

The Seven Deadly Frictions of Subprime Mortgage Credit Securitization

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The securitization of mortgage loans is a complex process that involves a number of different players. Figure 1 provides an overview of the players, their responsibilities, the important frictions that exist between the players, and the mechanisms used to mitigate these frictions. An overarching friction which plagues every step in the process is asymmetric information: usually one party has more information about the asset than another. Understanding these frictions and evaluating the options for allaying them is essential to understanding how the securitization of subprime loans can go awry. (For a more extended description of some of these frictions, see “Securitisation: When It Goes Wrong. . .” in the September 20, 2007, *Economist*.)

First Friction: Mortgagor vs. Originator— Predatory Lending

The process starts with the mortgagor or borrower, who applies for a mortgage in order to purchase a property or to refinance an existing mortgage. The originator underwrites and initially funds and services the mortgage loans, in some cases through a broker (yet

another intermediary in this process). Table 1 documents the top 10 subprime originators in 2006, which are a healthy mix of commercial banks and nondepository specialized monoline lenders.

The originator is compensated through fees paid by the borrower (points and closing costs), and through the proceeds of the sale of the mortgage loans. For example, the originator might sell a portfolio of loans with an initial principal balance of \$100 million for \$102 million, corresponding to a gain on sale of \$2 million. The buyer is willing to pay this premium because of anticipated interest payments on the principal as well as prepayment penalties.

The first friction in securitization is between the borrower and the originator. Subprime borrowers who are financially unsophisticated might be unaware of the best interest rate for a particular type of loan or might be unable to make an informed choice between different financial options, presenting lenders or mortgage brokers with the opportunity to act unscrupulously. This friction intensifies as loans become more complex and the true cost of credit is obscured. (However, this view ignores the possibility that mortgage brokers use part of the ysp [yield spread premium] to defray borrowers’ closing costs, which could explain at least part

