacerbating the misaligned incentives. It thus also touches on the literature on the boundary between commercial banking and investment banking. Our paper also contributes to a large literature on the effect of vertical integration (Bresnahan and Levin, 2012). While the existing literature paints a mixed picture of the welfare effect of vertical integration, in the setting of mortgage securitization it appears to be associated with poorer performance due to the worsened incentives associated with vertical integration.

The remainder of this paper is organized as follows. Section 2 describes the data sources and the variable construction. Section 3 reports univariate and Section 4 reports multivariate analyses of the deal performance and sponsor-underwriter affiliation. Further results are provided in Section 5. We introduce originators into the analysis in Section 6 and examine sponsor risk, soft information, deal structure and pricing in Section 7. Concluding remarks are in Section 8.

2 Identification Strategy, Data, and Variable Definition

2.1 Identification Strategy

To test the impact of the organization form on MBS performance, we first exploit the observational variation in sponsor-underwriter affiliation; that is, we compare the 90+ day delinquency rates of deals in which the sponsor and the underwriter are affiliated and those in which they are independent.

The variation in the sponsor-underwriter affiliation is close to exogenous. For example, when investment banks act as sponsors, the deals almost invariably involve using the investment bank as the underwriter, and thus the sponsor and the underwriter are affiliated. When originators that are not part of a conglomerate act as sponsors, the deals almost entirely involve using non-affiliated investment banks as underwriters, resulting in deals consisting of non-affiliated sponsors and underwriters.

However, for deals involving a conglomerate acting as the sponsor, whether to use the in-house investment bank division or an outside one is a choice. There is a concern that the sponsor uses the in-house investment bank for certain kinds of deals while using outside investment banks for other kinds of deals. That is, sponsor-underwriter affiliation may be affected by other factors, such as loan quality,

borrower creditworthiness, and deal structures, which also affect deal performance. We therefore include an exhaustive list of control variables on loan-, borrower-, and deal-characteristics, based on literature and data availability. An alternative to this parametric method is to match “treated” deals with deals that are similar but are not “treated.” Propensity Score Matching (PSM) allows matching on one dimension instead of matching on various dimensions. The identifying assumption for PSM is that given observable characteristics, the outcome is unrelated to the “treatment” status. We also conduct an instrumental variable (IV) approach. In the propensity score analyses, we “match” securitization deals by affiliated sponsor-underwriters with those by unaffiliated sponsor-underwriters in terms of their propensity to have affiliated sponsor-underwriters and then compare the default difference. In the IV approach, to address the concern that certain affiliation forms might be chosen for certain deals, we use the sponsor-level variation in its likelihood of using in-house underwriters. We measure it using the percentage of deals managed by a sponsor who has used an affiliated underwriter in the past year.

2.2 Data and Variable Definition

The data used in our study come from several sources. We focus on MBS deals securitized by private (non-GSE) issuers. Between 2000 and 2007, 6,054 such private-label (non-agency) MBS securities were closed. We identify and code the organizational variables between deal sponsor and security underwriter based on the ABSAlert and ABSNet. The MBS structure and tranche information as well as deal performance variables are from Bloomberg. To control skin-in-the-game effect reported by Demiroglu and James (2012), we include variables representing the organizational affiliation between mortgage originators and MBS deal sponsors. To ensure the accuracy of organizational affiliation, we manually process SEC filings and in some cases, court filings to identify these relationships.

To capture the various forms of organization structure, we create the following variables:

"sponsor_underwriter_unaffiliated" (S_U_UNAFFL) and "sponsor_underwriter_affiliated" (S_U_AFFL).

We further categorize S_U_AFFL into two sponsor-underwriter affiliation types: AFFL_TYPE1 and

AFFL_TYPE2. Table 1A provides the definitions and Table 1B presents examples on how we code these variables.

When the sponsor is a lender and does not have an affiliated investment bank arm, the variable S_U_AFFL takes the value of 0 and S_U_UNAFFL takes the value of 1. When the sponsor is a division of a conglomerate that includes both depositories and investment banks, and yet the deal involves the sponsor using an outside investment bank, the variable S_U_AFFL takes the value of 0 and S_U_UNAFFL takes the value of 1, whereas if it involves the sponsor using its affiliated investment bank, the S_U_AFFL variable takes the value of 1 and S_U_UNAFFL takes the value 0. When the sponsor is an investment bank or its subsidiary, the sponsor and underwriter are naturally affiliated, and the affiliation variable takes the value of 1.¹⁰ In the case of a deal where several underwriters are involved, if at least one of the underwriters and the sponsor is affiliated, we also define S_U_AFFL that takes the value of 1.¹¹

We also make the distinction of the two forms of vertical integration and create two variables: AFFL_TYPE1 (investment bank as sponsor) and AFFL_TYPE2 (sponsors use in-house underwriters in the same conglomerate) as follows. For a sponsor that is an investment bank, the AFFL_TYPE1 takes the value of 1. For a lender-sponsor using its affiliated in-house investment bank within the conglomerate, the variable AFFL_TYPE2 take the value of 1.

Following Demiroglu and James (2012), we also create a variable originator_sponsor_affiliated (O_S_AFFL) which is an indicator variable for whether the sponsor and the originator in the deal are affiliated. In the case of a single originator, if at least one of the originators is affiliated with the sponsor, O_S_AFFL takes the value of 1. In the case of multiple originators, if none of the originators are affiliated with the sponsor, O_S_AFFL takes the value of 0. Since we have the originator-sponsor affiliation variable for each originator-sponsor pair and we also know the dollar amount of loan contribution in a deal by each originator, we can build a quantitative measure of the extent to which the originator and

¹⁰ We do not know the percentage or volume each underwriter takes in a deal that involves multiple underwriters.

¹¹ If none of the underwriters are affiliated with the sponsor, S_U_AFFL takes the value of 0.

sponsor are affiliated. Using the loan contribution value as a weight, we create a variable `O_S_AFFL_PCT`, which measures the percentage of loans from affiliated originators.

The information on whether two organizations are affiliated is not always straightforward. We use several ways to identify such relation. We first identify such affiliation by manually screening the names of each participant from the database in ABS Alert. If the securitization participants present a common component in their names and are apparently related, we code them as affiliated. Examples include Merrill Lynch being the name of an underwriter and a Merrill Lynch Asset Acceptance as the affiliated sponsor. Second, for many deals, the SEC filings report the exact affiliation among various parties, including sponsors, underwriters, and originators. Third, in cases where SEC filings do not provide such information, we use court filings to identify the relation. Court filings often have very detailed descriptions of the relationships among various parties. Last, we pay special attention to changes in affiliation relationships due to mergers and acquisitions.¹²

We focus on securities that were closed during 2003-2007, because this was the most active period of time in non-agency MBS issuance. We use the 90 days or more delinquency rate two years later as our main performance measure.¹³ We also use an alternative dependent variable: the percent of loans that are 90 days or more delinquent as of December 2008, a cut-off point we choose.¹⁴

We use an exhaustive set of deal characteristics variables: the weighted average FICO score of the deal, Cumulative Loan-to-value ratio (CLTV), Debt-to-income ratio (DTI), the dollar amount of the deal, the weighted average coupon rate, percentages of the deal (in terms of dollar value) that are subprime mortgages (Subprime %), Alt-A loans (ALT_A %), interest only loans (IO %), negative amortization loans (NEGAM%), partial amortization with balloon payment (Balloon %), adjustable rate mortgages

¹² For example, on June 11, 2006, the MortgageIT, Inc., a residential mortgage lender, agreed to be acquired by Deutsche Bank Structured Products. On January 3, 2007, the acquisition was completed and added to Deutsche Bank's US residential mortgage business. In another example, in December 2006, First Franklin Financial Corp. was sold to Merrill Lynch, which intended to create a pipeline of loans that Merrill Lynch could package into mortgage-backed securities.

¹³ More specifically, the performance is as of the end of the two years after the origination year.

¹⁴ The strength of this variable is that it evaluates the deal's performance at an interesting point of time. The weakness of this variable is that for deals closed earlier, more time has elapsed.

(ARM %), and low or no-documentation loans (LOW-NO DOC %). Further deal-level variables include percentages of the deal (in terms of dollar value) that are home purchase loans (Purchase %), loans collateralized by one-to-four unit houses as opposed to multi-family houses (Single family %), having prepayment penalty clause (Prepayment penalty %), having a silent second lien (Silent second %), and loans collateralized by houses for own occupation as opposed to for investment (Owner occupied %).

Housing price appreciation (or depreciation thereof) changes the likelihood of borrower's default and prepayment decisions, and thus impacts loan as well as deal performance. Loans included in a deal may come from different regions and close at different dates. Using housing price index from FHFA, we measure the deal-level housing price appreciation by using a weighted average of state-closing-period housing price change through the applicable performance period.

Other deal-level variables include an indicator variable for whether the deal involves more than one underwriter. Also, for deals involving more than one originator, we create a Herfindahl index variable for the share of various originators (HHL_O), which captures the originators concentration of a deal.

3 Descriptive Statistics

Table 2 shows the summary statistics of our key variables used in the empirical analyses. Panel A presents the summary tables for the whole sample, while Panel B presents the summary statistics by MBS issuing year (vintage). During 2004-2007, 4,152 private-label securitized deals were closed, among which 4,113 deals contain sponsor-underwriter affiliation information. Among these MBSs, 66 percent are deals where sponsors and underwriters are affiliated, 34 percent are deals where they are not. Twelve percent of deals involve more than one underwriter. Within the sponsor-underwriter affiliation, two thirds are underwriters acting as sponsors (Type I), and one third involves sponsors and underwriters both within a

conglomerate (Type II). Shown in panel B of Table 2, the percent of deals that involve affiliated sponsors and underwriters reached to the highest level in history in 2006.¹⁵

The average 90 days or more delinquency rate is 17.67 for the whole sample. The worst deals were those closed in 2005-2006. The mean FICO score across deals and years is 688, CLTV is 76.64, deal amount is \$842 million, and coupon rate is 6.50 percent. On average, 38 percent of loans in a deal are subprime, 42 percent are Alt-A, 35 percent are IO, 8.6 percent are Negam, 7.0 are balloon, 60.0 percent are ARM, and 56 percent are low or no doc loans.¹⁶ On average, 40 percent of loans in a deal have prepayment penalty clause, 46 percent are for home purchase, 25 percent have silent second lien, 69 percent are for single-family, and 88 percent are for owner occupation. Across deals, the mean deal-level housing price depreciation is 13 percent as of December 2008. This is due to the decreasing housing price starting in 2007.

We further conduct a univariate analysis. Table 3 compares the performance of MBS by the sponsor-underwriter affiliation status. For MBS involving unaffiliated sponsor and underwriter, the mean (median) 90+ delinquency rate is 14.42 (11.67) percent. For deals in which sponsor and underwriter are affiliated, the mean (median) 90+ delinquency rate is 19.47 (17.02) percent. A similar difference is observed for the alternative performance measure.

Compared with deals with unaffiliated sponsor-underwriter, affiliated deals on average have higher LTV (75.28 versus 77.36), lower FICO (694 versus 684), a higher percentage of subprime loans (30 versus 42), a higher percentage of ARM loans (58 versus 62), and a higher percentage of low or no doc loans (55 versus 57). It is therefore important to include deal characteristics in our performance analyses below.

