

Commentary: The Panic of 2007

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Professor Gorton has given us an exceptionally informative picture of the nuclear core of the financial crisis—the fragile structure of subprime mortgage-backed securitization and the chain of derivatives built on top of it. Those who have the patience to read a long paper filled with lots of important details will be rewarded with a much better understanding and appreciation of the reasons why we fell into the current abyss. It is also an invaluable account for those charged with cleaning up the mess, including regulators, as well as generations of economists who will study the crisis.

I want to talk about two questions related to the crisis: (i) In what sense were mortgage-backed securities (MBSs) the cause of the crisis? (ii) Why did we get into subprime lending and securitization in the first place? My main focus will be on the first question, since it is most closely related to the paper and, I think, most relevant for changes in regulation.

In what sense were MBSs the cause of the crisis?

The paper's main thesis is that a large part of the problems that emerged in the subprime mortgage markets was due to excessively complex contracting, which obscured the value of the underlying mortgage assets. Unlike traditional mortgages held on the originating bank's balance sheet, subprime mortgages were increasingly brought

to market using an originate-and-distribute model (the fraction of securitized subprime mortgages reached 80% in 2006). Mortgages were pooled into a securitized asset, an MBS, that was sold off in tranches, with each tranche defined by its rights to interest and principal using complex payout rules that depended on how the underlying mortgage portfolio performed.

The tranches were created to serve clientele with different risk appetites. Tranches had ratings ranging from AAA (the highest) to BBB (the lowest). Naturally, the MBS was more valuable at issue if it could push ratings higher. The fact that the credit worthiness of the tranches could be carefully tailored to meet rating requirements changed the role of the rating agencies in a potentially fateful way. Instead of rating tranches *ex post*, the agencies were often brought in at the design stage to consult on what it would take to pass the bar for a desired rating level. At the time of issue, therefore, an AAA tranche was not an average AAA bond, but a marginal one. The rating game may have misled some market participants, and it certainly softened regulatory requirements on capital adequacy.

The subprime MBS was a complex instrument in its own right and challenging to value. But the degree of complexity and opaqueness was vastly increased as the various tranches were sold off and pooled with other MBSs through a chain of structured securities, including those of CDOs (collateralized debt obligations), SIVs (structured investment vehicles), ABCP conduits (asset-backed commercial paper conduits) and other investment vehicles. At each stage, there was “loss of information” about the underlying mortgage assets. At the end of it, minute pieces of the original mortgages had been strewn around hundreds, if not thousands, of structured instruments, making it impossible to trace the value of the fundamental assets, and, in that way, price the structured products.

Complexity and opacity are enormous problems in the subprime-related markets today. When housing prices started falling, the subprime-related securities lost value rapidly, and most tranches, including the AAA-rated ones, became sensitive to information about the underlying assets. Without a good way to value the assets, information

asymmetries led to serious adverse selection problems and loss of liquidity. Trading ground to a halt in key markets as subprime-related instruments became “toxic” and lost their ability to serve as collateral.

There seems to be wide agreement that the proximate cause of the crisis was the sudden loss of collateral quality in liquidity-providing markets. The paper does a great job explaining the rise of complexity and lack of transparency in these markets, but it asserts more than explains the abrupt change in liquidity. Let me try to elaborate on this link in the argument, because it has important consequences for regulatory changes.

The first thing to note is that that complexity and opacity need not cause market illiquidity. The initial success of subprime securitization is evidence in point. These markets were liquid for years before problems started to emerge. In fact, they positively thrived, with volumes growing exponentially until the sudden crash. People may have been misinformed. Indeed, the synthetic subprime mortgage index, ABX, which started trading in 2006, signaled a much higher default risk than the markets had priced in. Gorton argues that this revelation triggered the collapse of the structured products markets. If so, more accurate information about the underlying assets—*more* transparency—made markets *less* liquid.