The Seven Deadly Frictions

Predatory Lending

Information Asymmetry



Freddie

Policy Maker

Fannie



Investors

Credit Rating Agencies

The Borrower

Army of Agents

Services

Mortgage Brokers

FDIC

6.25%

Banks

Monoline Lenders

9.63%



Moral Hazard

Liability

Conflict of Interest

Yield Spread Premium



Model Error

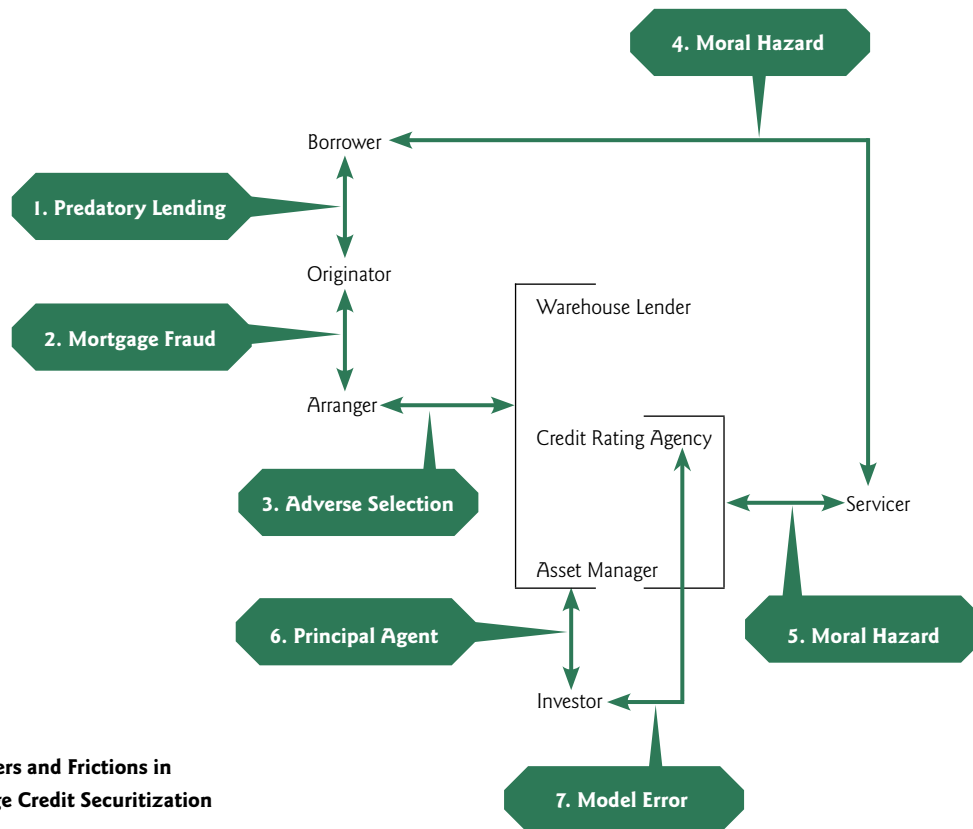


Figure 1. Key Players and Frictions in Subprime Mortgage Credit Securitization

of the higher interest rate on brokered loans.) Predatory lending is defined by Morgan (2007) as the welfare-reducing provision of credit, and typically involves steering a borrower into a product that is more profitable for the lender and/or mortgage broker than for the borrower.

A recent study by Ernst, Bocian, and Li (2008) demonstrates how mortgage brokers originated loans similar to loans originated directly by lenders, with the notable exception that these brokers' loans carried interest rates that were on average 130 basis points higher than lenders' loans. This difference is larger for borrowers with low credit scores or high leverage, and positive or close to zero for borrowers with high credit scores or low leverage. In the presence of prepayment penalties, these high interest rates are essentially locked in after origination.

The authors attribute this effect to lenders' common practice of paying mortgage brokers a YSP bonus in return for convincing the borrower to agree to a higher interest rate. Moreover, the authors estimate that between 63% and 81% of all subprime loans were originated through mortgage brokers in 2006. These estimates appear consistent with a claim by Lewis Ranieri (Tanta, April 28, 2007) that GSEs (government-sponsored enterprise) could have handled as much as 50% of recent subprime origination at a lower interest rate. The authors conclude by arguing that YSP and prepayment penalties should be banned on subprime loans, that lenders and investors should be held accountable for mortgage-broker

behavior, and that mortgage brokers have a fiduciary duty to serve borrowers.

But let's not throw the proverbial baby out with the bathwater. Prepayment penalties serve an important purpose, especially for subprime borrowers. A recent study by Mayer et al. (2007) documents borrowers with prepayment penalties receiving interest rates that are on average 80 basis points lower than those of borrowers without prepayment penalties, with larger reductions for more risky borrowers. More importantly, borrowers with prepayment penalties default at a lower rate. This result is driven by the fact that risky borrowers without a prepayment penalty are more likely to repay their mortgages in response to a positive shock to home prices.

Predatory behavior in subprime mortgage lending has a parallel in a policy debate about payday lending. A payday loan is typically a small loan (i.e., \$300) made for short maturity (i.e., two weeks). The Center for Responsible Lending (2006) reports that 90% of payday-lending revenues are based on fees stripped from trapped borrowers who refinance instead of repaying their loans, and that the typical payday borrower pays back \$793 for a \$325 loan.

While these are extremely high interest rates, research by Flannery and Samolyk (2005) suggests that this is because the loan size is small relative to the costs of originating and because default rates are quite high. Moreover, borrowers are willing to pay these high rates because the alternative—a bounced check or overdraft

	Rank	Lender	Volume (\$b)	Share (%)	Volume (\$b)	%Change
Table 1: Top Subprime Mortgage Originators, 2006	1	HSBC	\$52.8	8.8%	\$58.6	-9.9%
	2	New Century Financial	\$51.6	8.6%	\$52.7	-2.1%
	3	Countrywide	\$40.6	6.8%	\$44.6	-9.1%
	4	Citigroup	\$38.0	6.3%	\$20.5	85.5%
	5	WMC Mortgage	\$33.2	5.5%	\$31.8	4.3%
	6	Fremont	\$32.3	5.4%	\$36.2	-10.9%
	7	Ameriquest Mortgage	\$29.5	4.9%	\$75.6	-61.0%
	8	Option One	\$28.8	4.8%	\$40.3	-28.6%
	9	Wells Fargo	\$27.9	4.6%	\$30.3	-8.1%
	10	First Franklin	\$27.7	4.6%	\$29.3	-5.7%
		Top 25	\$543.2	90.5%	\$604.9	-10.2%
	Total	\$600.0	100.0%	\$664.0	-9.8%	

