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Solomon Y. Deku, Alper Kara,
David Marques-Ibanez

Do reputable issuers provide better-quality securitizations?

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Abstract

We examine the link between issuer reputation and mortgage-backed security (MBS) performance using a sample of 4,247 European MBS issued between 1999 and 2007. We measure performance with credit rating downgrades and delinquencies and track their changes over the long term. We find that, overall, MBS sold by reputable issuers are collateralised by higher quality asset pools which have lower delinquency rates and are less likely to be downgraded. However, as credit standards declined during the boom period of 2005-2007, asset pools securitized by reputable issuers were of worse quality compared to those securitized by less reputable issuers. Therefore, reputation as a self-disciplining mechanism failed to incentivise the production of high quality securities during the credit boom.

Keywords: Mortgage-backed securities; issuer reputation; rating shopping

JEL Classification: G21; G24; G28

Non-technical summary

The literature on securitization primarily addresses the failings of the US markets while the European markets have received very little academic research attention. To this end, this paper focuses on European mortgage backed securities (MBS) issued prior to the 2007-09 financial crisis and examines the performance of these securities considering the reputation of the originator.

The certification value of reputation in the financial services industry has been widely documented in finance theory. In the securitization literature, however, the role of reputation has been scantly considered and findings are inconclusive. We, therefore, consider the role of issuer reputation in the subsequent performance of MBS. More importantly, we emphasise the nature of this relationship during credit booms. We argue that reputation can function as a self-disciplining device so that issuers should, in principle, sell on high quality assets to protect their reputation, as the issuance of subpar quality assets can adversely affect investors' perceptions of future issuances.

We use a large dataset of 4,247 European MBS issued between 1999 and 2007. We model the relationship between tranche level performance and reputation with a logistic regression where performance is a binary variable indicating whether a tranche was ever downgraded by the cut-off. Subsequently, we model the deal level performance using a standard industry metric, annual 90-day delinquency rates.

Our main findings are twofold. First, securitizations from reputable issuers generally tend to be backed by higher quality collateral at origination. Yet, during the credit boom (2005-07) the quality of collateral originated by these issuers was of worse quality than that issued by less reputable issuers. Second, the results suggest that issuances from reputable sponsors are less likely to be downgraded, despite the decline in collateral quality.

1. Introduction

Modern securitization has grown significantly since the 1980s and has transformed the process of financial intermediation. However, it has come under scrutiny due to being a major contributing factor to the 2007-2009 financial crisis (Financial Crisis Inquiry Commission, 2011). Issuers, or originating banks, and credit rating agencies were criticised for failing to meet expected standards. Issuers relaxed lending criteria for securitized mortgages (Keys et al., 2009; Keys et al., 2012; Jiang et al., 2013; Kara et al., 2016) and rating agencies underestimated the risk (Coval et al., 2009; Brennan et al., 2009; Richardson and White, 2009). Consequently, investors in mortgage-backed securities (MBSs) suffered significant losses during the crisis. Although they were also blamed for being overly reliant on credit ratings (Mählmann, 2012), investors have attempted to incorporate the potential costs of misaligned interests at the pricing stage of MBSs beyond the informative content of ratings by accounting for issuer size, the rating bias, creditor protection, collateral, and tranche structure (Fabozzi and Vink, 2012a, b, 2015; He et al., 2012).

Investors may have also relied on issuer's reputation. Reputation has a certification value in the financial services industry (Booth and Smith, 1986; Titman and Trueman, 1986; Fang, 2005) and may be an important indicator for investors. In securitization, issuers' reputation is tied to the quality of the collateral pool; therefore, they should be motivated to ensure the quality of the collateral backing the securities. In theory, the risk of losing long run reputation should motivate issuers to avoid misrepresentations in contractual disclosures, mitigate opportunistic behaviour and moral hazard to produce high-quality securities in the interest of investors (Chemmanur and Fulghieri, 1994). Securitization is also wealth-creating for shareholders of reputable issuers and this value stems from the perceived comparative advantage of reputable issuers in credit origination and servicing (Thomas, 1999). Therefore, there is an incentive for issuers to protect their reputation.

Empirical evidence on issuer reputation in MBS quality is ambiguous and mainly based on United States (US) markets. For example, Winton and Yerramilli (2015) argues that reputable issuers are more likely to continue monitoring the loan pool even during credit booms, when monitoring is difficult to maintain, and therefore provide better quality MBS. On the contrary, Griffin et al. (2014) find that for complex securities, such as MBS, reputable underwriters may issue securities that underperform during downturns. However, He et al. (2016) report inconclusive results.

In this paper, we examine the predictive ability of issuer reputation on future MBS quality and whether reputation operates as a self-disciplining mechanism in the European MBS markets. Ideally, reputation concerns should mitigate opportunistic behaviour by the issuer. Thus, assuming issuers intend to access the market over the long term, the loss of reputation should act as an incentive to ensure that issuers securitize relatively high quality assets. We measure quality using two indicators: credit rating transitions (downgrades) of the tranches and underlying loan pool delinquency rates. Issuer reputation is measured by market volume of the issuer. We use a large dataset of 4,247 European commercial and residential MBS issued between 1999 and 2007.

We contribute to the literature on issuer reputation and MBS performance by providing evidence from the European market. The European market has received considerably less research attention on post securitization performance even though it is the second largest market after the US market. These markets are also considerably different in their historical development. Firstly, the remarkable expansion of the US securitization markets has been attributed to the influence of the Government Sponsored Enterprises (GSEs). However, there is limited government participation in the European market.[1] Secondly, the growth of the US securitization market has been progressive and continuous since the late 1960s. In contrast, the European securitization market grew rapidly and exponentially in the 2000s after the introduction of the euro and increased demand from institutional investors (Altunbas et al., 2009).[2] Given these differences, investors in Europe may have relied more on issuer reputation for mitigating MBS risks.

It is important to unearth the dynamics of the European securitization markets. Since 2008, the primary and secondary market for securitization instruments in the euro area has collapsed and European policy makers, recognizing the potential benefits of securitization to the financial system, are considering policy options to transform and revive securitization markets in the European Union. In particular, the STS (Simple, Transparent, and Standardised) approach is a priority for current work on creating a Capital Market Union (Constâncio, 2016). A healthy European securitization market is indicative of a functioning capital market in the European Union. In this respect, our research contributes to the discussion on the importance of issuer behaviour in maintaining the quality standards of asset backed securities and making these instruments attractive to investors.

[1] The development of European securitization had been limited by the variable and absence of legal and regulatory frameworks in many European countries (Baums, 1994; Hayre, 1999). From the demand side, the dearth of analytical tools and suitable information infrastructure to support the efficient information transmission to market participants limited the viability of securitization. Also, the lack of mortgage contract standardisation across countries and exchange rate risks somewhat limited the appeal of cross-border transactions (Hayre, 1999) .

[2] Outstanding volumes climbed by about 1,400% from $139 billion in 1999 to $2 trillion in 2007.

We find that issuers' reputational capital generated from the frequency of MBS issuance predicts future performance. Reputable issuers issued MBS collateralised by high quality asset pools with lower delinquency rates. However, as credit standards declined during the boom period, the asset pools securitized by reputable issuers were of worse quality compared to those securitized by less reputable issuers. We attribute this decline in quality to increased issuer complacency and reduced monitoring efforts. Our results also show that MBS sold by reputable issuers were less likely to be downgraded by the rating agencies, probably due to the compensating effects of structuring techniques.

The rest of the paper is structured as follows. The next section provides a background to the securitization process and reviews the extant literature. Section 3 describes the data followed by the methodology used in Section 4. Results are presented in Section 5 and Section 6 concludes.

2. Background and Related Literature

2.1. The securitization process

Securitization involves the transformation of illiquid assets such as mortgages into relatively marketable securities. Securitization starts with the extension of credit such as mortgages. These mortgages are pooled and conveyed to a special purpose vehicle, an entity set up for the sole purpose of this transaction. With the help of an underwriter, typically an investment bank, the asset pool is structured into various tranches, which are then rated by credit rating agencies. Credit rating agencies evaluate the credit risk of these tranches based on either expected losses or probability of default. Finally, the rated tranches are sold as MBS securities to investors.

It is well established that banks are comparatively efficient loan originators. They have a relative advantage at screening and monitoring borrowers hence securitization creates an avenue for banks to specialise and profit from these tasks while reaping diversification gains by shifting risks to capital market participants who are better suited to absorb these risks (Greenbaum and Thakor, 1987; Pavel and Phillis, 1987). Rosenthal and Ocampo (1988) argue that originators' portfolios grow concentrated over time as they tend to operate in areas where they are able to manage and absorb expected losses. Hence, securitization serves as an avenue to shed the catastrophe risk within their portfolios. Furthermore, securitization is a more efficient approach to risk management. This efficiency is achieved by stripping and partitioning credit and prepayment risks, which in turn enhances risk sharing (Greenbaum and Thakor, 1987; Rosenthal and Ocampo, 1988).