¹⁵ The majority of deals involve unaffiliated sponsor and underwriter in 2000-2001, but the percentage of such deals decreased to around one third towards 2007.

¹⁶ Jiang et al. (2013) show that the poor performance of low/no-doc loans results from income falsification among those loans.

4 Multivariate Analyses of the Impact of Sponsor-Underwriter Affiliation on MBS Performance

To test the effect of sponsor-underwriter affiliation on MBS deal performance, we estimate the following equation:

$$Delinquency_{jsut} = \beta_1 S_U_AFFL_{jsut} + \beta_X X_{jsut} + \alpha_s + \alpha_u + \varepsilon_{jsut},$$

where j is the security, s is the sponsor, u is the underwriter, t is deal close year, $Delinquency$ is the percent of loans (in balance) in the MBS that are 90+ delinquent two years after the deal close date, or as of December 2008. S_U_AFFL is the set of sponsor-underwriter affiliation variables, X_{jsut} are deal-level characteristics including the weighted average FICO scores, CLTV, deal amount, coupon rate, percentage of loan volume that is subprime, Alt-A, IO, Negam, balloon, ARM, no or low documentation, prepayment penalty, home purchase, silent second lien, single family, owner occupancy, and housing price appreciation from the deal close date to the performance date, α_s are sponsor fixed effects, α_i are underwriter fixed effects where applicable, and ε_{jsut} is the error term.

The baseline results are reported in Table 4. Column 1 includes the most basic deal-level characteristics: CLTV, FICO, deal amount, coupon rate, and house price appreciation. As in our baseline specification, column 2 further includes the full list of deal characteristics described in the summary statistics. Deals with higher CLTV, lower FICO, higher percentage of Alt-A loans, higher percentage of ARM, higher percentage of investment loans, and depreciation of housing price are associated with higher delinquency rates. Deals closed in 2005 and 2006 perform particularly poorly.

Across the three columns, we find that deals involving affiliated sponsor and underwriter are associated with higher delinquency rates. This is true for both deals where a single underwriter is involved and is affiliated with the sponsor, and deals where more than one underwriter is involved and one of them is affiliated with the sponsor. This suggests that even controlling for observable deal characteristics, sponsor-underwriter affiliations are associated with unobservable dimensions that adversely affect the security performance.

One concern is that certain underwriters tend to sponsor deals (and thus $S_U_AFFL=1$), and those underwriters tend to have worse performance. For example, with the benefit of hindsight, we now know that Bear Stearns, Merrill Lynch, and Lehman Brothers sponsored a lot of deals and their performance was poor. We exploit the fact that while investment banks sponsor their own deals, they are also hired to underwrite other sponsors' deals. For example, UBS sponsors their own deals, but also works as an underwriter for deals sponsored by Countrywide. To identify the effect of sponsor-underwriter affiliation, we thus include underwriter fixed effects. In such a specification, we are effectively using within-underwriter variation to identify the impact of sponsor-underwriter affiliation on deal performance.

Results are in column 3 of Table 4. We find that the coefficient on the S_U_AFFL in fact drops slightly and remains statistically significant. This suggests that the effect of sponsor-underwriter affiliation is not due to the underwriter (investment bank) fixed effects, but rather changed incentives associated with sponsor and underwriter being affiliated.

A similar concern is that certain sponsors tend to use affiliated underwriters and those sponsors tend to have worse performance. Thus our sponsor-underwriter affiliation variable might capture a spurious relation between sponsor-underwriter affiliation and deal performance. For example, Countrywide Home Loans heavily used its in-house investment banking arm, Countrywide Securities, to underwrite and their deals performed poorly. We exploit the fact that these sponsors also used outside investment banks as their underwriters in some of their deals. For example, Countrywide Home Loans worked with various other investments in many of their deals. To teeth out the effect of sponsor-underwriter effect, we thus include sponsor fixed effects. Results are in column 4 of Table 4. We find that the coefficient on S_U_AFFL is reduced slightly and remain statistically significant. This suggests that the sponsor-underwriter affiliation, on top of the sponsor themselves, is associated with poorer performance.

The above results use the deals' 90+ delinquency rate in the 4th quarter two years after the deal's close quarter. For an alternative performance measure, we use the deal's performance two years after the deal's close date as the cut-off date (December 2008). This variable has a mean (across deals) of 17.42 percent, very close to the mean value for the baseline performance measure. For this alternative performance

measure, we re-calculate the deal-level housing price appreciation. Its mean is - 2.4 percent.¹⁷ Using the same set of explanatory variables in a step-wise regression as in Table 4, we estimate the results with an alternative performance measure (not reported). The results are very close to those using 2-year-after as the cut-off date: Deals with affiliated sponsors and underwriters perform worse, controlling for deal characteristics.

The magnitude of the *S_U_AFFL* variable is also economically significant. Across the columns, the coefficient on the *S_U_AFFL* is around 2-3 percent, suggesting that deals with sponsor-underwriter affiliation is associated with 12 percent increase in the 90+ delinquency rate from the mean (2/12=17 percent). The coefficients on the control variables are of expected sign.

Besides looking at the performance of deals as a function of the organizational form, we also directly examine the impact of organizational form on the characteristics of the loans that comprise the securities. We examine FICO, LTV, deal size, coupon rate, being arm, being low/no doc, use of IO or Negam as a function of organizational form. Borrower FICO scores and loan LTV and DTI are known to greatly affect loan performance. The combination of a high LTV (low equity to value) ratio and a depressed house price would create a situation where the value of the house is lower than the loan amount, giving borrowers incentives to walk away from the loan. Borrowers with low FICO scores have less to lose from yet another default action. And a high debt to income ratio would put a borrower in a position to be ill prepared to pay when they encounter income shocks, particularly when combined with interest rate shocks, and the difficulty to refinance due to depressed house price.

We examine the percentage of securitized loans that have these features as a function of the sponsor-underwriter affiliation. Our econometric specification is as follows:

$$pct_mbs_having_risky_feature_{jsit} = \beta_1 S_U_AFFL_{sit} + \beta_X X_{jsit} + \alpha_s + \alpha_i + \varepsilon_{jsit},$$

where *j* is the security, *s* is the sponsor, *i* is the underwriter, and *t* is year. The dependent variable is the percent of MBS in investor dollar amount that has certain features.

¹⁷ The mean for the deal-level housing price appreciation is minus 13.06 percent. This is consistent with the lower housing price in December 2008 as opposed to December 2006 and 2007.

We find, in unreported results, that underwriter-sponsor affiliation is associated with lower FICO score, higher LTV, more use of low/no-doc, more use of lower risk-grade (subprime and Alt-A), more use of adjustable-rate loans (ARM), all indicators of riskier loans.

In summary, evidence in this section is consistent with an interpretation that organizational forms that place players with more skin in the game provide better incentives for sponsors to screen and underwriters to conduct due diligence activities.

5 Addressing Endogeneity Issues

A. Propensity score analysis

Until now we have used the observational difference in S_U_AFFL . A concern is that this may not be entirely exogenous. This is a potentially valid concern in the case of a sponsor being part of a conglomerate, where it is possible that the sponsor chooses to use affiliated underwriters for certain deals and use unaffiliated underwriters for others, and these deals differ in fundamental ways.¹⁹ While we have included an exhaustive list of control variables, we further use propensity score matching method (PSM) to address this concern.²⁰ To get a close-to-exogenous variation in S_U_AFFL , we look at deals with $S_U_AFFL=1$ and deals that are observationally very similar yet with $S_U_AFFL=0$. To implement this strategy, we calculate a propensity score using a logistic regression (Logit) model and a nearest neighbor matching technique to find a matching unaffiliated deal for each affiliated or mixed deal. We impose a common support dropping affiliated deals whose propensity score is higher than the maximum or less than the minimum propensity score of unaffiliated deals. This exercise generates a valid estimate of the Average Treatment Effect on the Treated (ATT).

We report the results in Table 5. Panel A shows the results of the logistic regression with S_U_AFFL being the dependent variable. Observationally good deals such as those with higher FICO, lower CLTV

¹⁹ In the case of $S_U_AFFL=1$ due to investment banks acting as sponsors, this is less of an issue since these deals invariably involve S_U_AFFL being 1.

²⁰ For the theoretical literature on PSM, see Rosenbaum and Rubin (1983) and Imbens (2004) and reference therein. For the programming guidance, see Becker and Ichino (2002) and Nichols (2007).

have S_U_AFFL equal to 1. However, deals having a higher percent of Alt-A, subprime, IO, ARM, NEGAM, low/no-doc, and investment purpose loans, are more likely to have S_U_AFFL being 1. It appears that there is a certain degree of compensating factors going on – higher FICO and lower CLTV for loans with riskier features for a deal to have sponsor and underwriter housed within one entity.

Panel B reports the match outcome and the magnitude of the treatment effects. Close to 85 percent of deals (3,076 out of 3,646) are used; a little over 20 percent of “treated” deals have to be dropped due to being off the common support. The difference in performance for those with S_U_AFFL=1 and those otherwise very similar deals (yet with S_U_AFFL=0) still persists at a level of 3.4 percentage points with statistical significance.²¹ To the degree that available information captures the considerations that results in S_U_AFFL decision, the results from the propensity score matching analyses suggest that sponsor-underwriter affiliation has an indisputable adverse effect on deal performance.

B. IV approach

As we explained earlier, the sponsor-underwriter affiliation can be a choice; that is, a sponsor can decide whether to use its own investment bank affiliate or an outside unaffiliated investment bank. Another method that addresses this selection issue is by using an instrument variable. We need an instrument variable that correlates with the S_U_AFFL variable, but not the dependent variable. One such candidate is the sponsor’s predilection to use outside underwriters. The variation at the sponsor level -- the percentage of deals where the sponsor used affiliated underwriters (Sponsor_pct_s_u_affl and Sponsor_pct_s_u_mix²²) -- captures the ex-ante incentives for a sponsor to monitor loan quality.

Columns (1), (3), and (5) of Table 6 report the regression results from the first-stage regression while the columns (2), (4), and (6) report those from the second-stage.²³ We see that the sponsor-level variable is highly predictive of the S_U_AFFL. With Sponsor_pct_s_u_affl being instrument variables, we find

²¹ Note that the magnitude is a bit smaller than the 4.6 percentage point, obtained from simple differencing, without matching the treated with the observationally similar untreated deals.

²² We define Sponsor_pct_s_u_affl and Sponsor_pct_s_u_mix as the total dollar amount of deals that a sponsor securitized during the past year.

²³ Since our instrument variable is a sponsor-level variable, we find including sponsor fixed effects adds little value, and we therefore do not report results from the specification containing sponsor fixed effects.

that the coefficient on S_U_AFFL remains positive. In fact, the magnitude slightly increases compared with those in baseline results.²⁴ In summary, the results from the PSM and IV analyses support an interpretation that sponsor-underwriter affiliation seals the incentives to pursue business volume, weakens the underwriter's incentives to conduct due diligence, dilutes the sponsor's incentives to adhere to underwriting standards for the mortgage loans that go into the securities.

6 Sponsor-Underwriter versus Originator-Sponsor Affiliation

When the sponsor is an investment bank, S_U_AFFL is almost 1. Meanwhile, sponsor as an investment bank naturally means that the sponsor is likely not the originator of the loans in the securities, unless the investment bank has its own mortgage origination arm. When the sponsor is a lender which does not have an investment bank arm, the S_U_AFFL variable is naturally 0, and the sponsor often is the originator.²⁵ For both kinds of deals, S_U_AFFL is negatively associated with the variable sponsor_originator_affiliated (O_S_AFFL).

