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# Andersons Policy Bulletin



## Why Regulate Shadow Banking?

### Banking Supervision

Much has been written about the key sources of risk at the heart of the financial crisis. Daniel Tarullo, a Member of the Board of Governors of the Federal Reserve System, indicated in his comments to the Brookings Panel on Economic Activity in September 2010 that there were two interrelated sources of financial instability: first, there was a rapid deterioration or outright failure of several large, leveraged financial institutions that resulted in widespread spillover effects; and second, there was an important market in *asset-backed securities*, containing many leveraged financial actors who were all dependent on a similar source of liquidity, the *repurchase market*.

In thinking about an appropriate post-crisis response, Tarullo (2010) argues that while the bulk of attention has been focused on regulation and supervision of large regulated institutions such as the commercial banks, more needs to be done with respect to *shadow banking*. While the US Dodd-Frank Act addresses a variety of commercial and shadow banking issues, it does not mandate specific levels for banks' capital requirements. This was left to the Basel Committee on Banking Supervision, a group of supervisors and bank regulators who formulate supervisory standards and guidelines for the commercial banking system. Its most recent recommendations, known as Basel III, include the following rules on capital adequacy: first, the minimum equity capital that banks must hold as a proportion of their assets was set at 7%, consisting of a mandatory 4.5% equity capital, as well as an additional cushion of

2.5% equity capital, where the latter can be used up in an emergency, as long as the bank involved halts dividend payments; second, Basel III introduced the option that during periods of rising asset prices, regulators can impose the requirement that banks hold an additional counter-cyclical buffer of 2.5% of risk-weighted assets. The latter requirement is designed as a "macro-prudential" measure, allowing bank supervisors to "...take away the punch bowl while the party is still in full swing or ... top it up when the economy is slowing..." (*The Economist*, September 13, 2010).

While many commentators agree that Basel III is tougher than its predecessors Basel I and II, there is also a common refrain that it creates strong potential for unintended consequences. Importantly, it may result in incentives for what has been termed *regulatory arbitrage*, which is the "...purposeful attempt by banks to avoid the rules which dictate how much capital they are required to hold..." (Jeremy Stein, May 2010). Specifically, the type of capital adequacy regime proposed by Basel III, raises the capital costs of the banks, and thereby reduces their profits. As a consequence, regulated banks will continue to try to escape these capital requirements by moving financial activities of their balance sheets into the unregulated *shadow banking* system. To quote from columnist John Plender, "...the banker's incentive to game the system is even greater than before. The temptation to engage in regulatory arbitrage and find ways of taking increased risk to generate profits to compensate for the capital hit can only be that much greater..." (*Financial Times*, September 21, 2010).

## The Panic of 2007

As is now well understood, the financial crisis which began in the summer of 2007 was essentially triggered by a systemic event. The bursting of the house price bubble, combined with an increase in subprime mortgage defaults, that resulted in the banking sector becoming insolvent and the credit market ceasing to function (Gorton, 2008; Gorton and Metrick, 2009).

Historically one can think of a bank-run as a situation where the majority of depositors attempt to liquidate their demand and savings deposits at the same time, but the banking sector is unable to honor such demands for cash, the latter having been converted into illiquid loans. US banking panics of this kind reached their peak in the 1930s, followed by what has been termed the "Quiet Period" after the introduction of federal deposit insurance in 1934 and discount-lending by the Federal Reserve (Gorton, 2009; Gorton and Metrick, 2009).

Even though the panic of 2007 did not emanate from the commercial banking system, Gorton and Metrick (2009; 2010a, 2010b) and others including Brunnermeier (2009), Hanson et al. (2010), and Stein (2011), have argued that it was a run on the shadow banking sector, with both forced rescues (Bear Sterns) and bankruptcies (Lehman Brothers). Essentially there was a run on what is known as the *repurchase market* or "repo" market, characterized by a rise in the price of *haircuts* and the termination of repo market lending on collateral in the form of asset-backed securities. The net result was a shortage of funding liquidity that caused significant stress to the financial system in late-2007.

