Reputation and Competition in the Credit Ratings Market - Evidence from Commercial Mortgage-Backed Securities

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ABSTRACT. We examine a quasi-experimental setting where a rating agency (S&P) is completely shut out of a large segment of the commercial mortgage-backed securities market for more than one year, following a procedural mistake. We exploit the fact that many tranches of CMBS deals have multiple ratings. Subsequent to the drop in its business volume (but not before), S&P assigned higher ratings than other raters, in particular for large deals and for deals from important issuers. The results suggest that issuing optimistic ratings is a strategy that can be used by a rating agency with a weak reputation to gain market share in a market with strong competition.

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I.   Introduction

"The decision by Standard & Poor's to change the calculation of a key credit metric has left some investors accusing the agency of watering down standards […]. […] '(This) just screams to me that they have to buy market share,' said Nilesh Patel, a managing director at Prima Capital Advisors, an investment firm specializing in high-quality CMBS." ("S&P criticized over changes to CMBS ratings standards" by Adam Tempkin, Reuters, October 5, 2012.)

"These proceedings involve misconduct by S&P in 2012 concerning its criteria for rating conduit/fusion Commercial Mortgage Backed Securities ("CF CMBS") and related research. After being frozen out of the market for rating CF CMBS in late 2011, S&P sought to re-enter the market in 2012 by publishing new ratings criteria […]." (Securities and Exchange Commission, 2015, "In the Matter of Standard & Poor's Rating Services", Administrative Proceeding File No.: 3-16346.)

Credit ratings exist to help investors judge risks in fixed income markets. However, rating agencies derive most of their revenues not from investors who use the ratings, but from the issuers that are rated. The conflict of interest inherent in this situation has been (partially) contained, because credit ratings have been found to be useful in a range of settings for a long time, including in investment mandates, loan pricing, in financial regulations, and in other contracts (see, e.g., White 2010). A standard view is that the key mechanism containing conflicts of interest in this setting is reputations: if a rating agency is found out to have provided low quality ratings, it may lose out on future business and profits, and this provides an incentive to produce high quality ratings.[1]

To understand exactly how reputations underpin credit ratings, the market structure facing rating agencies is important. In particular, the value of reputations is influenced by the competition producers face, through several channels. High competition generates price

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[1] Bolton, Freixas, and Shapiro (2012), Bouvard and Levy (2013), and Mathis, McAndrews, and Rochet (2009) develop theories of reputational concerns in ratings. We discuss related empirical literature in detail below. Throughout, we refer to raters' reputations in the sense of being considered a reliable source of credit risk information. We do not consider the possibility of having different reputations vis-à-vis different third parties (Frenkel 2015), or multi-dimensional reputations.

pressure and thereby reduces rents, which limits the value of maintaining a good reputation (Klein and Leffler 1981). Alternatively, a lack of (potential) competitors means that buyers of a service have nowhere else to turn, reducing the penalty that follows a ruined reputation (Holmström 1999 and Hörner 2002). This may be especially important for services that are necessary to the buyers (have few substitutes), like credit ratings. Thus, different mechanisms may result in poor quality both if competition is too high and if it is too low.[2]

Given the key role of reputation in the credit ratings market, and the theoretical ambiguity about whether competition is detrimental or beneficial for reputational incentives in this market, empirical evidence is particularly desirable. Prior findings on competition and ratings quality are somewhat mixed. Becker and Milbourn (2011) find that corporate bond ratings, largely used by institutional investors, became inflated and less precise when competition increased. On the other hand, Doherty, Kartasheva and Phillips (2012) find evidence of improved insurance ratings (a service targeted mainly at consumers buying life insurance) when a prior monopoly was challenged. These differing results may reflect variation in the nature of ratings users in these markets, or the difference between starting from one and from two incumbents. A general caveat with these studies is that they do not concern structured products. The largest failures to date concern structured ratings issued before the financial crisis (e.g., Benmelech and Dlugosz 2009, Griffin and Tang 2011, He, Qian and Strahan 2012 and Gordy and Willeman 2012), and this prior evidence on reputational incentives in ratings production concerns other types of ratings.[3]

In this paper, we examine how reputations influence ratings of structured securities, using a quasi-experimental setting where one rating agency (S&P) was shut out of one part of the commercial mortgage-backed securities (CMBS) ratings market after having made an apparent procedural mistake. CMBS are structured securities packaging loans secured by commercial property. The CMBS market provides important funding for real estate in the US, and, like other

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[2] Hörner (2002) discusses the conditions under which competition positively affects reputational incentives, such as the need for informed buyers who actively discriminate between alternative suppliers based on their historical performance.

[3] See also Flynn and Ghent (2016), who study competition for rating structured finance products. They analyze the entry of new credit rating agencies into this market and find that the new entrants issue higher ratings than incumbents.

structured finance markets, it relies heavily on credit ratings (Stanton and Wallace 2012). CMBS ratings are of additional interest because CMBS belong to the class of structured assets whose ratings were implicated in the financial crisis. Interestingly, the amount of competition has increased substantially in this market since the crisis, raising new questions of what quality of ratings can be expected in a market with seven or eight competitors (Flynn and Ghent 2015).

In July 2011, following questions from investors, S&P discovered inconsistencies in its rating methodology for a type of CMBS called "fusion" (these securities combine loans secured by large and small properties and constitute around one third of the CMBS market). The agency responded to this discovery by withdrawing its preliminary ratings on a fusion deal which was in the final stages. Without the ratings, the deal then failed to close. This was not well received by issuers and investors, and, as a result, S&P was completely shut out of rating fusion CMBS deals for a period of more than one year. We study how ratings were assigned to CMBS tranches before and after this event. Our main focus is on what S&P did to recover its lost market position.

This episode constitutes an interesting laboratory for examining the role of competition in ratings markets for several reasons. First, the drop in S&P's market share was large (to zero), sudden, and unexpected, which thus permits a sharp comparison of ratings before and after the event. Second, because the triggering event was a procedural mistake, i.e., related to the process but not to the content of credit ratings, reverse causality concerns are much reduced (compared to, e.g., a research design using ordinary variation in market share). The procedural nature of the triggering event also meant that S&P had the ability and resources to recover market share (S&P already had the staff, models, data etc. at its disposal). This motivation to grab market share is exactly what reputational theories suggest may compromise ratings quality (e.g., Bolton, Freixas, and Shapiro 2012). Indeed, after implementing changes to its rating methodology for fusion CMBS that were later described as lenient by some market participants (see Yoon and Neumann 2012 and Tempkin 2012), S&P managed to gradually recover market share in that segment. Third, the CMBS market in question is very similar to the structured asset markets where the financial crisis revealed substantial flaws (Benmelech and Dlugosz 2009). Fourth, the drop in market share was confined to fusion CMBS, likely reflecting that rating agencies use

different methodologies for rating different CMBS types (SEC 2013 and Flynn and Ghent 2016). Thus, non-fusion CMBS can be used as a placebo test.

We study whether S&P offered inflated ratings after the incident. We compare the ratings that S&P issues on CMBS tranches (see below for more detail on the nature of CMBS securities) to the ratings the other raters assign on the same tranches (we use Moody's and Fitch as benchmarks, as they are most similar in size and age to S&P). This permits us to use fixed effects to control for any omitted variables that vary by tranche (e.g., the credit quality of the deal and the tranche). We focus on whether the ratings of S&P moved, relative to other agencies, after the event that reduced S&P's market share.

We find that after the procedural error, S&P issued more optimistic ratings than the other raters; on average, S&P's ratings became between 0.1 and 0.3 notches higher than those of peers. This is consistent with reading the episode as an attempt by S&P to grab market share by catering to issuers through higher ratings. Thus, our results confirm a more negative view of competition in ratings markets, in line with Becker and Milbourn (2011), in the CMBS setting. Our results also suggest a possible asymmetry: rating agencies with lower market shares may be more aggressive than more established firms.[4] Our findings also support ancillary predictions consistent with rater commercial interests driving more lenient ratings. First, the effect is more pronounced for CMBS issuers which issue a lot of CMBS securities, who presumably represent more important commercial relationships for agencies. Second, the effect is more pronounced for large deals, which likely represent more revenue for rating agencies. Finally, we find no effect outside of fusion CMBS: in other CMBS securities, the evidence suggests that S&P did not change its standards relative to other agencies.

Overall, our findings suggest that reputations matter to how rating agencies behave; that a weaker reputation is associated with a lower market share; that a firm in such a position may compromise on long-term, difficult-to-observe quality (in the eyes of the end user) in order to improve revenue. Although our event reflects a specific incident in a particular market, these

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[4] This is a prediction of both Hörner (2002), in a general setting, and Doherty et al. (2012) in the ratings context.

implications confirm more generally the power of reputational models to describe important economic phenomena.

The rest of the paper is organized as follows. Section II discusses the institutional background. Section III describes the data sources, the variable construction, our empirical strategy, and the results. Finally, Section IV concludes.

II.   Institutional background

A. An overview of CMBS

A mortgage-backed security (MBS) is a bond whose interest and principal payments originate from a pool of mortgages. If the pool backing an MBS consists of residential mortgages, the securities are called residential mortgage-backed securities (RMBS). Alternatively, these mortgages may be secured by commercial property (such as apartments, office buildings, shopping malls, warehouses, and hotels), in which case the securities are called CMBS. Compared to RMBS asset pools, which can contain hundreds of residential mortgages, CMBS asset pools usually consist of relatively few loans, due to the large size of commercial mortgages.[5] CMBS are an important source of funding for commercial real estate-related loans in the US; in 2015, for example, non-agency CMBS worth $101 billion were issued.

