

Regulating Securitization

Securitization is a process by which non-tradeable assets (loan portfolios) are transformed to asset-backed debt instruments that can be traded in financial markets. On the surface, the recent financial crisis had little to do with it but much to do with the failures and near-failures of systemic important financial institutions. The cases of Frannie Mae and Freddie Mac, Lehman, AIG, and others institutions have led to a public outcry on “too-big-to-fail” (TBTF) and many of the policy responses have intended to mitigate the dire consequences of the problem. However, beneath the failures of big banks was the collapse of an entire market for securitized bonds, the outputs of securitization. The collapse of the market had triggered runs on the shadow banking system—repurchase agreements (repos) market and the asset-backed commercial paper (ABCP) market, for instance, which ultimately bit back to those financial institutions (FIs).

In what follows, I will first briefly describe how securitization works. Secondly, I will discuss some of the issues (concerning securitization) that contributed to the crisis (regulatory failures, market failures). Lastly, policy reforms and proposal on the securitization will be examined.

Securitization in Brief

Generally, securitization involves five stages:

- 1) Asset selection
- 2) Transfer (pooling) of assets to standard securitization special purpose vehicles (SPVs)

- 3) Structuring the transaction (tranching)
- 4) Issuance of securities by Special-purpose vehicles (SPVs) or special-purpose entity (SPEs)
- 5) Allocation of cash flow and principals

If the underlying assets are mortgage-related, the output of securitization is called mortgage-backed securities (MBS)¹; otherwise, it is called asset-backed securities (ABS), which generally are backed by student loans, auto loans, credit card loans, etc.

The two most crucial parts of the process is pooling and tranching. Pooling is transfer of assets (usually from various geographic locations) to the SPV, also called SPE. Specifically, SPV is a separate “bankruptcy-remote” legal entity set up for a limited purpose by the sponsoring firm. The SPV would pool assets from originators through a true sale condition which removes the assets from the originators’ balance sheet.

Tranching is to create different classes of bonds with different priorities of receiving interest payments and principle. The senior tranche is entitled to receive a last-loss, first-pay residual interest, then comes the mezzanine tranche and junior tranche. Tranching serves a credit enhancement purpose because the holders of junior and mezzanine tranches are to bear the losses prior to the holders of senior tranche. If the actual default correlation of the loan in the given portfolio is low, holders of senior tranches are well-protected by the diversification through securitization. The three classes of tranches described is simply a generalization. The exact bond class of the security is dependent on its credit rating issued by a rating agency.

¹ MBS can be further divided into agency/Government-sponsored Enterprises (GSE) and non-agency/“private label”. It is argued that the private label” MBS was more closely associated with non-prime, non-conforming conventional loan, relative to GSE MBS.

Collateral debt obligations (CDOs) and collateral debt obligations square (CDO²) are also outputs from resecuritization. To put it in a simple way, CDO is the second generation/layer of securitization, which is to redo the above five processes again on the ABS/MBS. MBS CDO based on subprime mortgage loans were conceived to be safe before the crisis. With the defaults of the underlying mortgage loans rising and subsequently S&P/Moody's first and significant downgrades in June 2007, investor soon realized the risk of holding MBS CDOs is hugely underestimated and saw CDOs as "toxic".

The figure from Hanson *etal.* (2010) (see next page) compares the issuances of traditional ABS (which have almost no default history), based on credit card student loans, to the non-traditional ABS which consist of subprime loans and CDO and other exotic securitized bonds in the U.S.

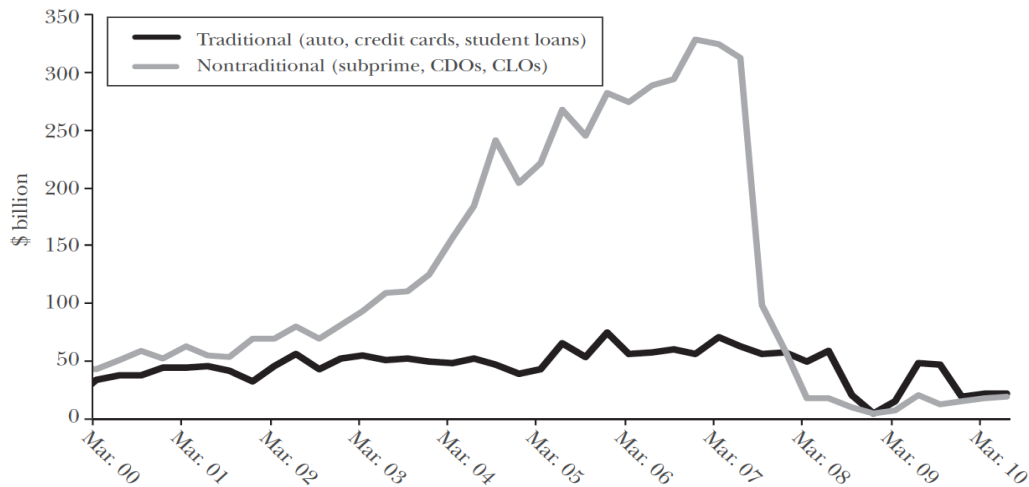
The boom and bust pattern of the non-traditional ABS is obvious and should have implication for reforms. In particular, reforms should look for ways to eliminate the excessive credit supply (especially those arose due to the "pseudo-riskless" securities) through securitization. The key is to understand why the systemic risk of holding those assets are mispriced in the first place. This involves understanding not only the regulatory failures but also the market failures.

