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The Brattle Group

Subprime Mortgage Problems: What to Look For and Where to Look

About the Author

Dr. George Oldfield *provides expert witness testimony and consulting on trading strategies, market making, corporate bond valuation, financial derivatives, and risk management.*

He specializes in asset- and mortgage-backed securities, employee stock option and financial derivatives pricing, and disclosure rules for corporate pension funding and executive compensation.

Dr. Oldfield served as an Economic Research Fellow at the U.S. Securities and Exchange Commission and spent much of his career in academia, most recently as Professor of Finance at the College of William and Mary's Mason School of Business. He also has taught at Dartmouth College's Tuck School and Cornell University's Johnson School.

Introduction

Subprime mortgage problems are much in the news these days. Some subprime mortgages originate with standard underwriting and documentation procedures. They are subprime because the borrowers' credit quality is poor, the loan-to-value ratio is high, or for some other reason that impairs creditworthiness. Other subprime categories are 'low doc', 'no doc', and 'pure schlock', which means that the documentation and underwriting of the mortgages are substandard, nonexistent, or potentially fraudulent.

Since many subprime mortgages get securitized at least once before reaching investors, those who purchased securitized products like CMO, ABS, and CBO instruments will likely experience adverse subprime mortgage effects in their portfolios before long.

Between 2001 and 2006, the volume of subprime mortgage origination grew from $120 billion (15.4 percent of origination) to $600 billion (20 percent of origination). About 10 percent of these subprime mortgages were more than 60 days delinquent or in foreclosure as of December 31, 2006, which was the highest rate in 7 years. Many of these new loans were paired with second mortgages or home equity loans in the origination process. Plenty of subprime mortgage collateral is therefore embedded in various sorts of securitized deals.

Problems with subprime mortgages also tend to be harbingers of issues with other residential mortgage and commercial mortgage portfolios. Thus securitized deals based upon higher quality residential loans and commercial mortgages may also be in danger of unexpected collateral defaults as property values decline in various geographic areas.

See the Appendix for definitions of acronyms used throughout.

Subprime Securitization

The securitization process frequently involves a securities dealer that establishes an entity to house the securitization transaction. The entity transforms subprime mortgage collateral into more uniform tranches of mortgage-backed instruments. A transaction begins when the dealer buys a subprime mortgage portfolio from a mortgage originator and immediately sells the portfolio to a special purpose entity set up for the transaction. The entity simultaneously issues and sells back to the dealer its tranches of mortgage-backed instruments, which the dealer then resells to investors. Tranches can vary by principal payment priority, credit support, coupon rate, and prepayment protection.

This set of transactions establishes the entity's structure: its asset is the subprime collateral (plus any credit enhancement arranged with a third party), its liabilities are the tranches of mortgage-backed instruments. The dealer's profit comes from the difference (spread) between the dealer's collateral purchase price and the revenues from selling the entity's tranches. Tranche sales depend upon the dealer structuring the entity so that its credit enhancement and tranche design appeal to investors.

Before a dealer purchases subprime collateral and resells it to an entity, the dealer reviews the lending and underwriting practices used to originate the loans in the portfolio. A sample of the loans is analyzed to assess the credit-worthiness of the collateral. Based on the properties of the collateral and information about investors' demands for different types of subprime mortgage-backed instruments, the dealer tries to identify the best combination of credit enhancement and tranche design for the securitization transaction. With subprime mortgage collateral, various credit enhancements and tranche design alternatives are available.

The two elements of the entity's structure are linked together. For example, with a credit-worthy third party guaranty on the collateral, no subordinated tranche designed to absorb collateral defaults may be required to assure that all the entity's tranches are credit-worthy. If the credit enhancement instead comes in the form of an originator's pledge to replace a defaulted loan with a new one, then a large subordinated class may be required to make the senior tranche credit-worthy. Moreover, the subordinated tranche would likely need a higher coupon rate than the senior tranche so the structure would not be a simple pass-through design. The senior class could be further tranched into classes that differ by coupon and priority of principal repayment.

Therefore the original subprime mortgage portfolio might support a range of different tranches that vary in subordination, coupon, and stated maturity. Such multi-tranche structures are engineered in an entity that elects REMIC status. A REMIC is a subprime mortgage securitizing entity that makes a tax election to become a Real Estate Mortgage Investment Conduit. This allows the entity to issue multiple types of tranches without being taxed at the entity level. The REMIC must also issue a residual class, which pays to its owner interest and principal amounts left over after all the other tranches are paid on schedule.[1]

Potential Problems Areas

For any subprime mortgage securitization (or for the securitization of any other type of loan collateral), some careful steps must be followed to move loan collateral from the originator to the ultimate investors. Key transaction trouble points for subprime deals are noted below.