Demiroglu and James (2012) argue that originator-sponsor affiliation implies that the originator retains the equity risk, so those securities shall perform better, and they find empirical evidence supporting this. Since S_U_AFFL is negatively correlated with O_S_AFFL for two major kinds of deals, and the literature finds that O_S_AFFL is positively correlated with good performance, by correlation, S_U_AFFL is negatively correlated with good performance. Therefore it is important to parse out the true effect of S_U_AFFL from the effect of O_S_AFFL.

We therefore include the O_S_AFFL variable in our analysis. We collect the information on originators from Bloomberg. From the first round of matching, there are quite a few deals missing exact information on the name of originators or the percentage contribution to the deal. For those deals, we use SEC filings accessible via secinfo.com to obtain originator information.

²⁴ This could be explained by the fact that sponsors often keep the “bad” deals to themselves while “outsourcing” the more “standard” deals to outside underwriters.

²⁵ For sponsors that are lenders having an investment bank arm, the S_U_AFFL can take the value of 0 or 1 and the O_S_AFFL is mostly 1 since the sponsor is a lender itself.

We utilize the same coding strategy as in Demiroglu and James (2012) to identify the originator-sponsor affiliation. For deals that involve only one originator and the originator is affiliated with the sponsor, our variable `O_S_AFFL` takes the value of 1. Moreover, we code `O_S_AFFL` for every originator-sponsor pair of the deal and then create a variable `O_S_AFFL_PCT`, which is (loan balance as of origination) the weighted average of the `O_S_AFFL`. We also create a variable that captures the originator concentration in a deal – the originator Herfindahl index (`HHI_O`).

Summary statistics for these variables are in Panel A of Table 2. Across the 3,340 deals where we have collected information on originators, 39 percent involve a single originator and it is affiliated with the sponsor. In another 39 percent of the deals, none of the originators is not affiliated with the sponsor. Across deals, the `O_S_AFFL_PCT` has a mean of 50 percent. The Herfindahl index for originators (`HHI_O`) has a mean of 0.94.

Regression results including originator-sponsor affiliation variables are in Table 7A. In columns (1), (3), (5), and (7), we include originator-sponsor affiliation variables only, and in columns (2), (4), (6), and (8) we include both the originator-sponsor and the sponsor-underwriter affiliation variables. In columns 1-2, we include the sponsor-underwriter affiliation and the originator-sponsor affiliation variables, `CLTV`, `FICO`, deal amount, coupon rate, and `HPI` change. We confirm the results in Demiroglu and James (2012). Column (1) shows that the coefficient on the `O_S_AFFL` is negative, indicating lower delinquency rates are associated with originator and sponsor affiliation. In column 2, once we include sponsor-underwriter affiliation variables, the coefficient on the originator-sponsor affiliation variable loses close to half of its magnitude and becomes only marginally significant. Columns 3-8 use the same set of specifications as in Table 4A. We find that once we gradually include the deal characteristics, the coefficient on the `O_S_AFFL` variable loses its statistical significance and its magnitude dramatically decreases and even changes sign. In addition, once underwriter or sponsor fixed effects are included, it loses its statistical significance. This suggests that the effect of originator-sponsor affiliation is fully captured by the deal characteristics. The coefficient on our variable of interest, `S_U_AFFL`, with the originator-sponsor

affiliation variables in the regression, remain statistically significant, as in our baseline results. The results using the alternative performance measure are very close to those in Table 7A (not reported).

Table 7B provides results using an alternative measure of originator-sponsor affiliation – O_S_AFFL_PCT rather than using the two dummy variables. The advantage of using this continuous variable is that it represents the extent to which a deal consists of loans from an affiliated lender. The higher the percentage, thus the more “skin in the game”, which should yield better loan and deal performance. Again, we find that the coefficient on O_S_AFFL_PCT loses its statistical significance once deal characteristics are included.²⁶

Consistent with our baseline findings, we find that sponsor-underwriter affiliation is associated with poorer performance while originator-sponsor affiliation is insignificantly associated with performance after deal characteristics are included. These findings suggest that a key force in affecting a deal’s performance, particularly in aspects not captured in deal characteristics, is the relation between its sponsor and its underwriter, more than the relation between its sponsor and its originators. After all, the structured financial product market, with the underwriters’ incentives to pursue business volume and the creation of CDO to buy up the risky tranches of MBS, provided the fuel to the primary mortgage market to manufacture loans with less regard to quality than warranted.

7 Sponsor Risk, Soft Information and Deal Structure

7.1 Sponsor Risk and Deal Performance

One of the rationales for creating asset-backed securities is that the credit risk of an asset pool and the credit risk of the securitization sponsor are separated in the securitization process. However, Faltin-Traeger et al. (2010, 2011) found that the sponsor riskiness is related to the performance of securities it

²⁶ We conduct the above analysis using the alternative performance measure (results not reported). We find that the coefficients on the originator-sponsor variables lose their statistical and economic significance once deal characteristics are included and the coefficients on the sponsor-underwriters variables remain significant.

sponsored. Specifically they documented that securities sponsored by a higher-rated sponsor achieved better performance.²⁷

To test whether deal performance is due to sponsor risks rather than organizational affiliations, we include sponsor rating information as the control variables. We create a full set of dummy variables for the sponsor ratings: AAA, AA+, AA, etc. Table 8 reports results with these dummy variables included. All large or major sponsors or their parent companies have credit ratings. Those who do not have credit ratings tend to be small sponsors. We find that including sponsor ratings improves the fit of the model and does not affect our baseline results.

7.2 Soft Information

Financial institutions utilize both hard and soft information to make decisions in providing credit (Stein, 2002). Recent studies in this literature include DeYoung, Glennon, and Nigro (2008), who link credit scoring to small business loan performance. Agarwal et al., (2011) document the importance of soft information in home equity credit market and find that a lender's efforts ex ante to mitigate contract frictions by using soft information can be effective in reducing overall portfolio credit losses ex post. To further test the hypothesis that incentives are the mechanism in which the organizational form affects deal performance, we test whether the effect is larger in situations where information asymmetry on the lender actions is more severe. If sponsor-underwriter affiliation is associated with worse incentives for sponsors in screening loans, this lack of incentive should be more prominent in low/no-documentation loans where efforts to collect soft information are more critical.²⁸

Results on subsample analyses are in Table 9. We separate the sample into full-doc and low-doc subsample according to whether the percent of full-doc loans in a deal is above or below the sample median value. The columns (1), (3), (5), and (7) report results for no-and low-doc subsample, while the

²⁷ A related paper is Titman and Tsyplakov (2010) in which they examine the impact of recent poor stock performance of the originator on the performance of commercial MBS.

²⁸ The low or no-documentation loans have missing or limited documentation about borrower's income, asset or creditworthiness (Keys et al., 2012).

columns (2), (4), (6), and (8) report results for full-doc subsample. We find that the coefficient on the S_U_AFFL variable is of a larger magnitude in low-doc than in full-doc subsample. This is consistent with the interpretation that sponsor-underwriter affiliation affects sponsor incentives, the degree of which appears to be larger when the sponsor's incentives to screen are more critical (Keys et al., 2012).

Prime borrowers being exhausted, loan officers and mortgage brokers turned to those with impaired credit scores, for loan originations in order to feed the frenzied demand for loans coming from the secondary markets and earn fees. Similarly, the low teaser rate in an ARM loan is conducive to moral hazard on the part of loan originators in facilitating loan origination to borrowers who may not fully understand the risk contained in the ARM loan. In unreported results on the differing effects of organizational form on deal performance by whether the deal is subprime or ARM, respectively, we find that the effect of organizational form is larger in magnitude for deals that are subprime and the effect is larger for ARM than for FRM deals. These findings are consistent with the interpretation that in situations where moral hazard on the part of lenders is more severe, the incentives provided by a proper organizational form for monitoring and due diligence efforts on the part of sponsors and underwriters reduces the moral hazard on the part of the originators.

7.3 Deal Structure and Pricing

A. Deal Structure

Subordination is a way to enhance the credit of a deal. It involves pooling the loans and put them into different tranches where the most junior tranches absorb the default risk first. The credit quality of the more senior tranches is thus raised and consequently they enjoy high credit ratings. Sponsors usually hold the equity (the most junior) tranches. The level of subordination is thus a way for sponsors to enhance the credit rating of tranches other than the most junior ones.

We wonder whether in deals in which the sponsor and the underwriter are affiliated, the level of subordination is different from those in unaffiliated deals. We thus regress the level of subordination, i.e.,

the percent of the deal amount that is in the junior (equity and mezzanine) tranches, on the S_U_AFFL variables. Results are in Table 10A.

We find that deals with S_U_AFFL being equal to 1 have a higher level of subordination. This is consistent with the interpretation that investors to a certain degree are aware of the worse incentives associated with sponsor-underwriter affiliation, and therefore the sponsor has to structure the deal so as to reduce the credit risk to facilitate selling of the bonds. Below we further examine whether investors price the lower quality of deals with S_U_AFFL being equal to 1 in the coupon rates.

B. Pricing

We examine whether investors are aware of the incentive issues associated with the organization form of mortgage securitization. Our measure of deal pricing is the *initial average yield spread*, which is defined as the average yield of all securities (weighted by the face value of the securities) minus the monthly yield on the 10-year Treasury bond, both measured as of deal close. We use the yields of 10-year Treasuries (obtained from Federal Reserve Board) to calculate the yield spreads. We regress the deal yield spread on the S_U_AFFL variables; results are in Table 10B. With the full list of deal characteristics controls, columns (3)-(4) show that the coefficients on the S_U_AFFL variable are overall positive. However, the magnitude of the coefficient is very small. For example, the coefficient on S_U_AFFL in columns 3-4 is around 0.05 percentage point. Noting that the mean value of the yield spread is 2 percentage points, this coefficient suggests that S_U_AFFL deals are associated with only 2.5 percent increase in yield spread from the mean. This appears very small considering the fact that S_U_AFFL deals have several percentage point higher default rates compared with the mean. Therefore the higher credit risk associated with S_U_AFFL equal to 1 is not fully priced.

8 Conclusion

We provide an empirical investigation of the impact of sponsor-underwriter affiliation on the performance of non-agency mortgage-backed securities. The role played by sponsors and underwriters in the

securitization of mortgages is a question that has important policy implications. Our paper shows that MBS where underwriters and sponsors are affiliated perform much worse than MBS where sponsors and underwriters are independent. The poorer performance of such MBS is partly due to the higher percentage of loans that are low/no doc, subprime, and ARM, and partly due to unobservable factors that adversely affect the deal performance. This evidence supports an interpretation that sponsors' incentives to adhering to underwriting standards and underwriter's incentives to conduct due diligence are compromised with the ease of securitization that a sponsor-underwriter affiliation engenders. It appears that investors did not fully take this into consideration when they made investment decisions.

During and in the wake of the 2008 Financial Crisis, the largest investment banks either went bankrupt (Lehman Brothers), became part of a conglomerate (Bear Stearns and Merrill Lynch), or transformed into bank holding companies (Goldman Sachs and Morgan Stanley). Therefore the backward vertical integration by the largest investment banks at the height of 2003-2006 (S_U_AFFL_type_2) is now transformed into activities within a conglomerate (S_U_AFFL_type_1). Meanwhile, the poorer performance of sponsor-underwriter-affiliated deals remains an issue.