## Shadow Banking

Shadow banking, or *securitized banking* (Gorton and Metrick, 2009) can be thought of in terms of the issuance of short-term money market instruments based on asset-backed securities, i.e., institutions such as *investment banks* seek to borrow money short-term where the transaction is collateralized, typically with securitized assets. Other players in this market include *money market mutual funds* wanting to invest in assets with short-

term maturities. By March 2008 the total liabilities of the shadow banking sector stood at nearly \$20 trillion (Pozsar et al., 2010). Even though the sector subsequently declined after the financial crisis, at the start of 2010, its total liabilities of close to \$16 trillion were still greater than those of the traditional banking system.

The rise of shadow banking over the past 30 to 40 years has been documented in detail by Gorton and Metrick (2010a). Essentially, the traditional commercial banking system became much less profitable due to competition from *junk bonds* and *commercial paper*, and money market mutual funds on the assets and liabilities side of their balance sheets respectively.<sup>1</sup> As a result, banks have exited the regulated sector. Gorton and Metrick (2010a) note three particularly important developments in the shadow banking sector: first, there has been a major shift away from demand deposits to money market mutual funds due to the zero interest-rate ceiling on the former – by 2008, money market mutual funds had grown to a value of \$3.8 trillion; second, the process of securitization, whereby illiquid loans are sold into capital markets grew significantly in the past decade; and third, the increase in securitization was driven partly by increased demand for AAA-rated collateral in repo agreements – with the US repo market estimated to be worth \$10 trillion in 2008 (Hördahl and King, 2008).

So how does securitized banking work? A starting point is commercial banking. In this system, depositors transfer cash to a bank in exchange for either a checking or savings account, the latter earning a rate of return. These cash deposits are then lent by the bank in the form of mortgages and other types of loan which remain on the bank's balance sheet. A key characteristic of this form of financial intermediation is *maturity mismatch*, whereby the terms of the institutions assets and liabilities do not match up, i.e., the loans have long-term maturities while depositors can withdraw their cash at short notice. The point of deposit insurance is to reduce the incentive for mass withdrawal of cash by

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<sup>1</sup> Junk bonds are rated below investment grade at the time of purchase but pay higher yields due to the risk of default; commercial paper is an unsecured promissory note with a fixed maturity of 1 to 270 days.

depositors when there is a shock to the financial system.

While deposit insurance works well for retail investors, the cap on the amount of insurance means that large financial institutions seek access to safe short-term investments.<sup>2</sup> Securitized banking, operating through the repo market offers this form of financial intermediation (see figure on next page).<sup>3</sup> Money market mutual funds and other investors such as *pension funds* deposit cash received from retail investors with banks in the securitized banking sector, with insurance coming in the form of collateral supplied by the bank.<sup>4</sup> Due to the fact that repo agreements are typically short-term in nature, they are the key source of maturity mismatch on the balance sheets of shadow banks (Brunnermeier, 2009).<sup>5</sup>

A repo agreement works as follows: for example, suppose the investor purchases assets (collateral) worth \$5 million from the bank, while the bank agrees to repurchase these assets after a short time period for \$5.1 million, i.e., the repo rate is  $(5.1-5.0)/5 = 10\%$ , analogous to the return a savings deposit earns in the traditional banking sector. If the bank defaults on its promise to repurchase the assets, the investor gets to keep the collateral.

An additional feature of repo agreements is the implementation of what is called a *haircut*. The actual amount deposited by the investor will be less than the market value of the asset used as collateral. For example, if the assets sold for \$5 million are actually worth \$6 million, then the haircut is equal to 20%. In other words, the bank borrowing cash in a repo agreement receives less than the value of the collateral they are putting up, i.e., the bank has to hold some fraction of their assets

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<sup>2</sup> The cap stood at \$100,000 per depositor per bank prior to the financial crisis. In 2008 this was temporarily raised to \$250,000, and subsequently this amount was made permanent in the Dodd-Frank Act of 2010.

<sup>3</sup> Banks in the shadow banking system are (were) the investment banks, also referred to as *broker-dealers* (Gorton and Metrick, 2010a).

<sup>4</sup> The asset backed securities received by the investor can also be used as collateral in another transaction such as a derivatives position – known as *re-hypothecation*.

<sup>5</sup> Brunnermeier (2009) reports that the fraction of investment banks assets financed through overnight repos doubled between 2000 and 2007.

in reserve when they borrow in the repo market. This can be thought of as analogous to the reserve requirements imposed on the traditional banking system (Gorton and Metrick, 2009).