Through securitization, a pool of commercial loans is transferred into a deal structure through which CMBS are issued to investors. The process starts with a borrower entering into a loan agreement with a lender through a mortgage broker. Once there is sufficient mortgage collateral, an underwriter (bookrunner) creates a CMBS-issuing trust—usually set up as a real estate mortgage investment conduit (REMIC) structure for tax purposes. A master servicer is

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[5] Other differences between CMBS and RMBS include: (1) CMBS have lower prepayment risk due to prepayment lockouts and penalties typically associated with commercial loans. (2) Many (but not all) RMBS are issued by government agencies whose explicit (or de facto) federal guarantee significantly reduces the credit risk for investors. (3) While residential mortgages are usually amortizing, commercial loans tend to have a single "bullet" payment of principal at maturity; this introduces the risk that the commercial borrower may be unable to refinance the loan at maturity ("balloon extension risk"). For details on these and other differences between CMBS and other securitized assets, see Goldman Sachs (2007).

hired to process payments from the borrowers; its main task is to transfer the mortgage payments to the trustee, which pays the CMBS investors.[6]

Deal cash-flows are spliced into securities with different risk-return profiles ("tranching"), which are sold to investors. Tranching is the primary means through which credit enhancement is achieved in CMBS deals (unlike RMBS, government guarantees are uncommon in CMBS). The CMBS tranches are rated by typically two agencies.[7] Collateral cash-flow, such as principal repayment of the underlying loans, is paid out sequentially, first to the highest rated ("senior") bonds, then to the lower rated ones. Possible losses are first borne by the lowest rated tranche; when that tranche is wiped out, additional losses are applied to the next junior tranche etc.

AAA-rated CMBS are the bonds that constitute the top tranches in a CMBS deal and which have the highest level of credit enhancement. The subordinated tranches are typically categorized into mezzanine bonds (investment grade, but subordinated to the senior bonds), junior (high-yield or B-piece) bonds (below investment grade), and the first loss piece (most junior security in a deal).[8] Finally, there may be interest-only (IO) bonds which are securities that receive the excess interest beyond the obligation of the senior note in a CMBS deal.[9]

The process of rating a CMBS deal starts with issuers privately announcing a potential CMBS transaction to raters several months before the planned sale of the securities to investors. Raters perform a preliminary analysis and provide feedback to the issuers, including the minimum credit enhancement (level of subordination) suggested for a given tranche to obtain a certain rating. Based on this private information from the raters, issuers choose the agencies that will rate the deal (agencies may be retained for only some tranches of a deal). Once hired, the rating agency spends several weeks analyzing the commercial properties and loans in detail and

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[6] See CRE Finance Council (2013) for further details on the CMBS origination process.

[7] Between 2000 and 2014, there have been 2,017 non-agency CMBS deals, according to data from the Commercial Mortgage Alert database. The median deal employs two raters, but around 25% of the deals use three or, in rare cases, more, raters.

[8] Subordination levels indicate the fraction of bonds in a deal that may be issued given a certain rating. For example, a AAA-rated tranche may have 30% subordination, which implies that 30% of the principal of the mortgage pool is structured below that tranche and that 30% of the pool's principal may be wiped out before the given AAA-rated tranche takes a loss.

[9] For further details on CMBS deal structure, see CRE Finance Council (2013).

subsequently drafts a report with key credit quality metrics for the deal. The transaction is then announced to investors and the rater publishes the preliminary ratings as well as the justifications for the ratings as part of the so-called presale report, which is distributed to investors. Final ratings are issued after the transaction closes.

CMBS are usually categorized into four broad types depending on the number of mortgages in the asset pool and the level of diversification of the underlying collateral (e.g., Goldman Sachs 2007).[10] A 'conduit' deal includes many, smaller mortgages. A 'large' CMBS deal consists of a single mortgage. A 'single' deal consists of several mortgages with a single borrower, such as a real estate investment trust (REIT). Finally, 'fusion' deals have mixed pools which typically combine large loans with a more diversified set of small conduit loans, and are sometimes called 'conduit fusion' deals to indicate the similarity to plain conduit deals.[11] Figure 1 illustrates the mix of CMBS types over the 2000-2014 period. The figure shows that CMBS issuance in the US declined from around 200 deals annually between 2005 and 2007 to less than 50 deals at the peak of the financial crisis in 2008. Subsequently, the CMBS market slowly recovered, reaching 141 deals in 2014. Since 2011, fusion CMBS deals accounted for more than a third of total deals. In terms of value, the total face value of all US fusion CMBS deals closed in 2014, for example, amounted to $57 billion.

Exhibit 1 illustrates the structure of a typical CMBS fusion deal ("JPMCC 2008-C2"). The issuer in the example is the J.P. Morgan Chase Commercial Mortgage Securities Trust. The deal closed on the 8th of May, 2008, and it has a total principal of $1,166 million. The assets of the deal, according to the initial SEC filings, consist of 79 fixed rate mortgage loans secured by first liens on 107 commercial properties and 11 housing community properties. The bookrunner on the deal is J.P. Morgan, and the master servicer is Midland Loan Services. The deal is rated by Moody's and Fitch. As can be seen from Exhibit 1, nine out of the 26 bonds in the deal are rated

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[10] Rating agencies use different methodologies for rating the different CMBS types, and the CMBS market is effectively segmented according to such broad categories of CMBS (see SEC 2013 and Flynn and Ghent 2016).

[11] A few deals fit neither of these categories, for example because they are organized by government agencies (Freddie Mac, Fannie Mae, and Ginnie Mae); consist of floating rate loans; have seasoned collateral, i.e., loans that are not new at the time of securitization; or because they are re-securitizations, i.e., have asset pools consisting of tranches from earlier securitizations.

AAA (corresponding to $994 million of the deal principal). The first seven AAA tranches (A-1 to A-SB) have the highest levels of subordination (30%) and are the so-called "super-duper" classes. The other two AAA-rated bonds have, respectively, 20% and 14.75% subordination levels, making them "junior-AAA" classes. Note also the heterogeneity in the expected maturity and coupon rate of the bonds, even within a given rating category (presumably to satisfy heterogeneous investor demand). Finally, there is a AAA-rated CMBS IO strip (tranche "X(IO)"), as well as a small non-rated equity tranche that absorbs first losses.

B. The July 2011 incident and S&P's subsequent market share flatline

There are a variety of factors that determine the credit quality of a commercial mortgage, including property quality and type, quality of borrowers and tenants, loan to value ratio, and debt-service coverage ratio, henceforth "DSCR" (see Woo, Mudrick, Barve, and Lee 2004). The DSCR is a key metric used to rate CMBS and measures the ability of a commercial property to cover debt service payments. In December 2010, S&P's CMBS Analytical Group changed the treatment of an input used to calculate DSCRs of loans contained in fusion CMBS.[12] The new methodology underlay several fusion CMBS transactions that S&P rated during the first six months of 2011.[13] Subsequently, the SEC claimed in a lawsuit that the methodological change had been misrepresented by S&P. The main point of contention was that presale reports for affected deals contained information on DSCRs calculated using the pre-December 2010 methodology, while the actual rating was based on the new, modified DSCR methodology. The SEC alleges that "S&P's statements in the Presales concerning DSCRs were thus knowingly or recklessly false and misleading" (SEC 2015a, p. 7).

The same inconsistency between the information provided in the presale reports and the actual rating methodology affected a large fusion CMBS transaction that was originated in July

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[12] Specifically, an assumption regarding the loan constant used to calculate the DSCR was modified. The new methodology tended to result in lower credit enhancement requirements.

[13] These fusion CMBS were MSC 2011-C1, JPMCC 2011-C3, and JPMCC 2011-C4. In its order against S&P (see SEC 2015a), the SEC notes that the following deals also employed S&P's modified methodology: FREMF 2011-K701, FREMF 2011-K11, and FREMF 2011-K13. These deals are Freddie Mac's "multifamily mortgage loan securitizations". Following the classification in the Commercial Mortgage Alert database (which underlies the empirical analysis in this paper), we classify these deals as non-fusion CMBS.

2011: GSMS 2011-GC4, issued by Goldman Sachs Mortgage Securities Trust, with a principal of $1.5 billion. On the 27th of July 2011, following questions from investors regarding the rating methodology, S&P's senior management announced a review of its fusion CMBS ratings criteria that "was prompted by the discovery of potentially conflicting methods of calculation in use." On the 28th of July 2011, in a move that was described as a "curveball" to CMBS investors (Ustun, Jousseaume, and Chew 2011) and as "unprecedented within the CMBS market" (Mulholland 2011), S&P withdrew its ratings on GSMS 2011-GC4.[14] Neumann (2012) reports that the "unusual step sent the commercial mortgage securities market into turmoil and scuttled the deal for weeks, angering investors and issuers."

According to Tempkin (2012), the "debacle badly eroded S&P's credibility, and left it effectively frozen out of the sector." Indeed, our data suggest that S&P was completely shut out of the fusion CMBS segment for more than one year. Figures 2 and 3 illustrate this point. Figure 2, Panel A, plots completed fusion CMBS deals between 2008 and 2014 and indicates the involvement of S&P, Moody's, and/or Fitch in a given deal. The figure shows that between mid-2008 and mid-2010, there are no issuances of fusion CMBS that either rater is involved in. Thereafter, the market picks up again, and all raters issue ratings on several deals (S&P is involved in somewhat fewer deals than Moody's and Fitch). Importantly, the figure illustrates that after the July 2011 incident, S&P is frozen out of the fusion CMBS segment. The next time S&P is able to secure a fusion deal is in September 2012. By contrast, Panel B of Figure 2, in which we plot non-fusion CMBS deals, shows that all three raters are rating some non-fusion CMBS deals throughout the same period. This suggests that S&P's market share loss was confined to the fusion CMBS segment, in which the event described above occurred. This is consistent with segmentation between the fusion and non-fusion segment of the CMBS market (e.g., SEC 2013, Flynn and Ghent 2016) and with the fusion-specific nature of S&P's mistake.

Figure 3 further illustrates these points. In this figure, we plot each rater's market share in a given quarter. More specifically, for each quarter, we calculate the percentage of deals that a given rater is involved in. It emerges quite clearly from these plots that while Moody's and Fitch

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[14] The deal FREMF 2011-K14 (principal of $1.2 billion) was affected in a similar manner.

consistently maintained market share in the fusion CMBS market between 2010 and 2014, S&P lost market share after the July 2011 incident (see Panel A). By contrast, all raters maintained comparable market shares in the non-fusion CMBS segment throughout the 2008-2014 period (see Panel B). We provide more detailed discussions of S&P's market share in Sections III.D and III.E below.

After it had lost significant market share to its competitors in the fusion CMBS segment, S&P appears to have been determined to re-enter the market (e.g., SEC 2015b). The agency published new ratings criteria in September 2012 and advertised them to issuers and investors.[15] These new criteria included changes to S&P's fusion CMBS rating methodology, such as a modification in the calculation of the capitalization rate as well as the introduction of "qualitative overlays" that provided rating analysts with more discretion in setting the level of credit enhancement. These changes in the rating methodology were described as lenient by some market participants (as reported by e.g. Yoon and Neumann 2012 and Tempkin 2012).