The mechanism, as discussed in the introduction, could be i) sponsors readily finding a willing underwriter in the conglomerate and thus having fewer incentives to screen, and ii) in the pursuit of business volume and profit, underwriters potentially pressing their in-house depositories to ramp up lending or purchase volume with potentially sacrificed quality (a form of conflict of interest).

In light of the misaligned incentives in originate-to-distribute mortgage financing model, several clauses of the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act are relevant to restore the missing incentives in the mortgage securitization process. The "Ability-to-repay" rule works on the part of the lender and borrower to ensure the borrower's ability to repay. The "Risk-retention" rule that sponsors keep at least 5 percent of the credit risk of the securities backed by mortgages and be forbidden to divest works on the part of the sponsor to restores their incentives to screen by retaining some risk. Finally, in the wake of all major investment banks now part of the Bank Holding Companies with an

affiliated depository institution, the “Volcker Rule” that investment banks do not use FDIC-insured depositories to engage in proprietary trading or sponsor hedge funds becomes extremely relevant.

References

Agarwal, Sumit, Ambrose, B., S. Chomsisengphet, and C. Liu, (2011), “The Role of Soft Information in a Dynamic Contract Setting: Evidence from the Home Equity Credit Market,” *Journal of Money, Credit and Banking*, 2011, Vol. 43(4), Pp. 633-655

Agarwal, Sumit, Yan Chang, Abdullah Yavas (2012), “Adverse Selection in Mortgage Securitization,” *Journal of Financial Economics*, 105 (3): 640-660.

Ashcraft, A. B. and T. Schuermann (2008), "Understanding the Securitization of Subprime Mortgage Credit," *Foundations and Trends in Finance* 2 (3): 191-309.

Benmelech, Effi, Victoria Ivashina, and Jennifer Dlugosz (2012), "Securitization without Adverse Selection: The Case CLOs," *Journal of Financial Economics*.

Becker, Sascha O. and Andrea Ichino (2002), “Estimation of Average Treatment Effects on Propensity Scores,” *The Stata Journal*, 2 (4): 358–377

Begley, Taylor and Amiyatosh Purnanandam (2013), “Design of Financial Securities: Empirical Evidence from Private-label RMBS Deals,” Working paper.

Bernstein, Jake and Jesse Eisinger (2010), "The `Subsidy': How a Handful of Merrill Lynch Bankers Helped Blow Up Their Own Firm," ProPublica.

Bresnahan, Timothy and Jonathan Levin (2012), "Vertical Integration and Market Structure," NBER Working Paper No. w17889.

Cetorelli, Nicola and Stavros Peristiani (2012), “The Role of Banks in Asset Securitization” *FRBNY Economic Policy Review*, July: 47-63.

Demarzo, Peter and Darrell Duffie (1999), “A Liquidity-based Model of Security Design”, *Econometrica* 67 (1): 65–99.

Demiroglu, Cem & James, Christopher (2012), "How Important is Having Skin in the Game? Originator-Sponsor Affiliation and Losses on Mortgage-Backed Securities," *Review of Financial Studies*.

DeYoung, R., D. Glennon, and P. Nigro, 2008, “Borrower-lender distance, credit scoring, and loan performance: Evidence from informational-opaque small business borrowers,” *Journal of Financial Intermediation*, 17, 113-143.

Downing, Chris, Dwight Jaffee, and Nancy Wallace. 2009. "Is the Market for Mortgage Backed Securities a Market for Lemons?" *Review of Financial Studies*, 22(7): 2457-2494.

The Economist (2007), "Spooking Investors: Financial Markets Remain on Edge Because the Credit Crunch Has Not Been Solved," *The Economist*, Oct 25th, 2007.

Eisinger, Jesse and Jake Bernstein (2010), "The Magnetar Trade: How One Hedge Fund Helped Keep the Bubble Going," *ProPublica*.

Faltin-Traeger, Oliver, Kathleen W. Johnson, and Christopher Mayer (2010), "Issuer Credit Quality and the Price of Asset Backed Securities," *American Economic Review: Papers & Proceedings* 100 (2): 501--505.

Faltin-Traeger, Oliver, Kathleen Johnson, and Christopher Mayer (2011), "Sponsor Risk and the Performance of Asset-backed Securities." Working paper, Columbia Business School.

Fender, Ingo and Janet Mitchell (2009), "Incentives and Tranche retention in Securitization: a Screening Model," *BIS Working Papers* 289.

Financial Crisis Inquiry Report (2011), Final Report of the National Commission on the Causes of the Financial and Economic Crisis in the United States.

Gibbons, Robert (2005), "Four formal(izable) theories of the firm?" *Journal of Economic Behavior & Organization*, 58: 200--245.

Hartman-Glaser, Barney, Tomasz Piskorski, and Alexei Tchisty (2012), Optimal securitization with moral hazard, *Journal of Financial Economics*, Volume 104, Issue 1, April, Pages 186-202,

Hu, Jian, Richard Cantor, Nicolas Will, Tad Philipp (2006), "Deal Sponsor and Credit Risk of U.S. ABS and MBS Securities," Special Comment, Moody's Investors Service, Global Credit Research.

Jiang, Wei, Ashlyn Nelson, and Edward Vytlacil (forthcoming), "Liar's Loan? – Effects of Origination channel and Information Falsification on Mortgage Loan Delinquency," *Review of Economics and Statistics*.

Kahn, Charles and Andrew Winton (2004), "Moral Hazard and Optimal Subsidiary Structure for Financial Institutions," *Journal of Finance*, 59 (6): 2531-2575.

Keys, Benjamin J., Tanmoy Mukherjee, Amit Seru, Vikrant Vig (2010), "Did Securitization Lead to Lax Screening? Evidence from Subprime Loans," *Quarterly Journal of Economics*, 125 (1): 307--362.

Mian, A., and A. Sufi, 2009, The consequences of mortgage credit expansion: Evidence from the 2007 mortgage default crisis, *Quarterly Journal of Economics* 124, 1449-1496. Nichols, Austin (2007), "Causal Inference with Observational Data," *The Stata Journal*, 7(4): 507-541.

Parlour, C. A., and G. Plantin, 2008, Loan Sales and Relationship Banking, *Journal of Finance* 63, 1291-1314.

Purnanandam, Amiyatosh (2011) "Originate-to-Distribute Model and the Sub-prime Mortgage Crisis," *Review of Financial Studies*, 24:1881-1915.

Rosenbaum, Paul R. and Donald B. Rubin (1983), "The Central Role of the Propensity Score in Observational Studies for Causal Effects," *Biometrika*, 70 (1): 41-55.

Imbens, Guido W. (2004), "Nonparametric Estimation of Average Treatment Effects Under Exogeneity: A Review," *The Review of Economics and Statistics*, 86(1): 4--29.

SEC filings, from secinfo.com websites.

Stein, J.C., 2002, "Information production and capital allocation: Decentralized vs. hierarchical firms," *Journal of Finance*, 57, 1891-1921.

Titman, Sheridan and Sergey Tsyplakov (2010), "Originator Performance, CMBS Structures, and the Risk of Commercial Mortgages." *Review of Financial Studies*, 23(9): 3558-3594.

Appendix A: Definitions of Variables

Variables	Definition
Deal Performance Measures	
90+ DELQ in Q4 in 2 Years (%)	Percent of loans, in terms of dollar amount, that are 90 days or more delinquent as of the 4 th quarter two years after the deal close quarter.
90+ DELQ at Cutoff (%)	Percent of loans, in terms of dollar amount, that are 90 days or more delinquent as of December 2008.
House Price Change	
	We use the Federal Housing Finance Agency's (FHFA) seasonally adjusted quarterly house price index to calculate the percentage change in house price from the deal close quarter to the fourth quarter two years after the deal close quarter (or December 2008, where applicable). We obtain information on the percentage of loans that were originated in each state from Bloomberg. We then calculate weighted-average house price change associated with a given deal as $\Delta HPI_i = \sum_s w_{i,s} \Delta HPI_{i,s},$ where i refers to deals, s refers to states.
Deal Characteristics	
Amount (x \$Billions)	The total amount of the deal, in billions of dollars.
CLTV (%)	Average cumulative loan-to-value ratio of mortgages in the deal weighted by original loan balance.
RATE (%)	Average percentage coupon rate of mortgages in the deal weighted by original loan balance.
FICO	Average Fair Issac Company (FICO) credit score for the borrowers at loan origination weighted by original loan balance.
DTI (%)	Average debt-to-income ratio weighted by original loan balance.
ALT_A%	Percentage of loans that are Alt-A, i.e., loans with reasonable FICO score but with otherwise risky features in the deal.
SUBPRIME%	Percentage of loans that are subprime (of risk grade B, C or lower) in the deal.
IO%	Percentage (in terms of loan balance) of loans in the deal that have interest only feature.
ARM%	Percentage (in terms of loan balance) of loans in the deal that are adjustable rate loans.
NEGAM%	Percentage (in terms of loan balance) of loans in the deal that have negative amortization feature.
Low/No-Doc%	Percentage (in terms of loan balance) of loans in the deal that have low or no documentation (of income) feature.
Balloon%	Percentage (in terms of loan balance) of loans in the deal that are balloon payment loans.
Prepayment penalty (%)	Percentage (in terms of loan balance) of loans in the deal that have the clause of prepayment penalty.
Purchase loan (%)	Percentage (in terms of loan balance) of loans in the deal that are for home purchase as opposed to re-finance purpose.
Silent second (%)	Percentage (in terms of loan balance) of loans in the deal in which the underlying property has silent second lien.
Single family (%)	Percentage (in terms of loan balance) of loans in the deal in which the underlying property is single family versus multi-family.
Owner occupied (%)	Percentage (in terms of loan balance) of loans in the deal in which the underlying property is for owner occupancy instead of investment purpose.
HHI_O	A variable that captures the concentration of originators in a deal, measured as $HHI_O = \sum_o s_{i,o}^2,$ where i refers to the deal, o refers to originators, and s is the share of originator i 's balance in the deal.

Appendix B: Robustness Checks

a. Alternative Specification with the Use of DTI

A large portion of deals have missing values for their weighted average DTI. In our baseline regression, we forego the use of the DTI variable. As an alternative, we include those deals and treat the missing DTI as the mean value of DTI from the sample (0.39) and meanwhile include a dummy variable for the missing DTI. Results are in Table 11. Coefficients on variables of interest are barely affected.

b. Sponsors Who Do Not Have Investment Bank Affiliate

Among S_U_UN_AFFL deals, there are two types: Those whose sponsors have affiliated investment banks but do not use them, and those whose sponsors do not have affiliated investment banks. Examples are mortgage companies. We further differentiate these two by including a dummy variable for the sponsor being part of a conglomerate while keeping the remaining specification intact (results not reported). We find that the coefficient on this variable is negative, suggesting that among those sponsor-underwriter unaffiliated deals, those sponsored by conglomerates perform better.²⁹ Importantly, the coefficients on the variables of interest are barely affected.

²⁹ This could be due to the safe-and-soundness regulation these conglomerates are under; non-depository institutions are not under the same level of federal regulations.