The Failures

Asymmetric information due to complexity of the system and opaqueness of the ABS/MBS contracts played an important role in worsening the contagion effect during the crisis. The securitization process of those products involves many stages and parties (borrowers, originators,

Figure 1

Quarterly Issuance of Asset-Backed Securities, 2000–2010Q2



Source: The data underlying this figure come from Thompson SDC.

Notes: The figure plots the quarterly issuance of traditional versus nontraditional asset-backed securities (ABS). Traditional ABS includes securitizations backed by auto loans, credit card receivables, and student loans. Nontraditional issuance includes ABS backed by subprime mortgages, collateralized debt obligations (CDOs), and collateralized loan obligations (CLOs). While the nontraditional category includes securitizations backed by subprime mortgages, it does not include securitizations backed by prime mortgages, such as mortgage-backed securities guaranteed by Fannie Mae or Freddie Mac.

arrangers, credit-rating agencies, asset managers, credit enhancers, liquidity providers and sponsors, etc.). Although some of the role could be performed by the same institution, pieces of information about the underlying mortgage assets were lost at each stage. Opaqueness of the securitized products prevents investor to obtain relevant and precise information about the values or exposures of the fundamental assets on which their securities were based. When news about subprime mortgages default arrived, the financial system was unable to summon the resources to locate the sources of risk. Due to the information constraint that investors faced, they either pulled back the funding (cash, etc.) by not rolling over the contract, or shortening the period of debt contract, or increasing “haircut” rate or margin over the collaterals. Either way, the effects are akin to a “run” on the structural investment vehicles (SIVs) or conduits which were or perceived to be exposed to the ABS/MBS. It is interesting to see in the figure above that

traditional ABS collapsed after that of the non-traditional ones (which were plunged by the information the most) in 2008, an example of fire sale. Holders of ABS/MBS were not willing to commit to assets of unknown or declining values. This led to serious adverse selection and illiquidity problems that ultimately shut down the entire ABS/MBS market in the U.S. Since the specific nature of the asset holdings were unavailable to investors in Canada who purchased these securities in the market,² relying on ratings provided almost exclusively by DBRS, Canada's only domestic rating agency, Canada's ABCP market froze on August 13, 2007 as well. Though complexity and opaqueness did not cause the panic, they were vulnerabilities to asymmetric information, adverse selection, information contagion and illiquidity problems.³

Moral hazard in mortgage securitization served as another market failure. More specifically, lenders who were planning to hold the mortgages themselves on their balance sheets had greater incentives to screen and monitor borrowers' ability to repay. If lenders are to sell their loans to other parties (such that the loans become off-balance sheet), he might not have to be worry about the borrowers' ability to repay and merely aim to maximize the loan (profit) he originates. Substantial researches have shown the positive correlation of securitization and declining underwriting standard. Shiller (2008), Demyanyk and Van Hemert (2011), Mian and Sufi (2009) and Agarwai *et al.* (2011) are some of the examples. IMF (2008) points out that foreclosures seem to take place well ahead of the resetting of interest rates and suggests that "the deterioration thus far has been a function of fraud, speculation, over-extension of borrowers, and the effects of

² ABCP was exempt from having a prospectus or an information notices in Canada during the crisis.

³ Note that this argument is associated with the externalities related to fire sales and externalities related to interconnectedness (with repo and ABCP markets, etc.) (Nicoló, Favara and Ratnovski, 2012).

weak underwriting standards”.⁴ Keys *etal.* (2008) argued that securitization adversely affects the screening incentives of subprime lenders by making used of a discontinuous jump in the probability of a mortgage being securitized at a FICO credit score of 620. In other words, securitization might well have caused the excessive credit supply of subprime mortgage. In sum, originating institutions generally did not hold he equity tranches of the portfolio they generated but sold to outside investors (Duffie, 2007 and Dodd, 2007). “No-shin-in-the-game” of the originators could be the reason for excessive credit extension.

While there are evidence suggesting the moral hazard argument, the argument fails to explain the fact that large financial intermediation, including originating institutions, borne a large share of total losses.⁵ Indeed, “the reason for the severity of the recent credit crisis lies precisely in the fact that the bad loans were not all passed on to final investors. Instead, the “hot potato” was sitting inside the financial system, on the balance sheet of the largest, and most sophisticated, financial intermediaries.” (Shin, 2010, p.157). What explain this? In my opinion, there are three reasons. The first reason is related to the loopholes of capital requirements and issuing, instead of selling, liabilities back by bad loans. Secondly, poor risk management practices may explain why FIs underestimated the systemic risk of those securitized products. Lastly, behavioral reasons can also explain why the systemic risk of those products was neglected. Together, the three reasons can explain the excessive credit growth.

⁴ This is in contrary to Gorton (2010) who attributes the subprime mortgage crisis to adjustable-rate subprime mortgage contracts which are “designed to fail” (overly rely on rising house prices).

⁵ Greenwood and Scharfstein (2013) p.23 noted that “in 2007 approximately 73 percent of outstanding mortgage-backed securities were held by financial intermediaries, including commercial banks (15 percent), government-sponsored entities (16 percent), and mutual funds (11 percent)”.