Securitization may also be used as an alternative source of capital to traditional debt and equity funding (Gorman, 1987; Farruggio and Uhde, 2015). Although, multiple empirical studies show that securing funding was the primary motivation for asset securitization in Europe[3], Jones (2000) highlights the central role of securitization in engineering regulatory capital arbitrage. Using securitization, banks can reduce their effective risk-based capital requirements significantly, without a commensurate reduction in economic risks. For example, under Basel I, unsecured loans were not risk adjusted hence banks had to hold the same level of capital for AAA and BBB rated corporate loans of the same value. Therefore, it was costlier to hold safer loans on the balance sheet. Securitization under this regime allowed banks to concentrate a large portion of the default risk in the equity tranche, which is then retained while selling the higher quality tranches. Thus, according to the regulatory arbitrage hypothesis, banks will securitize safer assets while keeping riskier ones as banks perceived the capital requirements on safer assets to be excessive. Although a few studies (Berndt and Gupta, 2009; Krainer and Laderman, 2013; Elul, 2015) show that portfolio loans were safer than securitized loans, several studies report converse findings where securitized assets were safer than portfolio loans (Ambrose et al., 2005; Agarwal et al., 2012; Albertazzi et al., 2015; Benmelech et al., 2012; Shivdasani and Wang, 2011; Cebenoyan and Strahan, 2004).

2.2. The impact of investor demand

The demand for MBSs climbed in the years leading to the financial crisis as these tranches offered higher yields[4], attracted lower capital charges and were often used as collateral. In addition, MBSs are offered in a wide range of maturities to meet various investment horizons (BlackRock, 2004). The strong demand for highly rated securities during the growth period prior to the financial crisis created an incentive for broker/dealers to harness developments in financial engineering to create more of these highly rated securities from low quality loans (Segoviano et al., 2015).

Investor demand for MBSs also soared due to rating-dependent regulation. Credit ratings were of prime importance in determining minimum capital requirements for financial institutions such as banks and insurance companies. National regulations also restrict pension funds from investing in non-investment grade bonds.[5] This central role of ratings spurred the institutional demand for highly rated bonds such as MBSs as the supply of highly rated single-name securities was quite limited (Benmelech and Dlugosz, 2009). Consequently, adverse selection problems emerged as issuers relaxed their lending standards to

[3] Martín-Oliver and Saurina (2007) and Cardone-Riportella et al. (2010) for Spanish banks; Affinito and Tagliaferri (2010) for Italian banks; Hänsel and Bannier (2008) for banks based in 17 European countries.
[4] Relative to single-name securities of comparable quality, MBSs offer higher yields to compensate investors for the variable maturity and payment characteristics of these bonds. MBSs tend to make monthly income payments as opposed to conventional fixed income securities that make semi-annual payments.
[5] Bonds rated BBB (Baa3) or higher by Standard & Poor's/Fitch (Moody's).

cater for this increase in demand. This is evident in the increased delinquencies recorded in the US subprime mortgage sector during the financial crisis (Keys et al., 2010; Nadauld and Sherlund, 2013; Demyanyk and Van Hemert, 2011)

This breakdown in the securitization machine can be attributed to misaligned incentives and imperfect information. Information loss occurs as securitization extends the distance between originators and the ultimate investors. Consequently, certain borrower characteristics observed by lenders are not transmitted to the final investor. There is an incentive for the bank to extend loans that rate highly on characteristics that affect its fee income, those characteristics observable by investors (hard information), despite the possibility that these loans are risky according to unreported dimensions (soft information). Thus, securitization limits or removes the incentive to collect soft information (Rajan et al., 2015) and to perform their screening and monitoring function efficiently.

2.3. Reputation as a self-disciplining mechanism

The bankruptcy-remoteness feature of these transactions, as well as the fact that investors do not observe the quality of the collateralised mortgages, limits the incentive to carefully screen the mortgagors, thereby creating the first inefficiency –adverse selection. Furthermore, the second inefficiency is the moral hazard problem where there is a limited incentive to continuing monitoring the securitized loans (Geithner and Summers, 2009; Keys et al., 2010; Kara et al., 2018). Securitization advocates argue that reputation is a sufficient self-disciplining mechanism. Therefore, the tendency of securitizing high quality assets can also be explained by the reputation hypothesis. Since the placement of securitization follows a repeated game structure, the potential loss of reputation creates an incentive for issuing banks to maintain or improve their credit quality standards to ensure encouraging levels of subscription and continual market access. Consequently, securitized loans should be safer than portfolio loans (Ambrose et al., 2005).

The value of reputation as a disciplining mechanism is supported in various standard finance theories (Booth and Smith, 1986; Chemmanur and Fulghieri, 1994). Hartman-Glaser et al. (2012) analyse a repeated security issuance game with reputation concerns. They find that there can be opportunistic issuers that are initially honest when reputation is low, but subsequently go on to build a reputation only to be exploited in the future by misreporting collateral quality. Similarly, Kawai (2015) show that the reputation incentive can actually worsen the moral hazard problem.[6]

[6] Buiter (2008) also criticised Alan Greenspan's tenure at the Fed as failing to recognise the weaknesses associated with reputation as a self-disciplining mechanism in markets characterised by short horizons and easy exits.

On the empirical front, using a sample of CLO, MBS, ABS, and CDOs worth $10.1 trillion, Griffin et al. (2014) find that for complex securities, reputable underwriters may issue securities that underperform during downturns. They show that the common intuition regarding the role of reputation in maintaining issuer discipline can break down with complex securities. In standard reputation models, investors can assess the quality of simple assets in good and bad states. In their model, securities are complicated such that investors are unable to evaluate the performance of the securities in a hypothetical economic state. Therefore, investors only become aware of asset values in a bad economic state only when this state occurs. This creates an incentive for reputable banks to issue poor quality securities. This explains the tendency for opportunistic reputable underwriters to increase issuance volumes prior to an economic downturn. In fact, Piskorski et al. (2015) and Griffin and Maturana (2016) show that misreporting by originators and underwriters was quite common in private label mortgage backed securitization. Furthermore, misreporting was a strong predictor of losses while issuance yields were not. This indicates that investors were unaware of these misreporting tendencies. However, it is not clear from this research whether reputable issuers were relatively more culpable.

In this paper, we extend the work of Griffin et al. (2014), which focuses on underwriters using the activity levels of these underwriter banks in the IPO market to measure reputation in the fixed income market. Our focus is on the issuer as they are responsible for asset (mortgage or loan) origination. We argue that holding the intricacies of structuring constant, high quality MBSs are created from high quality mortgages. Hence issuers who wish to retain favourable access to the securitization markets over the long term are more likely to securitize their high quality assets.

Winton and Yerramilli (2015) argue that reputable issuers are more likely to continue performing their monitoring function during periods of increased competition while less reputable institutions tend to increase market share at the expense of monitoring existing obligors. They show that investors are generally willing to receive lower spreads on tranches issued by reputable banks. However, He et al. (2012) find that investors demanded higher spreads on securities issued by reputable issuers in the few years prior to the financial crisis. They attribute this finding to investors' concern about the questionable relationship between issuers and rating agencies, where large issuers are better positioned to secure inflated ratings.

3. Data and Variables

3.1. Data

Our sample comprises 4,247 residential and commercial mortgage-backed securities issued in 12 European countries[7] from 1999 to the first half of 2007. This cut-off date is chosen to circumvent changing investor attitude as investors' appetite for asset-backed securities began declining in June 2007. Originators have largely retained post-2007 European issuances. According to data published by SIFMA, issuing banks were able to place only 36% of all issuances between July and December of 2007. Thus, investors were no longer buying these tranches hence issuing banks mainly use new issues as collateral for European Central Bank repo transactions. As of 2017, the UK and Dutch issues account for most placed issues throughout Europe.

We combine data from multiple sources. First, we collect rating transition data from Bloomberg to construct our primary MBS performance variable – *Downgrade*. We identify tranches that were downgraded by at least one of the three largest credit ratings agencies –Standard & Poor's, Moody's and Fitch– between the issuance date and 2011, as more than half the tranches in our sample are paid off by that date. We construct *Downgrade* as a dummy variable where all downgrades take the value of 1 and 0 otherwise. This variable allows us to test our hypotheses on individual tranches within deals thereby increasing the number of observations available for analysis. Although the ratings of all three agencies are forward-looking, ratings issued by Moody's measure expected losses contingent on default while ratings issued by Standard & Poor's and Fitch are indicators of the probability of the securities defaulting. A prime weakness of this measure is that credit ratings are not reviewed as frequently as delinquency rates are reported. Also, credit ratings can be supported by structural features thereby weakening the link between the performance of the underlying assets and rating changes.

Second, we focus on the industry standard metric of the performance of loan portfolios –*delinquencies*. In this regard, we collect data on the delinquency rates of the underlying asset pools covering the first four years after issuance. Due to the sparseness of pool delinquency data prior to 2002, only 50% of the deals in the sample end up in our regressions.