- **Collateral**. Critical issues are the origination process, loan underwriting, and loan stratification in a portfolio. Securitization starts with a subprime mortgage originator's collateral loan portfolio. In the securitization process, loans in the collateral portfolio are first documented and underwritten by the originator and then analyzed and reassessed by the portfolio's purchaser.

The portfolio is stratified to segregate transaction-conforming loans that can be securitized from those that do not meet underwriting standards for the transaction. Only the transaction-conforming loans move on to securitization. The others are returned to the originator for separate treatment. If a subprime mortgage portfolio seller does not carefully assess the quality of loans sold to a securitization entity and disclose adequately the assessment to investors, the likely default behavior of the portfolio may not be appreciated by investors in instruments backed by the loans.

- **Issuer**. Key points for evaluating an issuer are the credit enhancement and tranche structure, the mortgage servicer, and the residual interest claim. An entity, usually a trust that elects REMIC tax status, is established to buy the collateral, arrange for collateral servicing, and issue tranches of mortgage-backed instruments to finance its collateral purchase. The issuer is the entity that owns subprime mortgage collateral and issues investment grade instruments.

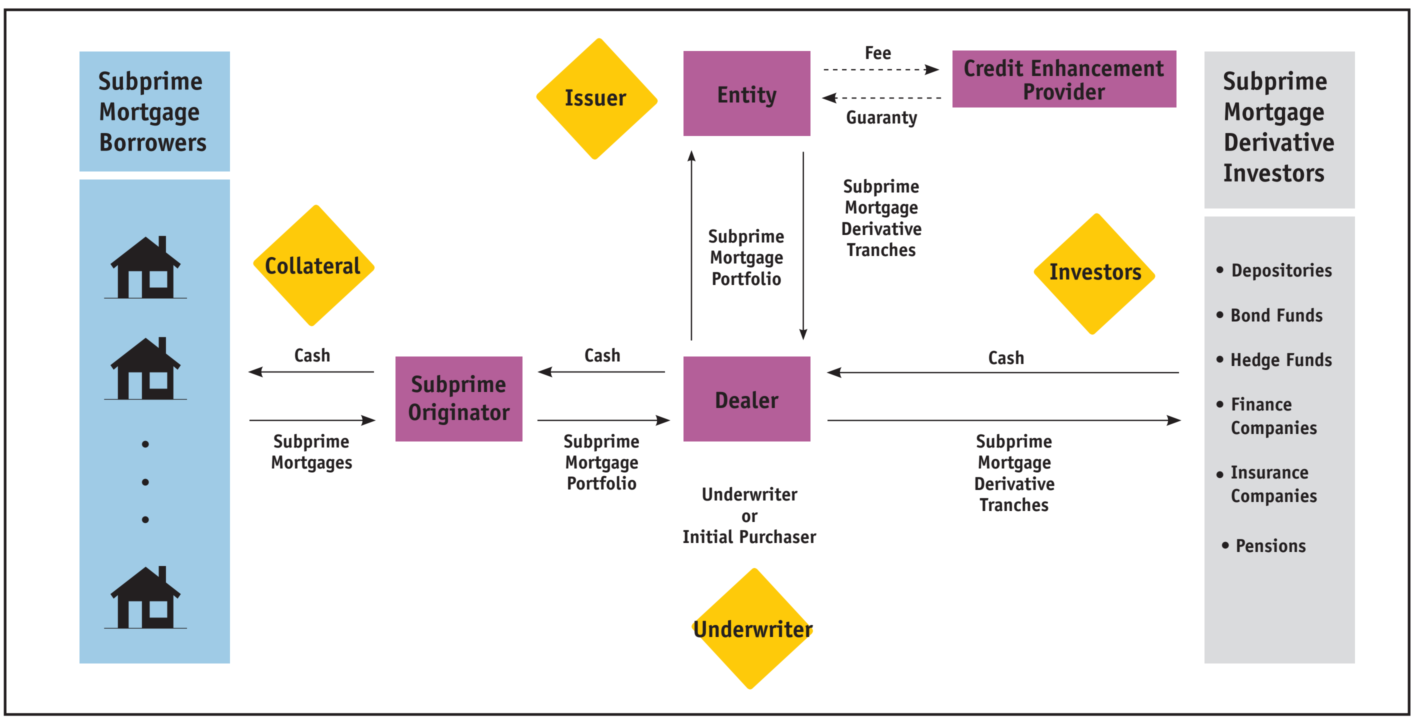
The entity depends on a servicer to collect and process principal and interest payments owed by mortgagors and to pursue nonperforming mortgagors through foreclosure if necessary. REMIC tranches can be credit-enhanced through loan replacement guarantees, letters of credit, or over-collateralization. The value of such enhancement depends on the creditworthiness of the credit-enhancement provider.

