

Securitization and the Subprime Mortgage Crisis of 2007-2008

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Abstract

The paper reviews literature on securitization process in real estate markets and an analysis of the subprime mortgage market crisis of 2007-2008. In particular, it presents a highlight of the various market participants in the securitization process and an overview of securitized transactions in the US secondary mortgage market. The paper further presents a highlight of financial malpractices precipitating the subprime mortgage crisis and the associated financial implications of the same. In addition, the paper identifies the institutions and participants in the subprime mortgage crisis securitized transactions leading to the housing market debacle. The paper further explores the creation of ABS and CDOs as an outcome of securitization and a review of empirical literature on financial implications associated with the abuse of securitized transactions in the US mortgage market.

Key Words: Securitization, Asset-Backed Securities, Special-Purpose Vehicles/Entities, Credit enhancement and Conduit Lending.

List of Acronyms

ABS	- Asset-backed Securities
CDOs	- Collateralized Debt Obligations
SPV/E	- Special-Purpose Vehicle/Entity
Fannie Mae	- Federal National Mortgage Association
Freddie Mac	- Federal Home Loan Mortgage Corporation

1. Introduction

The paper presents a review of general, theoretical and empirical literature on the securitization process in the real estate market, a financial analysis of securitization process and an overview of the institutions that participate in the process. In particular, the paper reviews both general and empirical literature on securitized transactions in the events leading to the subprime mortgage market crisis of 2007-2008. First, the paper documents the securitization process in terms of the key participants/institutions involved in the process and their role. In addition, it reviews literature on ABS and CDOs as the main forms of securitization in real estate markets.

2. Operational definition of terms

**Securitization- this is a process (in structured finance) that creates complex debt instruments by pooling assets (especially receivables) into low risk entities in order to limit risk exposure.*

**Subprime Mortgage- these are low quality loans that were sold by loan originators during the period preceding the mortgage market fiasco of 2007-2008. Such loans were issued to home buyers who did not have the repayment ability with most of them subsequently defaulting soon after.*

**Credit Rating Agencies- these are firms that give an outside perspective or unconditional view of the risk exposure and rating of securities that investors are about to invest.*

**Conduit Lending- the loan originators generated poor quality loans from high credit risk mortgage borrowers without property 'screening' them since the originators knew that they would quickly sell off such loans in the secondary mortgage markets to unsuspecting secondary mortgage market investors.*

2. Review of Literature

2.1 Securitized Transactions and Institutions involved in Securitization

Securitization is the selling of debt instruments backed by a pool of mortgages; the process is associated with several frictions which involve moral hazards, adverse selection and principal-agent problems (Ashcraft & Schuermann, 2008). Securitization is a financial transaction (under structured finance) in which a corporate entity moves assets/ pools assets or loans to an ostensibly bankruptcy-remote/ low risk vehicle to obtain lower

interest rates from potential lenders since the standardized securities are collateralized/secured. The process involves packaging of designated pools of loans or receivables with an appropriate credit enhancement and redistribution of these packages to investors. Transformation of these pools into standardized securities enables issuers to deal in a volume large enough that they can bypass intermediaries (Giddy, 2004; Bodie *et al.*, 1992). Structured finance is a financing technique tailored to special needs or constraints of issuers or investors (Giddy, 2008).