Third, we collect initial tranche and deal-level data as well as the identity of the issuing bank from Dealogic and Bloomberg. Tranches in our sample are either floating rate or fixed rate tranches issued in the Euromarkets. We restrict our sample to floating rate tranches only to circumvent the difficulties

[7] United Kingdom, Spain, Netherlands, Germany, Italy, Portugal, Ireland, France, Greece, Sweden, Belgium, and Switzerland.

associated with estimating a consistent benchmark yield curve for each fixed rate tranche. For the floating rate notes, we use the quoted spreads in excess of the relevant benchmark (3mLibor/3m-Euribor) as a measure of funding cost. These spreads represent extra compensation for credit, liquidity and optionality risks. However, the optionality risk in the price for floating rate tranches is marginal (Fabozzi and Vink, 2015). Therefore, the initial spreads reflect the risk premiums compensating for liquidity risk and credit risk. Rather than assuming that all securities are issued at par, we restrict our sample to tranches issued at par to preclude distortions of discounts or premiums on the actual yield spreads. This results in a final sample of 4,247 tranches from 733 mortgage-backed deals.

Finally, in an attempt to substantiate our results, we collect bank-level data from Bankscope (now Orbis Bank Focus) to control for the influence of bank characteristics on the performance of the mortgage-backed securities in our sample. The dependent and explanatory variables used in our empirical models and analyses are explained in Table 1 and in the following sub-sections.

3.2. Dependent Variables

We measure MBS performance using *credit rating downgrades* and *delinquency rates* as proxies of tranche and deal (pool) performance respectively.

3.2.1. Rating Downgrades

Although recent evidence (Fabozzi and Vink, 2012a, b, 2015; He et al., 2012) indicates that investors incorporated a variety of factors into pricing asset backed securities, credit ratings are the single most important determinant of tranche prices at origination. Structured finance credit ratings are forward-looking credit opinions that account for credit risks of the underlying assets, structural risks and counterparty risks.

We assume that ratings account for delinquency rates. However, structural features can be engineered to stave off rating downgrades. For instance, high levels of credit protection can result in the maintenance or upgrade of an existing credit rating. Therefore, credit ratings measure the performance of the underlying assets as well as structural features. Given that no organised secondary market for MBS exists, pricing data is very scant. Therefore, we rely on credit rating downgrades as a measure of deterioration in at least one or more of these dimensions.

We collect credit ratings at issuance and rating changes of all tranches from issuance until 2011. Subsequently, we convert the ratings to a numerical point scale, where AAA/Aaa=1, AA+/Aa1=2 and so on. Thus, *Downgrade* is defined as a negative migration to a lower rating for instance from AAA to AA+. Downgrades are typically triggered by adverse changes in credit risk, counterparty risk or structural risk associated with how the deal was engineered. Following Adelino (2009), we model *Downgrade* as a binary variable where 1 represents downward rating adjustments relative to the rating awarded at issuance while 0 represents upgrades or maintained ratings. Therefore, this variable represents tranches that suffered at least one downgrade by any of the rating agencies.

3.2.2. Delinquencies

We identify non-performing deals based on the proportion of loan pools that are 90+ days delinquent. We do not observe actual defaults in our dataset, however, we rely on delinquency rates as a measure of severely underperforming loans (Avery et al., 1996). A loan is delinquent when an obligor fails to make a scheduled payment. As the payments are typically made in monthly intervals, lenders typically classify delinquent loans into 30, 60, 90, or more days delinquent relative to the duration that the earliest missed payment has been overdue. The delinquency rate is simply the ratio of the number of loans with delinquent payments to the total number of loans within the asset pool.

Delinquency rates are customarily used as measures of performance in the lending industry as the definition of default varies significantly.[8] This metric has also been increasingly used as a measure of performance in academic research.[9] Furthermore, the Basel Committee classifies obligations beyond 90 days overdue as unlikely to be repaid (BCBS, 2002). Also, we focus on 90+ delinquencies (serious delinquencies), as loans in this category are more likely to default. Although not all delinquent loans eventually default, Keys et al. (2010) show that approximately 66% of loans that are 90 days delinquent tend to default within the next 12 months. Similarly, Tracy and Wright (2016)show that mortgages entering the 90+ delinquency bucket have a reasonably low cure rate[10] of approximately 23.3%. Furthermore, 90% of 90 day+ delinquent subprime loans usually transition to foreclosure (Keys et al., 2008).

SIFMA also issued a standard default assumption for analysing mortgage defaults where mortgage default rates peaks between 30 and 60 months after origination (Hu, 2011). Using historical data, Soyer and Xu (2010) find that mortgage default rates tend to peak between 40 and 50 months after origination. Securitization deals are typically closed within three to twelve months, and issuers are usually required to replace mortgage loans that are delinquent within a specified warranty period after the deal closes.

[8] Experian (2014) defines default as payments that are at least six months overdue while Equifax (2016) only considers a loan to be in default if payments are more than 60 days overdue.
[9] See Demyanyk and Van Hemert (2011); Keys et al. (2010); Keys et al. (2012); Dell'Ariccia et al. (2012)
[10] The cure rate refers to the percentage of delinquent loans that are either repaid or brought current by making missed payments.

However, we do not have data on seasoning of the loan pool. Therefore, we are unable to ascertain the exact stage in the life cycle of the loans within the pool.

To circumvent this limitation, we plot the delinquency data over the first four years, presented in Figure 1. We find that the highest point of the distribution tends to occur within the third and fourth year. Delinquency rates are highest in the third (fourth) year for 2 (3) out of 5 vintages. For this reason, we focus more on the delinquency rates in the third and fourth year as our dependent variables. Initially, we compute the average delinquency rates in the third and fourth year after issuance. Subsequently, as suggested by Guettler et al. (2011), we compute the average delinquency rates over the first three and four years to obtain a summary measure that captures the delinquencies within the initial years as well. Although our 36-48 month range is rather crude, it falls within the 30-60 month and 40-50 month bands indicated above.

3.3. Independent Variables

3.3.1. Reputation

Frequent securitizers tend to build a reputation, and hence they can issue MBS at relatively lower costs. It is also argued that reputable issuers are more likely to continue performing their monitoring function during periods of increased competition while less reputable institutions tend to increase market share at the expense of monitoring existing obligors (Winton and Yerramilli, 2015). Therefore, we expect that tranches issued by reputable market players to outperform those issued by their rivals who securitize less frequently.

The reputation variable – *Top Issuer* – is computed based on the market share of the issuing banks. Market share or market share-based measures have been widely used in the existing literature as empirical proxies for reputation.[11] Following the intuition in Fang (2005), we use a binary variable to capture the qualitative difference between large and small issuers. *Top Issuer* is a dummy variable that takes the value of 1 if the issuer features in the list top 10 issuers by market volume, and 0 otherwise. There are 12 issuers satisfying this criterion, and they jointly represent 33.78% of issuance levels (see Table 2, Panel A).[12]

[11] See Megginson and Weiss (1991); Beatty and Welch (1996); Fang (2005); Guettler et al. (2011)

[12] There are 12 issuers on this list because the bottom 3 issuers had the same market share over the aggregate period.

3.3.2. Credit Ratings

We incorporate two credit rating variables in our regressions – *Credit Rating* and *3 CRA* Reported. Firstly, the securitization pricing literature overwhelmingly concurs that credit ratings explain substantial variation in initial yields. For instance, Fabozzi and Vink (2012a) find that credit ratings explain 74% of the variation in the yields of UK RMBS. Other papers find similar evidence (Fabozzi and Vink, 2012b; Cuchra, 2005). This is expected since MBS are typically structured by underwriters, in consultation with rating agencies, to achieve a specific rating. All deals in our sample are rated by at least one of the three well-renowned credit rating agencies – Standard & Poor's, Moody's and Fitch.[13] Dealogic reports a composite credit rating that combines the credit ratings from different rating agencies for each tranche. The use of composite credit ratings is quite common in the corporate bond literature (Campbell and Taksler, 2003) as well as the securitization literature (Fabozzi and Vink, 2015; Cuchra, 2005). We map the composite ratings onto a numerical scale where AAA=1, AA+=2 and AA=3 and so on, in order to compute the summary statistics for this variable. However, we only include an indicator for each rating in all our regressions. Furthermore, we categorise the AAA-rated tranches as prime and tranches with other ratings as non-prime in the latter aspect of our analyses (See Table 2, Panel B).

Rating shopping, where issuers solicit ratings from multiple agencies and then only reporting the favourable ratings or ratings from agencies with lenient standards, was common practice in the securitization industry (Adelson, 2006). Sangiorgi and Spatt (2016) theoretically show that investors adjust prices to account for potential rating bias when issuers report fewer ratings than the number of ratings available to the issuer. Furthermore, empirical evidence shows that single rated deals tend to suffer more severe adverse credit migrations relative to deals with multiple ratings (Benmelech and Dlugosz, 2010). He et al. (2016) also find that cumulative losses are higher on solely rated MBS deals compared to deals with multi-rated deals. Although rating shopping is beyond the remit of our paper, given the evidence of its influence on tranche performance, we control for this phenomenon using a dummy variable *3 CRA.* This variable takes the value of 1 where a tranche is rated by all three agencies (less likelihood of rating shopping) and 0 otherwise (See Table 2, Panel C for the distribution of the number of ratings).

Additionally, Fabozzi and Vink (2012b) provide empirical evidence indicating that investors consider a number of credit factors when pricing European ABS deals. These credit factors include credit enhancement, collateral, and country of origination. We explain these below.