Like the traditional banking system, institutions in the shadow banking sector also make loans, but with a key difference: instead of keeping loans on their balance sheets shadow banks securitize these loans and then either sell them off directly or use them as collateral in repo agreements (see figure on next page). The basic steps of securitization are as follows (Gorton and Metrick, 2009; Stein, 2011): multiple loans are *pooled* and then assembled off-balance sheet through sale to a trust known as a *special purpose vehicle*;<sup>6</sup> the special purpose vehicle finances the purchase of the loans by issuing asset-backed securities in the form of bonds with ratings AAA, AA, A and BBB, a process known as *tranching*. The senior-most tranches of securitizations are supposed to be of the highest credit quality, only rarely experiencing losses.

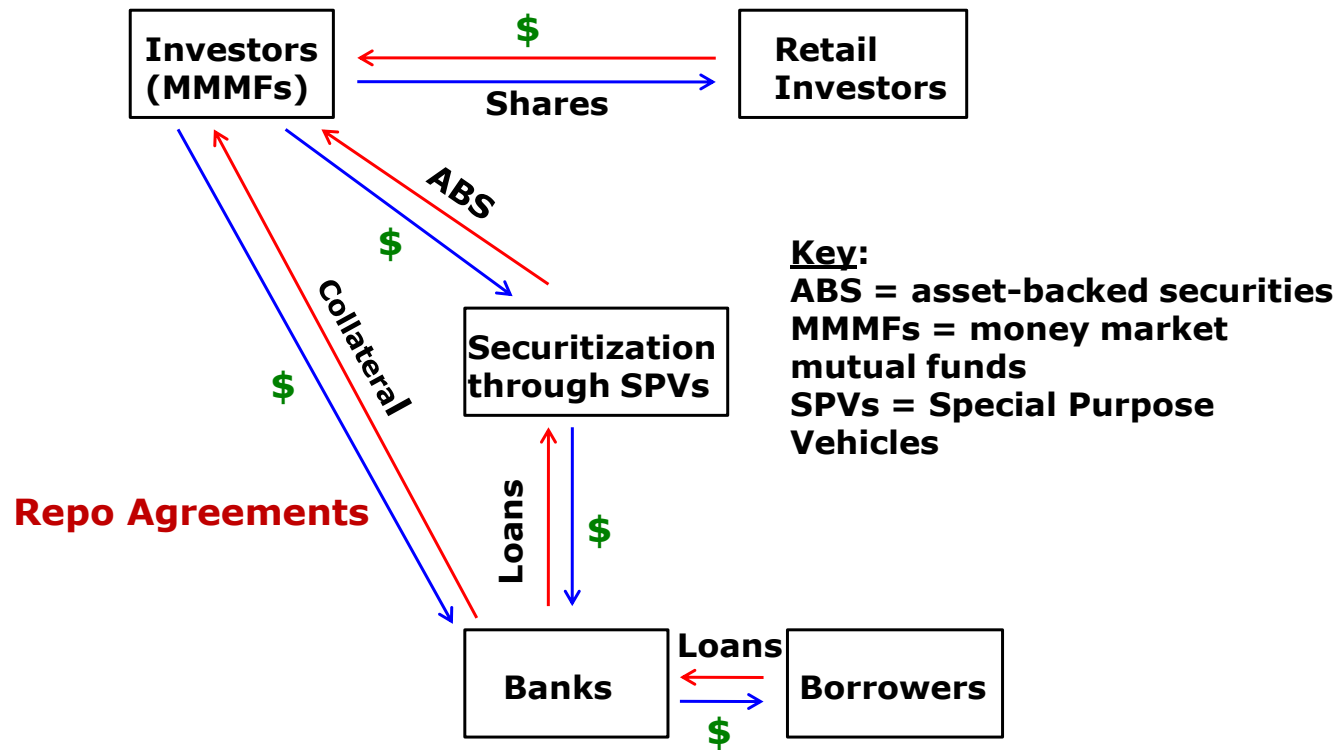
AAA-rated asset-backed securities are attractive to investors such as money market mutual funds seeking safe investments but without the ability to undertake loan-quality due diligence. Gorton (2009) terms such securities as consisting of *informationally-insensitive* debt, i.e., debt requiring little investigation by the purchaser. In principle, there is no inherent problem with the basic process of securitization. However, during the run up to the financial crisis, not only were a large proportion of sub-prime mortgages financed through securitization, but most importantly less senior tranches ended up in bonds given AAA ratings. Stein (2011) describes how lower-rated tranches rather than the original mortgages were themselves used in re-securitizations, which were then rated AAA, despite the risk of default. Consequently, when the scale of the sub-prime mortgage crisis became common knowledge in 2007, it created a problem of *adverse selection*.<sup>7</sup>