■ **Underwriter.**[2] Key points include the underwriter's due diligence, information production, tranche design, and sales processes. An underwriter for the issuing entity usually assists the issuer in collateral loan underwriting and due diligence, tranche design, information production about the collateral, credit enhancement arrangement, and sales of the tranches. A subprime-owning entity may have tranches structured in a simple, senior-subordinate pass-through design or in a complex, multi-tranche CMO mechanism. The tranche design is based on the preferences of potential investors.

■ **Investors.** For investors like insurance companies, finance companies, banks, and hedge funds, the critical points for evaluating subprime-based investments are: due diligence, investment suitability, and hedging efficiency. Investors buy REMIC-issued tranches of subprime instruments that are suitable for their investment portfolios. Purchases of REMIC tranches by investors are based upon the investors' own due diligence and investment standards as they are applied to the information supplied by the issuer's underwriter. Investors in mortgage-backed instruments frequently hedge the instruments' interest rate sensitivities with other types of fixed income products. Excessive defaults can affect the quality of these investors' hedging programs. In addition, many tranches of subprime collateral-based REMICs have been bought by CBO-issuing entities. These tranches are part of the CBO-issuing entities' collateral portfolios.

Thus investors who normally concentrate solely on corporate credit-based instruments like CBOs may have subprime mortgage investments lurking in their portfolios indirectly. This can also affect hedge quality.

Transaction Diagram for Subprime Mortgage Securitization



This diagram depicts the flows of subprime mortgage finance with subprime instruments moving from borrowers to ultimate investors and cash moving in the opposite direction.

Transaction Troubleshooting

Most problems in subprime mortgage transactions surface first for holders of low credit quality tranches, owners of residual interests, loan servicers, and credit enhancement providers. When collateral defaults significantly exceed expectations, sources of credit enhancement are adversely affected and loan servicers both lose interest revenue and must incur substantial work-out costs. A loan default means that a portion of the collateral principal is impaired and that interest and principal payments from the defaulted loan cease.

When a subprime mortgage-based structured deal runs into trouble due to unanticipated collateral defaults, owners of the deal's subordinated tranches can find the principal values of their investments contracting in an unexpected fashion. This makes their investment positions unexpectedly less valuable, which defeats the standard hedging programs used by investors like hedge funds and finance companies. It also can trigger credit downgrades of the affected tranches, which means that original issue investment grade tranches can become junk credits.

In this case, investors that are limited to investment-grade holdings must try to sell the downgraded tranches into a difficult market. The credit rating services currently are downgrading hundreds of subprime mortgage-based tranches from structured entities sponsored by broker-dealers.

To analyze how principal default problems affect subprime mortgage-based instruments, the entire transaction process must be assessed. This goes from loan origination and underwriting through due diligence procedures to tranche design and distribution, and ultimately to investors' purchasing decisions and hedging programs. A failure at any point in the securitization process can cause problems downstream even for holders of highly-rated REMIC tranches, ABS, and CBOs.

The Brattle Group's Capabilities

When subprime mortgage defaults exceed expectations, disputes frequently arise among the various participants in a deal:

- originator
- underwriter
- credit enhancement provider
- loan servicer
- investors

The Brattle Group can assist each of these parties in evaluating the securitization process from start to finish.

CONCLUSION

The first line of defense against excessive subprime defaults in collateralized subprime mortgage-based deals is supplied by the credit enhancement features of the structure. If credit enhancement is provided by the originator's pledge to replace nonperforming mortgages with performing loans, the whole structure works as long as the originator can itself perform. Several large originators have already sought bankruptcy protection. This exposes the tranches of deals based on these originators' subprime collateral to unanticipated defaults and credit downgrades.