Loopholes of capital requirements are one of the main drivers of securitization and, arguably, excessive credit growth. According to Casu (2009) p.364, “originators tend to violate the true sale condition by providing implicit recourse, or non-contractual performance guarantees to investor ... (which) provides scope for regulatory arbitrage.”. This regulatory arbitrage hypothesis is best illustrated by Acharya *etal.* (2013) who find that in the U.S. “the majority of guarantees were structured as capital-reducing liquidity guarantees and that the majority of (ABCP) conduits were sponsored by commercial banks (which among FIs are subject to the most stringent capital requirements).” (p.516). The timing of the surge of ABCP was shortly after the U.S regulatory authorities’ (OCC, Fed, FDIC, OTS) announcement of permanent exemption of regulatory capital requirement to those guarantees in 2004. Effectively, FIs could place assets in off-balance sheet entities (SPVs, SIVs, conduits, etc.) without holding the appropriate level of capital against these assets. Moreover, converting non-investment-grade securities higher rating, especially for mortgaged related securities, “economize” regulatory capital. For example, under Basel II, “non-mortgage retail loans received a 75 percent risk weight, while mortgage retail loans could attract just a 35 percent weight in some cases. In securitized form, the risk weight for AAA-rated mortgage bonds could be 7 percent for banks applying an internal ratings-based (IRB) approach.” (Segoviano *etal* 2013, p.22). Thus, FIs were severely “under-capitalized” when they honored their guarantees and provided liquidity to the sponsoring entities.

Poor risk management practices also explain the underestimation of the systemic risk of those securitized products FIs carried and the excessive credit extension. Milne (2009) argues that unrealistic underlying theoretical formulation and imperfect statistical calibration hinder private risk management systems’ ability to deal with systemic risk. Concerns about overreliance on complicated yet constrained quantitative models were also raised by Hellwig (2008) (2010) and

Haldane (2012). In particular, many of the time series that are being used are short to estimate a financial cycle. Non-stationarities of the series preclude reliable estimates of the underlying structures. The problems are especially serious when it comes to estimating correlations for credit risks, where realized events of defaults are relatively rare compared to market risk. These risk management practices also plagued the rating agencies. Coval *etal.* (2009) demonstrate that ratings prescribed by rating agencies are highly sensitive to the parameters (probability of default and loss given default) and model assumptions.⁶ The whole picture is even darker when risk is endogenous (originated within the financial system due to strategic complementarities).⁷ When return of assets and correlation of default were miscalculated and shocked, results of the quantitative models are less unreliable. Risk management and rating agencies grading based on these were untenable.

Before moving on to behavioral reasons for why the systemic risk of ABS/MBS was neglected, I want to discuss one of the notorious *defects of the rating agency system*—conflicts of interests. Rating agencies were paid by issuers for rating their structured products. This “issuer-pay” model causes an incentive misalignment between ABS/MBS issuers and investors. One of the direct consequences was “ratings shopping” (IMF 2009). Thanks to competition, it was not surprising that rating agencies would be more lenient in examining their customers’ products.

⁶ For example, for Fitch’s rating system, “...within the investment grade range, there are ten distinct rating categories (from AAA to BBB-) even though the annualized default rate only varies between 0.02 and 0.75 percent. Given the narrow range of the historical default rates, distinguishing between the ratings assigned to investment grade securities requires a striking degree of precision in estimating a security’s default likelihood. By contrast, the ten rating categories within the speculative grade range (from BB to C) have default rates ranging from 1.07 to 29.96 percent” (Coval *etal.* 2009 p.8). On this note, one of the solutions in Stein (2010) is to simplify the grading brackets to, for instance, only A, B, C.

⁷ See Shin (2010) and Nicoló, Favara and Ratnovski, (2012).

Moreover, instead of rating ex post, the agencies were brought in at the design stage to consult on what it would take to pass the requirements for a desired rating level. Therefore, an AAA tranche was not an average AAA, but one that merely meets the marginal requirements. Lastly, under the “issuer-pay” model, rating agencies had little incentive to make the models, methodologies, assumptions, and information used in the rating process transparent. Yet, regulatory requirements such as Basel and investors were relying on the ratings to monitor risk. Though the role of rating agencies in misleading investors could be overstated since a huge amount of ABS/MBS were purchased by FIs themselves, the rating system is indeed flawed. Others have pointed out that systemic fraud, negligence or even incompetence are problems facing rating agencies as well.

Was there any role for “*irrational exuberance*” (behavioral reasons) to play during the lead-up of the crisis? I believe so. “Irrational exuberance” was most relevant to the supply side of credit (debt instruments). Gennaioli *et al.* (2012) argue that one of the reasons for credit cycle has to do with “neglected risks”— a scenario when investors systemically ignore certain tail losses (investors being not fully rational). Importantly, such boom and bust cycle are amplified by the excessive supply of credit that caters to this “neglected-risks” characteristic (think of CDOs, CDO², etc). When the seemingly unlikely event (sustained national decline in house prices, etc) takes place, investors soon realize their mistakes and flee back to traditional securities. Under this argument, securitization (or more precisely re-securitization) was then more of a means to exploit the behavioral imperfection of investors than a means to improve allocative efficiency.