[13] Based on turnover in 2014, S&P, Moody's and Fitch controlled 91.89% of the credit ratings sector in the EU (ESMA, 2015).

3.3.3. Credit Enhancement

The most popular form of credit enhancement in securitization is *subordination*. Consequently, this variable features as a standard control variable in the securitization literature (He et al., 2016; Fabozzi and Vink, 2012b; He et al., 2012). Subordination is exemplified in the waterfall structure (senior-subordinate) of cash flow/loss distribution. Under a waterfall structure, the priority of cash flow distribution follows a descending order of seniority while losses are allocated from the bottom-up (from the equity tranche to the senior-most tranche). For each tranche, the subordination level is computed as the value of tranches in the same deal that have an equal or higher rating than the given tranche as a fraction of the total deal value. Although this variable is our main measure of deal structure, it also represents the level of protection offered by lower tranches in each deal.

Furthermore, we control for tranche retention in our regressions. Gorton and Pennacchi (1989); Gorton and Pennacchi (1995) show that securitization (loan sales) decreases banks' screening and monitoring incentives; however, this misalignment of incentives can be addressed by the issuer retaining some exposure to the issue. Retained tranches are essentially credit enhancement devices to shield investors from the effects of the originator's perverse incentives (Franke et al., 2012). Our dataset does not explicitly indicate which tranches are retained; however, deal notes state whether at least one tranche was retained in the deal. We account for retention by constructing *Retained* as a binary variable indicating deals in which certain tranches of the deal were retained by the originator.

3.3.4. Collateral

Securitization instruments are usually classified by collateral. Our sample contains tranches backed by two distinct types of collateral: residential and commercial mortgages (See Table 2, Panel B). CMBSs are significantly different from RMBSs. CMBSs are business loans secured against commercial real estate while RMBSs are retail loans. When rating RMBS, agencies pay more attention to underwriting standards and historical loss data. However, the focus of agencies when rating CMBS is the income earning potential of the property. Also, prepayment risk has been historically lower for CMBS due to the covenants stipulating lock-in periods and prepayment penalties (Kothari, 2006). We introduce *Collateral* as a dummy variable that takes the value of 1 for RMBS and 0 for CMBS.

Concerning collateral quality, Demyanyk and Van Hemert (2011) finds that combined loan-to-value ratio is one of the most important determinants of loan performance. Consequently, we use the weighted average loan to value ratio at origination (*WALTV*) as a measure of borrower leverage to account for credit risk that credit ratings fail to capture. Loan-to-value (LTV) represents loan value as a percentage of the value of the collateral backing the said loan. *WALTV* is calculated as the average, weighted according to the loan amount, of the LTV of each loan in the pool.

3.3.5. Country of origination

Drawing on the information based theories of banking (Berger et al., 2008; Detragiache et al., 2008; Mian, 2006; Stein, 2002), where foreign banks encounter difficulties in evaluating opaque local borrowers, we also control for issuer being a foreign bank. We construct *Distance*, a binary variable that takes the value of 1 if the nationality of the issuer's parent differs from the country of the issuer's operations, and 0 otherwise.[14] Table 3 presents the sample distribution according to the country of origination. Tranches backed by mortgages originated in the UK account for more than half of our sample. Other significantly active countries include Spain, Netherlands, Germany and Portugal account for approximately 38% of our sample.

3.3.6. Complexity

We control for credit ratings in all our specifications. However, Opp et al. (2013) and Furfine (2014) show that increased deal complexity may result in rating inflation. Furfine (2014) further shows that complexity proxied by the number of tranches is correlated with poor loan performance. Therefore, we initially account for deal complexity using the number of tranches per deal. Furthermore, we find that most deals contain multiple tranches with identical ratings but with different issue currency and weighted average life. In practice, it has been suggested that these additional tranches are usually created to meet the needs of a broad range of investors (Cuchra and Jenkinson, 2005). However, both variables are highly collinear, consequently, we create a refined measure of complexity as the ratio of the number of uniquely rated tranches to the total number of tranches in a deal – *Ratings/Tranches*.

3.3.7. Other deal and tranche characteristics

We account for tranche size using principal values (also used as a measure of complexity in Furfine, 2014) and control for interest rate risk exposure using the *Weighted Average Life* of each tranche. Based on prepayment speed assumptions, the weighted average life of a tranche is computed as the weighted average time that each monetary unit of principal remains outstanding. The weighted average life accounts for prepayment risk and will always be shorter than the nominal maturity of the underlying mortgages.

[14] We define issuers to including institutions that originated the collateral backing a given securitization transaction, rather than the special purpose vehicle establish to fulfil the transaction.

We also utilise the variable *Boom*, a dummy variable that equals 1 if the relevant tranche was issued between 2005 and 2007, and 0 otherwise. This variable is used to proxy for the exponential growth period in European securitization markets. Additionally, we control for year of issuance (*Year*).

In our robustness tests, we control for common bank characteristics to ensure that our findings are not driven by time-varying underlying issuer characteristics. These include size (*Total Assets*), asset diversification (*Net Loans/Total Assets*), funding diversification (*Deposits/Total Assets*), leverage (*Equity/Total Assets*), *Loan Growth* and asset quality (*Loan Loss Reserves/Gross Loans*).

4. Empirical Models

4.1. Issuer Reputation

Following Adelson and Bartlett (2005) and Adelino (2009), the first set of models employ credit rating migrations (*Downgrade*) as the dependent variable and the independent variables include, issuer reputation (*Top Issuer*), rating shopping (*3 CRA*), weighted average loan to value (*WALTV*) and other control variables. The baseline logistic regression model is specified as follows:

$$Downgrade_i = \beta_0 + \beta_1 TopIssuer_i + \beta_2 3CRA_i + \beta_3 WALTV_i + All\ other\ controls + \ \varepsilon \quad (1)$$

In subsequent iterations of this model, we use the interaction of *TopIssuer* with *Boom* to determine whether reputable issuers sold relatively poor quality securities during the growth period. We interact *TopIssuer* with *3 CRA* to ascertain whether tranches with 3 ratings issued by reputable issuers were riskier. Finally, we interact *TopIssuer* with *AAA*-rated tranches to assess the performance of highly rated tranches issued by reputable issuers.

Using *Downgrade* as our dependent variable inherently assumes that downgrades represent deterioration in underlying asset quality. However, rating changes may reflect changes in the structural integrity of the deal as well as changes in the quality of the underlying asset pool. To relax this assumption, we use 90+ day delinquency rates to measure pool quality. Consequently, we specify another, but similar model to Equation 1 based on deal level variables only. This is because delinquency rates reflect pool wide performance and are not tranche specific. This model is as follows:

$$Delinquency_j = \beta_0 + \beta_1 TopIssuer_j + \beta_2 3CRA_j + \beta_3 WALTV_j + All\ other\ controls + \ \varepsilon \quad (2)$$

Subsequently, we run models controlling for bank-level characteristics to test the reliability of our inferences. We assume that unobservable factors that might affect both dependent and independent variables simultaneously are time invariant. Thus, we introduce entity fixed effects to exploit within-group variation over time and control for unobserved heterogeneity, and time fixed effects to control for market conditions and macroeconomic trends associated with the relevant issuance years. All regressions are estimated with heteroskedasticity-robust standard errors clustered at the issuer level to control for heteroskedasticity and control for correlation between deals from the same issuer.

4.2. Descriptive Statistics

Table 4 presents the summary statistics of our sample at the deal, tranche and bank levels. The deal and tranche level variables are described below.

4.2.1. Deal Level Variables

For the deal level analysis, we use default frequencies (delinquency rates) as our dependent variables. These variables represent the proportions of the collateral pool that are at least 90 days delinquent. We use the average delinquency rate in the third and fourth years of issuance as measures of pool performance. Furthermore, we use the average delinquency rates over the 3 and 4-year period after issuance to capture pool performance in the earlier years. The mean delinquency rate in the third year of issuance is 5.26% compared to a 3-year average delinquency rate of 3.31% for 432 deals. Similarly, the mean delinquency rate in the fourth year stood at 5.71% in the fourth year compared to a 3.72% 4-year average delinquency rate on 465 deals. This trend indicates that delinquency rates must have been much lower in the first two years of issuance. It is also worth noting that the distribution of the default frequencies is quite uneven: the median delinquency rates range from 0.72% to 1.19% while the mean ranges from 3.31% to 5.71%.

Demyanyk and Van Hemert (2011) find that combined loan-to-value ratio is one of the most important determinants of loan performance. Consequently, we use the weighted average loan to value ratio at origination (WALTV) as a measure of risk embedded in the underlying loans. The mean (median) WALTV of our sample is 71.39% (71.92%). The typical deal is worth €1.190 billion and contains at least 6 tranches with 3 distinct rating classes resulting in an average complexity measure (Number of ratings/Number of tranches) of 75.33%.