S&P's attempts to regain market share quickly bore fruit. A few weeks after the publication of the new ratings criteria, S&P was hired by JP Morgan to rate the fusion transaction JPMCC 2012-C8; the settlement date of the deal was 18th of October, 2012. Somewhat unusually, three additional agencies were asked to rate the deal, "a peculiar signal that some investors saw as an effort by JP Morgan to quell concerns about S&P's presence" (Tempkin 2012).[16]

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[15] On June 4, 2012, as part of the development of new fusion CMBS Criteria, S&P published an article entitled "Request For Comment: Rating Methodology And Assumptions for U.S. And Canadian CMBS." That publication outlined the parameters of S&P's proposed new CMBS ratings criteria and invited feedback and questions from market participants. On September 5, 2012, S&P published its new CMBS criteria in a publication titled "Rating Methodology And Assumptions For U.S. And Canadian CMBS".

[16] The events described above were the subject of two orders issued by the SEC against S&P (a third related order involved internal control failures in S&P's surveillance of residential mortgage-backed securities ratings). These orders maintain that some elements of S&P's conduct were fraudulent: the inconsistencies related to the December 2010 changes of the DSCR calculation and the failure to properly disclose changes in the methodology to investors, the associated failures of internal controls, as well as allegedly false and misleading statements made by S&P in connection with the 2012 ratings criteria change. As a result, S&P was prohibited from rating fusion CMBS for a period of twelve months starting in January 2015. Furthermore, S&P paid approximately $58 million to settle the SEC's charges. S&P also settled related cases by the NY Attorney General and Massachusetts Attorney General for $12 million and $7 million, respectively. For more details, see the SEC press release from January 21, 2015 entitled "SEC Announces Charges Against Standard & Poor's for Fraudulent Ratings Misconduct".

III. Analysis

In this section, we study the strategy that S&P employed to regain market share in the fusion CMBS market following the July 2011 mistake. In particular, we test whether S&P's attempt to re-enter the fusion CMBS segment after July 2011 was associated with a change in the level of its ratings. To this end, we compare S&P's ratings to those assigned on the same securities by other raters. We first discuss the data used; we then describe the empirical strategy and the results.

A. Data

Our main analysis focuses on fusion CMBS deals between beginning of 2008 and end of 2014, approximately three-and-a-half years before and after S&P's procedural mistake in July 2011. We obtain data on deal details, including ratings, from Commercial Mortgage Alert, a commercial real estate finance trade publication. Ratings are assigned to each tranche of a deal, often by several rating agencies, so each observation in our main sample is at tranche-rating. The database contains information on ratings assigned at the deal closing date. We identify the type of CMBS for each deal. For each tranche, we identify the seniority ranking in its deal. We exclude government agency deals from the sample. Finally, we focus on ratings assigned by S&P, Moody's, and Fitch, the main raters in the CMBS market at the time.

B. Empirical strategy

As discussed in Section II, following what may be described as a procedural mistake in handling apparent inconsistencies in its rating methodology for fusion CMBS, S&P was unable to secure any ratings business for fusion deals between July 2011 and September 2012. In September 2012, S&P issued new rating criteria for fusion CMBS. Around this time, they were then again retained to rate fusion deals.

We estimate the change in S&P's market share using the following model:

$$
\begin{aligned}
Market\ Share_{r,t} \\
= \alpha \cdot Ind(S\&P)_r \cdot Ind(Post\ July\ 2011)_t + \beta \cdot Ind(S\&P)_r + \gamma \cdot \\
\cdot Ind(Post\ July\ 2011)_t + \Psi_{r,t} + \varepsilon_{r,t}
\end{aligned}
$$

where *r* denotes the rating agency and *t* the year-quarter. *Market Share* is the percentage of deals in a given year-quarter that a given rater is involved in; because a tranche can have more than one rating, market shares in this sense can add up to more than 100% if summed across raters in a given year-quarter. *Ind(Post Q2 2011)* is a dummy variable taking the value of one after the second quarter of 2011. *Ind(S&P)* takes a value of one if an observation refers to S&P, zero if it refers to Moody's or Fitch. Finally, $\Psi_{r,t}$ is a matrix containing rater and year-quarter fixed effects. In these regressions, we report standard errors that are adjusted for clustering of the error terms $\varepsilon_{r,t}$ at the year-quarter level.

The main tests concern the level of ratings. We compare ratings assigned by S&P in fusion deals after July 2011 to ratings before; we identify biases in the ratings assignment by benchmarking ratings by S&P to those issued by Moody's and/or Fitch on the same deals. Our baseline regression model is:

$$Tranche\ Rating_{i,j,r,t}$$
$$= \alpha \cdot Ind(S\&P)_{i,j,r,t} \cdot Ind(Post\ July\ 2011)_t + \beta \cdot Ind(S\&P)_{i,j,r,t} + \gamma \cdot$$
$$\cdot Ind(Post\ July\ 2011)_t + \Psi_{i,j,r,t} + \varepsilon_{i,j,r,t}$$

where *i* denotes the deal, *j* the tranche, *r* the rating agency, and *t* the year-quarter in which the deal closed. *Tranche Rating* is the rating of a tranche at the time deal closure; we assign numerical values to the alphanumeric tranche ratings, with a value of one denoting the highest credit rating ("AAA" in the case of S&P and Fitch, "Aaa" in the case of Moody's). *Ind(Post July 2011)* is a dummy variable that takes the value of one if the deal is closed in August 2011 or later, zero otherwise. *Ind(S&P)* is a dummy variable indicating that a rating is by S&P; the variable is zero if a rating is by Moody's or Fitch. Finally, we employ a set of fixed effects $\Psi_{i,j,r,t}$ to control for unobserved heterogeneity. Since the variables *Ind(Post July 2011)* and *Ind(S&P)* are subsumed by the time and rater fixed effects, respectively, the coefficients β and γ are not identified and not reported. We report standard errors that are adjusted for clustering of the error terms $\varepsilon_{i,j,r,t}$ at the deal level.

The tranche fixed effects alleviate concerns relating to omitted or imperfectly measured variables specific to a given tranche of a given deal (such as the credit quality of a deal). We

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identify possible ratings biases after the July 2011 event through differences in ratings across agencies *within* a given tranche. Our tests can thus be interpreted as difference-in-differences estimates, where the ratings issued by S&P after July 2011 are compared to ratings issued by S&P on earlier fusion deals, and relative to the ratings assigned by the "control group" consisting of Moody's and Fitch (these raters are similar to S&P in that they are large, well-established agencies with a long history of rating CMBS). With reference to the above regression equation, the relevant difference-in-differences coefficient is α. The identifying assumption is that absent the July 2011 event, ratings by S&P of new issues would have related to Fitch's and Moody's ratings of the same tranches the same way as before the crisis; we examine this assumption in Section III.E.

C. Summary statistics

Summary statistics are reported in Table 1. The sample consists of CMBS deals closed between 2008 and 2014. Panel A describes fusion deals, which are the main focus of our analysis, while Panel B is for non-fusion deals, which we employ in robustness tests. In both panels, we present summary statistics for two samples: one for the ratings analysis, and one for the analysis of market shares. In the ratings sample of Panel A, there are 3,678 observations at the tranche-rater level, corresponding to each rating for every tranche of 153 unique fusion CMBS deals. The average *Tranche Rating* is approximately equal to five on the numerical scale, which corresponds to an "A+" rating on S&P's and Fitch's alphanumeric rating scale and an "A1" on Moody's scale. About 13% of the ratings assigned are by S&P, corresponding to 32 fusion deals that S&P was involved in over the sample period. In the market share sample of Panel A, there are 84 observations (there are 28 year-quarters in the 2008-2014 period, and we have three raters in our sample). The sample mean of *Market Share* is about 45%, which suggests that each of the three raters is involved in almost half of the fusion deals during the sample period.

Panel B reports summary statistics for non-fusion CMBS deals. The sample for the ratings analysis corresponds to a total of 2,622 observations. In this sample, as in Panel A, the average *Tranche Rating* is also 5 (A+). Around 37% of the ratings assigned in the non-fusion sample are by S&P. In the market share sample, the average *Market Share* is 42%.

D. Main results

Does S&P issue more optimistic ratings after July 2011 in order to re-gain lost market share? We first examine this question graphically in Figure 4. The figure reports the difference between the *Tranche Rating* assigned by S&P and the average *Tranche Rating* assigned by Moody's and/or Fitch in the same tranches; a negative "rating difference" therefore suggests that S&P is more optimistic with regard to a given tranche than the other raters. Larger circles in the graph indicate a larger number of tranches that exhibit the same "rating difference" in deals that close on the same date. The dashed vertical line denotes the 27th of July 2011, the day when S&P announced the discovery of potentially conflicting methods of calculation in its fusion CMBS ratings models. Panel A of Figure 4 shows fusion deals. Remarkably, between January 2008 and July 2011, there was no ratings disagreement between S&P, Moody's and Fitch on any tranche of *any* fusion deal. However, after July 2011, S&P was, by and large, more optimistic than its competitors (by about a tenth of a notch, on average).[17] We compare this to non-fusion deals in Panel B of the figure. While there was somewhat more disagreement in non-fusion ratings between different agencies (likely reflecting the more heterogeneous types of deals that we include under the "non-fusion" heading), these rating differences are not statistically different from zero on average. Furthermore, there is no statistically significant difference between ratings assigned by S&P and the other raters in non-fusion deals when we compare the post July 2011 period to the period before.

Table 2 reports results of regressions that examine this issue more formally. Column 1 reports coefficients from a regression model that employs deal and seniority fixed effects. Column 2 reports regression results including tranche fixed effects (this is our base-line model). Both regressions also include rater and time (quarter-year) fixed effects. The coefficient estimate for S&P post-even (α) is negative and statistically significant (at the 5% level or higher) in both regressions. This suggests that after the July 2011 mishap, S&P assigned, on average, more optimistic ratings in fusion deals than Moody's and Fitch. The magnitude of this effect is about a

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[17] The average rating difference between S&P and the other raters post July 2011 is statistically significantly different from zero at the 1% level. Furthermore, the difference between the average rating difference before July 2011 and afterwards is also statistically significant at the 1% level.

tenth of a notch on average. Although small, in light of the fact that there was no difference in ratings between S&P and the other two raters on any fusion deal in the three years leading up to July 2011, this is striking. One optimistic interpretation is that short-term commercial interests exert only a modest impact on ratings quality.