Note that some failures are time-series related, some cross-sectional. “The time series or procyclical aspect relates to the cycle in financial variables, particularly credit.” (Longworth, 2011, p.4). Failures related to procyclicality include complexity and opaqueness, moral hazard and behavioral reasons. The long chain of intermediation did not happen in one day, so as financial innovation and the outreaching of credit to borrowers of limited ability to repay. “Availability heuristic” (Thakor, 2015) and supply of credit targeting “neglected risks” are also dependent on time. Failures that are cross-sectional include regulatory loopholes, defects in rating agencies, which involved various market participants from different sectors. Factors such as risk management practices and account framework can be viewed as structural vulnerabilities.

A more general perspective on market failures is to follow Brunnermeier et al. (2009) who listed six major externalities: (1) “pure informational contagion” in which the failure of a bank casts doubt on the solvency of a bank that has a similar structure in terms of assets or liabilities (cross-section); (2) “loss of access to future funding for the failed bank’s customers”; (3) interconnection of financial intermediaries (cross-section); (4) fire sales and liquidity spirals (deleveraging), which “further drives down asset prices and financial intermediaries’ assessed profit and loss and balance sheet net worth.” (cross-section, procyclicality); (5) credit crunch that restricts new credit extension.”; and (6) “resource misallocations during the boom phase, with excessive credit expansion and investment in the ‘bubble’ assets.”. As explained above, it is not difficult to see that securitization and its products (ABS/MBS), had either directly or indirectly involved in these six market failures, leading to the global financial implosion. For example, complexity and opaqueness of ABS/MBS and the financial system increase interconnection between FIs and amplify the effects of fire sale and likelihood of information contagion.

In sum, asymmetric information, moral hazard, regulatory loopholes, unsound risk management practices, defects in rating agencies, and behavioral reasons contributed to the crisis.

Securitization was an indispensable part of the story. Blanchard *et al.* (2012) argue that the less certain we are that the supply of complicated and opaque securities is efficiency-improving, the more “radical” and financial-stability-oriented the reforms should be.⁸

Regulating Securitization

Capital and Liquidity Requirements: There are needs for both capital and liquidity requirements to internalize the externalities (1-6).⁹ In fact, capital and liquidity requirements should be time-varying and dependent on the size of the FI. Time-varying requirements tackle the procyclicality of credit expansion (6). Since during bad time, the fixed regulatory requirements are often not the binding constraints on banks; while, during good time, the fixed requirements are too low to prevent banks from leveraging. Capital surcharges on systemic important FIs guard against the TBTF problem and the explicit and implicit subsidies by governments (taxpayers’ money). It also lessens the bigger adverse effect on markdown of market values of other banks’ assets. Basel III’s countercyclical buffer (0-2.5% of risk-weighted assets (RWAs)) and systemic surcharge (0-3.5% of RWAs) on top of the capital conservation buffer (2.5% of RWAs) reflect just that.

⁸ This proposition is raised by Adair Tuner in chapter 1, p 110.

⁹ An increase in capital requirements rises the marginal cost of finance to a bank, which would be passed on to borrowers through an increase in interest rate spreads and thus constrain the growth of credit. Liquidity requirements focus on short run stresses faced by banks and can deal with market failures such as the effects of fire sales, informational contagion and interconnection.

Capital and liquidity requirements should be designed to close the regulatory loopholes. First, regulatory requirements on institutions involved in securitization should consider assets and liabilities both on and off balance sheet. That is, capital and liquidity requirements of securitization exposure (exposure due to any transaction, such as credit enhancements, interest rate or currency swaps, along the securitization process) should be determined by economic substance of transactions, rather than merely legal or accounting frameworks. Second, capital requirements should be structured and updated regularly in a coherent way to limit regulatory arbitrage through exploiting differences in risk weights (an example would be packaging poorly rated securities into “pseudo-riskless” AAA securities). This is easier said than done as the financial sector has all the resources and incentive to lever up. Third, since regulators would likely be in a disadvantageous position to monitor the forever changing financial landscape, a high simple leverage ratio (at a minimum of 10% Tier 1 common equity) should be put in place as a backstop of the risk-weighted assets approach. Empirical studies have shown that simple leverage ratio performs the same, if not better, in predicting bank failures in the crisis. While contingent capital would be of help in times of crisis, the uncertain effects and relatively complicated triggering of contingent capital make Tier 1 common capital, in my view, more superior in absorbing losses during a crisis.

During the crisis, I think the authorities should have intervened the commitment of liquidity guarantee to single clients provided by FIs, particularly with respect to the implicit guarantees of the size that threaten the solvency of FI. This is because liquidity guarantees that could wipe out the FI's equity increases the interconnectedness of the financial system and the effects of illiquidity spiral. The reason for suspension of liquidity transfer (either through intervention of

authorities or systemic organization of liquidity providers) is akin to the suspension of convertibility in a banking crisis in the old days.¹⁰ Here, more transparency in accounting framework and bank loss would be helpful to the regulators. Would this encourage the moral hazard problem—banks later writing more liquidity guarantees, knowing that they may get away? Maybe. But comparing the collapses of SIVs or conduits to the collapse of TBTF FIs during the crisis, that seems to me a lesser of two evils.