4.2.2. Tranche Level Variables

The mean yield spread is 66.45 basis points (bps) over the whole sample with a standard deviation of 91.67 bps. Weighted average life, proxies the interest rate risk associated with a tranche. Due to the propensity of obligors to prepay their mortgages, nominal maturity is a less reliable measure of the term of MBSs. Based on prepayment speed assumptions, the weighted average life is computed as the weighted average time until each monetary unit of principal is repaid. Hence, the weighted average life will always be shorter than the nominal maturity of the underlying mortgages. The mean (median) weighted average life of the sample is 5.44 years (5.10 years). The average principal of tranches in our sample equals €224m, and the average credit rating of 4.73 corresponds to Aa3 (AA-) on the Moody's (S&P/Fitch) scale.

5. Regression Results

5.1. Results with Downgrades

Table 5 presents the results of the logistic regression on the full sample. We regress *Downgrade* on issuer reputation (*TopIssuer*), tranche and deal characteristics, and other control variables. Consistent with our expectations, *TopIssuer* is negative and highly statistically significant in all regressions, indicating that tranches issued by frequent issuers are less likely to be downgraded. *3 CRA* is not statistically significant in any of our regressions, thereby indicating that even if ratings were shopped, this had no bearing on the probability of a downgrade.

In columns 2 to 5, we interact *TopIssuer* with *Boom*, *3CRA*, *Distance* and *AAA* respectively. *TopIssuer#Boom* and *TopIssuer#3CRA Reported* are not significant at any of the conventional levels. Therefore, issuances from frequent issuers during the boom were no different from deals issued by less reputable institutions. Similarly, the interaction of *TopIssuer* and *3CRA* in column 3 is of no significance in determining the likelihood of a downgrade.

In column 5, we introduce *TopIssuer#AAA* into the baseline model to ascertain the extent to which the highest quality ratings on tranches issued by reputable issuers are revised downwards. This interaction is statistically insignificant. In column 6, our prominent findings remain consistent when we include all the interactions in the baseline model, and *TopIssuer#AAA* is now significant at the 10% level. AAA rated tranches sponsored by reputable issuers are generally less likely to face deterioration in quality.

We replicate the regression model in column 6 while controlling for the sponsoring banks' characteristics, the results of which are reported in Table 6. We control for size (*Total Assets*) in all the regressions, asset concentration (*Net Loans/Total Assets*) in column 1, diversification of funding sources (*Deposits/Total Assets*) in column 2, leverage (*Tier 1 Ratio*) in column 3, *Loan Growth* in column 4, *Loan Loss Reserves/Gross Loans* in column 5. Column 6 controls for all bank characteristics simultaneously.

Similar to the findings highlighted above, *TopIssuer* is negative and statistically significant at the 1% level in columns 1 to 4. However, this variable loses its significance after controlling for the loan loss reserve ratio in columns 5 and 6. *TopIssuer#Boom* remains negative but is now statistically significant at the 5% (1%) level in columns 1-5 (column 6) indicating that issuance by reputable players during the growth period were less likely to be downgraded. Once more, *TopIssuer#3 CRA* is not significant in any of our models and also *TopIssuer#AAA* is no longer significant after controlling for bank-level characteristics.

In Table 5, we find that *WALTV* is positive and statistically significant at the 5% level suggesting that tranches collateralised by mortgages with high LTV ratios (lower borrower equity) are more likely to deteriorate in quality. This is not surprising as high LTV mortgages are generally considered to be riskier and hence attract higher interest rates. *Ratings/Tranches* is negative and statistically significant at the 10% level. However, this significance is lost upon controlling for loan loss reserves in column 5 and all the bank characteristics simultaneously in column 6. Therefore, it would seem that complex deals tend to retain their original ratings. The ratings of different agencies tend to converge for simple securities. Ratings typically differ significantly on relatively complex securities thereby creating an incentive to shop for ratings (Skreta and Veldkamp, 2009). However, our findings suggest that complex and opaque deals are less likely to suffer downgrades. This may be because of the efficacy of the structural component of complex deals. These deals usually feature high-level engineering to tailor cash flows to a diverse range of investors. This resulting complexity stands in sharp contrast to structuring designed to confuse investors. *Weighted Average Life (LogWAL)* has a positive coefficient and remains statistically significant at the 1% level. Thus, long-term tranches are more likely to be downgraded as tranches with longer maturities, or less prepayment risk are statistically more likely to be effected with an increased risk that the tranches will not fully pay down by their final maturity dates. We also find that *Distance* is positive but weakly significant, showing that tranches sold by foreign issuers performed worse than those issued by domestic issuers. We interact *Distance* with *TopIssuer*, and find that it is positive and significant at the 5% level. It seems bonds issued by reputable foreign issuers are more likely to be downgraded. Consistent with Vrensen (2006), as CMBS tend to be more complicated and riskier, we find that RMBSs are still less likely to be downgraded even after controlling for bank characteristics individually and collectively in Table 6. We are agnostic regarding the influence of bank level characteristics on tranche performance as the focus of our paper is the importance of higher-level variables such as reputation and functional distance.

5.2. Results with Delinquencies

In Table 7, we regress delinquency rates in the third (column 1) and fourth years (column 2) of issuance, as well as 3-year (column 3) and 4-year (column 4) average delinquency rates, on issuer reputation and deal level characteristics. We use these time periods as delinquencies tend to be highest in these years.[15]

The regression results consistently indicate that deals sponsored by reputable issuers (*TopIssuer*) perform better – indicated by lower ex-post delinquency rates. *TopIssuer#Boom* has a positive sign and is statistically significant. Therefore, although issuances by reputable (frequent) banks are usually of higher quality in normal periods, the delinquency rates on issuances during the growth years were higher than less reputable securitizers. One interpretation is that during the boom period when general asset quality declined, larger issuers securitized comparatively poorer quality assets. Alternatively, the delinquency rates could have increased as a result of decreased monitoring effort. However, this is inconsistent with Winton and Yerramilli (2015) who argue that reputable issuers are more likely to continue performing their monitoring function during periods of increased competition while less reputable institutions tend to increase market share at the expense of monitoring existing obligors. Thus, although the quality of issuances from reputable issuers declined during the boom period, these issuances were less likely to be downgraded. This could be because of strong structural features that compensate for declines in underlying asset quality.

3 CRA is still not significant, furthermore, *TopIssuer#3 CRA* is not significant in any of the models while *Deal Size* variable is negative and statistically significant at the 5% and 10% levels in columns 1 to 3 and 4 respectively. This indicates that larger deals generally performed much better. Certainly, it is reasonable to assume that larger deals are more diversified thereby driving delinquency rates downwards. Also, deals collateralised by residential mortgages tend to suffer higher defaults. However, it is worth noting that CMBS only make up 15-19% of the various samples used in the regressions. We also find that *Distance* is positive but marginally significant.

Subsequently, we run the same set of regressions while controlling for all the bank characteristics simultaneously. The results are presented in Table 8. *TopIssuer* remains negative, but this variable is only statistically significant at the 10% level in column 3 where the dependent variable is the 3-year average delinquency rate. Once more, *3 CRA* remains an insignificant.

[15] Similar to our analysis above, we also include time and entity fixed effects to control for the influence of aggregate trends and unobserved heterogeneity respectively.

Regarding the interactions, *TopIssuer#Boom* remains positive and is now statistically significant at the 1% level. Thus, reputable issuers generally issued higher quality deals however during the lending boom, they issued tranches collateralised by subpar asset pools. Moreover, the extent of this deterioration is significant at the 99% confidence level. *TopIssuer#3CRA* is now negative but still insignificant, and *Deal Size* remains negative but is only statistically significant in columns 3 and 4.

Our findings show that the delinquency rates of loan pools securitized by reputable issuers increased during the boom period. Therefore, it would be plausible to expect that the relevant tranches will suffer relatively more severe downgrades. However, we show that these tranches did not suffer more severe downgrades. This may be due to the tranches' structural features which may have compensated for increasing delinquency rates.

6. Concluding Remarks

In this paper, we test whether reputation functions as a self-disciplining mechanism in the MBS market and reputable issuers provide higher quality MBS. We find that issuers' reputational capital generated from the frequency of MBS issuance predicts future performance. Reputable issuers issued MBS collateralised by high quality asset pools with lower delinquency rates. However, we find that during the boom period, as credit standards declined, the asset pools securitized by reputable issuers were of worse quality compared to those securitized by less reputable issuers. We conjecture that this may have occurred because of decreased monitoring efforts.

Our results also show that issuances by reputable sponsors were less likely to be downgraded by the rating agencies. This finding could be because of the efficacy of structuring techniques in compensating for the declining credit quality of the underlying assets. Overall, our findings are consistent with conventional wisdom regarding the tendency of reputable banks to create high quality securities. Reputable issuers tend to offer higher quality securities, even from low quality assets pools.

Our conclusions are relevant from a policy perspective. On the backdrop of several post-crisis proposals, the European lawmakers reached an agreement with national governments to revive the European securitization markets. This deal sets out criteria for simple, transparent and standardised securitization (STS), and represents a cornerstone of the drive to establish a capital markets union. It is expected that these criteria in conjunction with the reform of the credit rating industry should make the pricing process more efficient. Furthermore, as the market is re-established, it would be interesting to see further dialogue on the role of reputation, and information asymmetry in the post-crisis issuance.