Source: Inside Mortgage Finance (2007)

	Rank	Lender	Volume (\$b)	Share (%)	Volume (\$b)	%Change
Table 2: Top Subprime MBS Issuers, 2006	1	Countrywide	\$38.5	8.6%	\$38.1	1.1%
	2	New Century	\$33.9	7.6%	\$32.4	4.8%
	3	Option One	\$31.3	7.0%	\$27.2	15.1%
	4	Fremont	\$29.8	6.6%	\$19.4	53.9%
	5	Washington Mutual	\$28.8	6.4%	\$18.5	65.1%
	6	First Franklin	\$28.3	6.3%	\$19.4	45.7%
	7	Residential Funding Corp.	\$25.9	5.8%	\$28.7	-9.5%
	8	Lehman Brothers	\$24.4	5.4%	\$35.3	-30.7%
	9	WMC Mortgage	\$21.6	4.8%	\$19.6	10.5%
	10	Ameriquest	\$21.4	4.8%	\$54.2	-60.5%
		Top 25	\$427.6	95.3%	\$417.6	2.4%
	Total	\$448.6	100.0%	\$508.0	-11.7%	

Source: Inside Mortgage Finance (2007)

	Rank	Lender	Volume (\$b)	Share (%)	Volume (\$b)	%Change
Table 3: Top Subprime Mortgage Services, 2006	1	Countrywide	\$119.1	9.6%	\$120.6	-1.3%
	2	JPMorgan Chase	\$83.8	6.8%	\$67.8	23.6%
	3	Citigroup	\$80.1	6.5%	\$47.3	39.8%
	4	Option One	\$69.0	5.6%	\$79.5	-13.2%
	5	Ameriquest	\$60.0	4.8%	\$75.4	-20.4%
	6	Ocwen Financial Corp.	\$52.2	4.2%	\$42.0	24.2%
	7	Wells Fargo	\$51.3	4.1%	\$44.7	14.8%
	8	Homecomings Financial	\$49.5	4.0%	\$55.2	-10.4%
	9	HSBC	\$49.5	4.0%	\$43.8	13.0%
	10	Litton Loan Servicing	\$47.0	4.0%	\$42.0	16.7%
		Top 30	\$1,105.7	89.2%	\$1,057.8	4.5%
	Total	\$1,240	100.0%	\$1,200	3.3%	

Source: Inside Mortgage Finance (2007)

protection—may be even costlier. Interestingly, a recent academic study by Morse (2006) links the presence of payday lending opportunities to increased community resilience in the case of natural disasters, and finds impacts on foreclosures, births, deaths, and even alcohol and drug treatment.

This friction is mitigated through federal, state, and local laws that prohibit certain lending practices and require certain disclosures of fees and interest rates, as well as by the recent regulatory guidance on subprime lending.

Second Friction: Originator vs. Arranger— Predatory Lending and Borrowing

The pool of mortgage loans is typically purchased from the originator by an institution known as the arranger or issuer. The first responsibility of the arranger is to conduct due diligence on the originator. This review includes but is not limited to financial statements, underwriting guidelines, discussions with senior management, and background checks. The arranger is responsible for bringing together all the elements required to close the deal. In particular, the arranger creates a bankruptcy-remote trust that will purchase the mortgage loans, consults with the CRAS (credit-rating agencies) in order to finalize the details about deal structure, makes necessary filings with the SEC, and underwrites the issuance of securities by the trust to investors.

Table 2 documents the ten largest subprime MBS (mortgage-backed security) issuers in 2006. In addition to institutions which both originate and issue independently, the list of issuers includes investment banks that purchase mortgages from originators and issue their own securities. The arranger is typically compensated through fees charged to investors and through any premium that investors pay on the issued securities over their par value.

The second friction in the process of securitization is the disparity in the information available to the originator and to the arranger with regard to the quality of the borrower. In this unequal relationship, the originator has the advantage. Without adequate safeguards, an originator may be tempted to collaborate with a borrower to make significant misrepresentations on the loan application. Depending on the situation, this might be construed as predatory lending (the lender convinces the borrower to borrow “too much”) or predatory borrowing (the borrower convinces the lender to lend “too much”).