Transparency: If ignorance is bliss, the crisis shows just the opposite. During the crisis investors and regulators were eager to find out the fundamental values of structured products used as collaterals.¹¹ Liquidity, the ease with which an asset can be sold quickly and without a loss of value, dried up. With the benefit of hindsight, it is now recognized that a lack of information might be useful for avoiding “lemons problems” in normal times but might be a source of panic when there are doubts about the collateral.¹² Thus, it is agreed that more transparency of securitized products is needed. The questions are: how would transparency improve investors’ confidence in securitization and securitized products and to what extent should transparency be?

¹⁰ For the theoretical reasoning of suspension of convertibility, see Diamond and Dybvig (1983).

¹¹ When asked about his view on the U.S. ABCP market stress in October, 2007, Ben Bernanke, the former Fed Chairman joked “*I would like to know what those damn things (structured products) are worth ... This episode has revealed a weakness in structured credit products.*” The difficulty in coming up with valuations in periods of stress concerned not only to investors but also regulators.

¹² An analogy from Gorton (2010) is insightful to the discussion. Gorton (2010) compare securitization to the production of ground beef, E. coli to subprime loan risk, and the panic of investors in the financial crisis to the avoidance of ground beef or its induced products by consumers. “Ground beef is made by grinding cow carcasses and then mixing the meat ... If E. coli is later discovered, perhaps from only one steer, it can still happen that millions of pounds of ground beef are recalled... *the idea is that we have enough confidence in the system not to worry about this*, and to eat hamburgers without fear.” (Gorton, 2010, p. 112-113).

Two relevant implications from Holmstrom (2015) are that: (1) there is no need to make the system or securitized products as transparent as possible because investors (who used the assets as collaterals) have little incentive to check to the collateral value during normal time and (2) in making the system and securitized products more transparent, regulators may run the risk of worsening the problem of asymmetric information creating uncertain value of the collateral. Just as the fact that consumers do not need to and often have no incentive to know which slot(s) of cow is involved in the ground beef production process, the details of the securitized products do not matter to investors who collateralize the securities. If symmetric information holds (either all parties involved in the transaction are equally ignorant or equally knowledgeable in the value of the collateral), there would be no liquidity concern for those securitized products. This is not to say that transparency is unimportant. Just as now we have barcode system that allows food safety authorities to trace the source of contamination, we should have a more transparent system that enables regulators to pin down the risk source(s). This has implication for disclosure policy.

I think that disclosure policy should require issuers to give out equal and more easily digestible (standardized) information and data to rating agencies and public investors. The International Organization of Securities Commissions (IOSCO) had shown signs in moving to this direction. IOSCO (2012) considers that it is essential to give investors the means to assess issuer disclosure especially by receiving comprehensive data on underlying assets from the issuer such that investors can conduct their own stress testing (due diligence). “In some cases, this could require that the issuer provide the investor with the necessary tools.” (IOSCO, 2012, p.34). Giving out the equal information and data to rating agencies and public investors has several benefits. First, it gives pressure on issuers to scrutinize their underlying loans and securitization process more

carefully, knowing that information disclosed are publicly recorded and available. Second, it lessens the possibility of asymmetric information problem. Recall that, in debt contracting, just the *possibility* of one side knowing more than the other lowers the value of transaction by increasing the haircut/discount rate. Disclosure policy that requires issuers give out a set of information to parties such as rating agencies different from that to public investors could give rise to public speculation, especially in times of stress. Third, it weakens investors' reliance on rating agencies. Investors skeptical of the ability of rating agencies will now be provided with the relevant raw data so they can do the analysis themselves. Those without the experience or resources to confidently perform adequate analyses are deterred from buying such products. I also agree with IOSCO position against disclosure of stress tests models by issuers (IOSCO, 2012, p.35). After all, methodology, assumptions, parameter inputs, etc, require judgment and may create disagreements that render the securitized product "information-sensitive", worsening the asymmetric information problem that reforms try to deal with.

Nevertheless, I am doubtful of the usefulness of transparency, besides the two concerns above given by Holmstrom (2015). First, if one supports the "neglected risk" model by Gennaioli *et al.* (2012)—that financial products are supplied in a way to take advantage of investors not being rational in their investment decisions, even with "due diligence", investors will still be prone to those "underpriced" risky products and even demand them. Second, rational investors may be constrained by resources such as time and ability. Yet, the benefits of performing "due diligence" could be very low. Investors may have to resort, again, to rating agencies or media to research for them. Would "due diligence" really work in a model where only a subset of the market participants specializes and others follow (a classical free-rider problem)? I do not think so.

Above all, if one recalls that it was the banks themselves who borne the heavy losses, transparency does not seem to matter much (banks are supposed to have better information and risk management practices). In short, transparency may be a necessary condition for reforming securitization, but not a sufficient one. There are alternatives tackling the failures more directly.

Risk Retention: Locating which slot of cow is contaminated by E. coli is important, but understanding how and why E. coli are mixed into the ground beef and preventing it from happening again are of equal importance as well. Risk retention deals with the moral hazard problem in a sense that it attempts to impose greater accountability¹³ for the asset originators and sponsors, thereby aligning the incentives of the suppliers of securitization products and investors, preventing loans of low quality from being fed into securitization and excessive credit extension.