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Table 1 Definitions of variables and sources of data

Variable	Description	Source
Dependent Variables		
Downgrade	Downgrade is a binary variable that is equal to 1 if the relevant tranche was ever downgraded by any of the rating agencies from issuance up to 2011	Bloomberg
90+ Day Delinquency (3rd Year)	The average 90+ day delinquency rate (%) in the third year of issuance	Bloomberg
90+ Day Delinquency (4th Year)	The average 90+ day delinquency rate (%) in the fourth year of issuance. An increasing rate indicates deterioration in asset quality	Bloomberg
90+ Day Delinquency (3 Year Average)	The average 90+ day delinquency rate (%) over the first three years of issuance	Bloomberg
90+ Day Delinquency (4 Year Average)	The average 90+ day delinquency rate (%) over the first four years of issuance. This variable captures variations in the earlier years of issuance.	Bloomberg
Deal Level Variables		
TopIssuer	Top Issuer is a dummy variable that takes the value of 1 if the issuer is within the top 10 issuers based on volume, and 0 otherwise. There are 12 issuers on this list as the bottom 3 issuers had the same market share over the aggregate period. These issuers individually accounted for more than 2% in terms of total market volume during this period. Jointly, they account for 33.78% of the market activity	Authors' calculation
3 CRA	The number of initial ratings reported by credit rating agencies/issuer for a tranche. This variable is constructed as a binary variable that takes the value of 1 if the relevant tranche is rated by 3 agencies and 0 otherwise. We use this variable to control for rating shopping.	Bloomberg
Weighted Average Loan to Value (WALTV)	Weighted average loan to value (WALTV) measures the quality of a pool of mortgages; where loan to value (LTV) is the ratio of the mortgage loan to the value of the real estate. Hence, high LTV ratios correspond to lower equity. WALTV is computed as the average of the loan-to-value ratios of all the loans within the pool, weighted by the respective loan amount relative to the value of the asset pool.	Bloomberg
Number of tranches	Number of tranches per deal	Dealogic/Bloomberg
Number of ratings	Number of distinct ratings within a deal	Bloomberg
Ratings/tranches	The ratio of the number of distinct ratings to the number of tranches. We use this variable as a measure of complexity such that deals with more rating classes for given number of tranches are considered to be more opaque and riskier	Authors' calculation
Deal Size	The value of the total deal in €millions	Dealogic
Retained	This is a binary variable that takes the value of 1 when at least one tranche is retained as per the notes accompanying each transaction	Dealogic
Tranche Level Variables		
Tranche Size	The value of the tranche deal in €millions	Dealogic
Spread	The quoted margin (in basis points) in excess of the relevant benchmark. This spread measures the compensation required by	Dealogic

Variable	Description	Source
	investors for the risk borne. It is expected that this margin still has predictive value even after conditioning on credit ratings	
LogSpread	The natural logarithm of the quoted margin; to correct a positive skew in the distribution of the Spread	Authors' calculation
Year	The year of deal issuance, ranging from 1999-2007. We expect that the general quality of the issuances declined throughout the growth period	Dealogic
Boom	This is a dummy variable that equals 1 if the relevant bond was issued between 2005 and 2007, and 0 otherwise	Authors' calculation
Distance	This is a binary variable that takes the value of 1 the nationality of the issuer's parent differs from the country of the issuer's operations	Authors' calculation
Collateral	This is a factor variable indicating whether a deal is backed by either residential or commercial mortgages	Dealogic
Weighted Average Life	The effective maturity of the relevant tranche subject to prepayment speed assumptions.	Bloomberg
Credit rating	The reported credit ratings are mapped onto an ordinal numerical scale where AAA=1, AA+=2 and so on. These are used as indicator variables within the regressions, and the numeric values are of no significance.	Dealogic/Bloomberg
Bank Characteristics		
Total Assets	Total assets is used as a proxy for bank size and scale of operations	Orbis Bank Focus (previously Bankscope)
Net Loans/ Total Assets	This variable measures diversification of the asset base. More specifically, it measures the proportion of total assets made up of loans. A higher ratio may indicate low liquidity	Orbis Bank Focus (previously Bankscope)
Deposits/Total Assets	As a measure of funding diversification, this ratio measures what fraction of assets are funded by deposits	Orbis Bank Focus (previously Bankscope)
Equity/Total Assets	Leverage - The ratio of total equity to total assets.	Orbis Bank Focus (previously Bankscope)
Loan Growth	Annual percentage change in the value of gross loans	Orbis Bank Focus (previously Bankscope)
Loan Loss Reserves/Gross Loans	The ratio of loan loss reserves to gross loans issued	Orbis Bank Focus (previously Bankscope)

Figure 1 Distribution of delinquency rates

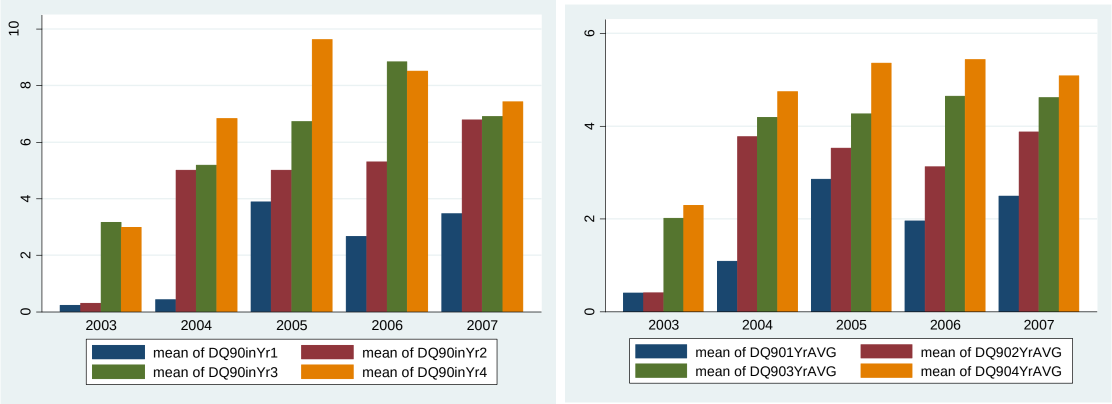

Table 2 Sample characteristics

Panel A: Top issuing banks (Number of deals)	
Issuing Banks	Percentage
Lehman Brothers Holdings Inc.	4.90%
Ally Financial Inc.	4.39%
Morgan Stanley	3.37%
Barclays Bank Plc	2.96%
Royal Bank of Scotland Group Plc	2.76%
NRAM PLC	2.55%
Kensington Group Plc	2.35%
Credit Suisse AG	2.24%
Commerzbank AG	2.14%
Banco Santander SA	2.04%
Deutsche Bank AG	2.04%
HBOS Plc	2.04%
	33.78%

Panel B: Tranche distribution by rating categories and underlying collateral

Collateral	Prime	Non-Prime	Total
Commercial mortgages	257	643	900
Residential mortgages	1,326	2,021	3,347
Total	1,583	2,664	4,247
Percentage	37%	63%	100%

Panel C: Tranche distribution by Number of Ratings Secured

No. of Ratings	CMBS	RMBS	Total
1	55	206	261
2	581	1,205	1,786
3	264	1,936	2,200
Total	900	3,347	4,247

Table 3 Country of origination

	CMBS	RMBS	Total	Percentage
United Kingdom	451	1885	2336	55.00%
Spain	6	568	574	13.52%
Netherlands	9	369	378	8.90%
Germany	189	152	341	8.03%
Italy	45	279	324	7.63%
Portugal		80	80	1.88%
Ireland	4	70	74	1.74%
France	44	19	63	1.48%
Greece		25	25	0.59%
Sweden	7	14	21	0.49%
Belgium		18	18	0.42%
Switzerland	1	1	2	0.05%
	756	3491	4247	100.00%

Table 4 Descriptive statistics

Panel A: Tranche Level Variables	Deals	Tranches	Mean	St. Dev	25th percentile	Median	75th percentile
Spread (basis points)	733	4247	66.45	91.67	18.00	34.00	73.00
Weighted Average Life (years)	733	4247	5.44	2.99	3.73	5.10	6.93
Tranche Value (Euro m)	733	4247	224.00	443.00	20.60	47.50	226.00
Credit Rating Average	733	4247	4.73	3.83	1.00	3.33	8.50
Subordination	733	4247	8.1%	10.4%	1.6%	5.0%	10.7%
Panel B: Deal Level Variables	**Deals**	**Tranches**	**Mean**	**St. Dev**	**25th percentile**	**Median**	**75th percentile**
90+ Day Delinquency (3rd Year)	432	2929	5.26%	8.75%	0.17%	1.04%	5.31%
90+ Day Delinquency (4th Year)	465	3048	5.71%	9.82%	0.24%	1.19%	5.34%
90+ Day Delinquency (3 Year Average)	432	2929	3.31%	5.53%	0.13%	0.72%	3.55%
90+ Day Delinquency (4 Year Average)	465	3048	3.72%	6.18%	0.18%	0.88%	3.36%
Weighted Average Loan-to-Value	733	4247	71.39%	12.35%	63.33%	71.92%	77.54
Number of tranches	733	4247	6.06	3.95	4.00	5.00	7.00
Number of Ratings	733	4247	3.86	1.40	3.00	4.00	5.00
Ratings/Tranches	733	4247	75.33%	0.25	0.60	0.80	1.00
Deal Value (Euro m)	733	4247	1,190.00	1,420.00	495.00	804.00	1,300.00
Panel C: Bank Characteristics	**Deals**	**Tranches**	**Mean**	**St. Dev**	**25th percentile**	**Median**	**75th percentile**
Total Assets (Euro bn)	440	2767	429.28	550.35	16.87	123.32	720.18
Tier 1 Ratio	440	2767	9.27%	10.55%	6.39%	7.60%	9.45%
Net Loans/Total Assets	440	2767	55.76%	23.46%	36.99%	57.61%	72.26%
Deposits to Total Assets %	440	2767	33.93%	19.43%	25.77%	33.01%	44.07%
Loan Loss Reserves/Loans %	391	2382	2.28%	6.43%	0.88%	1.49%	2.04%
Loan Growth %	428	2717	2.13%	19.73%	-2.81%	0.08%	5.15%