While mortgage fraud has been around as long as the mortgage loan, it is important to understand that fraud becomes more prevalent in an environment of high and increasing home prices. In particular, when home prices are high relative to income, borrowers unwilling to accept a low standard of living can be tempted into lying on a mortgage loan application. When prices are high and rapidly increasing, the cost of waiting is an even lower standard of living, and the incentive to commit fraud is even greater. Rapid appreciation of home prices increases speculative and criminal activity. And what happens when the expectation of higher prices creates equity that reduces the probability of default and the severity

of loss in the event of default? The benefits of fraud increase, while the costs of fraud decline.

Mortgage fraud played an important role in the subprime meltdown. A recent report by Fitch Ratings (2007) conducted an autopsy of 45 early payment defaults from late 2006. Early payment defaults occur when a borrower becomes seriously delinquent shortly after origination. Fitch investigated the loan files, finding widespread evidence of fraud that was ignored by the underwriting process: occupancy misrepresentation, suspicious items on credit reports, incorrect calculation of debt-to-income ratios, poor underwriting of stated income for reasonability, first-time homebuyers with questionable credit and income.

In addition, research by Ben-David (2008) documents how sellers provided cash back to buyers at closing in a fashion that was neither detected nor priced by lenders. Buyers of properties where the seller hinted about giving cash back paid more for those properties and were more likely to face foreclosure. These effects were stronger when borrower leverage was higher.

A paper by Keys et al. (2008) documents the lender’s participation by focusing on loans near a 620 FICO (Fair Isaac Corporation) score. Loans with a FICO score just above 620 are easiest for a lender to sell. To the extent that the ability to sell loans reduces incentives for screening and monitoring, loans just above 620 might conceivably perform worse than loans just below 620. This is exactly what the authors document. Additionally, this effect is most significant for low documentation loans in which the lender has the greatest scope to help the borrower misrepresent income.

Several important checks are designed to prevent mortgage fraud, the first being the due diligence of the arranger. In addition, the originator typically makes a number of r&w (representations and warranties) about the borrower and the underwriting process. When these are violated, the originator generally must repurchase the problem loans. However, in order for these promises to have a meaningful impact on the friction, the originator must have adequate capital to buy back the loans. Moreover, when an arranger does not conduct (or routinely ignores) its own due diligence, as suggested in a recent Reuters piece by Rucker (2007), there is little to stop the originator from committing widespread mortgage fraud.

Third Friction: Arranger vs. Third Parties— Adverse Selection

The pool of mortgage loans is sold by the arranger to a bankruptcy-remote trust, a special-purpose vehicle that issues debt to investors. This trust is an essential component of credit risk transfer, as it protects investors from bankruptcy of the originator or arranger. Moreover, the sale of loans to the trust protects both the originator and arranger from losses on the mortgage loans, provided that there has been no breach of r&w by the originator.

An important information asymmetry exists between the arranger and the third parties concerning the quality of mortgage loans. The fact that the arranger has more information than the third parties about the quality of the mortgage loans creates an

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adverse selection problem: the arranger can securitize bad loans (the lemons) and keep the good ones (or securitize them elsewhere). This third friction in the securitization of subprime loans affects the relationship that the arranger has with the warehouse lender, the CRA, and the asset manager.

Adverse Selection and the Warehouse Lender

The arranger is responsible for funding the mortgage loans until all the details of the securitization deal are finalized. When the arranger is a depository institution, this can easily be accomplished with internal funds. However, monoline arrangers typically require funding from a third-party lender for loans kept in the “warehouse” until they can be sold. Since the lender is uncertain about the value of the mortgage loans, it must take steps to protect itself against overvaluing their worth as collateral. This is accomplished through due diligence by the lender, haircuts to the value of collateral, and credit spreads.

The use of haircuts to the value of collateral implies that the bank loan is *o/c* (over-collateralized). For example, the lender might extend a \$9 million loan against collateral of \$10 million of underlying mortgages, forcing the arranger to assume a funded equity position (in this case, \$1 million) in the loans while they remain on its balance sheet.