The regressions reported in Table 2 may underestimate the extent of ratings bias as there may be limited scope for ratings disagreement in the top tranches of a deal: the senior bonds of a deal are almost always rated triple-A by all raters. We therefore re-estimate the coefficients of our regressions using a sub-sample in which we exclude tranches for which all raters assign the highest rating (that is, AAA or Aaa). In these tests, we effectively focus on so-called *Mezzanine CMBS* (the middle tranches of a CMBS structure ranging from AA+ to BBB-) and the *B-Piece* (or *high yield*) *CMBS*, tranches rated BB+ and lower. Results are reported in Table 3. In these specifications, the difference-in-differences coefficient is larger in absolute terms than the estimates reported in Table 2. According to Table 3, S&P assigns higher ratings (that is, ratings closer to AAA) than its competitors by about a fourth (column 1, specification with deal and seniority fixed effects) or a fifth (column 2, specification with tranche fixed effects) of a notch after the July 2011 event. Table 3 suggests that S&P's optimism relative to the other raters appears to primarily manifest in the subordinated, riskier tranches.

Prior research has documented that large issuers (He, Qian, and Strahan 2012) and issuers that provide more securitization business to rating agencies (Efing and Hau 2014) receive higher ratings. It is therefore plausible that the effects on S&P's ratings that we document for the post July 2011 period are more pronounced if a CMBS issuer or a deal is more important, perhaps because the deal is big or the issuer has considerable market share. We test this hypothesis in Table 4.

In Panel A of Table 4, we split the sample according to issuers' shares in the CMBS market in the previous calendar year. Specifically, we annually divide the total face value of CMBS deals attributable to an issuer over the total face value of CMBS deals sold by all issuers.[18] We

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[18] We use the definition of issuer from the CMBS Database, which is the name of the issuing entity, exactly as it is shown on the prospectus.

then estimate regressions separately for issuers with above median market share (columns 1 and 2) and for those with below median market share (columns 3 and 4).[19] Consistent with our conjecture, we find that S&P's ratings are only higher than those of Moody's and Fitch for deals by "important" issuers, that is, those with a relatively high market share in the CMBS market. The difference-in-differences coefficient is negative and statistically significant according to the regressions in columns 1 and 2. In contrast, it cannot be ruled out at traditional levels of statistical significance that the effect is zero for fusion deals from issuers with below median market share (columns 3 and 4). In Panel B of Table 4, we distinguish between deals according to their presumed importance to the raters. We proxy deal importance by splitting the sample into fusion deals with a face value above (columns 1 and 2) and below (columns 3 and 4) the sample median face value. Consistent with our results in Panel A, we find that S&P's ratings are only more optimistic than those of the other two raters in the group of large deals.

Were S&P's attempts to re-gain market share in the fusion CMBS segment successful? Figure 3, Panel A, shows that while S&P was initially shut out of the fusion CMBS segment for at least one year after its July 2011 setback, it was indeed able to regain some market share after the change in ratings criteria in mid-2012. S&P's gap in market share vis-à-vis Moody's and Fitch markedly narrowed. However, it does not appear that S&P regained its pre-event position.

We examine this question more formally in Table 5. In column 1, the dependent variable is raters' *Market Share* in the fusion CMBS segment and the coefficient of interest is the interaction between *Ind(S&P)*, an indicator for S&P, and *Ind(Post Q2 2011)*, a variable indicating the period after the July 2011 event. The coefficient estimate is significant at the 1% level and takes a value of -50.7, which implies that after the July 2011 event, S&P's market share in the fusion CMBS segment was lower, on average, by about 51 percentage points compared to the other raters and the period before mid-2011.

In the analysis of market shares, there are two distinct periods of interest: (1) the period between July 2011 (when S&P's procedural mistake took place) and September 2012 (when S&P

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[19] As we merge data from a given year with the previous calendar year's market share and some issuers may not have issued in the prior year, the total number of observations in Panel A of Table 4 is lower by 754 compared to the sample in Table 2.

published new CMBS ratings criteria), during which S&P wasn't involved in rating any fusion deal; (2) the period after September 2012 when S&P was finally able to secure new fusion deals. In column 2 of Table 5, we separately examine S&P's market share relative to its competitors during these two time periods. The two regression coefficients of interest which highlight the respective time periods are both negative and significant. However, the coefficient on the post-September 2012 interaction (*Ind(S&P) x Ind(Post Q2 2012)*) is smaller in absolute terms (that is, less negative) by about 28 percentage points than the coefficient on the interaction designating the period between mid-2011 and mid-2012 (*Ind(S&P) x Ind(Post Q2 2011, Pre Q3 2012)*). The difference between these two interaction coefficients is significant at the 5% level. This confirms the interpretation that S&P lost market share dramatically after the July 2011 procedural mistake, and then managed to recover some, but not all, of that market share after issuing ratings which we found in our previous analysis (see Tables 2—4) to be higher than those of its competitors.

Did the more issuer-favorable ratings cause the recovery of market share? This seems plausible, but is difficult to confirm. Perhaps S&P changed their pricing, or other contract terms. S&P's higher ratings post September 2012 may not have been the (sole) cause of S&P's market share increase.

E. Robustness

The sample period we consider in our tests is 2008 to 2014, approximately three-and-a-half years before and after the July 2011 procedural mistake of S&P. Our results are not sensitive to this choice of period. In Panel A of Table 6, we re-run our main specification using alternative sample periods: 2010 to 2012 (column 1), and 2009 to 2013 (column 2). We find qualitatively similar results as those reported in Table 2; if anything, the point estimates of the difference-in-differences coefficient are larger when considering a shorter window around the July 2011 event (see column 1). This may suggest that S&P issued particularly high ratings early in its attempt to

regain market share, and perhaps to a lesser extent in subsequent years once its market share started to rise.[20]

The interpretation of our results on ratings rests on the identifying assumption that, absent the July 2011 reputational shock, ratings of S&P and Moody's / Fitch would have evolved similarly between 2011 and 2014. The concern could arise that, instead, ratings of S&P would have been different even absent the "treatment" of the July 2011 shock. To alleviate this concern, we compare ratings on fusion CMBS by S&P to ratings by Moody's and Fitch prior to the July 2011 shock. Specifically, we consider the pre July 2011 period and split it into two equal sub-periods; we define the placebo "treatment" period as the period after September 2009, indicated by the dummy variable *Ind(Post Sept. 2009)*.[21] We report these placebo regressions in Panel B of Table 6. We find the coefficient on the interaction term *Ind(S&P)*Ind(Post Sept. 2009)* to be not significantly different from zero, which suggests that ratings by S&P and the other two raters were indeed similar (more specifically, they followed similar trends) in the pre-event period, i.e., prior to July 2011.

As discussed in Section II (see also SEC 2013, Flynn and Ghent 2016), the CMBS market is effectively segmented according to broad deal types, and raters apply different methodologies for rating different types of CMBS. Furthermore, the procedural mistake at the center of our analysis involved ratings and disclosures for fusion CMBS transactions. This is consistent with the evidence in Figures 2 and 3 (discussed above), in the sense that the July 2011 mishap affected S&P's market share in the fusion CMBS segment, but not—or at least to a much lesser extent— its market share in the non-fusion segment. Consequently, we focused our tests on the fusion CMBS market segment.

In Table 7, we test the identifying assumption that ratings and market shares do not vary systematically in other segments of the CMBS market. Specifically, we consider *non-fusion* CMBS deals as a placebo sample and compare ratings and market shares before and after July 2011 in

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[20] We note as a caveat that S&P only rated four fusion deals in 2012, all between October and December of that year. We also confirm that results remain significant if we drop the year 2012 from the 2008-2014 (or 2009-2013) sample period; we do not report these tests for the sake of brevity.

[21] This test effectively serves as a test of the common trends assumption of our difference-in-difference test design.

this alternative CMBS segment that we would not expect to be affected by S&P's procedural mistake. This test also serves as a more formal test of the conjecture that the CMBS market is segmented along deal types into a fusion and non-fusion segment. Panel A examines ratings, while Panel B examines market shares in the non-fusion CMBS segment. In both panels, column 1 reports the regression results for the sample period 2010 to 2012, while columns 2 and 3 report the results for the 2009 to 2013 and 2008 to 2014 periods, respectively. In Panel A, the difference-in-differences coefficient is not significantly different from zero. That is, in the non-fusion CMBS segment, we find no statistically significant changes in the ratings assignment of S&P compared to the other raters after July 2011. Similarly, in Panel B, we find no difference in market share (trends) between S&P and the other raters after July 2011 compared to the preceding period.

F. Discussion

Overall, our results show that after July 2011, S&P on average issues more optimistic ratings than the other raters. We interpret this as consistent with an attempt by S&P to regain market share by catering to issuers through higher ratings. However, by construction, we identify this bias only relative to the ratings of other agencies. Therefore, our results permit alternative interpretations. For example, one could argue that the modified ratings criteria that S&P employs after September 2012 allow it to better assess credit risk, and that, rather than S&P being too optimistic, it is the case that the other raters are too conservative than warranted.

A good way of addressing this concern would be to consider the ex post performance of the ratings, that is, to investigate defaults. We collected data on defaults for fusion CMBS issued between 2008 and 2014.[22] At the time of writing, there were no defaults for deals originated between 2011 and 2014, which is the relevant "post-event" period in our setting; therefore, this way of assessing the ex post performance of the ratings is impractical in our case. However, we believe that the interpretation of the results that we discussed above is more plausible than the alternatives for at least three reasons. First, the new fusion CMBS criteria that S&P employed from September 2012 have been specifically described by some market participants as lenient

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[22] We obtain data from Trepp, LLC. We use information from the database on cumulative losses for each fusion deal and tranche to determine if a default occurred.

and as aimed at increasing market share by catering to issuers (e.g., Yoon and Neumann 2012; Tempkin 2012). Second, the cross-sectional tests discussed above are more consistent with the interpretation that S&P's ratings become more lenient with the purpose of regaining market share. If S&P is catering to issuers through higher ratings, one would precisely expect these effects to be stronger for larger deals and more important issuers, as we document in Table 4. Finally, if it is indeed other raters that become more conservative rather than S&P becoming more optimistic, this would beg the question why this occurs only in the fusion CMBS segment (we find no rating differences for non-fusion CMBS, see Panel A of Table 7) and precisely after S&P is shut out of that market segment.