Table 1A: Definitions of organizational affiliation variables during the securitization process

This table defines the key variables of organizational affiliation along the private label mortgage securitization process. For a private label mortgage-backed security, a sponsor is the party that either originates or purchases loans. Broadly speaking, the sponsor also pools the loans and tranches them, and issues certificates (for a precise legal description, see Appendix A). It also conducts other credit enhancements and files the registration with the SEC. The sponsor usually keeps the equity (the most risky) tranche. The underwriter, also called book-runner, is the dealer that brings and markets the certificates to investors. Affiliation means either a direct parent-subsidary relation between the two parties, or an indirect relation via a parent company. Procedures in defining whether an originator and a sponsor are affiliated are as follows: i) if the name of the originator and the name of the sponsor overlaps: e.g., Countrywide Home Loans as both; ii) if the name of the originator and the name of the sponsor partially overlaps; iii) if the originator is involved in more than one deal and is associated with only one sponsor: e.g., EMC with respect to Bear Stearns, and DLJ with respect to Lehman Brothers; and iv) legal suits, which details the relation between parties, including originators, sponsors, and other parties. Procedures in defining whether a sponsor and an underwriter are affiliated are based on similar reasoning.

Variables	Variable Definition
S_U_UNAFFL	An indicator variable at the deal level for the sponsor and none of underwriters being affiliated
S_U_AFFL	An indicator variable at the deal level for the sponsor and at least one of the underwriters being affiliated.
AFFL_TYPE1	Type 1 of sponsor-underwriter affiliation, where an investment bank serves as the sole sponsor and the sole underwriter. It is an indicator variable at the deal level for i) the sponsor and the sole underwriter being affiliated, and ii) the underwriter (an investment bank) sets up affiliated companies/corporations to sponsor for the whole purpose of securitization.
AFFL_TYPE2	Type 2 of sponsor-underwriter affiliation, where the sponsor and the underwriter are subsidiaries of a financial conglomerate. An indicator variable at the deal level for i) the sponsor and the sole underwriter being affiliated, and ii) the sponsor being a conglomerate and using its in-house investment bank to underwrite.
O_S_UNAFFL	An indicator variable at the deal level for i) the sponsor and the sole originator being un-affiliated, or ii) the sponsor and none of the multiple originators are affiliated.
O_S_AFFL	An indicator variable at the deal level for the sponsor and at least one of the originators being affiliated.
O_S_AFFL_PCT	A continuous variable at the deal level for the percent (weighted by each originator's loan balance value) of originators being affiliated with the sponsor.

Table 1B: Examples of organizational affiliations in the securitization process

This table provides examples of definitions of the affiliation variables. In Harborview 2005-09, for example, the sponsor, Greenwich Capital Financial Products, Inc., is a wholly owned, direct subsidiary of Greenwich Capital Holdings, Inc. The underwriter, Greenwich Capital Markets, Inc., is a wholly owned, direct subsidiary of Greenwich Capital Holdings, Inc. In Bear Stearns 2006-AC5, the sponsor, EMC Mortgage Corporation, was incorporated as a wholly owned subsidiary corporation of The Bear Stearns Companies Inc., and is an affiliate of the underwriter, Bear, Stearns & Co. Inc. The sponsor, EMC Mortgage Corporation, was established as a mortgage banking company to facilitate the purchase and servicing of whole loan portfolios. In security CWATL 2006-OA11, the origination amount by Countrywide Home Loans was 60.75%. In Bear Stearns 2006-AC5, the proportion of loan origination amount by EMC was 51.86%.

	Security Name	Underwriters (U)	Sponsor (S)	Originators (O)	S_U_UNAF_FL	S_U_AF_FL	AFFL_TYPE_1	AFFL_TYPE_2	O_S_UNAFFL	O_S_AF_FL	O_S_AFFL_PCT
1	WFALTA 2005-02	Goldman Sachs	Wells Fargo Bank, N.A.	Wells Fargo Bank	1	0	0	0	0	1	1
2	CWALT 2005-10CB	Deutsche Bank	Countrywide Home Loans	Countrywide Home Loans	1	0	0	0	0	1	1
3	CWABS 2004-08	Countrywide Securities Corp.	Countrywide Home Loans	Countrywide Home Loans	0	1	0	1	0	1	1
4	CWALT 2004-28CB	1)Countrywide Securities Corp. 2)Credit Suisse	Countrywide Home Loans	Countrywide Home Loans	0	0	0	0	0	1	1
5	CWATL 2006-OA11	Countrywide Securities Corp.	Countrywide Home Loans	1)Countrywide Home Loans 2)MortgageIT, Inc.	0	1	0	1	0	0	0.61
6	Harborview 2005-09	RBS Greenwich Capital	Greenwich Capital Financial Products, Inc.	Countrywide Home Loans	0	1	1	0	1	0	0
7	Bear Stearns 2006-AC5	Bear Stearns	EMC Mortgage Corporation	1)EMC Mortgage Corporation 2)GreenPoint Mortgage Funding, Inc.	0	1	1	0	0	0	0.51

Table 2: Summary Statistics

This table presents summary statistics for various sponsor-underwriter affiliation measures, deal performance measures, house price changes, and deal characteristics variables for all deals in our sample. Data on deal structure, which is on tranche (bond) level, is from Bloomberg. Tranche information on some deals is missing. For those (2,836) deals that have tranche information, we calculate the percent (in balance) of the deal that is comprised of tranche (bond) that is subordinated. We use (d) to denote that the variable is a dummy variable. In Panel A, we present summary statistics for the overall sample. In Panel B, we present mean values of the variables by vintage. Variable definitions are in Appendix A and Table 1A.

Panel A: Summary statistics for all sample periods						
Variables	N	Mean	SD	Min	Median	Max
Sponsor-Underwriter Affiliation						
S_U_UNAFFL	4,113	34.50%	-	-	-	-
S_U_AFFL	4,113	65.57%	-	-	-	-
AFFL_TYPE1	4,113	40.14%	-	-	-	-
AFFL_TYPE2	4,113	20.96%	-	-	-	-
TYPE_NO_IBANK	4,113	16.48%	-	-	-	-
TYPE_CONGLOMERATE	4,113	43.06%	-	-	-	-
TYPE_IBANK	4,113	40.48%	-	-	-	-
Sponsor-Originator Affiliation						
O_S_UNAFFL	3,340	39.34%	48.86%	-	-	-
O_S_AFFL	3,340	38.56%	48.68%	-	-	-
O_S_AFFL_PCT	3,328	50.46%	46.05%	-	-	-
HHI_O	3,340	0.94	6.74	-	-	-
Deal Performance and House Prices						
90+ DELQ rate in 2 Years (%)	3,993	17.67	15.60	0	13.65	72.39
90+ DELQ rate as of Dec.2008 (%)	4,078	17.41	13.96	0.05	14.43	62.18
House price change in 2 Years	4,151	-2.41	21.95	-38.63	-4.81	117.85
House price change as of Dec.2008	4,151	-13.05	11.85	-38.63	-15.73	74.95
Deal Characteristics						
Amount (x \$Billions)	4,125	0.84	0.60	0.05	0.70	5.76
CLTV (%)	4,124	76.64	7.36	50.89	75.71	118.19
Rate (%)	4,123	6.50	1.85	1.05	6.67	13.12
FICO	4,097	688.14	47.58	533	706	762
ALT_A%	4,117	41.53	48.68	0	0	100
Subprime%	4,117	37.86	48.44	0	0	100
IO%	4,117	34.78	32.89	0	24.09	100
ARM%	4,117	59.95	42.33	0	79.45	100
NEGAM%	4,117	8.57	27.50	0	0	100
LOW/NO-DOC%	4,107	55.46	23.48	0	55.53	100
Balloon%	4,135	6.97	16.42	0	0	99.87
Prepayment penalty (%)	4,135	40.23	32.99	0	38.36	100
Purchase loan (%)	4,135	46.13	16.93	0	46.09	100
Silent second (%)	4,135	24.49	20.00	0	24.53	100
Single family (%)	4,135	68.54	10.20	0	68.13	99.95
Owner occupied (%)	4,135	87.50	10.55	0	90.75	100
Multi-underwriter (d)	4,152	0.12	0.32	0	0	1
Pct_subordinated (%)	2,836	3.55	6.77	0.00	0.00	73.95

Panel B: Mean characteristics by vintage

Variables	2004	2005	2006	2007
90+ DELQ at 2 Year (%)	6.01	11.69	23.74	29.55
90+ DELQ as of Dec.2008 (%)	9.72	16.69	23.75	17.84
S_U_UNAFFL	35.80%	35.74%	32.03%	33.12%
S_U_AFFL	63.99%	63.27%	66.47%	66.37%
AFFL_TYPE1	42.34%	38.23%	40.85%	37.39%
AFFL_TYPE2	15.42%	19.40%	23.54%	24.97%
O_S_UNAFFL	63.94%	74.22%	48.22%	34.72%
O_S_AFFL	33.50%	39.84%	23.56%	25.09%
O_S_AFFL_PCT	45.63%	47.91%	47.91%	42.39%
HHI_O	0.79	0.82	0.67	0.66
Amount (x \$Billions)	0.76	0.88	0.88	0.82
CLTV (%)	75.75	76.43	77.68	76.47
Rate (%)	6.09	6.12	6.96	6.86
FICO	687.65	688.66	682.38	696.55
ALT_A%	33.55	42.11	42.91	48.25
Subprime%	37.27	37.92	43	30.58
IO%	26.45	36.79	35	41.48
ARM%	59.25	61.98	60.68	56.55
NEGAM%	3.15	8.1	10.68	12.65
LOW/NO-DOC%	45.35	52.99	60.99	63.24
Balloon%	1.77	2.53	12.16	12.11
Prepayment penalty (%)	35.39	39.95	45.84	38.01
Purchase loan (%)	44.73	48.17	48.66	40.89
Silent second (%)	16.19	23.7	29.42	28.16
Single family (%)	70.45	68.43	67.46	68.07
Owner occupied (%)	87.97	87.52	87.3	87.19
Multi-underwriter (d)	0.16	0.14	0.06	0.13
Number of deals	947	1,206	1,202	797

Table 3: Univariate deal-level summary statistics, all and by sponsor-underwriter affiliation

This table presents deal-level summary statistics. We present summary statistics for the overall sample and by sponsor-underwriter affiliation. Variables are defined in Appendix A and Table 1A.