The issues created out of securitization are low risk ventures since the asset cannot be seized in a bankruptcy proceeding courtesy of SPVs. An SPV is a legal entity created by a sponsor or originator to carry out some specific purpose or a series of transactions (Gorton & Soules, 2005). The SPVs exist essentially to reduce bankruptcy costs since they cannot in practice go bankrupt. The risk is therefore low for lenders and they are willing to ask for a lower interest rate. This financial process (securitization) leads to an emission of ABS and CDOs. *Structured finance* is a process that involves the creation of complex debt instruments by securitization or the addition of derivatives to existing instruments by pooling assets, tranching of liabilities and creation of special purpose vehicles to limit risk. Structured finance involves pooling of economic assets and subsequent issue of prioritized capital structure claims against these collateral pools (Coval *et al.*, 2008). The securitization process involves packaging of designated pools of loans or receivables with an appropriate *credit enhancement* and redistribution of these packages to investors. Transformation of these pools into standardized securities enables issuers to deal in a volume large enough that they can bypass intermediaries (Giddy, 2004). Credit enhancement is meant to reduce the risk to the investors and subsequently increasing the rating of the securities. The process of securitization is *complex* and *involves several parties*. Assets (like Mortgage receivables, student loans and car loan receivables) are pooled together and shares (backed by these pools of assets) are sold. In this process, a suitably large portfolio of assets is 'pooled' and sold to an SPV; there is normally no recourse to the originator. The issuer (SPV) is bankruptcy remote since the likelihood of default is minimal; their activities are restricted to issuance of securities. A servicer collects payments and monitors the assets; the servicer can often be the originator. They ensure that the loan repayments are paid to the SPV. The investor benefits by investing in a specific pool of high quality credit-enhanced assets; all investors receive a pro rata interest in the incoming revenues from the asset pool (Lumpkin, 2002). Securitization deals may at times be faced with foreclosure. This is the legal right of a lender of money if the borrower fails to repay the money or part of it on the due date. The lender would apply to the court to be permitted to sell the property that has been held as a security for the debt; in case of mortgage loans, the mortgage lender would sell the house where the mortgagor lives (Bodie *et al.*, 1992).

The process of securitization involves many investors with receivables of high quality; the seller usually continues to service the receivable. In the management of an ABS, a *trustee* ensures the orderly payment of interest & final payment of interest. The *issuer is often a trust or SPV* whose only business activity is to acquire and hold the assets, and issue securities backed by the assets. Costs associated with establishing a trust or SPV include underwriting fees, servicing fees and other costs. *Originator* initially owns the assets engaged in the deal. The transfer of assets from sponsor (originator) to SPV should constitute a 'true sale' to avoid bankruptcy challenges. Securitization separates the assets from the originator. The largest sectors of the ABS market in the US are securities backed by Credit Card receivables, Auto Loans, Home Equity Loans, Manufactures Housing Loans, Student Loans, Small Business Administration Loans, and Bond Obligations (Sharpe *et al.*, 2004).

Special Purpose Vehicles (SPVs) play a key role in enhancing the cash flow payments to the investors when a securitization contract is created. They simply ensure that the investor gets the most out of the deal. They would modify the loan terms or even recommend foreclosure as part of administration of the deal. In most cases, investors would control the appointment of the special server. They simply maximize the position of the investors. To minimize agency conflicts, the special servicer usually holds a portion of the first-loss piece in order to align the incentives of the investors and the special server. The first-loss investors are the ones who stand to lose a lot if the mortgage borrowers default (Ambrose *et al.*, 2006).

Rating Agencies are active players in securitized transactions. These agencies provide an outside perspective (which is also unconditional) on the risks involved in the securitized issue. They publicly disclosed their rating criteria for the subprime mortgages though the investors lacked the ability to evaluate the efficacy of the models used. Most of the products offered to subprime borrowers were very complex and subject to misunderstanding and/or misrepresentation (Ashcraft & Schuermann, 2008). The Rating Agencies assist in structuring the transaction by offering credit enhancement. Rating agencies are important since they provide an outside perspective of the risk exposure of the prospective investors. Such agencies mandate changes in the loan servicing procedures. The nature and amount of credit enhancement depends on the risk of the securitization as determined by the Rating agencies. These agencies give an outside perspective on the liabilities being created and allow the investors make a more informed decision. The rating agencies grade the issues into different tranches: the Senior tranche (which is paid off first incase anything happens) is followed by the mezzanine

tranche then the junior tranche which is most likely to be impacted by default- this is usually held by the originator (Zywicki & Adamson, 2009).