Table 5 The impact of reputation on performance measured by *Downgrades*

This table reports logit regressions of the Downgrade of European MBS tranches on issuer reputation, collateral, deal, and tranche-level characteristics. The sample includes all rated floating tranches issued between 1999 and June 2007. TopIssuer is a binary variable set to 1 if an issuer is in the top ten issuers in terms of volume and 0 otherwise. Boom equals to 1 if a deal is issued in the years from 2005 to 2007 and 0 otherwise. Ratings/Tranches is the ratio of the number of distinct rating classes within a deal divided by the number of tranches per deal. Retained is a dummy variable that is equal to 1 if a tranche in the relevant deal is retained. Distance is a dummy variable that is equal to 1 if an issuers' nationality of operations differs from the home country of the parent institution. 3CRA is a dummy variable equal to 1 if the relevant deal was rated by 3 agencies and 0 otherwise. Subordination is the value of tranches with an identical or a better rating as a fraction of the total deal value. LogWAL is the natural logarithm of the mean number of years the principal value of a tranche remains unpaid. Tranche Size is the natural logarithm of tranche face value in euros. Credit Rating dummy variables indicate initial effective tranche credit rating. Collateral is a factor variable indicating whether the relevant tranche is backed by commercial or residential mortgages. Issuer and trustee fixed effects is a set of dummy variables indicating each issuer and trustee respectively. Time is a factor variable consisting of the issuance periods annually. The omitted categories are commercial mortgage backed notes, and issuance year 1999. Standard errors in parentheses are clustered at the issuer level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)		(2)		(3)		(4)		(5)		(6)	
TopIssuer	-2.728***	(0.843)	-2.810***	(0.853)	-2.753***	(0.816)	-3.688***	(0.965)	-2.545***	(0.829)	-3.661***	(0.951)
TopIssuer#Boom			0.866	(0.532)							0.839	(0.530)
TopIssuer#3CRA					0.197	(0.641)					0.343	(0.643)
TopIssuer#AAA									-0.567	(0.364)	-0.658*	(0.354)
3CRA	-0.182	(0.343)	-0.225	(0.350)	-0.316	(0.386)	-0.180	(0.344)	-0.159	(0.338)	-0.417	(0.355)
Retained	0.445	(0.327)	0.504	(0.340)	0.448	(0.329)	0.392	(0.323)	0.440	(0.329)	0.448	(0.338)
Ratings/Tranches	-1.434*	(0.833)	-1.457*	(0.811)	-1.423*	(0.826)	-1.468*	(0.837)	-1.454*	(0.827)	-1.485*	(0.800)
WALTV	4.713**	(2.075)	4.728**	(2.009)	4.715**	(2.066)	4.605**	(2.044)	4.598**	(2.089)	4.478**	(1.971)
Subordination	-3.611	(2.313)	-3.820*	(2.320)	-3.608	(2.317)	-3.488	(2.333)	-3.473	(2.294)	-3.542	(2.299)
LogWAL	2.343***	(0.392)	2.351***	(0.398)	2.342***	(0.390)	2.357***	(0.390)	2.364***	(0.395)	2.384***	(0.396)
Distance	0.802*	(0.447)	0.800*	(0.452)	0.792*	(0.442)	-0.493	(0.905)	0.807*	(0.448)	-0.505	(0.857)
TopIssuer#Distance							2.099**	(0.950)			2.145**	(0.922)
Tranche Size	0.156	(0.118)	0.156	(0.118)	0.157	(0.121)	0.137	(0.123)	0.142	(0.121)	0.123	(0.127)
Residential Mortgages	-1.952***	(0.705)	-1.931***	(0.720)	-1.981***	(0.702)	-2.067***	(0.740)	-1.911***	(0.695)	-2.053***	(0.735)
Control for												
Credit Ratings	Yes		Yes		Yes		Yes		Yes		Yes	
Trustee fixed effects	Yes		Yes		Yes		Yes		Yes		Yes	
Issuer fixed effects	Yes		Yes		Yes		Yes		Yes		Yes	
Time fixed effects	Yes		Yes		Yes		Yes		Yes		Yes	
N	3513		3513		3513		3513		3513		3513	
Pseudo R-squared	0.512		0.514		0.512		0.515		0.513		0.518	
AIC	2484.487		2478.675		2484.122		2467.109		2480.337		2459.535	
BIC	2909.819		2910.170		2909.453		2873.948		2911.833		2891.030	

Table 6 The impact of reputation and bank characteristics on performance measured by *Downgrades*

This table reports logit regressions of the Downgrade of European MBS tranches on issuer reputation, collateral, deal, tranche and bank level characteristics. The sample includes all rated floating tranches issued between 2000 and June 2007. TopIssuer is a binary variable set to 1 if an issuer is in the top ten issuers in terms of volume and 0 otherwise. Boom equals to 1 if a deal is issued in the years from 2005 to 2007 and 0 otherwise. Ratings/Tranches is the ratio of the number of distinct rating classes within a deal divided by the number of tranches per deal. Retained is a dummy variable that is equal to 1 if a tranche in the relevant deal is retained. Distance is a dummy variable that is equal to 1 if an issuers' nationality of operations differs from the home country of the parent institution. 3CRA is a dummy variable equal to 1 if the relevant deal was rated by 3 agencies and 0 otherwise. Subordination is the value of tranches with an identical or a better rating as a fraction of the total deal value. LogWAL is the natural logarithm of the mean number of years the principal value of a tranche remains unpaid. Tranche Size is the natural logarithm of tranche face value in euros. Credit Rating dummy variables indicate initial effective tranche credit rating. Collateral is a factor variable indicating whether the relevant tranche is backed by commercial or residential mortgages. Issuer and trustee fixed effects is a set of dummy variables indicating each issuer and trustee respectively. The omitted categories are commercial mortgage backed notes, and issuance year 2000. Standard errors in parentheses are clustered at the issuer level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)		(2)		(3)		(4)		(5)		(6)	
TopIssuer	-4.254***	(1.205)	-3.720***	(1.320)	-4.080***	(1.341)	-3.610***	(1.215)	-0.540	(9.241)	-24.985	(21.142)
TopIssuer#Boom	-2.679**	(1.059)	-2.429**	(1.210)	-2.515**	(1.057)	-2.705**	(1.217)	-3.507**	(1.595)	-5.588***	(1.883)
TopIssuer#3CRA	-0.095	(0.852)	-0.078	(0.833)	-0.081	(0.841)	-0.195	(0.865)	-0.140	(0.908)	-0.183	(0.996)
TopIssuer#AAA	0.104	(0.519)	0.094	(0.520)	0.099	(0.513)	0.241	(0.522)	0.653	(0.566)	0.682	(0.575)
3CRA	-0.192	(0.552)	-0.243	(0.538)	-0.202	(0.554)	-0.104	(0.570)	-0.131	(0.539)	0.040	(0.655)
Retained	0.449	(0.437)	0.463	(0.428)	0.469	(0.426)	0.385	(0.428)	0.066	(0.537)	-0.226	(0.485)
Ratings/Tranches	-1.623*	(0.921)	-1.599*	(0.933)	-1.613*	(0.922)	-1.631*	(0.908)	-1.271	(1.386)	-1.716	(1.286)
WALTV	5.142**	(2.208)	4.946**	(2.131)	5.116**	(2.187)	5.375**	(2.243)	6.276***	(2.394)	5.797**	(2.414)
Subordination	-4.959**	(2.223)	-4.761**	(2.157)	-4.821**	(2.172)	-5.215**	(2.367)	-6.067***	(2.323)	-5.622**	(2.438)
LogWAL	2.328***	(0.360)	2.329***	(0.362)	2.328***	(0.360)	2.288***	(0.353)	2.275***	(0.437)	2.332***	(0.455)
Distance	-0.211	(1.097)	-0.247	(1.080)	-0.221	(1.073)	-0.079	(1.113)	-0.772	(1.031)	-0.549	(0.956)
TopIssuer#Distance	2.012*	(1.211)	2.030*	(1.201)	2.043*	(1.202)	1.676	(1.258)	2.814*	(1.505)	2.519*	(1.495)
Tranche Size	0.114	(0.156)	0.116	(0.159)	0.116	(0.157)	0.110	(0.153)	0.127	(0.142)	0.140	(0.155)
Residential Mortgages	-3.125***	(1.020)	-3.023***	(1.043)	-3.093***	(1.025)	-3.300***	(0.987)	-4.289***	(0.976)	-5.074***	(0.650)
Bank Characteristics												
Total Assets	0.950**	(0.400)	0.794**	(0.372)	0.694	(0.554)	0.897**	(0.437)	1.225**	(0.566)	-1.268	(1.210)
Net Loans/Total Assets	0.011	(0.014)									-0.039	(0.062)
Deposits/Total Assets			-0.018	(0.011)							-0.067**	(0.028)
Tier 1 Ratio					-0.033	(0.097)					-0.442***	(0.124)
Loan Growth							-0.012**	(0.005)			-0.026*	(0.014)
LLR/Gross Loans									0.101	(0.245)	-0.720	(0.578)
Control for												
Credit Ratings	Yes		Yes		Yes		Yes		Yes		Yes	
Trustee fixed effects	Yes		Yes		Yes		Yes		Yes		Yes	
Issuer fixed effects	Yes		Yes		Yes		Yes		Yes		Yes	
Time fixed effects	Yes		Yes		Yes		Yes		Yes		Yes	
N	2302		2302		2302		2264		1937		1912	
Pseudo R-squared	0.518		0.520		0.518		0.521		0.546		0.563	
AIC	1628.770		1625.294		1641.046		1613.621		1308.591		1260.536	
BIC	1892.881		1889.404		1939.606		1928.490		1559.191		1543.887	