IOSCO (2012) p.19 reports, in U.S. (similarly in EU), options of risk retention are offered, like:

- A ‘vertical slice’ option whereby the sponsor retains not less than 5 percent of each class of ABS interests issued in the securitization;
- A ‘horizontal slice’ option whereby the sponsor retains a first-loss, last-pay residual interest in an amount equal to at least 5 percent of the par value of all ABS interests in the securitization.
- An ‘L-shaped’ option whereby the sponsor holds at least half of the 5 percent retained interest using the vertical slice option and half in the form of the horizontal slice option;

and two other options that are similar to the first-loss, last-pay residual interest.

Essentially, the proposal offers a variety of options for the sponsor to bear losses of the interest and principle payment, if the originate cash pool is non-performing. For Canada, the regulation of risk retention was relatively rudimentary, as IOSCO (2012) p.24, notes:

¹³ Another way to increase accountability is CEO certification which requires CEOs of the originators to certify the assets quality and the structure of tranching for the securitized products they sell.

“In Canada, the structure of securitization of standard asset classes is such that the originator of a pool of assets retains the risk of expected loss through mechanisms such as over-collateralization, excess spread allocation to investors to offset losses, cash reserve accounts to cover debt service shortfalls and/or subordinated notes issued to originators.”

In my view, there are needs to formalize and improve the existing regulation on “skin-in-the-game” regulation in Canada. I argue for two measures. The first one is that the ‘vertical slice’ option to sponsor, which requires them to retain not less than a certain percent of each class of ABS interests issued in the securitization, should be promoted. The second measure is by Allan and Bergevin (2010, 2011) (explain below).

The main reason for promoting the ‘vertical slice’ option rather than the ‘horizontal slice’ (first-loss, last-pay residual interest) is that it incentivizes the originator to continue to monitor and report for investors when loss is piling up. For the ‘horizontal slice’ to work effectively, the equity (junior) tranche needs to be relatively unlikely to be wiped out in downturns or the equity (junior) tranche needs to be relatively thick during downturn. Once the downturn arrive and the losses exceed the equity (junior) tranche and if the originator holds only that tranches, the incentive between the originator and senior investors may not be aligned. For example, the originator would probably lower its effort in monitoring as the it knows that the likelihood of residual interest being paid is low. The originator could also engage in “forbearance-like” behavior by letting the delinquent parties to slowly repay their loans, which may not be in line with interest of senior tranche-holders. Therefore, to be safe, given the equal “thickness” of tranches the originator needs to hold for ‘vertical slice’ and ‘horizontal slice’, I am more inclined to the ‘vertical slice’ option.

Allan and Bergevin (2010, 2011) argue that reforms should require participation by an informed third-party investor(s) who have the expertise and incentive to assess the ABS' viability. As a condition for allowing an ABS/MBS issue to be sold on the public market, the informed third-party institution to buy some of "mezzanine tranche of a specified minimum size" (Allan and Bergevin 2010 p.16) before any tranche of the securitization can be issued.

Requiring "skin-in-the-game" by third-party investor(s), in addition to the originator, has two main advantages. Firstly, it serves as a validation of the views of rating agencies. The third-party investors¹⁴ would have every incentive to analyze the creditability of the mezzanine tranches before purchasing them since they would have "skin-in-the-game" once the ABS/MBS are issued. This provides an additional assessment other than the one done by rating agencies, which have no "skin-in-the-game" besides reputational risk. If the rating agencies and the third-party investors disagree on the product creditability, chances are that investors would refer to the decision made by the third-party investors who have "skin-in-the-game" in the tranches. Ratings issued by agencies might have to be tighten up accordingly to avoid serious deviation with the third-party investors on the creditability of the securitized products. Secondly, requiring "skin-in-the-game" by third-party investor(s) prevents the dilution of the mezzanine tranche. The mezzanine tranche is a key component that allows securitization to disperse credit risk to deep-pocketed investors who were well-placed to share in any losses from defaults. However, leading up to the crisis, the proportion of the mezzanine tranche to the subordination was falling to a very low level. For example, Gorton (2010) p.93 studies two U.S. subprime securitization deals, one

¹⁴ Allan and Bergevin (2010) p.16 suggest that the third party would be required "to certify its independence and to provide a representation that it is not receiving any financing for the purchase from any party not at arms length with the originator and that there are no put rights available to it with respect to the security".

in 2005 and the other in 2006 and notes that their tranche sizes of the BBB tranches of the two deals, both as a percentage of collateral at inception and a percentage of subordination, were “unbelievably thin” that “normally, the rating agencies would not allow such thin tranches”.¹⁵ With the proposal by Allan and Bergevin (2010, 2011), the mezzanine tranche will be fixated at specified minimum size, avoiding the repeat of the mistakes made in the subprime securitized loans and increasing the financial system’s capacity for managing risk.

Rating Agencies: After the crisis, G-20 and IOSCO (2012) had advocated for stronger oversight regimes and reduction in reliance on credit rating agencies. Steps such as greater transparency, improved disclosure on rating methodologies, higher quality of the rating process, and so on have been taken by rating agencies to regain investors’ confidence. However, the fundamental defect of the rating agency system— the “issuer-pay” model (conflicts of interest) remains.¹⁶

In that regard, Blinder (2014) proposed three measures:¹⁷

- 1) Increasing the agencies' legal liability for issuing misleading ratings through legal reforms.
- 2) Taking the task of selecting and paying rating agencies away from issuers and give it to a neutral third party instead (eg. SEC, an exchange).