	All (N=4113)			Affiliated (N=2694)			Unaffiliated (N=1419)		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
Vintage									
2004 (d)	22.81%	--	--	21.77%	--	--	23.89%	--	--
2005 (d)	29.05%	--	--	27.66%	--	--	30.37%	--	--
2006 (d)	28.95%	--	--	30.80%	--	--	27.13%	--	--
2007 (d)	19.20%	--	--	19.78%	--	--	18.60%	--	--
Performance and house price									
90+ delinquency rate (%)	17.41	14.43	13.96	19.47	17.02	14.40	14.42	11.67	12.36
House price change (%)	-13.05	-15.73	11.85	-13.47	-16.42	12.30	-12.90	-14.92	10.69
Deal characteristics									
CLTV (%)	76.64	75.71	7.36	77.36	76.58	7.30	75.28	74.43	6.86
FICO	688.14	706.00	47.58	683.94	703.00	47.20	694.37	710.00	47.57
DTI (%)	38.62	39.00	3.45	38.74	39.00	3.45	38.30	39.00	3.40
Amount (x\$Billions)	0.84	0.70	0.60	0.85	0.73	0.55	0.83	0.66	0.67
Rate (%)	6.50	6.67	1.85	6.62	6.80	1.91	6.28	6.49	1.71
ALT_A%	41.53	0.00	48.68	41.13	0.00	48.39	43.94	0.00	49.37
Subprime%	37.86	0.00	48.44	41.86	0.00	49.30	30.30	0.00	45.85
IO%	34.78	24.09	32.89	34.78	24.22	32.43	35.89	24.77	34.00
ARM%	59.95	79.45	42.33	62.12	80.16	41.33	58.05	78.75	43.54
NEGAM%	8.57	0.00	27.50	8.91	0.00	28.05	8.29	0.00	27.01
LOW/NO-DOC%	55.46	55.53	23.48	56.48	56.16	23.24	54.51	54.57	23.46
Balloon%	6.97	0.00	16.42	7.17	0.00	16.16	6.76	0.00	17.13
Prepayment penalty (%)	40.23	38.36	32.99	40.70	38.39	32.49	39.63	39.14	33.65
Purchase loan (%)	46.13	46.09	16.93	47.04	46.93	16.25	44.90	44.36	18.15
Silent second (%)	24.49	24.53	20.00	24.56	24.42	20.79	24.80	25.09	18.90
Single family (%)	68.54	68.13	10.20	67.83	67.89	9.53	69.56	68.54	11.25
Owner occupied (%)	87.50	90.75	10.55	86.90	90.65	11.71	88.62	91.14	8.29

Table 4: Sponsor and underwriter affiliation and deal performance

Dep Var = 90+ DELQ after 2 Years

Explanatory Variables	(1)	(2)	(3)	(4)
S_U_AFFL	3.046*** (0.567)	2.686*** (0.485)	2.647*** (0.359)	1.420*** (0.517)
CLTV	0.176*** (0.0495)	0.120* (0.0714)	0.112* (0.0637)	0.109 (0.0707)
FICO	-0.226*** (0.00813)	-0.221*** (0.0137)	-0.220*** (0.0175)	-0.218*** (0.0156)
Amount	-0.281 (0.583)	-0.512 (0.511)	-0.557 (0.469)	-0.513 (0.583)
Rate	-1.464*** (0.197)	-0.156 (0.344)	-0.178 (0.293)	-0.0409 (0.316)
HPI	-0.164*** (0.0326)	-0.115*** (0.0272)	-0.118*** (0.0297)	-0.111*** (0.0304)
ALT_A%		2.946*** (0.861)	2.692*** (0.501)	2.629*** (0.928)
Subprime%		-2.053 (2.073)	-2.492 (1.617)	-2.570 (2.217)
IO%		-1.413 (1.311)	-2.114* (1.092)	-2.428* (1.383)
ARM%		7.607*** (1.149)	7.795*** (1.051)	7.836*** (1.306)
NEGAM%		-0.216 (2.019)	-0.584 (1.698)	-0.380 (1.878)
LOW/NO-DOC%		-0.634 (0.829)	-0.726 (0.919)	-0.575 (0.859)
Balloon%		0.103 (1.424)	0.0393 (1.063)	0.0170 (1.457)
Prepayment penalty (%)		-0.919 (0.664)	-1.218* (0.616)	-1.856** (0.726)
Purchase loan (%)		3.162*** (1.140)	2.811** (1.126)	1.856 (1.175)
Silent second (%)		-0.488 (0.887)	-0.640 (0.982)	-0.684 (0.931)
Single family (%)		2.254 (1.819)	2.438 (2.176)	2.640 (2.030)
Owner occupied (%)		-3.397* (1.795)	-2.944 (2.037)	-2.062 (2.183)
Vintage FE	Y	Y	Y	Y
Underwriter FE	N	N	Y	N
Sponsor FE	N	N	N	Y
N(Observations)	3,932	3,904	3,842	3,904
R ²	0.767	0.797	0.802	0.820

R²

This table reports deal performance, measured as default rates 2 years after its origination year, as a function of sponsor-underwriter affiliation variables and other control variables. Variables are defined in Appendix A and Table 1A. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Propensity score analysis

Panel A: Logistic regression (Dep Var: S_U_AFFL)	
CLTV	-0.036*** (0.012)
FICO	0.005* (0.003)
Amount	-0.227*** (0.078)
Rate	0.482*** (0.089)
HPI	0.009 (0.006)
ALT_A%	0.317* (0.168)
Subprime%	1.185*** (0.349)
IO%	0.608** (0.276)
ARM%	0.545*** (0.204)
NEGAM%	3.363*** (0.506)
LOW/NO-DOC%	0.801*** (3.7)
Balloon%	-0.794** (0.317)
Prepayment penalty (%)	0.731*** (0.170)
Purchase loan (%)	0.255 (0.333)
Silent second (%)	-0.767*** (0.268)
Single family (%)	-2.022*** (0.581)
Owner occupied (%)	-1.338*** (0.515)
Vintage FE	Yes
N(Observations)	3646
Pseudo R-sqrd	0.2949

Panel B: Treatment effects			
perf_Q4_2yrs	Treated	Controls	Difference
Unmatched sample	19.325	14.734	4.592*** (0.576)
Matched sample, ATT	19.103	15.703	3.4*** (1.291)
Assignment	Off support	On support	Total
Untreated	1	1,043	1,044
Treated	569	2,033	2,602
Total	570	3,076	3,646

Note: We use psmatch2 command in Stata. The matching method is the nearest neighbor match. Rating variables are included in the logit regression.

Table 6: IV estimator

Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Stage 1 S_U_AFFL	Stage 2 perf_Q4_2yrs	Stage 1 S_U_AFFL	Stage 2 perf_Q4_2yrs	Stage 1 S_U_AFFL	Stage 2 perf_Q4_2yrs
Sponsor_pct_s_u_affl (IV)	0.962*** (0.0382)		0.975*** (0.0268)		0.909*** (0.107)	
S_U_AFFL		2.728*** (0.767)		2.110** (0.837)		3.334*** (0.746)
CLTV	0.00227* (0.00114)	0.168** (0.0739)	-0.00606*** (0.00145)	-0.0365 (0.0474)	0.000668 (0.00280)	-0.0396 (0.0464)
FICO	-0.00107 (0.000753)	-0.232*** (0.00800)	0.000537* (0.000285)	-0.200*** (0.00981)	0.00182** (0.000873)	-0.199*** (0.0126)
Amount	-0.00821 (0.0157)	-1.998*** (0.582)	-0.0276 (0.0190)	-1.850*** (0.517)	0.000162 (0.00746)	-1.895*** (0.313)
Rate	0.00964 (0.0176)	-1.741*** (0.304)	0.0862*** (0.00846)	0.873 (1.124)	0.0243 (0.0223)	0.975** (0.461)
HPI	0.000488 (0.000793)	-0.0997*** (0.0358)	0.00100 (0.000837)	-0.0741** (0.0292)	-0.000546 (0.00101)	-0.0685*** (0.0200)
ALT_A%			-0.0606 (0.0577)	2.612** (1.018)	-0.0344 (0.0209)	2.649*** (0.506)
Subprime%			0.141*** (0.0465)	-0.976 (3.034)	0.0914 (0.103)	-1.269 (1.524)
IO%			0.0854 (0.0621)	-2.221 (1.721)	-0.0764* (0.0401)	-2.797*** (1.005)
ARM%			0.0589 (0.0357)	7.659*** (1.451)	0.0544* (0.0269)	8.332*** (0.716)
NEGAM%			0.478*** (0.129)	5.695 (5.409)	0.0337 (0.151)	5.360** (2.412)
LOW/NO-DOC%			0.0337 (0.0231)	1.168 (1.235)	-0.0355 (0.0458)	1.126 (0.823)
Balloon%			-0.186 (0.121)	-1.159 (3.238)	-0.141** (0.0500)	-0.591 (1.323)
Prepayment penalty (%)			0.0384 (0.0779)	-0.722 (0.791)	-0.00493 (0.0241)	-0.770 (0.624)
Purchase loan (%)			0.0789 (0.0711)	1.451 (2.176)	0.0668 (0.0600)	1.529 (1.290)
Silent second (%)			-0.0937 (0.0623)	0.341 (1.675)	-0.0394 (0.0561)	-0.134 (1.035)
Single family (%)			0.0789 (0.102)	3.809* (2.104)	0.388*** (0.0667)	3.740* (2.166)
Owner occupied (%)			-0.217** (0.0899)	-4.039** (1.999)	-0.293*** (0.0716)	-3.906** (1.550)
Vintage FE	Yes	Yes	Yes	Yes	Yes	Yes
Underwriter FE	No	No	No	No	Yes	Yes
Sponsor FE	No	No	No	No	No	No
Observations	1,733	1,624	1,705	1,596	1,689	1,582
R-squared	0.434	0.784	0.458	0.817	0.706	0.820

This table reports IV estimator of deal performance, measured as default rates 2 years after its close year, as a function of sponsor-underwriter affiliation variables. Variables are defined in Appendix A and Table 1A. The instrument variable is a sponsor-level variable -- percent of deals prior to the deal close-year that involve affiliated sponsor-underwriter (Sponsor_pct_s_u_affl). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 7A: Sponsor and underwriter affiliation, originator and sponsor affiliation, and deal performance