Table 7 The impact of reputation on performance measured by *Delinquency*

This table reports OLS regressions of the Delinquency rates of European MBS tranches on issuer reputation, collateral, and deal level characteristics. The sample includes all rated floating tranches issued between 1999 and June 2007. TopIssuer is a binary variable set to 1 if an issuer is in the top ten issuers in terms of volume and 0 otherwise. Boom equals to 1 if a deal is issued in the years from 2005 to 2007 and 0 otherwise. Ratings/Tranches is the ratio of the number of distinct rating classes within a deal divided by the number of tranches per deal. Retained is a dummy variable that is equal to 1 if a tranche in the relevant deal is retained. Distance is a dummy variable that is equal to 1 if an issuers' nationality of operations differs from the home country of the parent institution. 3CRA is a dummy variable equal to 1 if the relevant deal was rated by 3 agencies and 0 otherwise. Subordination is the value of tranches with an identical or a better rating as a fraction of the total deal value. Collateral is a factor variable indicating whether the relevant tranche is backed by commercial or residential mortgages. Issuer and trustee fixed effects is a set of dummy variables indicating each issuer and trustee respectively. The omitted categories are commercial mortgage backed notes, and issuance year 1999. Standard errors in parentheses are clustered at the issuer level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. We control for fixed effects in all specifications (credit ratings, trustee, issuer and time)

	(1) DQ90inYr3		(2) DQ90inYr4		(3) DQ903YrAVG		(4) DQ904YrAVG	
TopIssuer	-0.095***	(0.030)	-0.100***	(0.037)	-0.051**	(0.022)	-0.046*	(0.024)
TopIssuer#Boom	0.044***	(0.014)	0.046**	(0.018)	0.018**	(0.008)	0.015*	(0.009)
TopIssuer#3CRA	0.004	(0.020)	0.001	(0.026)	0.004	(0.011)	0.007	(0.012)
3CRA	0.015	(0.015)	0.010	(0.017)	0.010	(0.008)	0.006	(0.008)
Retained	-0.002	(0.007)	0.010	(0.015)	0.005	(0.005)	0.006	(0.005)
Ratings/Tranches	0.005	(0.025)	0.008	(0.039)	-0.016	(0.022)	-0.019	(0.023)
Deal Size	-0.024**	(0.012)	-0.020**	(0.010)	-0.018**	(0.008)	-0.015*	(0.008)
WALTV	0.016	(0.038)	-0.001	(0.044)	0.009	(0.025)	0.018	(0.027)
Distance	0.079	(0.049)	0.161**	(0.078)	0.036	(0.027)	0.034	(0.032)
TopIssuer#Distance	-0.066	(0.045)	-0.136*	(0.076)	-0.038	(0.025)	-0.034	(0.031)
Residential Mortgages	0.121***	(0.031)	0.137***	(0.036)	0.069***	(0.016)	0.083***	(0.020)
N	411		446		411		465	
Adjusted R-squared	0.784		0.713		0.806		0.789	
AIC	-1582.366		-1496.002		-1999.653		-2131.510	
BIC	-1489.938		-1397.594		-1907.225		-2019.675	

Table 8 The impact of reputation and bank characteristics on performance measured by ***Delinquency***

This table reports OLS regressions of the Delinquency rates of European MBS tranches on issuer reputation, collateral, deal, and bank level characteristics. The sample includes all rated floating tranches issued between 1999 and June 2007. TopIssuer is a binary variable set to 1 if an issuer is in the top ten issuers in terms of volume and 0 otherwise. Boom equals to 1 if a deal is issued in the years from 2005 to 2007 and 0 otherwise. Ratings/Tranches is the ratio of the number of distinct rating classes within a deal divided by the number of tranches per deal. Retained is a dummy variable that is equal to 1 if a tranche in the relevant deal is retained. Distance is a dummy variable that is equal to 1 if an issuers' nationality of operations differs from the home country of the parent institution. 3CRA is a dummy variable equal to 1 if the relevant deal was rated by 3 agencies and 0 otherwise. Subordination is the value of tranches with an identical or a better rating as a fraction of the total deal value. Collateral is a factor variable indicating whether the relevant tranche is backed by commercial or residential mortgages. Issuer and trustee fixed effects is a set of dummy variables indicating each issuer and trustee respectively. Time is a factor variable consisting of the issuance periods annually. The omitted categories are commercial mortgage backed notes, and issuance year 1999. Standard errors in parentheses are clustered at the issuer level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. We control for fixed effects in all specifications (credit ratings, trustee, issuer and time)

	(1)		(2)		(3)		(4)	
	DQ90inYr3		DQ90inYr4		DQ903YrAVG		DQ904YrAVG	
TopIssuer	-0.273	(0.325)	-0.024	(0.375)	-0.235*	(0.131)	-0.216	(0.171)
TopIssuer#Boom	0.116***	(0.035)	0.115***	(0.041)	0.069***	(0.018)	0.080***	(0.018)
TopIssuer#3CRA	-0.017	(0.035)	-0.016	(0.041)	-0.005	(0.015)	-0.008	(0.020)
3CRA	0.031	(0.032)	0.029	(0.031)	0.016	(0.014)	0.018	(0.017)
Retained	0.003	(0.010)	-0.006	(0.026)	0.004	(0.004)	0.001	(0.007)
Ratings/Tranches	0.005	(0.030)	0.014	(0.051)	0.005	(0.012)	0.008	(0.017)
Deal Size	-0.014	(0.011)	-0.001	(0.013)	-0.013**	(0.006)	-0.011*	(0.006)
WALTV	0.044	(0.034)	0.085	(0.057)	0.027	(0.023)	0.039	(0.024)
Distance	0.076*	(0.045)	0.161***	(0.061)	0.037	(0.026)	0.061**	(0.027)
TopIssuer#Distance	-0.054	(0.056)	-0.128**	(0.064)	-0.028	(0.030)	-0.047	(0.032)
Residential Mortgages	0.096**	(0.043)	0.084	(0.054)	0.068***	(0.020)	0.072***	(0.023)
Bank Characteristics								
Total Assets	0.009	(0.029)	-0.007	(0.033)	0.001	(0.013)	-0.002	(0.015)
Net Loans/ Total Assets	0.000	(0.001)	-0.000	(0.001)	-0.000	(0.001)	-0.000	(0.001)
Deposits/Total Assets	-0.001**	(0.001)	0.000	(0.001)	-0.001***	(0.000)	-0.001**	(0.000)
Tier 1 Ratio	-0.001	(0.004)	-0.005	(0.005)	0.000	(0.002)	-0.001	(0.003)
Loan Growth	-0.001	(0.000)	-0.000	(0.000)	-0.000	(0.000)	-0.000	(0.000)
Loan Loss Reserves/Gross Loans	-0.006	(0.009)	0.001	(0.010)	-0.006	(0.003)	-0.005	(0.005)
N	265		273		277		282	
R-squared	0.802		0.688		0.829		0.805	
Adjusted R-squared	0.657		0.449		0.703		0.658	
AIC	-1028.464		-862.760		-1432.655		-1348.416	
BIC	-924.651		-758.086		-1327.558		-1242.801	

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Solomon Y. Deku
Nottingham Trent University, Nottingham, United Kingdom; email: solomon.deku@ntu.ac.uk

Alper Kara
University of Huddersfield, Huddersfield, United Kingdom; email: a.kara@hud.ac.uk

David Marques-Ibanez
European Central Bank, Frankfurt am Main, Germany; email: david.marques@ecb.europa.eu

Postal address 60640 Frankfurt am Main, Germany
Telephone +49 69 1344 0
Website www.ecb.europa.eu

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