We emphasize this friction because an adverse change in the warehouse lender’s views of the value of the underlying loans can bring an originator to its knees. The failure of dozens of monoline originators in the first half of 2007 can largely be explained by the firms’ inability to respond to increased demands for collateral by warehouse lenders (Wei, 2007; Sichelman, 2007).

Adverse Selection and the Asset Manager

The arranger underwrites the sale of securities secured by the pool of subprime mortgage loans to an asset manager, who is an agent for the ultimate investor. However, the information advantage of the arranger creates a standard lemons problem. This problem is traditionally mitigated by the market by means of: the arranger’s reputation; the provision of a credit enhancement to the securities by the arranger, with its own funding; due diligence conducted by the portfolio manager on the arranger and originator; and short-term funding.

Short-term funding is effective in resolving the information problem between unsophisticated investors and arrangers with an information advantage. However, it makes the financial system fragile. This particular lemons problem became acute in August 2007 when investors in ABCP (asset-backed commercial paper) grew nervous about mortgage exposure. Their concern was aggravated in part by mortgage originators reliant on ABCP for funding exercising their options to extend the maturities of outstanding paper. The subsequent run for the exits resulted in a significant decline in the amount of ABCP outstanding, putting stress on the balance sheets of banks that provided explicit or implicit liquidity support for sponsored ABCP conduits and SIVs (structured investment vehicles).

In March 2008, this friction came to the fore again. Secured funding markets seized up in response to repo market lenders growing anxious about their exposure to investment banks. Ultimately, the lenders forced Bear Stearns shareholders to accept a rescue by JPMorgan Chase in order to avoid filing for bankruptcy protection.

Adverse Selection and CRAs

The rating agencies assign credit ratings on MBSS issued by the trust. These opinions about credit quality are determined using publicly available rating criteria that map the characteristics of the pool of mortgage loans into an estimated loss distribution. From this loss distribution, the rating agencies calculate the amount of credit enhancement that a security requires to attain a given credit rating. The opinion of the rating agencies is vulnerable to the lemons problem (the arrangers likely still know more than the agencies) because they only conduct limited due diligence on the arranger and originator.

Fourth Friction: Servicer vs. Mortgagor—Moral Hazard

The trust employs a servicer who is responsible for collection and remittance of loan payments. The servicer makes advances of unpaid interest by borrowers to the trust. It accounts for principal and interest, provides customer service to the mortgagors, holds escrow or impounds funds related to payment of taxes and insurance, contacts delinquent borrowers, and supervises foreclosures

and property dispositions. The servicer is compensated through a periodic fee paid by the trust. Table 3 documents the ten largest subprime servicers in 2006, a mix of depository institutions and specialty nondepository monoline servicing companies.

Moral hazard refers to changes in behavior in response to redistribution of risk. For example, insurance may induce risk-taking behavior if the insured does not bear the full consequences of a negative outcome. The problem in that case occurs when the mortgagor has unobserved costly effort that affects distribution over the cash flows it shares with the servicer. The mortgagor then has limited liability: it does not share in downside risk.

An important moral hazard concerns a borrower's option to walk away. With significant declines in home prices, millions of borrowers could find themselves underwater. Borrowers who are performing but still underwater could find it difficult to sell their homes without bringing cash to closing, which limits their ability to move. Borrowers without this cash may simply walk away from their homes. This option can give borrowers significant bargaining power over lenders who do not want to foreclose in a difficult home-price environment.

A recent report by Experian (2007) provides some evidence that this is more than just conjecture, as there appear to have been changes to the pecking order of payments. Traditionally, borrowers pay their mortgages first, then their credit cards. However, the credit-score agency reports some evidence of borrowers making credit-card payments before mortgages. Another piece of evidence is the Web site www.youwalkaway.com, which offers underwater borrowers the opportunity to live in their homes for free for eight months, claiming that foreclosure can be removed from a credit report.