¹⁵ Gorton (2010) p.93 explains the thin tranches were a result of the expectation of cash flow coming into the deal from prepayments on the subprime mortgages via refinancing, which ultimately depends on the expectation on rising house prices.

¹⁶ It also seems to me that there has not been much progress on the introduction of separate rating categories to both structured products and corporate bonds, as noted by Selody and Woodman (2009). A separate rating scale or additional rating symbols for structured products should be implemented by rating agencies because of the fundamental differences of the two products. Risk characteristics, information and methodologies used in the rating process are different. Thus, the two products should be reflected in a separate rating scale.

¹⁷ A system in which investors pay for ratings is dismissed because of the classic “free-rider” problem.

- 3) Adopting random assignment of rating agencies, just as courts rely on random assignment of judges—and for similar reasons: to minimize biased decisions and opinion shopping. Under this option, rating agencies will still be paid by issuers.

Option (1), if adopted, would surely increase the cost of issuing misleading ratings and change rating agencies' behavior accordingly. But it is not plausible for three reasons. First, I do not believe laws that increase dramatically liabilities of a party would be legalized without waves of lobbying (it will simply die off in the legalization process). Second, enforcement and whether it would be successfully suing a rating agency for its "opinion" seems unlikely to me. Third, best illustrated in Blinder's words, "... securities markets need better incentives, not more lawsuits". The legal burden of this option does not seem to be cost-efficient.

Both option (2) and (3) are plausible in that they minimize biased decisions (rating agencies being consulted by issuers before issuance) and "ratings shopping". Both options involve having a third party. In option (2), the third party would collect payments ("for example, an exchange would collect funds from a small levy on all security issuance to customers.") and hire rating agencies for issuers. In option (3), the third party would randomly assign rating agencies to issuers. My question is: what would the rating agency industry would be like under the option?

Under option (3), I could see the profitable rating agencies screaming that this would adversely affects their profitability while those less profitable ones or new ones would be more than welcome to have an equal chance of getting a customer. Though the rating industry is an oligopoly one, it is hard to imagine that rating agencies would like to opt for a system in which they cannot control which issuers and what kind of deals they are getting. From the perspectives

of issuers and consumers, option (3) may be fine. Yet, to (some of) the rating agencies, option (3) would be like a doomsday.

Option 2 is Blinder's pick. Given the undesirability of option (1) and (3), it would also be mine. Option 2 avoids the serious drawback of option (3). But the same question remains. I do not have a good answer as the impact to rating agencies would likely be different depending on what the third party is and its criteria (if it is mandated) or incentives for hiring rating agencies. Yet, disaggregating the right to pay rating agencies seems to me an attractive solution to the problem of conflict of interests. It is unlikely that the situation of "roughly 60 percent of all global structured products were AAA-rated, in contrast to less than 1 percent of the corporate issues." would repeat under this option.¹⁸

Structural Reform of Intermediation: Structural reforms had been proposed to address the problems of complexity and excessive maturity transformation. This section discusses Gorton and Metrick (2010)'s proposal of establishing narrow funding banks (NFB).

Complexity is illustrated by the long chain of financial intermediation. The figure below is obtained from Shin (2010) conceptualizes the long chain. Importantly, such long chain of intermediation¹⁹ had grown hand in hand with the use of liquid debts such as demand deposits to fund illiquid investments (liquidity transformation) and the use of short-term debts like deposits

¹⁸ Coval *etal* (2009) p.4 reporting from Fitch Ratings (2007) "Inside the Ratings: What Credit Ratings Mean."

¹⁹ The Credit Intermediation Index from Greenwood and Scharfstein (2013) supports the increasing number of steps involved in credit creation. The paper also documents the growth of shadow banking as well.

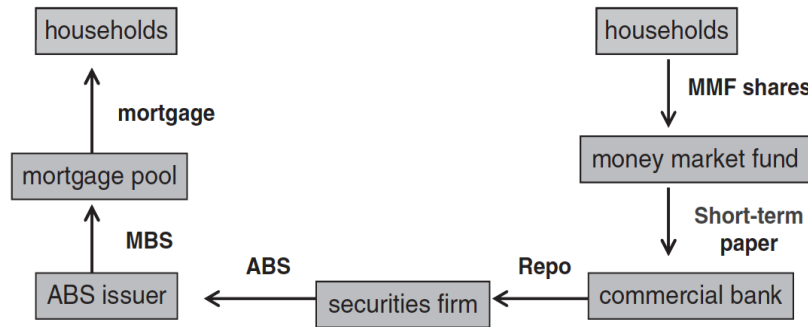


Figure 6.7: Long intermediation chain

to finance long-term investments like loans (maturity transformation).²⁰ Accordingly, financial institutions face not only risks of illiquidity and runs but also risks of insolvency. The situation was worsened when FIs were highly leveraged and out of the radar of regulators.

Gorton and Metrick (2010) focus in U.S and attempt to address these problems (as well as the regulation of repo market) by setting up narrow funding banks (NFB) which would be genuine banks with charters, capital requirements, periodic examinations, and access to the Federal Reserve's discount window. The key points are that:

- All securitized products must be sold to NFBs; no other entity would be allowed to buy ABSs. (NFBs could also buy other high-grade assets, such as U.S. T-bills)
- NFBs would be new entities located between securitizations and final investors.
- Instead of buying ABSs, final investors would buy the liabilities of NFBs.