Citing Standard & Poor (2008), Mandel, Morgan and Wei (2012) define *Credit enhancement* as a protection, in the form of financial support, to cover losses on securitized assets in adverse conditions. If estimated losses are high, then more enhancements are called for to achieve a given rating, all else constant. Credit enhancement is meant to reduce the risk to the investors and thereby increasing the rating of the securities. A company that does not want to issue bonds directly (this requires a lot of disclosure) can engage an insurance company to put its credit behind the corporation for a fee. The firm can then float a bond of “enhanced” credit rating directly to the public. Credit Rating Agencies rate the securities in order to provide an external perspective of liabilities being created and help the investor make a more informed decision. The fact that a securitization has an AAA rating does not mean it is risk free –it only means that the chance of a bondholder incurring a loss attributable to default on the underlying assets is remote (Riley & Brown, 2006).

Bodie *et al.* (1992) indicates that credit enhancement could take several forms which include: over-collateralization (whereby the amount of over-collateralization, which is usually 5% to 10%, is often determined by the rating agencies and underwriters depending on the receivables), senior/ subordinate structure (Subordinate or secondary classes of securities are lower rated and bear higher interest rates and if a problem arises, higher rated (senior) securities receive payments prior to the lower rated subordinate securities), liquidity provider (this requires a guarantee by the originator that is the entity that either generates receivables or assembles portfolios of receivables or another entity of all or a portion of payments due on the securities) and cash collateral account (whereby the originator deposit funds in an account with trustee to be used if proceeds from receivables are not sufficient).

2.2 *Regulatory Failures leading to the Subprime Mortgage Crisis*

Regulatory intervention may often be justified on the premise of financial markets being inefficient. Market systems are not always informationally efficient since information asymmetries are a common feature of most markets and information is a public good whose supply is often insufficient (Stiglitz, 1993; Lofgren *et al.*, 2002). Liberalization of financial markets is intended to facilitate efficient allocation of resources. The existence of market failure does not necessarily justify government intervention since such failures are not directly attributed to market problems; instead, they are often seen to be associated with regulatory failure (Stiglitz, 1993).

Dowd (2009) indicates that US policy failures contributed much to the subprime mortgage crisis. Dowd notes that *misguided intervention by the federal government* in the US housing market was largely to blame for the crisis. With an ambitious desire to increase home ownership (especially to the low income households who to a great extent did not have a repayment ability), the US government introduced some key interventions including: the mortgage interest deductions in the tax code, affordable lending requirements (contributing to laxity in screening of mortgage borrowers) and the enactment of the Community Reinvestment Act of 1977 which put a lot of pressure to bankers to advance mortgages to individuals with poor credit. Consequently, the US interest rates declined from about 6% to 1% in the pre-crisis and crisis period).

The abuse of securitization in the US mortgage market led to huge investor losses and bankruptcies. The mortgage lenders were accused of lending without proper credit risk appraisal leading to subprime loans (Purnanandam, 2009). During this period, most of the beneficiaries were advanced huge amounts of loans than their repayment ability could justify. The loan originators were equally to blame for lending with an intention of selling the loans off their balance sheet in the short run. They therefore lacked the incentive to obtain the necessary information from the prospective borrowers before lending. When the originators found that they could sell off the loan receivables, their lending practices became rather mechanical hence the proliferation of subprime loans. The SPVs (which bought most of these loans), became the victims of asymmetric information since they could not tell that the loan originators had actually generated mortgage loans with an intention of selling them off their balance sheets in the short run (An *et al.*, 2010).