Other deals with third-party credit enhancement may be at risk too if the credit provider opts out because the collateral does not actually conform to the stated standards required by the third party. This means that the apparent credit enhancement that supported initial credit ratings in even senior tranches may not actually be available when needed in some disputed deals. The dealers that sponsored such deals and produced the information in support of their structures and sales may face significant risks.

The basis for evaluating any subprime mortgage transaction is the information about the collateral produced by the originator. At each stage in the securitization process, the participants in the transaction at that stage must weigh, summarize, and present the appropriate information to the next group of participants. Each participant relies on the others to produce adequate and timely information. In any dispute about a subprime mortgage-based deal, the information trail from the originator to the contestants is the key to evaluating the substance of the dispute.

In subprime mortgage securitization the origination, due diligence, underwriting, structuring, disclosure, investment suitability, and hedging procedures can all be assessed. It is also possible to reverse engineer a deal to ascertain if the structure performed in accord with its design specifications. An informed analysis and explanation of a subprime mortgage-based transaction is an essential part of successful dispute resolution.

Contact Us

> More information about the financial aspects of loan securitization and transaction structuring is available from the author.

Contact Principal **George S. Oldfield** in our Washington, DC office. He can be reached at +1.202.955.5050 or by email at George.Oldfield@brattle.com.

APPENDIX
Common Structured - Finance Terms

ABS Asset-Backed Security

An ABS transaction is based on loans or other fixed income instruments. This includes collateral like auto loans, credit card loans, and time-share apartment loans. In these transactions, an entity such as an investment trust is established by the transaction's sponsor to purchase the collateral, secure credit-enhancement, and issue the ABS instruments. ABS issues come under the SEC's new Rule AB, which establishes the procedures for ABS issuance and the requirements for information production about the ABS collateral by deal sponsors.

CBO Collateralized Bond Obligation

CBOs are issued by entities established to buy fixed income instruments- usually corporate debt securities, but also commercial loan participations- other ABS based on loans, and derivative instruments based on different sorts of collateral like subprime mortgages. Similar instruments are CDOs (Collateralized Debt Obligations) and CLOs (Collateralized Loan Obligations). CLO collateral is usually bank or commercial finance company loans. CBOs, CDOs, and CLOs cannot qualify for REMIC treatment. They are all subsets of ABS.

CMO Collateralized Mortgage Obligation

A CMO is an instrument issued by an entity that owns qualifying mortgage collateral. Examples of qualifying collateral include residential mortgages, commercial mortgages, mortgages on mobile homes and agency-issued mortgage-backed securities. A CMO-issuing entity usually issues multiple tranches of different mortgage-backed derivative instruments. Tranches' payouts differ in terms of coupon, principal payment terms, prepayment protection, or some other measure of the collateral's payout schedule. An instrument from one tranche of such mortgage-backed instruments is called a CMO.

Entity

A trust, corporation or partnership established to buy collateral (loans, fixed income securities, or mortgages), arrange for collateral servicing and credit-enhancement, and issue collateral-derivative instruments. The principal and interest payments on the derivative instruments are based solely on the principal and interest payments on the collateral and the credit-enhancement mechanism if it is required. An entity is the structure used to transform different sorts of collateral (the entity's assets) into tranches or classes of uniform derivative instruments (the entity's liabilities).

REIT Real Estate Investment Trust

A REIT is a special trust set up to own real estate and real estate-based instruments like mortgages. A REIT that pays out almost all of its earnings to its shareholders is tax-free at the trust level.

REMIC Real Estate Mortgage Investment Conduit

An entity that issues CMOs or other mortgage-based instruments can elect REMIC tax status. This means the entity can issue multiple tranches of different instruments and remain tax-free at the entity level. It also means that the entity must issue a residual interest. A plain-vanilla pass-through type of deal does not need REMIC status (it is not tranched) so no residual interest is created in such a transaction. An entity's residual is frequently hard to sell because its cash flows are difficult to model and hedge.

Senior-Subordinated Structure

The liabilities of an entity that securitizes loan collateral can be structured in a simple two-class design. Both classes have the same proportional claim to timely collateral interest and principal payments but defaults reduce the principal balance of the subordinated class first. The senior class is called "over-collateralized". Because this structure is basically a pass-through design, a simple trust can be used without a REMIC election.