IV.   Conclusions

In this paper, we study how reputation and competition for market share affect ratings quality. We consider a quasi-experimental setting in which the market share of a rater, relative to its competitors, drops to zero after the rater suffers reputational damage. Due to procedural mistakes related to inconsistencies in its fusion CMBS ratings model, S&P was shut out of that market segment for a period of more than one year. The July 2011 mishap that triggered the drop in market share was unexpected by the market and can thus be considered exogenous. We use this setting to study S&P's response, that is, how the rater's attempts to regain market share affect ratings quality. To measure ratings bias, we compare S&P's ratings on specific tranches of fusion CMBS deals to the ratings Moody's and Fitch assign on the same tranches. To control for unobserved heterogeneity, we employ an extensive set of fixed effects, including those for each rater and tranche. We find that after July 2011, S&P issues more optimistic ratings on average than the other raters, in particular in larger deals and deals from more important issuers; subsequently, S&P regains some of the market share it lost. The results suggest that issuing optimistic ratings is a strategy that can be used by a rating agency with a weak reputation to gain market share in a market with strong competition.

Do our results point to any policies for maintaining the quality of issuer-paid credit ratings? Competition improves the quality of products and services in most markets. Regulators appear to adhere to this view when calling for more competition in the credit ratings market. For

example, in the US, the primary purpose of the Credit Rating Agency Reform Act of 2006 is to "improve ratings quality for the protection of investors and in the public interest by fostering accountability, transparency, and competition in the credit rating industry".[23] Similarly, according to the European Securities and Markets Authority (ESMA), the main regulator of credit rating agencies in Europe, one "of the objectives of the EU's regulation of credit rating agencies (the CRA Regulation) is to stimulate competition in the credit rating industry".[24] Our results however indicate that strong competition in the credit ratings market may impair the quality of ratings in some situations. Policymakers should therefore proceed with caution when aiming to increase the number of rating agencies. This is particularly relevant in the market for structured finance products, which has, since the financial crisis, experienced a large increase in the number of active rating agencies (see Becker 2011, and Flynn and Ghent 2016).

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[23] Preamble of the Credit Rating Agency Reform Act of 2006 (Public Law 109–291, 109th Congress).

[24] ESMA technical document entitled "Competition and choice in the credit rating industry" (document ESMA/2015/1879 published on the 18th of December 2015).

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Exhibit 1. An example of a fusion CMBS deal

This exhibit illustrates the structure of a typical CMBS fusion deal ("JPMCC 2008-C2"). The issuer is J.P. Morgan Chase Commercial Mortgage Securities Trust. The deal closed on the 8th of May, 2008. All information is as of the settlement date of the deal. *Sub* is the subordination level of a tranche (in percent). *Coupon* is the initial annual pay rate of the bonds (in percent). *Life* is the weighted average expected time to retirement of each class of securities (in years). The information on the deal structure is from Commercial Mortgage Alert, a commercial real estate finance trade publication.

Tranche	Face amount (mn $)	Rating (Moody's)	Rating (Fitch)	Sub (%)	Coupon (%)	Life (years)
A-1	23.4	Aaa	AAA	30	5.02	2.72
A-1A	65.1	Aaa	AAA	30	6.00	8.42
A-2	68.1	Aaa	AAA	30	5.86	4.53
A-3	105.5	Aaa	AAA	30	6.29	6.43
A-4	354.6	Aaa	AAA	30	6.07	9.42
A-4FL	145.0	Aaa	AAA	30	LIBOR + 1.5	9.42
A-SB	54.5	Aaa	AAA	30	0.13	6.73
A-M	116.6	Aaa	AAA	20	6.80	9.68
A-J	61.2	Aaa	AAA	14.75	6.80	9.68
B	14.6	Aa1	AA+	13.5	6.80	9.68
C	14.6	Aa2	AA	12.25	6.80	9.68
D	10.2	Aa3	AA-	11.38	6.80	9.68
E	10.2	A1	A+	10.5	6.80	9.74
F	13.1	A2	A	9.38	6.80	9.76
G	11.7	A3	A-	8.38	6.80	9.76
H	16.0	Baa1	BBB+	7	6.80	9.76
J	14.6	Baa2	BBB	5.75	6.80	9.76
K	14.6	Baa3	BBB-	4.5	6.80	9.76
L	8.7	Ba1	BB+	3.75	4.30	9.84
M	4.4	Ba2	BB	3.38	4.30	9.84
N	5.8	Ba3	BB-	2.88	4.30	9.84
P	4.4	B1	B+	2.5	4.30	9.84
Q	2.9	B2	B	2.25	4.30	9.84
T	4.4	B3	B-	1.88	4.30	9.84
NR	21.9	NR	NR	0	4.30	10.73
X(IO)	(1,165.9)	Aaa	AAA		variable	8.35

Table 1. Summary statistics

This table reports summary statistics for the variables underlying the analysis of ratings, as well as for the tests examining rater market shares. Panel A focuses on the sample of fusion CMBS deals, while the sample in Panel B consists of non-fusion deals (used in robustness tests). In the ratings analysis sample, each observation is measured at the tranche-rater level. *Tranche Rating* is the rating of a tranche at the time of deal closure; we assign numerical values to the alphanumeric tranche ratings, with a value of one denoting the highest credit rating ("AAA" in the case of S&P and Fitch, "Aaa" in the case of Moody's). *Ind(Post July 2011)* is a dummy variable that takes the value of one if the deal is closed in August 2011 or later, zero otherwise. *Ind(S&P)* is a dummy variable indicating that a tranche rating is by S&P; the variable takes a value of zero if a tranche rating is by Moody's or Fitch. In the market share analysis sample, there is one observation for each rater per year-quarter. *Market Share* is the percentage of deals in a given year-quarter that a given rater is involved in. *Ind(Post Q2 2011)* is a dummy variable taking the value of one after the second quarter of 2011; *Ind(Post Q2 2011, Pre Q3 2012)* is a dummy taking the value of one after the second quarter of 2011 but before the third quarter of 2012; *Ind(Post Q2 2012)* takes a value of one after the second quarter of 2012. *Ind(S&P)* takes a value of one if a market share observation refers to S&P, zero if it refers to Moody's or Fitch. We exclude Government Agency deals from the analysis. The sample spans the years 2008-2014. The data are from Commercial Mortgage Alert, a commercial real estate finance trade publication.

Panel A: Fusion deals

Rating analysis sample

	Obs.	Mean	Std. Dev.	Min.	Max.
Tranche Rating	3,678	4.569	4.669	1	16
Ind(Post July 2011)	3,678	0.796	0.403	0	1
Ind(S&P)	3,678	0.132	0.339	0	1

Market share analysis sample

	Obs.	Mean	Std. Dev.	Min.	Max.
Market share	84	44.799	40.617	0	100
Ind(Post Q2 2011)	84	0.500	0.503	0	1
Ind(S&P)	84	0.333	0.474	0	1
Ind(Post Q2 2011, Pre Q3 2012)	84	0.143	0.352	0	1
Ind(Post Q2 2012)	84	0.357	0.482	0	1

Panel B: Non-fusion deals

Rating analysis sample

	Obs.	Mean	Std. Dev.	Min.	Max.
Tranche Rating	2,622	5.154	4.353	1	16
Ind(Post July 2011)	2,622	0.612	0.487	0	1
Ind(S&P)	2,622	0.374	0.484	0	1

Market share analysis sample

	Obs.	Mean	Std. Dev.	Min.	Max.
Market share	84	42.410	17.406	12.121	87.500
Ind(Post Q2 2011)	84	0.500	0.503	0	1
Ind(S&P)	84	0.333	0.474	0	1

Table 2. S&P ratings changes after July 2011

This table reports the coefficients for regression models comparing initial ratings by S&P to those assigned by Moody's and/or Fitch for deals closed before and after July 2011. The sample consists of fusion deals. Each observation in the sample is measured at the tranche-rater level. The variables are defined in Table 1. Heteroskedasticity-robust standard errors, clustered by deal, are reported below coefficients. * denotes estimates that are significantly different from zero at the 10% level, ** at the 5% level, and *** at the 1% level.

	(1)	(2)
	Tranche Rating	
Ind(S&P) x Ind(Post July 2011)	-0.127**	-0.092***
	(0.064)	(0.031)
Deal F.E.	x	
Seniority F.E.	x	
Tranche F.E.		x
Rater F.E.	x	x
Year-quarter F.E.	x	x
Observations	3,678	3,678
Number of deals	153	153
Adjusted R-squared	0.937	0.995

Table 3. S&P ratings changes after July 2011, excluding AAA-rated CMBS securities

This table reports the coefficients for regression models comparing S&P ratings to those assigned by Moody's and/or Fitch before and after July 2011. The sample consists of fusion deals. In the tests reported in this table, we omit observations of tranches for which the variable *Tranche Rating* takes a value of one for all raters rating that tranche, that is, tranches that are assigned the highest possible rating by all raters. Each observation in the sample is measured at the tranche-rater level. The variables are defined in Table 1. Heteroskedasticity-robust standard errors, clustered by deal, are reported below coefficients. * denotes estimates that are significantly different from zero at the 10% level, ** at the 5% level, and *** at the 1% level.

	(1)	(2)
	Tranche Rating	
Ind(S&P) x Ind(Post July 2011)	-0.255**	-0.225***
	(0.099)	(0.072)
Deal F.E.	x	
Seniority F.E.	x	
Tranche F.E.		x
Rater F.E.	x	x
Year-quarter F.E.	x	x
Observations	1,743	1,743
Number of deals	153	153
Adjusted R-squared	0.900	0.984

Table 4. Sample splits by deal and issuer importance

This table reports the coefficients for regression models comparing S&P ratings to those assigned by Moody's and/or Fitch before and after July 2011. The sample consists of fusion deals. In Panel A, the sample is divided based on issuers' market shares in the CMBS market in the previous calendar year; columns 1 and 2 show regressions for deals by issuers with above median market share, while columns 3 and 4 reports regressions for deals by issuers with below median market share. In Panel B, the sample is divided into deals above and below the sample median deal face amount. Each observation in the sample is measured at the tranche-rater level. The variables are defined in Table 1. Heteroskedasticity-robust standard errors, clustered by deal, are reported below coefficients. * denotes estimates that are significantly different from zero at the 10% level, ** at the 5% level, and *** at the 1% level.