To achieve the objective of promoting home ownership to most of the American citizens, the federal government established massive government mortgage enterprises sponsored by the government (especially Fannie Mae and Freddie Mac). *Fannie Mae* was set up in 1938 to expand the ability of residential mortgage finance. Its primary role was to buy mortgages from the loan originators and hold them- the institution was later privatized in 1968. *Freddie Mac* was set up in 1970 with the objective of expanding the availability of residential mortgage finance primarily through securitization of S & L mortgages. With huge government support, lower capital requirements and several legal privileges, the two institutions were able to gain significant control of the US mortgage market and consequently contributing much to the growth of mortgage securitization (Dowd, 2009). In year 2002, the Department of Housing and Urban Development imposed “affordable housing quotas” which encouraged Fannie Mae and Freddie Mac to further increase their huge holdings of subprime portfolios (Mitchell, 2008). *The Greenspan Doctrine of 2002 was also to blame* since it held that the Fed could do nothing to stop asset bubbles from occurring but would stand by to cushion the fall if they did occur (Dowd, 2009). Bubbles are price increases which are far beyond the asset’s true fundamentals.

2.3 Theoretical Review

This section presents an overview of theories that inform the securitization process in mortgage markets. In view of the subprime mortgage crisis of 2007-2008, the *Securitizer-First and Lender-First theories* apply. Bubb and Kaufman (2009) extensively explore the role of credit score cut off rules in screening borrowers. They subsequently develop Securitizer-First theory to incorporate the concept in the screening process. In a securitization deal, the lenders may lack the incentive to properly screen borrowers and obtain relevant information if they intend to sell off the loans in an active secondary mortgage market. The use of *borrower credit scores* facilitates measuring their default risk with higher credit scores indicating a lower chance of default.

The *Securitizer-First theory* was first put forth by Keys, Mukherjee, Suru and Vig (2008). The theory posits that secondary-market mortgage purchasers employ rules of thumb whereby they are exogenously most likely to purchase loans advanced to borrowers with credit scores just above some cut off. By extension, lenders will similarly adopt a screening cut off rule in response. In view of this theory, securitizers exogenously use credit score cutoff rules in their purchase decisions and such rules compel mortgage lenders to utilize screening cutoff rules to enhance the value of loans sold off (Boston Fed, 2009). This is due to the Securitizers' demand for loans with credit scores above some certain thresholds despite their use of rules of thumb in the market. Since the mortgage originators know that they are unlikely to keep the loans above these credit score thresholds (due to their sale in the securitization markets), they will adopt weaker screening standards for such loans. Conversely, they will apply more stringent rules in screening borrowers whose scores are below the threshold point since such loans would remain unsold and into their portfolio (Bubb & Kaufman, 2009; Boston Fed, 2009). A moral hazard arises since lenders have knowledge of their malpractices in obtaining borrower information and their loan screening incentives unlike the securitizers.

An alternative theory is the *Lender-First theory*. In view of this theory, private mortgage securitizers adjust their loan purchases around the lender screening threshold in order to maintain lender incentives to screen (Boston Fed, 2009). When lenders are encountered with a fixed per-applicant cost of obtaining additional information about each prospective borrower, the cutoff rules in screenings will increase endogenously. Since lenders will get a higher pay off in collecting more relevant information for high credit risk borrowers, they will be more inclined to collect more additional information for those borrowers whose cutoff scores are below the thresholds. Heuson, Passmore and Sparks (2000) indicate that credit scoring improves the quality of information and that their empirical investigation found a negative correlation between mortgage rates and volume of securitization implying causation in that greater securitization reduces mortgage rates. The Lender-First theory thus predicts that the volume of loans advanced and their rate of default will be significantly lower for borrowers with cutoff scores below the threshold since much of the lenders information search efforts are directed to this category (Bubb & Kaufman, 2009). The theory is therefore a more likely explanation for the cut off rules.

The use of *FICO scores* is a popular measure of credit risk in order to inform lenders on which loans need increased credit screening. Straka (2000) indicates that the use of FICO scores became more popular (in practice) in the mid-1990s. A FICO score is a summary measure of an individual borrower's creditworthiness based on their credit history with higher credit scores indicating higher creditworthiness. In most cases, a FICO score of 620 is considered as the threshold. Interestingly, a research conducted by *Fannie Mae* (to ascertain the relationship between FICO scores and mortgage performance) showed that despite the borrowers with FICO scores of less than 620 representing only a small percentage of the total, they actually contributed to about 50% of the total defaults. In 1997, *Fannie Mae* provided further guidance to lenders by proposing 3 tiers of FICO scores: borrowers with FICO scores of above 720 had a 'very low' default risk, those with FICO scores between 660 and 719 had a 'low' default risk, those with FICO scores between 620 and 659 "represent a high degree of default risk" while borrowers with a credit score of 620 represent a "very high" risk of default (Fannie Mae, 1995).