Dep Var = 90+ DELQ after 2 Years								
Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
O_S_AFFL	-2.284*** (0.320)	-1.365*** (0.345)	-2.052*** (0.306)	-1.191*** (0.326)	-2.044*** (0.665)	-0.958 (0.769)	-0.535 (1.006)	-0.520 (1.004)
S_U_AFFL		2.475*** (0.302)		2.304*** (0.286)		2.339*** (0.447)		1.329** (0.649)
HHI_O	-0.00779 (0.0117)	-0.00844 (0.0117)	-0.0120 (0.0113)	-0.0128 (0.0115)	-0.0151 (0.00947)	-0.0159 (0.00960)	-0.0170 (0.0106)	-0.0172 (0.0108)
CLTV	0.187*** (0.0318)	0.175*** (0.0312)	0.126*** (0.0385)	0.124*** (0.0376)	0.120* (0.0675)	0.119* (0.0653)	0.120 (0.0821)	0.122 (0.0811)
FICO	-0.227*** (0.00443)	-0.229*** (0.00437)	-0.216*** (0.00940)	-0.220*** (0.00935)	-0.217*** (0.0214)	-0.221*** (0.0202)	-0.222*** (0.0174)	-0.222*** (0.0175)
Amount	-0.436* (0.239)	-0.424* (0.239)	-0.418* (0.228)	-0.435* (0.230)	-0.461 (0.427)	-0.462 (0.431)	-0.535 (0.531)	-0.519 (0.528)
Rate	-1.346*** (0.0967)	-1.375*** (0.0973)	-0.140 (0.211)	-0.215 (0.210)	-0.164 (0.290)	-0.254 (0.281)	-0.116 (0.359)	-0.138 (0.355)
HPI	-0.255*** (0.0282)	-0.255*** (0.0280)	-0.184*** (0.0264)	-0.186*** (0.0263)	-0.191*** (0.0376)	-0.192*** (0.0387)	-0.172*** (0.0387)	-0.173*** (0.0387)
ALT_A%			3.786*** (0.475)	3.626*** (0.472)	3.516*** (0.487)	3.357*** (0.490)	3.204*** (1.144)	3.260*** (1.096)
Subprime%			-1.027 (1.218)	-1.364 (1.201)	-1.657 (1.650)	-1.887 (1.597)	-1.856 (2.185)	-1.897 (2.187)
IO%			-1.490* (0.798)	-1.400* (0.794)	-2.215 (1.476)	-2.037 (1.327)	-2.066 (1.623)	-2.094 (1.630)
ARM%			7.435*** (0.573)	7.439*** (0.572)	7.601*** (1.079)	7.612*** (1.054)	7.716*** (1.331)	7.667*** (1.335)
NEGAM%			-0.826 (1.086)	-1.059 (1.067)	-1.197 (1.643)	-1.371 (1.476)	-0.798 (1.926)	-0.899 (1.890)
LOW/NO-DOC%			-0.143 (0.642)	-0.158 (0.636)	-0.383 (0.947)	-0.272 (0.945)	-0.0519 (0.924)	-0.0443 (0.920)
Balloon%			-0.135 (0.992)	0.247 (0.984)	0.00114 (1.135)	0.275 (1.091)	0.254 (1.350)	0.333 (1.299)
Prepayment penalty (%)			-0.773 (0.477)	-0.751 (0.477)	-1.017* (0.594)	-1.031* (0.601)	-1.562** (0.734)	-1.594** (0.709)
Purchase loan (%)			3.913*** (0.999)	3.725*** (0.984)	3.653*** (1.243)	3.391** (1.237)	2.420* (1.265)	2.347* (1.234)
Silent second (%)			-0.871 (0.733)	-0.698 (0.726)	-0.900 (1.048)	-0.774 (0.990)	-0.926 (0.947)	-0.874 (0.925)
Single family (%)			2.206 (1.656)	2.599 (1.660)	2.606 (2.128)	2.811 (2.201)	2.339 (2.014)	2.363 (2.019)
Owner occupied (%)			-3.285** (1.369)	-2.921** (1.353)	-2.734 (1.905)	-2.454 (1.896)	-1.753 (2.270)	-1.620 (2.234)
Vintage FE	Y	Y	Y	Y	Y	Y	Y	Y
Underwriter FE	N	N	N	N	Y	Y	N	N
Sponsor FE	N	N	N	N	N	N	Y	Y
N(Observations)	3,203	3,203	3,176	3,176	3,123	3,123	3,176	3,176
R ²	0.759	0.764	0.790	0.793	0.795	0.799	0.817	0.817

This table reports deal performance, measured as default rates 2 years after its close year, as a function of sponsor-underwriter affiliation variables and other control variables, in particular including the affiliation variables between the originators and the sponsor. Variables are defined in Appendix A and Table 1A. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 7B: Sponsor and underwriter affiliation, originator and sponsor affiliation, and deal performance using percentage of loan contributed by the affiliated originator
 Dep Var = 90+ DELQ after 2 Years

Explanatory Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
O_S_AFFL_PCT	-2.217*** (0.334)	-1.162*** (0.370)	-1.880*** (0.313)	-0.851** (0.344)	-1.768** (0.813)	-0.447 (1.005)	-0.00321 (1.325)	0.0511 (1.296)
S_U_AFFL		2.414*** (0.311)		2.323*** (0.298)		2.504*** (0.524)		1.343*** (0.662)
HHI_O	-0.00448 (0.0116)	-0.00623 (0.0116)	-0.00892 (0.0111)	-0.0108 (0.0114)	-0.0122 (0.0101)	-0.0143 (0.00951)	-0.0162 (0.0104)	-0.0163 (0.0105)
CLTV	0.175*** (0.0323)	0.168*** (0.0317)	0.114*** (0.0391)	0.119*** (0.0381)	0.112 (0.0705)	0.117* (0.0674)	0.125 (0.0812)	0.126 (0.0802)
FICO	-0.231*** (0.00442)	-0.232*** (0.00435)	-0.218*** (0.00948)	-0.222*** (0.00945)	-0.219*** (0.0211)	-0.224*** (0.0199)	-0.223*** (0.0175)	-0.223*** (0.0176)
Amount	-0.479** (0.242)	-0.461* (0.240)	-0.456** (0.229)	-0.470** (0.231)	-0.490 (0.428)	-0.492 (0.436)	-0.537 (0.540)	-0.521 (0.539)
Rate	-1.354*** (0.0965)	-1.383*** (0.0971)	-0.166 (0.210)	-0.239 (0.210)	-0.190 (0.277)	-0.287 (0.271)	-0.152 (0.355)	-0.174 (0.351)
HPI	-0.255*** (0.0284)	-0.253*** (0.0282)	-0.184*** (0.0266)	-0.184*** (0.0265)	-0.189*** (0.0378)	-0.189*** (0.0384)	-0.171*** (0.0390)	-0.171*** (0.0390)
ALT_A%			3.738*** (0.477)	3.578*** (0.474)	3.486*** (0.503)	3.308*** (0.506)	3.148*** (1.147)	3.204*** (1.102)
Subprime%			-0.668 (1.219)	-1.123 (1.205)	-1.323 (1.707)	-1.697 (1.640)	-1.836 (2.178)	-1.878 (2.177)
IO%			-1.431* (0.801)	-1.313* (0.798)	-2.120 (1.489)	-1.906 (1.347)	-2.051 (1.655)	-2.076 (1.659)
ARM%			7.343*** (0.574)	7.363*** (0.574)	7.542*** (1.096)	7.542*** (1.086)	7.697*** (1.402)	7.644*** (1.406)
NEGAM%			-0.695 (1.091)	-0.937 (1.073)	-1.065 (1.596)	-1.263 (1.443)	-0.818 (1.881)	-0.918 (1.846)
LOW/NO-DOC%			0.0682 (0.644)	0.00924 (0.638)	-0.194 (0.968)	-0.114 (0.957)	0.0280 (0.934)	0.0387 (0.928)
Balloon%			-0.242 (1.002)	0.210 (0.989)	-0.0915 (1.168)	0.270 (1.112)	0.294 (1.359)	0.377 (1.307)
Prepayment penalty (%)			-0.837* (0.479)	-0.798* (0.479)	-1.068* (0.602)	-1.078* (0.612)	-1.650** (0.737)	-1.685** (0.710)
Purchase loan (%)			4.130*** (1.005)	3.903*** (0.988)	3.938*** (1.267)	3.549*** (1.256)	2.456* (1.300)	2.379* (1.270)
Silent second (%)			-1.043 (0.737)	-0.782 (0.731)	-1.038 (1.049)	-0.798 (0.985)	-0.900 (0.929)	-0.845 (0.906)
Single family (%)			1.988 (1.666)	2.488 (1.671)	2.375 (2.111)	2.717 (2.181)	2.429 (2.014)	2.455 (2.020)
Owner occupied (%)			-2.866** (1.390)	-2.702** (1.367)	-2.383 (1.958)	-2.288 (1.874)	-1.728 (2.294)	-1.593 (2.258)
Vintage FE	Y	Y	Y	Y	Y	Y	Y	Y
Underwriter FE	N	N	N	N	Y	Y	N	N
Sponsor FE	N	N	N	N	N	N	Y	Y
N(Observations)	3,191	3,191	3,164	3,164	3,111	3,111	3,164	3,164
R ²	0.760	0.764	0.789	0.793	0.795	0.798	0.817	0.817

This table reports deal performance, measured as default rates 2 years after its deal close year, as a function of sponsor-underwriter affiliation variables and other control variables, in particular the the percent of loans contributed by affiliated originators. Variables are defined in Appendix A and Table 1A. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Sponsor and underwriter affiliation and deal performance, adding parent rating

Dep Var = 90+ DELQ after 2 Year

Explanatory Variables	(1)	(2)	(3)	(4)	(5)
S_U_AFFL	3.095*** (0.253)	3.046*** (0.244)	2.686*** (0.233)	2.647*** (0.359)	1.420*** (0.517)
CLTV	0.0135 (0.0277)	0.176*** (0.0259)	0.120*** (0.0313)	0.112* (0.0637)	0.109 (0.0707)
FICO	-0.212*** (0.00367)	-0.226*** (0.00374)	-0.221*** (0.00806)	-0.220*** (0.0175)	-0.218*** (0.0156)
Amount		-0.281 (0.224)	-0.512** (0.211)	-0.557 (0.469)	-0.513 (0.583)
Rate		-1.464*** (0.0860)	-0.156 (0.186)	-0.178 (0.293)	-0.0409 (0.316)
HPI	-0.238*** (0.0215)	-0.164*** (0.0205)	-0.115*** (0.0193)	-0.118*** (0.0297)	-0.111*** (0.0304)
ALT_A%			2.946*** (0.402)	2.692*** (0.501)	2.629*** (0.928)
Subprime%			-2.053** (1.031)	-2.492 (1.617)	-2.570 (2.217)
IO%			-1.413** (0.695)	-2.114* (1.092)	-2.428* (1.383)
ARM%			7.607*** (0.501)	7.795*** (1.051)	7.836*** (1.306)
NEGAM%			-0.216 (0.960)	-0.584 (1.698)	-0.380 (1.878)
doc_low_no			-0.634 (0.566)	-0.726 (0.919)	-0.575 (0.859)
Balloon%			0.103 (0.917)	0.0393 (1.063)	0.0170 (1.457)
Prepayment penalty (%)			-0.919** (0.418)	-1.218* (0.616)	-1.856** (0.726)
Purchase loan (%)			3.162*** (0.863)	2.811** (1.126)	1.856 (1.175)
Silent second (%)			-0.488 (0.651)	-0.640 (0.982)	-0.684 (0.931)
Single family (%)			2.254 (1.502)	2.438 (2.176)	2.640 (2.030)
Owner occupied (%)			-3.397*** (1.166)	-2.944 (2.037)	-2.062 (2.183)
Vintage dummies	Y	Y	Y	Y	Y
Parent rating variables	Y	Y	Y	Y	Y
Underwriter FE	N	N	N	Y	N
Sponsor FE	N	N	N	N	Y
Observations	3,932	3,932	3,904	3,842	3,904
R-squared	0.751	0.767	0.797	0.802	0.820

This table reports deal performance, measured as default rates 2 years after its deal close year, as a function of sponsor-underwriter affiliation variables, other control variables, and the credit rating of the parent company of the sponsor (obtained from Bloomberg). Variables are defined in Appendix A and Table 1A. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Sponsor and underwriter affiliation and deal performance, by low versus full doc