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<sup>6</sup> Special purpose vehicles are protected from bankruptcy in the sense that the originator of the underlying loans cannot get back those assets if the originator subsequently enters bankruptcy.

<sup>7</sup> Investors in asset-backed securities had little knowledge of the riskiness of the loans they contained.

# Shadow Banking



Source: Gorton and Metrick (2010a)

## The Run on Shadow Banking

The run on the shadow banking sector was initially triggered by the increase in sub-prime mortgage defaults. This was first noted in February 2007 as the ABX index began to decline, indicating that the cost of insuring a basket of mortgages of a specific rating against default was increasing.<sup>8</sup> How did this shock to the financial system then turn into a panic? Essentially the shock, combined with a lack of information about the location and size of the exposure to sub-prime mortgage risk, as well as uncertainty about whether the system would be backstopped by the Federal Reserve, caused a run on the repo market. Depositors became concerned about their ability to recover the value of any collateral if the bank party to a repo agreement defaulted. As a consequence, the price of haircuts rose, forcing banks to over-collateralize on any cash deposits they took in, i.e., they had to hold more equity in the collateral they were using in repo agreements (Gorton and Metrick, 20010b).

Prior to the crisis starting, Gorton and Metrick, (2010b) report that haircuts were set at 0% for all classes of asset-backed securities. In contrast, by early-2009, the average haircut on all asset-backed securities had risen to just over 40%, while the haircut rose to 100% on asset-backed securities containing sub-prime mortgages. As Gorton and Metrick (2010b) point out, if the US repo market was worth \$10 trillion in 2008, and if the average haircut then rose to 40%, this meant that an additional \$4 trillion had to be raised by the banks in order to fund their assets, i.e., the increase in haircuts represented a huge reduction in liquidity. The only way to deal with this was for the banks to shrink the asset side of their balance sheets by selling asset-backed securities. As a consequence the prices of such securities fell in a *fire-sale*. In turn, the same securities became less valuable as collateral in repo agreements, resulting in further sales and so on. In other words, the shadow banking system became insolvent due to a run in the repo market.

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<sup>8</sup> Each ABX index is based on a basket of 20 *credit default swaps* referencing asset backed securities containing sub-prime mortgages of different ratings. Credit-default swaps are contracts insuring against default of a specific bond or tranche.

## So Why Regulate Shadow Banking?

It should be obvious from this discussion that increased regulation of the traditional commercial banking sector will have no impact on the likelihood of another run on the shadow banking system. In fact it will most likely result in more financial activities being moved off balance-sheet into the shadow banking sector. In addition, while some steps have been taken in the Dodd-Frank Act to regulate shadow banking, nothing has been done to resolve the inherent vulnerability of this sector to a future run.

While the issue of how to regulate shadow banking is complex enough to take up another policy bulletin, an obvious possibility is regulation of haircuts.<sup>9</sup> As Stein (2011) notes, the problem with haircuts during the crisis was that they went from being very low to very high in a short space of time, thereby putting tremendous pressure on the owners of asset-backed securities to sell. Stein argues instead that minimum haircut requirements of at least 10% should be implemented on AAA-rated securities irrespective of market conditions.

This type of regulation would result in two benefits: first, it would help to damp down the type of dynamic that resulted in forced selling of asset-backed securities, i.e., investors in such securities would have to put up more of their own equity at the outset; second, by applying minimum haircuts to shadow banks, effectively they would be regulated in the same way as commercial banks subject to capital requirements. In other words, by harmonizing bank regulations across organizational form, commercial vs. shadow banking, there will be less incentive for regulatory arbitrage.

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<sup>9</sup> A detailed proposal for how to regulate shadow banking can be found in Gorton and Metrick (2010a). Part of their focus is on how to ensure that the collateral used in repo agreements is of high quality.

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