3. Empirical Literature

3.1 Commercial Mortgage-Backed Securities and Special Servicers

Ambrose, Sanders and Yavas (2006) empirical study was intended to investigate the impact of conflict of interest on servicing non-performing loans. Their sample was made up of 46,082 loans in 363 CMBS deals obtained from the Intex CMBS database- most of the loans were originated between 1997 and 1999. In total, 27,275 loans had different master and special servers, 25,673 had a master server who also performed and carried out other special servicing roles for other loans, 1,602 loans had a master server that did not also perform special servicing functions for other loans while 17,044 loans had a special server that only performed special servicing functions for loans in the database (Ambrose *et al.*, 2006). First, the authors note that the servicing of loans in a CMBS transaction could further involve a sub-servicer (who is assigned special functions) besides the main servicer. The *Special Servicer* would take the administration of the loan by either recommending the modification of its terms of a foreclosure. They hypothesize that the default risk is highly correlated to whether or not the master servicer and special servicer of the pool are the same firm. Ambrose *et al* (2006) indicate further that there are

moral hazards and adverse selection problems when the two roles of master and special server are held by the same firm- their findings prove their hypothesis to be true.

In a CMBS deal, the master server is meant to oversee the overall administration and monitoring of the underlying loan and the dispatch of cash flows to the investors in the tranche. However, in the event of a loan in the deal failing to perform to expectation, the master server forwards the same to the special server who has the rights to restructure the repayment terms, force it to foreclosure or ensure maximum cash flows to the deal investors. The moral hazard factor becomes an issue where the master and special server will treat the loan differently depending on whether or not they are the same. Adverse selection arises where the willingness of the special server to bid for a risky pool may be determined by whether the master server has a high chance of also being the special server in the deal. Ambrose *et al.* (2006) contend that if the two servers were the same, then the special server will have more information about underperforming loans and subsequently put in place more effective recovery measures. There are conflicts of interests between the two servicers when handling troubled loans- there are inefficiencies created when the two functions are held by the same firm leading to faster handling of defaulted loans. Consequently, this enables the master servicer to become more aggressive in bidding for a risky pool of loans if the same firm expects to be the special servicer. The master server in a CMBS deal supervises the regular cash flows from the loan and manages information and any interaction with the performing borrower.

The Ambrose *et al.* (2006) study was based on more than 46,000 securitized Commercial real estate loans and it eventually supports their hypothesis. They predict a positive correlation by utilizing 46,082 securitized commercial real estate loans in 363 CMBS deals to test their conjecture. The study found that the time a loan remains in default is much shorter when servicing rights are held by one firm comparative to when they are held by two firms. The empirical study analyzes the correlation between default probability of a pool of loans and whether the two servicing rights are held by the same firm. They operate with the premise that servicing firms prioritize maximize their profits in their activities.

3.2 Asymmetric Information, Adverse Selection and Pricing of CMBS

An *et al.* (2010) document the ‘lemons problem’ in the real estate market. Their empirical investigation narrows down to the CMBS and the role played by *conduit lenders* in the abuse of the securitization process in the US mortgage subprime crisis of 2007-2008. Akerlof (1970) documents *quality uncertainty problems* in the automobile markets due to asymmetric information problems that is the ‘lemons problem’. Akerlof uses the market for used cars as an example of the problem of quality uncertainty; owners of good cars will not sell their cars in the used car market for fear of not getting value for their good cars. This concept is often thought of as “the bad driving out the good” in a market.