Tranche

A class of instruments issued by an entity established to securitize loan collateral. For example, an agency-sponsored trust set up to issue agency-guaranteed mortgage-backed instruments usually issues a single tranche called a "pass-through". All the collateral's principal and interest payments that flow into the trust and are paid back, i.e. "passed-through" (*pari passu)* at the pass-through rate to owners of the trust's single class of liabilities (after the trust pays for servicing, the guaranty, and administrative costs). In contrast, private-label (non-agency) pass-through instruments generally use a two tranche design called a senior-subordinated structure, which is defined above. Multi-tranched entities collateralized with qualified mortgage products generally elect REMIC status.

ENDNOTES

1. Every REMIC entity issues a small REMIC residual interest, which is a subordinated claim to no more than two percent of the entity's collateral principal value. The residual's principal claim absorbs collateral defaults first so a REMIC residual frequently has an inspired cash flow pattern that is very hard to model or to hedge. REMIC residuals may be retained by loan originators or tranche underwriters to facilitate deals' executions. They are sometimes purchased by mortgage servicers, hedge funds, REITs, and finance companies. Residuals can cause investment problems wherever they reside.

2. Subprime-based issues may be underwritten in a process akin to security issues or be bought outright by initial purchasers and then resold immediately like private placements. The term underwriter is used here as a shorthand representation for the way a subprime-based issue gets to its ultimate investors.

LATEST FIRM-WIDE NEWS

Telecommunications Expert Dr. Coleman Bazelon Joins *The Brattle Group's* Litigation Practice

Dr. Coleman Bazelon, an expert in the economics of telecommunications, has joined the firm's Washington, DC office as a Principal.

Dr. Bazelon is an expert in regulation and strategy in the wireless, wire line, and video sectors. He has consulted and testified on behalf of clients in numerous telecommunications matters, ranging from wireless license auctions, spectrum management, and competition policy, to patent infringement, wireless reselling, and broadband deployment.

Prior to joining *The Brattle Group*, Dr. Bazelon was a Vice President at the Analysis Group. He formerly served as an analyst in the Microeconomic and Financial Studies Division of the Congressional Budget Office, where he handled telecommunications issues. Dr. Bazelon received his Ph.D. and M.S. from the University of California at Berkeley.

Former Senior Advisor Appointed Economic Counsellor of the International Monetary Fund

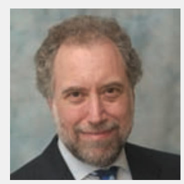
Simon Johnson, the Ronald A. Kurtz Professor of Entrepreneurship at MIT, has been appointed Economic Counsellor and Director of the Research Department of the International Monetary Fund. Until his nomination, Dr. Johnson was a Senior Advisor to *The Brattle Group*.

Principal Richard Goldberg Recently Testified in Case Related to Possible Wrongdoing in Options Granting

Dr. Richard Goldberg, a Principal in *The Brattle Group's* San Francisco office, provided expert testimony in a trial seeking books and records of a well known mortgage company to investigate allegations of potential backdating and springloading of employee stock options.

Dr. Goldberg testified that he examined the 15-day returns in options grants to the mortgage executives over a six-year period and found that the returns were all "well above" what would be expected if based simply on chance. He has been quoted in various media outlets about his findings in this case which the presiding judge described as precedent-setting due to the fact that it was based almost exclusively on statistical evidence.

International Trade Expert Seth Kaplan Joins the Firm's Washington, DC office



Dr. Kaplan, an expert in the economics of international trade disputes, has many years of experience in assisting clients with matters including anti-dumping, countervailing duty, escape clause, and Section 337 investigations. He has provided expert testimony and prepared submissions for petitioners and respondents in over 60 investigations involving a wide range of high-tech, industrial, and agricultural products. He has also worked on behalf of clients in international arbitrations, antitrust matters, and intellectual property litigation.

Prior to joining *The Brattle Group*, Dr. Kaplan was Vice President and head of the International Trade Practice at CRA International. He also served as a Staff Economist at the U.S. International Trade Commission and as Director of Economic Research at Trade Resources Company. He taught international economics at The George Washington University from 1990 to 1998. Dr. Kaplan received his Ph.D. from Michigan State University.

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About The Brattle Group

The Brattle Group provides consulting services and expert testimony in economics, finance, and regulation to corporations, law firms, and governments around the world.

We combine in-depth industry experience, rigorous analysis, and principled techniques to help clients answer complex economic questions in litigation, develop strategies for changing markets, and make critical business decisions.

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- *Thoughtful, timely, and transparent analyses of industries and issues*
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