Panel A: Issuers with large vs. small market share

	(1)	(2)	(3)	(4)
Issuer Market Share:	> Median		< Median	
Dependent Variable:	Tranche Rating			
Ind(S&P) x Ind(Post July 2011)	-0.215***	-0.140***	-0.032	-0.028
	(0.060)	(0.034)	(0.126)	(0.065)
Deal F.E.	x		x	
Seniority F.E.	x		x	
Tranche F.E.		x		x
Rater F.E.	x	x	x	x
Year-quarter F.E.	x	x	x	x
Observations	1,419	1,419	1,505	1,505
Number of deals	64	64	57	57
Adjusted R-squared	0.955	0.993	0.928	0.995

Panel B: Large deals vs. small deals

	(1)	(2)	(3)	(4)
Deal Size:	> Median		< Median	
Dependent Variable:	Tranche Rating			
Ind(S&P) x Ind(Post July 2011)	-0.142**	-0.112***	-0.127	-0.042
	(0.067)	(0.021)	(0.128)	(0.089)
Deal F.E.	x		x	
Seniority F.E.	x		x	
Tranche F.E.		x		x
Rater F.E.	x	x	x	x
Year-quarter F.E.	x	x	x	x
Observations	1,830	1,830	1,848	1,848
Number of deals	62	62	91	91
Adjusted R-squared	0.930	0.996	0.947	0.994

Table 5. Market share

In this table, we study S&P's market share relative to that of Moody's and Fitch in the fusion CMBS segment. The variables are defined in Table 1. In the sample underlying this analysis, there is one observation for each rater per year-quarter. Heteroskedasticity-robust standard errors, clustered by year-quarter, are reported below coefficients. * denotes estimates that are significantly different from zero at the 10% level, ** at the 5% level, and *** at the 1% level.

	(1)	(2)
	Market Share	
Ind(S&P) x Ind(Post Q2 2011)	-50.653***	
	(16.125)	
Ind(S&P) x Ind(Post Q2 2011, Pre Q3 2012)		-70.417***
		(13.804)
Ind(S&P) x Ind(Post Q2 2012)		-42.747**
		(17.876)
Rater F.E.	x	x
Year-quarter F.E.	x	x
Observations	84	84
Adjusted R-squared	0.664	0.674

Table 6. Robustness: alternative sample periods

This table reports the coefficients for regression models comparing S&P ratings to those assigned by Moody's and/or Fitch before and after July 2011. The sample consists of fusion deals. In Panel A, the sample period underlying the regression in column 1 is 2010 to 2012, while the sample for column 2 is 2009 to 2013. In Panel B, we perform placebo tests for the period from January 2008 until July 2011. The variable *Ind(Post Sept. 2009)* takes the value of one for observations after September 2009. All other variables are defined in Table 1. Each observation in the sample is measured at the tranche-rater level. Heteroskedasticity-robust standard errors, clustered by deal, are reported below coefficients. * denotes estimates that are significantly different from zero at the 10% level, ** at the 5% level, and *** at the 1% level.

Panel A: Alternative sample periods

	(1)	(2)
Sample Period:	2010-2012	2009-2013
Dependent Variable:	Tranche Rating	
Ind(S&P) x Ind(Post July 2011)	-0.215***	-0.107***
	(0.055)	(0.034)
Tranche F.E.	x	x
Rater F.E.	x	x
Year-quarter F.E.	x	x
Observations	1,154	2,251
Number of deals	51	96
Adjusted R-squared	0.996	0.995

Panel B: Placebo sample period tests

	(1)	(2)
Dependent Variable:	Tranche Rating	
Ind(S&P) x Ind(Post Sept. 2009)	0.164	-0.036
	(0.176)	(0.022)
Deal F.E.	x	
Seniority F.E.	x	
Tranche F.E.		x
Rater F.E.	x	x
Year-quarter F.E.	x	x
Observations	749	749
Number of deals	24	24
Adjusted R-squared	0.938	0.999

Table 7. Robustness: placebo tests with non-fusion deals

This table reports placebo tests that focus on the sample of non-fusion deals. Panel A reports the coefficients for regression models comparing S&P ratings to those assigned by Moody's and/or Fitch before and after July 2011. Each observation in the sample is measured at the tranche-rater level. Panel B studies rating agency market shares. In both panels, the sample period underlying the regression in column 1 is 2010 to 2012, the sample for column 2 is 2009 to 2013, and the sample for column 3 is 2008-2014. The variables are defined in Table 1. Heteroskedasticity-robust standard errors are reported below coefficients. In Panel A, standard errors are clustered by deal, while in Panel B they are clustered by year-quarter. * denotes estimates that are significantly different from zero at the 10% level, ** at the 5% level, and *** at the 1% level.

Panel A: Non-fusion deal ratings

	(1)	(2)	(3)
Sample Period:	2010-2012	2009-2013	2008-2014
Dependent Variable:		Tranche Rating	
Ind(S&P) x Ind(Post July 2011)	0.079	-0.006	-0.065
	(0.108)	(0.074)	(0.062)
Tranche F.E.	x	x	x
Rater F.E.	x	x	x
Year-quarter F.E.	x	x	x
Observations	928	1,823	2,622
Number of deals	143	271	383
Adjusted R-squared	0.935	0.948	0.969

Panel B: Non-fusion market share

	(1)	(2)	(3)
Sample Period:	2010-2012	2009-2013	2008-2014
Dependent Variable:		Market Share	
Ind(S&P) x Ind(Post Q2 2011)	-8.718	4.843	12.904
	(16.501)	(14.250)	(12.375)
Rater F.E.	x	x	x
Year-quarter F.E.	x	x	x
Observations	36	60	84
Adjusted R-squared	0.037	-0.086	-0.049

Figure 1. US CMBS issuance, 2000-2014

The figure shows the number of CMBS transactions in the US, excluding Government Agency deals (i.e., the sample is all US 'non-agency' issuance), for the 2000-2014 period. Securitizations are divided by year and type. 'Conduit' is a deal where the asset pool includes many small mortgages. 'Large/Single' refers to asset pools consisting of one mortgage, or of a group of mortgages with a single borrower. 'Fusion' represents mixed pools, which include both large and small mortgages. 'Other' refers to securitizations with unusual features, including asset pools with floating rate loans, seasoned collateral (i.e. loans that are not new at the time of securitizations) and re-securitizations.
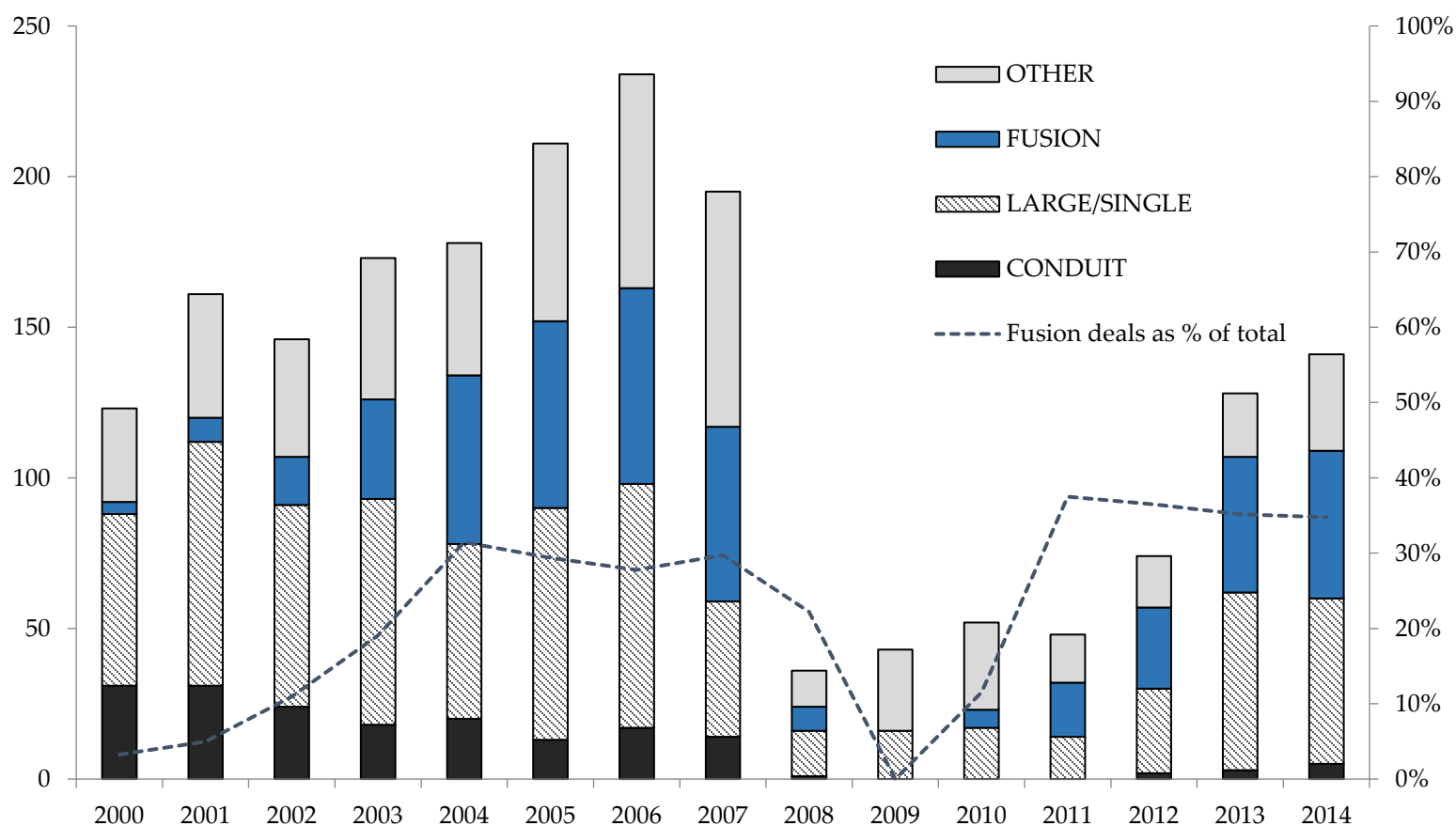
Figure 2. Deal involvement, 2008-2014

The figure shows involvement of S&P, Moody's, and Fitch in CMBS deals over the 2008-2014 period. Each marker 'x' in the figure corresponds to a CMBS deal. A marker on the line corresponding to "deal involvement = 1" indicates that a given rater is rating at least one tranche in the deal, while a marker on the line "deal involvement = 0" indicates that the rater is not involved in the deal. The dashed vertical line corresponds to the 27th of July 2011. Panel A shows fusion CMBS deals, while Panel B shows non-fusion CMBS deals.