The recent bankruptcy reform law has also adversely affected the bargaining power of mortgage lenders vis-à-vis other lenders. Previous to the reform, borrowers could file Chapter 7, discharge their credit-card debts, and keep their homes. However, with the increased difficulty of filing Chapter 7, mortgage lending has become riskier. A recent study by Morgan et al. (2008) documents the increase of subprime foreclosures in states where home-equity exemptions are high, and where the limitations of bankruptcy reform on Chapter 7 filings are most severe.

This friction is typically resolved through the down payment, which limits borrower leverage ex ante, and through modification of principal, which reduce borrower leverage ex post. An important challenge stems from the frictions between the servicer and investor (discussed in the next section), which constrain the servicer's ability to modify principal. As reductions of principal lower home prices, the bargaining power of borrowers increases. The inability of investors to respond to this power shift could result in unprecedented levels of foreclosure and loss, as borrowers walk away.

Fifth Friction: Servicer vs. Third Parties—Moral Hazard

The servicer can have a significantly positive or negative effect on the losses realized from the mortgage pool. Moody's estimates that

servicer quality can affect the realized level of losses by plus or minus 10%. This presents a problem similar to the fourth friction (servicer vs. mortgagor). In this case, the servicer has unobserved costly effort that affects the distribution over cash flows shared with other parties, and has limited liability, with no share in downside risk. (Several points in the argument that follows were first raised in a post by Tanta [screen name] on the *Calculated Risk* blog.)

The servicing fee is a flat percentage of the outstanding principal balance of mortgage loans. Each month, the first payment goes to the servicer; then funds are advanced to investors. Because mortgage payments are generally received at the beginning of the month and investors receive their distributions near the end of the month, the servicer benefits from earning interest on float. (In addition to the monthly fee, the servicer can generally keep late fees. This can tempt a servicer to post payments in a tardy fashion or not make collection calls until late fees are assessed.)

In the event of a delinquency, the servicer must advance unpaid interest (and sometimes principal) to the trust as long as the interest is deemed collectible. That typically means the loan is less than 90 days delinquent. In addition to advancing unpaid interest, the servicer must continue to pay property taxes and insurance premiums as long as it has a mortgage on the property. In the event of foreclosure, the servicer must pay all expenses out of pocket until the property is liquidated, at which point it is reimbursed for advances and expenses.

Those expenses for which the servicer cannot be reimbursed are largely fixed and front loaded: registering the loan in the servicing system, posting the initial notices, performing the initial escrow analysis and tax setups, and so on. At the same time, the income of the servicer increases during the time that the loan is serviced. It is to the servicer's advantage to keep a loan on its books for as long as possible. It strongly prefers to modify the terms of a delinquent loan and to delay foreclosure.

Resolving this problem requires striking a delicate balance. On one hand, strict rules within the pooling and servicing agreement can limit loan modifications, and an investor can actively monitor the servicer's expenses. On the other hand, the investor must allow the servicer flexibility to act in the investor's best interest, and must avoid incurring excessive expense monitoring the servicer. This last point is especially important, given that other investors will exploit a given investor's exceptional monitoring efforts for their own benefit. Not surprisingly, CRAs play a key role in resolving this collective action problem through servicer quality ratings.

A servicer quality rating is intended to be an unbiased benchmark of a loan servicer's ability to prevent or mitigate pool losses across changing market conditions. It assesses collections/customer service, loss mitigation, foreclosure-timeline management, staffing and training, financial stability, technology, disaster recovery, legal compliance, oversight, and financial strength. In constructing a quality rating, the rating agency attempts to break out the actual historical loss experience of the servicer into an amount attributable to the underlying credit risk of the loans and an amount

attributable to the servicer's collection and default management ability.

In addition to monitoring effort by investors, servicer quality ratings, and rules about loan modifications, there are two other significant options for mitigating this friction: servicer reputation and the master servicer. The fact that the servicing business is an important countercyclical source of income for banks suggests that the servicers themselves would make a concerted effort to minimize third-party friction. The master servicer is responsible for monitoring the performance of the servicer under the pooling and servicing agreement. It validates data reported by the servicer, reviews the servicing of defaulted loans, and enforces remedies for servicer default on behalf of the trust.