Dep Var = 90+ DELQ after 2 Years

Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Low-doc	High-doc	Low-doc	High-doc	Low-doc	High-doc	Low-doc	High-doc
S_U_AFFL	3.035*** (0.629)	2.844*** (0.790)	2.854*** (0.562)	2.570*** (0.651)	2.614*** (0.302)	2.458*** (0.478)	1.609** (0.801)	1.822 (1.179)
CLTV	0.112* (0.0604)	0.204*** (0.0547)	0.121 (0.0767)	0.0848 (0.0725)	0.127 (0.0777)	0.0620 (0.0657)	0.0803 (0.0807)	0.0796 (0.0742)
FICO	-0.271*** (0.0122)	-0.197*** (0.00819)	-0.281*** (0.0156)	-0.174*** (0.0240)	-0.277*** (0.0170)	-0.175*** (0.0263)	-0.285*** (0.0136)	-0.174*** (0.0275)
Amount	-0.217 (0.546)	0.00177 (0.583)	-0.384 (0.380)	-0.447 (0.542)	-0.418 (0.382)	-0.352 (0.473)	-0.556 (0.411)	-0.278 (0.622)
Rate	-1.469*** (0.172)	-1.272*** (0.300)	-0.349 (0.387)	0.0633 (0.336)	-0.318 (0.385)	0.0819 (0.294)	-0.00662 (0.386)	-0.00187 (0.264)
HPI	-0.247*** (0.0361)	-0.120*** (0.0323)	-0.193*** (0.0325)	-0.0783** (0.0311)	-0.197*** (0.0312)	-0.0825** (0.0358)	-0.172*** (0.0348)	-0.0790** (0.0350)
ALT_A%			2.923*** (0.852)	2.909** (1.116)	2.663*** (0.460)	2.821*** (0.846)	2.411** (0.985)	2.238* (1.146)
Subprime%			-4.938** (2.236)	0.958 (2.570)	-5.585*** (1.492)	0.743 (2.301)	-5.648** (2.292)	0.294 (2.908)
IO%			-2.047 (1.398)	-0.489 (1.728)	-2.779* (1.617)	-0.916 (1.427)	-2.317* (1.314)	-1.582 (1.845)
ARM%			7.245*** (0.940)	7.906*** (1.273)	7.657*** (1.020)	7.917*** (1.223)	7.756*** (1.115)	7.417*** (1.308)
NEGAM%			-1.453 (2.279)	-0.0332 (2.346)	-1.454 (1.973)	-0.431 (2.057)	0.0569 (2.071)	-1.394 (2.527)
LOW/NO-DOC%			-3.905* (2.205)	-1.043 (1.488)	-3.168 (2.389)	-1.678 (1.672)	-2.876 (2.239)	-0.839 (1.785)
Balloon%			-0.100 (1.484)	-0.296 (2.026)	0.483 (1.388)	-0.889 (1.303)	0.537 (1.367)	-1.340 (2.102)
PP penalty (%)			0.0712 (0.819)	-1.331 (0.987)	-0.313 (0.800)	-1.614 (0.956)	-0.663 (0.995)	-2.948*** (1.036)
Purchase loan (%)			0.680 (1.538)	4.409** (1.836)	0.250 (1.547)	3.815** (1.654)	-0.638 (1.704)	3.098 (1.923)
Silent second (%)			-2.272** (0.918)	0.694 (1.339)	-2.398*** (0.805)	0.687 (1.494)	-1.743* (0.977)	0.489 (1.484)
Single family (%)			2.673 (2.405)	1.860 (2.375)	4.342 (2.678)	1.744 (2.648)	3.573 (2.683)	2.972 (2.792)
Owner occupied (%)			-3.704* (1.864)	-2.346 (2.759)	-3.214 (1.971)	-1.755 (2.651)	-2.429 (2.345)	-0.755 (3.096)
Vintage FE	Y	Y	Y	Y	Y	Y	Y	Y
Underwriter FE	N	N	N	N	Y	Y	N	N
Sponsor FE	N	N	N	N	N	N	Y	Y
Observations	2,023	1,909	1,995	1,909	1,969	1,873	1,995	1,909
R-squared	0.794	0.757	0.824	0.789	0.831	0.798	0.849	0.820

This table reports deal performance, measured as default rates 2 years after its deal close year, as a function of sponsor-underwriter affiliation variables and other control variables in sub-samples. Low-doc (High-doc) refers to the subsample in which deals' percent of low-doc loans is higher (lower) than the sample median. Robust standard errors in parentheses. Variables are defined in Appendix A and Table 1A. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 10A: Deal structure as a function of sponsor-underwriter affiliation

Dep var: Pct_subordinated

Explanatory Variables	(1)	(2)	(3)	(4)	(5)
S_U_AFFL	1.232** (0.532)	1.226** (0.537)	1.262** (0.548)	1.264** (0.466)	1.817*** (0.580)
CLTV	0.0775 (0.0812)	0.0881 (0.0687)	0.0184 (0.0403)	0.0477 (0.0366)	0.0873* (0.0486)
FICO	1.46e-05 (0.0137)	-0.00137 (0.0149)	0.000520 (0.0266)	0.000269 (0.0269)	-0.00249 (0.0303)
Amount		-0.0747 (0.260)	-0.0389 (0.271)	-0.00769 (0.174)	0.0896 (0.229)
Rate		-0.113 (0.216)	0.611 (0.584)	0.469 (0.510)	0.374 (0.527)
HPI	-0.0395 (0.0285)	-0.0349 (0.0231)	-0.0284 (0.0250)	-0.0144 (0.0253)	-0.00991 (0.0289)
ALT_A%			0.786 (0.761)	1.041 (0.713)	1.078 (0.771)
Subprime%			-0.0122 (2.016)	0.198 (1.886)	-0.0455 (2.221)
IO%			0.166 (0.665)	0.415 (0.758)	0.724 (0.545)
ARM%			0.611 (0.558)	0.438 (0.665)	0.155 (0.531)
NEGAM%			3.537 (2.277)	3.545** (1.714)	3.200 (2.447)
LOW/NO-DOC%			-0.304 (0.599)	-0.212 (0.460)	-0.627 (0.530)
Balloon%			1.016 (0.804)	0.776 (0.936)	0.682 (1.201)
Prepayment penalty (%)			-0.284 (0.542)	-0.639 (0.575)	-0.459 (0.500)
Purchase loan (%)			0.592 (1.152)	0.880 (0.945)	0.230 (1.190)
Silent second (%)			0.233 (1.059)	0.168 (0.950)	0.0750 (0.750)
Single family (%)			-1.519 (1.803)	-0.457 (1.522)	-1.407 (1.976)
Owner occupied (%)			2.561 (1.554)	1.528 (1.595)	1.098 (1.162)
Vintage FE	Y	Y	Y	Y	Y
Underwriter FE	N	N	N	Y	N
Sponsor FE	N	N	N	N	Y
N(Observations)	2,801	2,801	2,797	2,741	2,797
R ²	0.021	0.021	0.029	0.071	0.118

This table reports deal structure, in particular, the percent of deal amount that is put into subordinated tranches, as a function of sponsor-underwriter affiliation variables and other control variables. Variables are defined in Appendix A and Table 1A. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 10B: Deal pricing as a function of sponsor-underwriter affiliation

Dep var: Yield Spread

Explanatory Variables	(1)	(2)	(3)	(4)	(5)
vi_all	-0.00614 (0.171)	-0.0324 (0.160)	0.0386 (0.0598)	0.0401 (0.0250)	0.0931*** (0.0315)
CLTV	0.102*** (0.00972)	0.105*** (0.0103)	0.0829*** (0.00593)	0.0828*** (0.00646)	0.0874*** (0.00630)
FICO	-0.0116*** (0.00154)	-0.0103*** (0.00136)	-0.00350** (0.00157)	-0.00374** (0.00162)	-0.00326* (0.00175)
Amount	-0.611*** (0.129)	-0.487*** (0.108)	-0.0821* (0.0458)	-0.0726* (0.0382)	-0.0882** (0.0426)
HPI		0.0475*** (0.00662)	0.00918*** (0.00286)	0.00835*** (0.00290)	0.00968*** (0.00290)
ALT_A%			0.133* (0.0734)	0.113** (0.0459)	0.0622 (0.0754)
Subprime%			1.044*** (0.212)	1.023*** (0.159)	0.979*** (0.221)
IO%			0.375 (0.230)	0.382* (0.201)	0.436* (0.234)
ARM%			-0.988*** (0.171)	-1.010*** (0.139)	-1.013*** (0.166)
NEGAM%			-3.634*** (0.243)	-3.599*** (0.237)	-3.512*** (0.251)
LOW/NO-DOC%			0.0216 (0.0953)	0.0346 (0.0889)	-0.0250 (0.0844)
Balloon%			-0.0740 (0.120)	-0.0919 (0.120)	-0.0467 (0.131)
Prepayment penalty (%)			-0.161*** (0.0454)	-0.165*** (0.0416)	-0.210*** (0.0335)
Purchase loan (%)			-0.0748 (0.123)	-0.115 (0.0885)	-0.119 (0.0930)
Silent second (%)			-0.0231 (0.0851)	-0.0297 (0.0775)	0.0113 (0.0825)
Single family (%)			0.142 (0.167)	0.203 (0.126)	0.217 (0.144)
Owner occupied (%)			-0.00634 (0.174)	-0.0182 (0.197)	-0.0293 (0.177)
Vintage FE	Y	Y	Y	Y	Y
Underwriter FE	N	N	N	Y	N
Sponsor FE	N	N	N	N	Y
N(Observations)	4,085	4,085	4,057	3,992	4,057
R ²	0.416	0.462	0.867	0.870	0.881

This table reports Yield Spread, which is the deal weighted average coupon rate (in percentage) minus the monthly yield on the 10-year Treasury bond, as a function of sponsor-underwriter affiliation variables and other control variables. Variables are defined in Appendix A and Table 1A. Robust standard errors are in parentheses. *** p<0.01. ** p<0.05. * p<0.1.

Table 11: Robustness checks

Dep Var: 90+ DELQ rate in 2 yrs

Explanatory Variables	(1)	(2)	(3)
S_U_AFFL	2.846*** (0.526)	2.597*** (0.487)	2.578*** (0.382)
CLTV	0.162*** (0.0401)	0.118* (0.0669)	0.108* (0.0597)
FICO	-0.213*** (0.00799)	-0.211*** (0.0127)	-0.210*** (0.0156)
DTI_expand	0.396*** (0.110)	0.488*** (0.124)	0.474*** (0.0980)
DTI_missing	-1.955*** (0.518)	-1.218** (0.496)	-0.875 (0.680)
Amount	-0.303 (0.556)	-0.476 (0.482)	-0.527 (0.447)
Rate	-1.610*** (0.193)	-0.267 (0.349)	-0.270 (0.287)
HPI	-0.145*** (0.0294)	-0.0964*** (0.0243)	-0.0998*** (0.0270)
ALT_A%		2.923*** (0.877)	2.697*** (0.474)
Subprime%		-2.570 (2.009)	-2.823* (1.470)
IO%		-1.183 (1.241)	-1.836* (1.030)
ARM%		7.463*** (1.027)	7.753*** (0.975)
NEGAM%		0.349 (2.050)	0.0381 (1.668)
LOW/NO-DOC%		-0.638 (0.841)	-0.644 (0.951)
Balloon%		-0.0785 (1.470)	-0.0541 (1.110)
Prepayment penalty (%)		-1.104 (0.707)	-1.262** (0.617)
Purchase loan (%)		2.636** (1.161)	2.435** (1.095)
Silent second (%)		-0.625 (0.873)	-0.787 (0.996)
Single family (%)		2.146 (1.824)	2.418 (2.266)
Owner occupied (%)		-3.301** (1.620)	-3.151* (1.837)
Observations	3,932	3,904	3,842
R-squared	0.771	0.801	0.806

The first three columns include DTI (debt-to-income) information. DTI_expand is equal to the original DTI except that those with missing values takes the value of the median DTI value.

DTI_missing takes the value of 1 if the DTI is missing. Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.