Panel A: Fusion
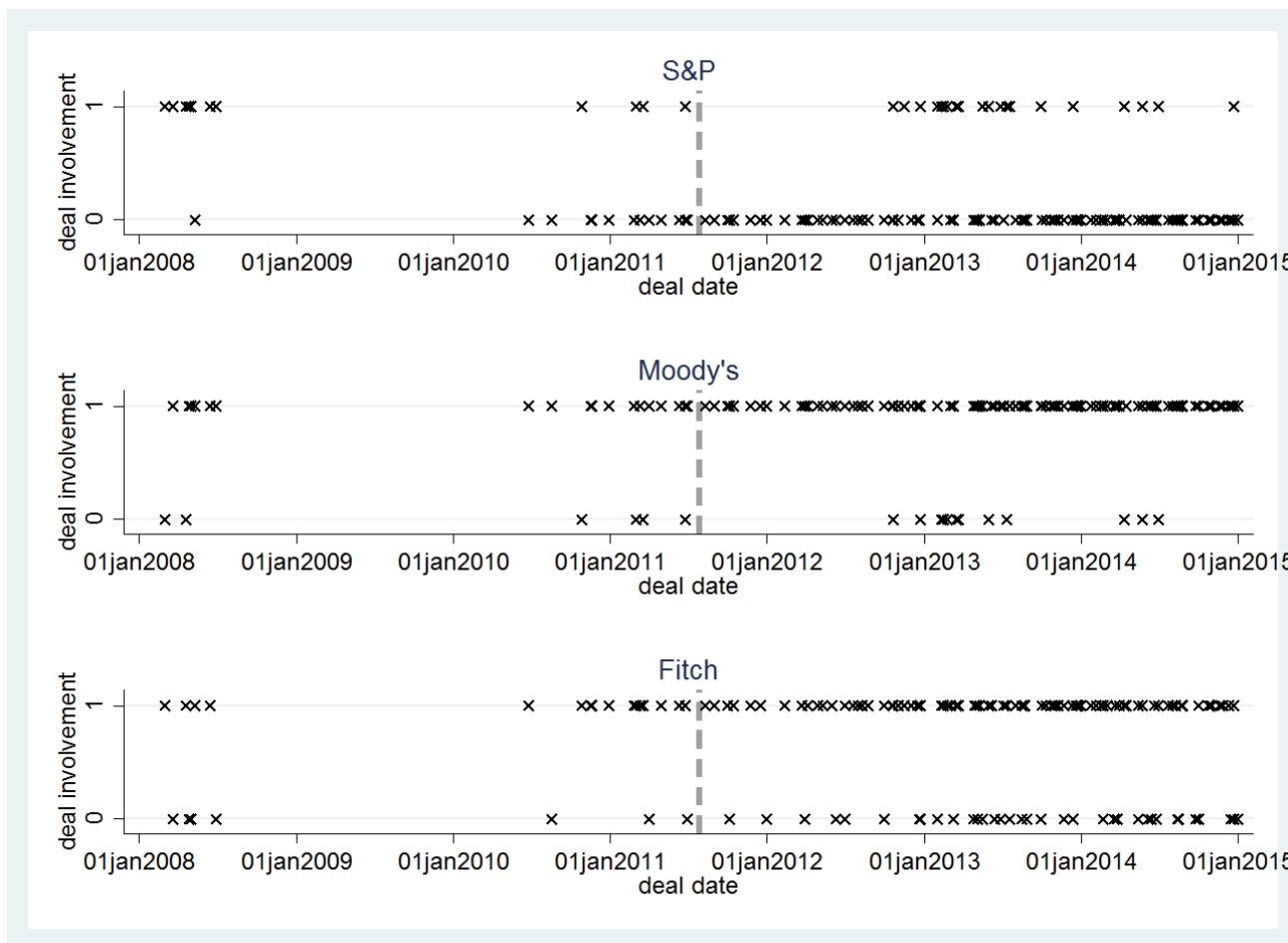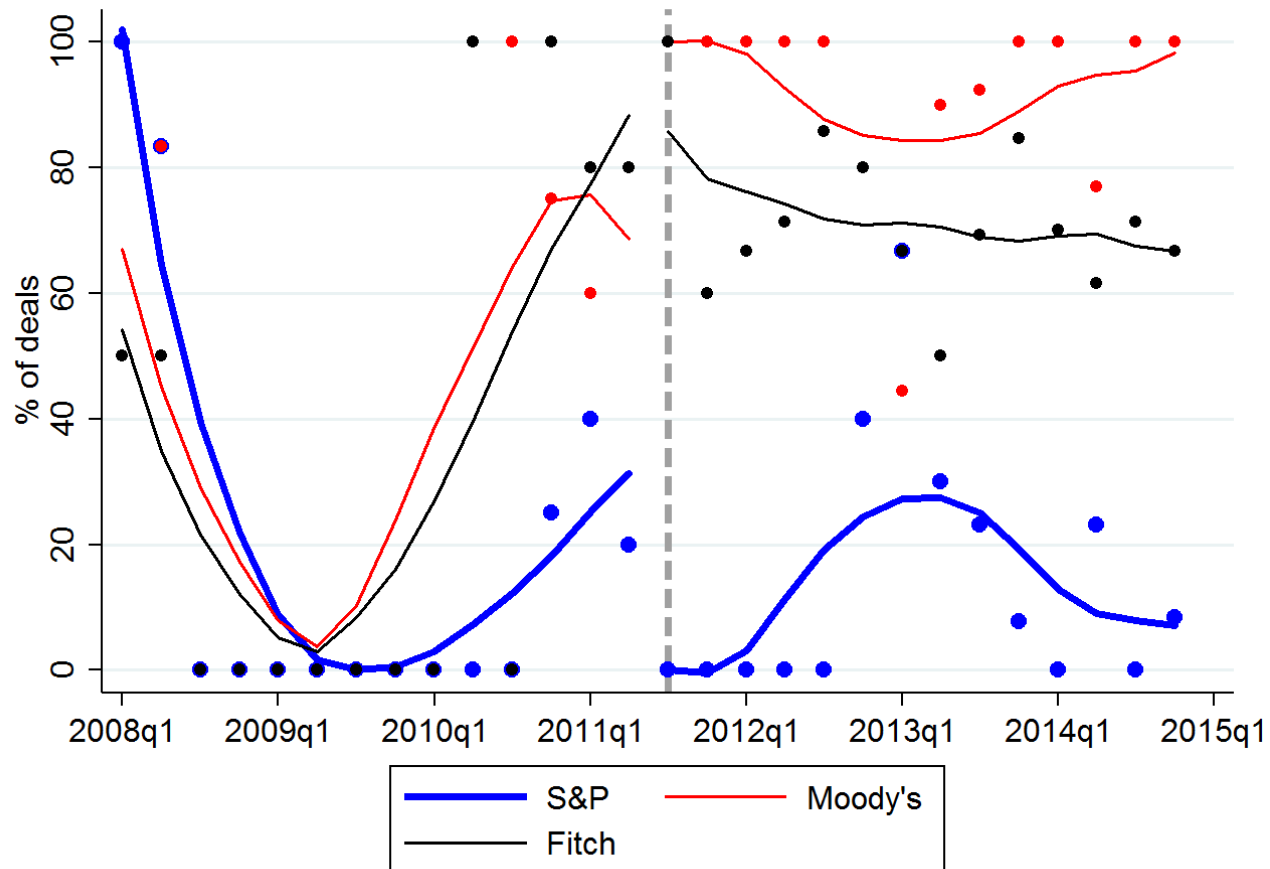
Panel B: Non-Fusion
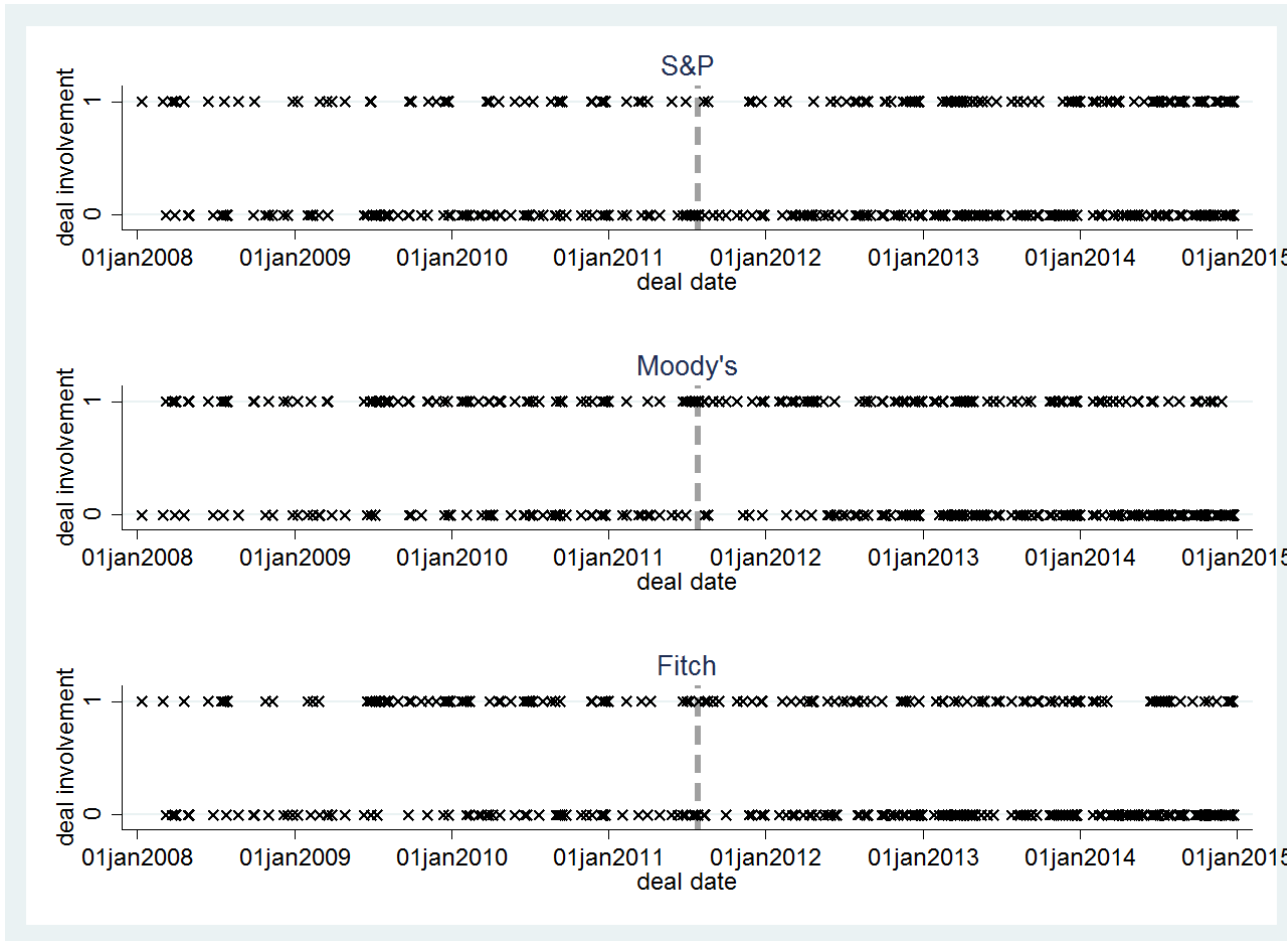
Figure 3. Market share, 2008-2014