Sixth Friction: Asset Manager vs. Investor—Principal-Agent

The investor provides the funding for the purchase of the MBS. As the typical investor lacks financial sophistication, an agent is employed to formulate an investment strategy, conduct due diligence on potential investments, and find the best price for trades. The investor, however, may not fully understand the manager's investment strategy, may doubt the manager's ability, or may not observe the manager's due-diligence efforts. The information gap between the investor and asset manager gives rise to the sixth friction. This friction between the principal/investor and the agent/manager is mitigated through the use of investment mandates and the evaluation of manager performance relative to a peer benchmark.

(Most subprime MBS tranches issued in 2005–2007 were repackaged in new structures called ABS CDOs [collateralized debt obligations with portfolios comprised of asset-backed securities]. A significant fraction of the exposure to ABS CDOs was either retained by CDO-issuing banks or was hedged with the monoline bond insurance companies. As a result of this exposure, both the banks and the insurance companies suffered devastating losses in late 2007 and early 2008. A recent note by Adelson and Jacob [2008] argues that underwriting standards in subprime did not deteriorate until ABS CDOs became the marginal investor. This line of argument suggests that the largest risk-management failures were by large sophisticated investors who may have relied too heavily on CRAs' views of the underlying RMBS [residential mortgage-backed security] bonds in managing the risk of these exposures.)

Another instrument of sixth-friction mitigation is the FDIC. As an implicit investor in commercial banks through the provision of deposit insurance, the FDIC prevents insured banks from investing in speculative-grade securities and enforces risk-based capital requirements that use credit ratings to assess risk weights. An actively managed CDO imposes covenants on the weighted average rating of securities in its portfolio, as well as on the fraction of securities with a low credit rating.

As investment mandates typically involve credit ratings, they comprise another point where the CRAs play an important role in the securitization process. By evaluating the riskiness of offered securities, the rating agencies help resolve information frictions

between the investor and portfolio manager. Credit ratings are intended to capture expectations about the long-run or through-the-cycle performance of a debt security. A credit rating is fundamentally a statement about an instrument's suitability for inclusion in a risk class. Importantly, though, it is an opinion only about credit risk. The opinions of CRAs are crucial in securitization, because ratings are the means through which much of the funding from investors is actually applied to a particular deal.

However, recent events have demonstrated that the resolution of this friction does not end with the rating agencies. In particular, a recent report by the Senior Supervisors Group (2008) details significant differences in the risk-management practices of large financial institutions with regard to structured-credit exposures in their trading books. In general, institutions with better outcomes questioned the accuracy of credit ratings.

Seventh Friction: Investor vs. CRAs—Model Error

Arrangers, not investors, pay rating agencies. This creates a potential conflict of interest. If investors cannot assess the efficacy of rating agency models, they are susceptible to both honest and dishonest errors. The information asymmetry between investors and the CRAs is the seventh and final friction in the securitization process. Honest errors are a natural by-product of rapid financial innovation and complexity. Dishonest errors may be driven by the dependence of rating agencies on fees paid by the arranger.

Some critics claim that rating agencies are unable to rate structured products objectively due to conflicts of interest that stem from issuer-paid fees. Moody's, for example, made 44% of its revenue last year from structured-finance deals (Tomlinson and Evans, 2007). Such assessments command more than double the fee rates of simpler corporate ratings, helping keep Moody's operating margins above 50% (*Economist*, May 31, 2007). Despite these concerns, a July 2008 SEC investigation recently found "no evidence that decisions about rating methodology or models were based on attracting or losing market share." In other words, credit-ratings analysts are exposed to pressure but do not succumb.

What is behind the dishonest errors, then, if not conflicts of interest? A recent report by the Committee on the Global Financial System (2008) tackles this question, concluding that major mistakes have included underestimating the severity of the housing downturn, limited use of historical data, and ignoring differences in the quality of originator underwriting practices across firms and over time.

Another possibility is that the rating agency builds its model honestly, but applies judgment in a fashion consistent with its economic interest: the average deal is structured appropriately, but the agency gives certain issuers better terms. Alternately, the model itself may knowingly be aggressive: the average deal is structured inadequately.

This friction is minimized through two devices: the reputations of the rating agencies and the public disclosure of ratings and downgrade criteria. The rating agencies' business is all about reputation, so it is difficult if not impossible to imagine them

jeopardizing their franchise by deliberately inflating credit ratings to earn structuring fees. Moreover, public rating and downgrade criteria allow the public to catch any deviations in credit ratings from their models.