An NFB regulator would design and monitor the criteria for NFB portfolios (eg. what classes of ABS, the proportion of assets with different ratings to purchase, etc). With these rules, the

²⁰ See, for example, Greenwood and Scharfstein (2013), Gorton and Metrick (2010) and Shin (2010).

regulator would be setting collateral requirements for NFBs capital requirements as well. The essence is to bring the supply of ABS/MBS under the oversight by regulators. With that, the illiquidity problem facing the issuers would decrease due to the liquidity facilities by the authorities. The chance of insolvency would decrease thanks to the increasing NFBs' incentive to preserve their charter value (the oligopoly, or even monopoly rents earned by NFBs).

Yet, one may wonder if the NFB approach is taken too far. Firstly, the NFB approach assumes a large share ABS/MBS were held by investors that financed themselves largely with short-term debt.²¹ Yet, as far as I know, there is no comprehensive data to confirm that. To require NFBs to purchase all the securitized products (presumably issued by the home country) without appropriate data analyses may be taken too far.²² Secondly, from an industry organization perspective, giving the NFBs monopoly right of selling ABS/MBS could create too much oligopoly, or monopoly rents on top of the staggering amount of implicit subsidies, and, accordingly, rent-seeking behavior for the industry, especially when considering securitization and repo lending are national, if not international, activities. Gorton and Metrick (2010) may promote financial stability. But the effect on economic efficiency and income distribution at

²¹ Amati and Hellwig (2014) p.298 note that "The risks (of maturity transformation and liquidity transformation) would have been irrelevant if the mortgage-related securities had been held by pension institutions or life insurance companies, whose liabilities extend over decades and which should actually be happy to acquire long-lasting assets such as mortgages and real estate, so that the question of what to invest in when current assets expire will not arise." This argument is further explored in Hellwig (1994).

²² Krishnamurthy et al. (2012) show that tri-party repo lending played a much smaller role than asset-backed commercial paper (ABCP) and accounted for a small fraction of the short-term funding of securitized assets in the shadow banking system prior to the crisis, although tri-party repo lending was concentrated in a small number of deal banks like Bear Stearns and Lehman Brothers. However, the data on the bilateral repo market is lacking. In short, there is no comprehensive data on the fraction of repo over short-term debt, which may also include short-term debt instruments such as prime brokerage and ABCP (the issue is further complicated by rehypothecation). Thus, the assumption in Gorton and Metrick (2010) that a great deal of ABS/MBS were held by investors that financed themselves largely with short-term debt, particularly with repo, is debatable.

stake seem to me outweigh its benefits. Third, creating NFBs could aggravate the too-big-to-fail problem. With NFBs, one cannot wonder how their resolution planning would play out (or would there even be one?). It seems to me that, in a systemic event, the only possible backstop for the NFBs is the government. In this regard, introducing NFBs seems to add complexity to the financial intermediation, not reducing it. Forth, given the already complex and rule-based regulatory system in the U.S, it would be costly and inefficient to further expand the regulation. Regulatory authority on NFBs is essentially in charge of the nation's macroprudential policy. Yet, whether the field of macroprudential policy sophisticated to pin down the policy framework (resilience-based or credit smoothening) is still debatable. Regulating NFBs may either require a new bureau being set up or an expansion of power of an existing regulatory bureau, which certainly require significant changes in law and practices. Prohibition on ABS being sold to other parties would also be difficult to implement. To sum up, setting up NFBs could be a too costly thing to put up in the U.S (let alone in Canada in which the size shadow banking is way smaller). Further evidence is needed to justify such a big move.

Conclusion: As noted by Shin, 2010, p. 152, "The global financial crisis has the distinction of being the first post-securitization crisis in which banking and capital market developments have been closely intertwined". This article briefly discusses what went wrong with securitization leading up to the crisis and the corresponding measures taken and proposed. That includes but not limits to: asymmetric information, moral hazard, regulatory loopholes, unsound risk management practices, defects in rating agencies, and behavioral reasons contributed to the crisis. In the wake of the crisis, various steps have been taken to restore the system of securitization. Capital and liquidity requirements have been strengthened. Transparency and

disclosure standards have been improved. Measures aiming at correcting the moral hazard problem for the originator have been adopted. However, there are areas where improvements are needed. The “issue-pay” model between rating agencies and issuers remains a concern, despite measures attempts to weaken the reliance of the use of rating agencies. Radical structural reforms²³ are also proposed (yet most, if not all, have not been adopted). Lastly, it seems to me that poor risk management, be it by financial institutions, rating agencies, regulatory authorities and general investors, had also played a central role for the crisis. In particular, market participants, as well as the regulators, under-estimated the risks inherent in ABSs and other new types of securities. The scenario that national home prices could fall rapidly and stayed low was considered as “impossible”. Thus, correlations in home prices and defaults were miscalculated. As a naïve student of risk management, I suspect that central bank and financial regulators should take on more responsibility in dealing with systemic risk. Given the unique positions they are in, perhaps they could have a more complete picture of the buildup of systemic risk, something individual financial institutions and investors were constrained to grasp. It is hope that market participants and regulators will be better-equipped when the next crisis hit.

²³ Besides Gorton and Metrick (2010), Shin (2010) Chapter 9 has proposed shortening the long chain of financial intermediation through setting up mortgage banks to link ultimate borrowers and lenders more directly.

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