The figure shows the market shares of S&P, Moody's and Fitch in the CMBS market over the 2008-2014 period. For each quarter, we calculate the percentage of deals that a given rater is involved in. We also fit a local polynomial smooth line to the market share observations of each rater. The dashed vertical line indicates the third quarter of 2011. Panel A shows fusion CMBS deals, while Panel B shows non-fusion CMBS deals.

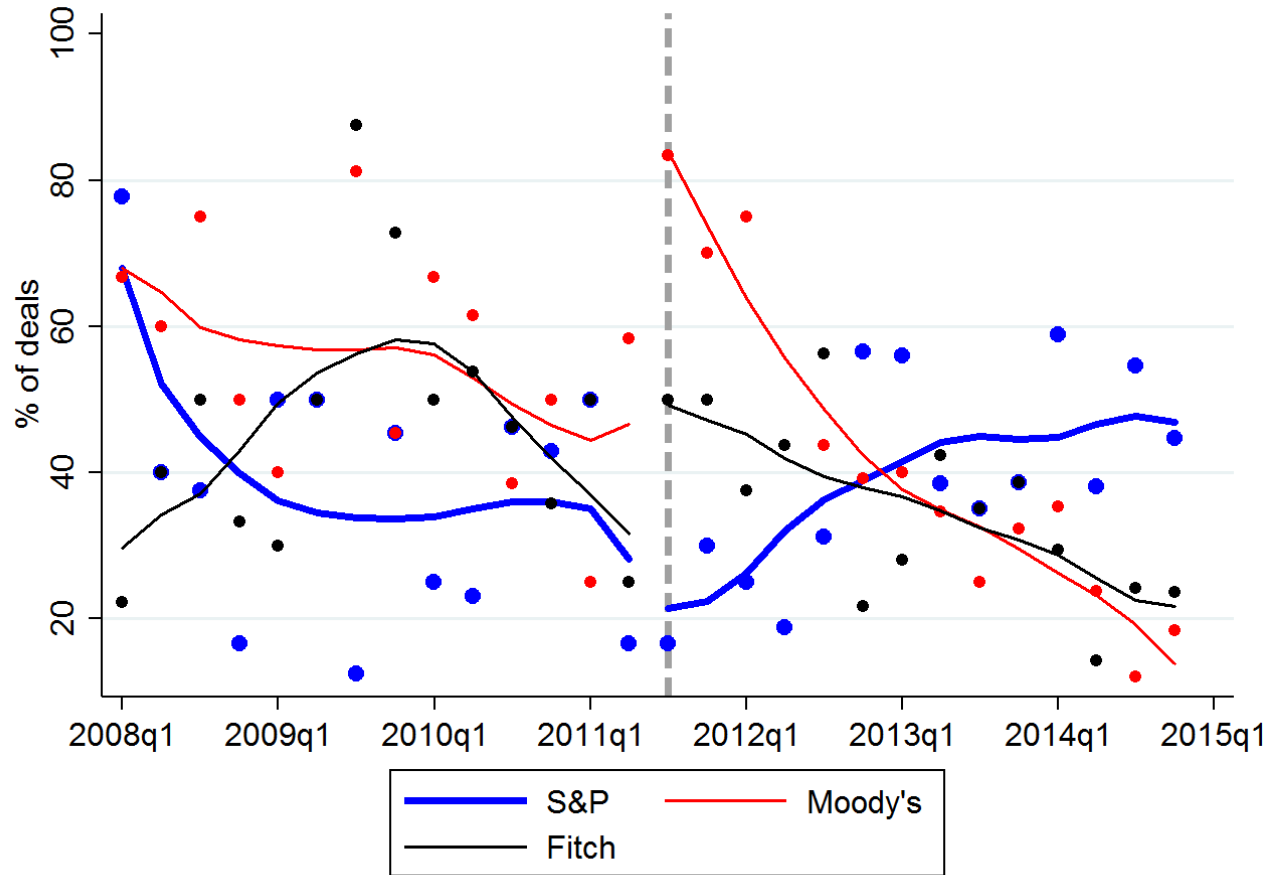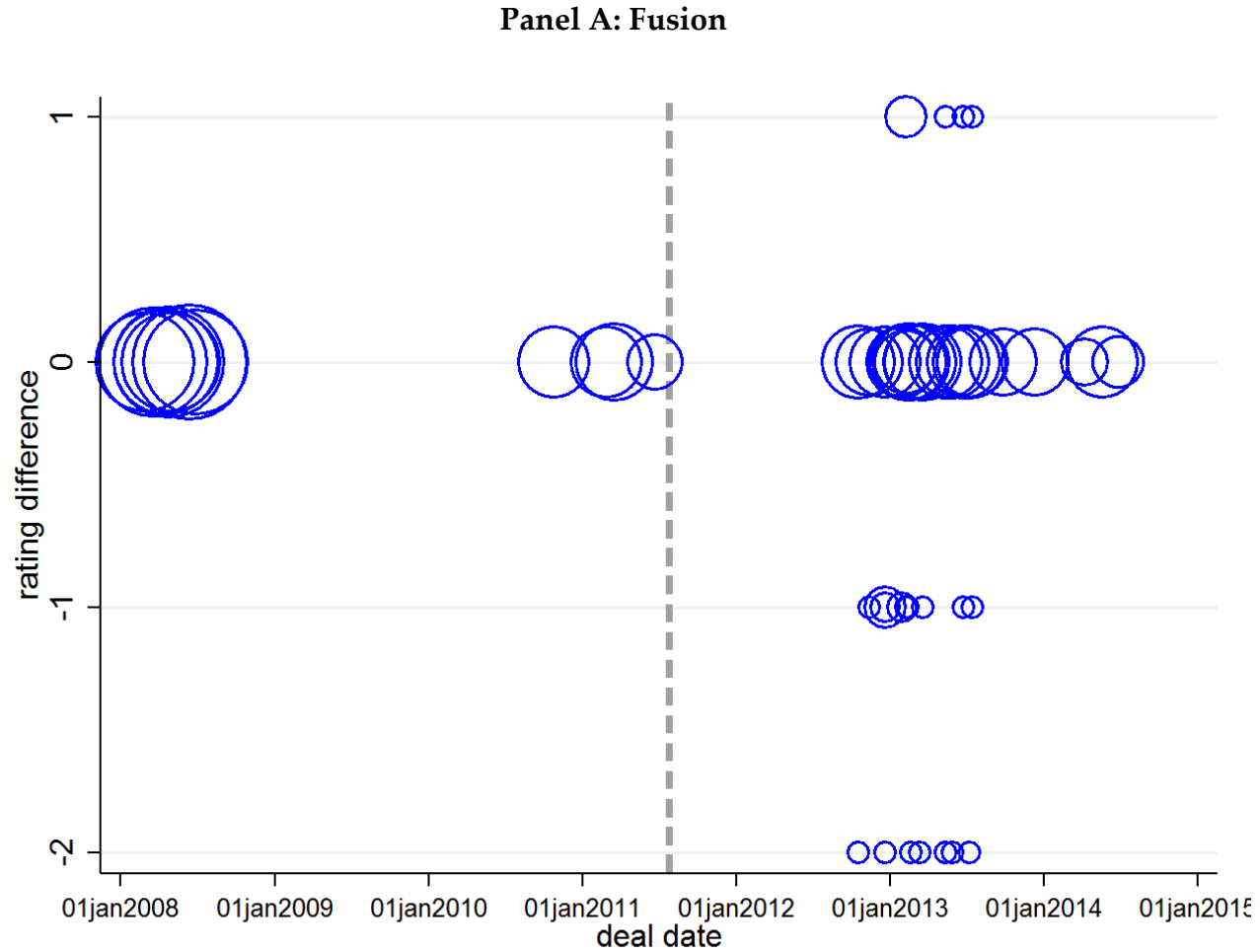### Panel A: Fusion

Panel B: Non-Fusion

Figure 4. Tranche ratings, 2008-2014

The figure reports the difference between the *Tranche Rating* assigned by S&P and the average *Tranche Rating* assigned by Moody's and/or Fitch. Larger circles on the graph indicate a larger number of tranches corresponding to a given rating difference on a given deal closing date. The dashed vertical line corresponds to the 27th of July 2011. Panel A shows fusion deals only, while Panel B shows non-fusion deals. The sample period is 2008-2014.

Panel A: Fusion

Panel B: Non-Fusion