Five Frictions That Caused the Subprime Crisis

In terms of the breakdown in the subprime mortgage market, five of these seven frictions played key roles.

The first friction set the downward spiral spinning. Many products offered to subprime borrowers were very complex and subject to misunderstanding and misrepresentation. This led to excessive and predatory borrowing and lending.

Then the sixth friction began to work: the principal-agent conflict between the investor and asset manager. Investment mandates failed to adequately distinguish between structured and corporate credit ratings. This was a problem because asset-manager performance was evaluated relative to peers or relative to a benchmark index. Asset managers had an incentive to reach for yield by purchasing structured-debt issues with the same credit rating as corporate debt issues, but with higher coupons. (The fact that the market demands a higher yield for similarly rated structured products than for straight corporate bonds ought to provide a clue to the potential of higher risk.)

Initially, this portfolio shift was probably led by asset managers with the ability to conduct their own due diligence, recognizing value in the wide pricing of subprime MBSS. However, once other asset managers began to underperform, they may have made similar portfolio shifts without investing the same effort in due diligence of the arranger and originator.

This phenomenon exacerbated the third friction between the arranger and the asset manager. Without due diligence by asset managers, the arrangers' incentives to conduct their own due diligence were reduced. Moreover, as the market for credit derivatives developed (including but not limited to the ABX), arrangers were able to limit their funded exposure to securitizations of risky loans in a fashion unknown to investors. Together, these considerations worsened the second friction between the originator and arranger, opening the door for predatory borrowing and providing incentives for predatory lending.

In the end, only the opinion of the rating agencies put any constraint on underwriting standards. With limited capital backing R&W, an originator could easily arbitrage rating-agency models, exploiting the weak historical relationship between aggressive underwriting and losses in the data used to calibrate required credit enhancement.

The rating agencies' failure to recognize arbitrage by originators and to respond appropriately resulted in significant errors in the credit ratings assigned to subprime MBSS. Friction seven, between investors and the rating agencies, drove the final nail in the coffin. Even though the rating agencies publicly disclosed their rating criteria for subprime, investors lacked the ability to evaluate the efficacy of these models.

While mechanisms such as antipredatory lending laws and regulations are in place to mitigate or even resolve each of these seven frictions in the mortgage securitization process, some of these mechanisms have failed to deliver as promised. Can this be fixed?

There is a solution, and it begins with investment mandates. Investors must realize the incentives of asset managers to push for yield. Investments in structured products should be compared to a benchmark index of investments in the same asset class. Forcing investors or asset managers to conduct their own due diligence in order to outperform the index restores incentives for the arranger and originator. Moreover, investors should demand that the arrangers or originators (or both) retain the first-loss or equity tranche of every securitization and should insist that they disclose all hedges of this position. At the end of the production chain, originators must be adequately capitalized so that their R&W has value. Finally, the rating agencies should evaluate originators with the same rigor that they evaluate servicers, perhaps including the designation of originator ratings.

None of these solutions necessarily require additional regulation, and the market is even now taking steps in the right direction. For example, the CRAS have already responded to the crisis with enhanced transparency, and have announced significant changes in the rating process. Moody's updated its subprime RMBS surveillance criteria in October 2007, putting originators into different tiers in recognition of the impact that different underwriting practices have had on performance. In addition, the demand for structured-credit products in general and subprime mortgage securitizations in particular has declined significantly as investors have started to reassess their own views of the risk in these products. Given these fledgling efforts, policy makers may be well advised to give the market a chance correct itself.

On the other hand, the tranching of subprime mortgage credit risk has challenged those servicers implementing loan modifications that reduce principal balance. While such modifications might benefit both the borrower and average tranche, especially in a market of declining home prices, they require the most junior tranche to absorb loss. The threat of litigation by these junior investors, or the outright ownership of these junior tranches by servicers, may prevent the market from achieving a socially desirable outcome. The public sector should consider requiring securitization structures to manage these conflicts in a socially optimal fashion, possibly through tax-code provisions preventing the double-taxation of interest income collected from borrowers and remitted to investors.

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