The An *et al.* (2010) empirical work sought to investigate originate-to-distribute and originate-to-hold loans, the design of securitization in terms of excess leverage, opaqueness of securitized transactions and lax ratings. The empirical investigation was based on 142 CMBS deals and 16,760 CMBS loans in the 1994-2000 sample period. In particular, the sample included 13,655 conduit loans and 3,105 portfolio loans sold into securitization markets during the period 1994-2000. They found that CMBS investors paid a higher price for CMBS backed by such conduit loans comparative to portfolio CMBS deals. The study further found that the loan originators lacked the incentive to properly screen loans; most of the loans that were created were expressly for pass-through to securitization markets. There was no motivation to generate relevant private information on the quality of the loans. Theoretically, the An *et al.* (2010) study confirms that only low quality portfolio loans will be sold in the secondary market and their sales price incorporates a “lemons discount”. Conduits gain from loan origination fees and do not mind so much about long-term returns that come with portfolio holding of loans. The empirical investigation found that in the period 1994-2000, CMBS investors paid higher prices for CMBS backed by conduit loans as compared to portfolio CMBS deals. By 1992, conduit lending constituted less than 5% of all CMBS. By 1998, conduit lending had grown to 75% and reached almost 100% by 2001. Downing *et al.* (2009) study similarly found that residential mortgage-backed securities sold by Freddie Mac to SPVs were generally of poor credit quality compared to those they retained in their portfolio. Freddie Mac simply used private information to sell “lemons” to securitization markets.

The An *et al.* (2010) empirical work found that portfolio lenders used private information to sell off lower quality loans to unsuspecting buyers. The study documents that conduit lenders originated loans with an express intention of selling them directly into the securitization markets. Since the buyers of the mortgage loans could not perfectly ascertain their quality (they could not also ascertain the credit risk of each loan), the sellers (originators) became more aggressive in selling off low quality loans while retaining the high quality loans for their own loan portfolio. Eventually, the securitization market was flooded with low quality loans which were to become uncollectible.

The sellers of these bad loans are expressly referred to as conduit lenders since they did not have an incentive to collect appropriate borrower private borrower information for loan appraisal since they knew that they were to sell off the loans soon after creating them (Stein, 2002). Their profits were mainly from the loan origination fees

rather than the long-term returns associated with holding onto a portfolio of the loans. The An et al (2010) study confirms that their findings were consistent with those of Downing, Jaffe and Wallace (2009) who showed that residential mortgage backed securities sold by Freddie Mac to the SPVs were generally of low credit quality than those that Freddie Mac retained in its loan portfolio. Using an information-economics model, the study shows why conduit CMBS deals were priced higher than those CMBS deals kept for portfolio purposes and why conduit lending became the most popular source of loans in the CMBS secondary market. An *et al.* (2010) compare conduit lending to the Akerlof (1970) 'lemons problem' whereby the mortgage originators can separate poor quality loans from high quality loans and subsequently assign higher valuations for higher quality loans. Eventually, the market for lemons prescribes that lower quality loans will drive higher quality loans out of the market place.

4. Summary

The paper reviews literature on securitization process, the participation of several parties/institutions in the process and financial analysis of empirical work on creation of CMBS and ABS. The paper further provides an overview of the credit enhancement process and the role of SPVs, Special and Master servers in a securitized transaction. Regulatory failure, intentional malpractices on the part of loan originators and liberalization of the US financial market are cited as some of the key issues leading to the subprime mortgage crisis of 2007-2008. The paper documents reforms in the US housing market that precipitated the crisis such as the creation of Fannie Mae and Freddie Mac institutions. Securitizer-First and Lender-First theories form the theoretical anchorage of the paper. SPVs, Originators, Rating agencies and Trustees are identified as the key parties in the securitization process. The paper further captures the various moral hazards and asymmetric information conditions leading to creation of subprime loans. Relevant empirical literature on securitization and the crisis is reviewed in a nut shell.

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