To give another example, consider the way de Beers sells wholesale diamonds. They place the diamonds in packets that buyers are forbidden to explore. The packets are sold based on their gross attributes on a take-it-or-leave-it basis. If buyers were allowed to look into the packets first to get a better estimate of their value, packets left behind would become tainted. Inspection would slow down trade and might even prevent trade entirely.¹ Placing diamonds in packets eliminates adverse selection problems among buyers. Similar problems between de Beers and the buyers are, in turn, eliminated by de Beers’ concern for its reputation, supported by its rents from the monopoly and from repeat buying. Again, far from being a problem, lack of transparency enhances market liquidity.

The shared feature in these examples is symmetric information. Symmetric information about *payoffs* promotes liquidity. Adverse

selection thrives on asymmetric information, but contrary to what one might think, increased transparency need not reduce information asymmetries and hence may decrease liquidity. Of course, total transparency, where all payoff relevant information is made available to all traders at the same time, keeps information symmetric and markets liquid. But so does complete ignorance. It is partial transparency that is problematic, and adverse selection may increase or decrease with more transparency.

I put the word *payoffs* above in italics, because the sensitivity of payoffs to information is the second critical element in understanding the breakdown of the subprime markets. Financial instruments vary with regard to how sensitive they are to information. Consider the trivial case where a claim on an asset has a constant payoff. Then asymmetric information doesn't matter, since all information is irrelevant. Debt is an instrument that promises close to a constant payoff as long as the likelihood of default is very low.² An AAA-rated bond is in that category. It is backed up by sufficiently valuable assets that one does not need to collect much, if any, further information about the underlying assets. The low information sensitivity of AAA-rated bonds makes them more liquid than lower-rated bonds. Lower-rated bonds are more information sensitive because the likelihood of default is higher, and therefore, investors care more about the bond's underlying assets.³

Interbank markets, repo markets and other near-money markets are not ones in which trading is based on a careful, continuous assessment creditworthiness. They are low-information markets where trading has to be based on trust because there is no time for detailed evaluations. The need for information is kept low by making sure that there are more than enough assets, including reputation, to back up the liabilities. Holding securities that are not information sensitive also helps liquidity. As major liquidity providers, bank assets are often debt instruments or close cousins of debt. Because house prices tend to move slowly compared with other assets, mortgages are especially well-suited for banking business. The connection between asset payoffs and liquidity is developed in detail in Gorton and Pennacchi

(1998), and the theory is used to explain the liquidity providing role of banks.

Of course, if the value of the assets backing up the debt falls below the face value of debt (or gets close to it), debt becomes much more information sensitive. Creditors become more like equity holders. They now need to assess the value of all the individual assets securing the debt (explicitly or implicitly). This is a much more challenging exercise and one that markets for liquidity provision are ill-equipped to deal with. In a market that is supposed to roll over billions of dollars of debt each day, a sudden need to evaluate counterparty collateral can be devastating. These markets operate on trust, that is, faith that the counter-party is creditworthy, with no time for detailed evaluations. As the saying goes, if a banker has to prove his creditworthiness, he has already lost it.

In this respect, markets for liquidity provision are very different than stock markets. In the stock market, uncertainty and adverse selection fears are present all the time, but this does not prevent the markets from functioning. One reason is that stock traders are typically not tied in a chain of debt obligations that make risk hard to bear. Another reason is that the urgency to buy and sell is normally absent. If one is uncertain about the value of a stock, one can simply wait for more clarity. A third reason is that differences in beliefs often alleviate adverse selection. Stock markets thrive on differences in beliefs. Markets for liquidity are killed by it.

In light of this discussion, the problem with subprime-related securities was not the lack of transparency as such; in fact, opacity is a common characteristic of liquidity-providing markets, as I have tried to illustrate. The real problem was the sensitivity of the MBSs to a fall in the average housing price. The protective layers of lower-rated tranches in the subprime securitization were meant to absorb the losses from a drop in housing prices. But they were not designed properly. One of the most interesting and important details in Gorton's narrative is the description of how the BBB tranche was meant to grow in size over time. He gives the example of two MBSs, one issued in 2005, the other issued in 2006. Each starts off with a BBB layer that is roughly 1% of the value of the underlying

mortgage portfolio and subordination of between 3 and 4%—a very thin buffer indeed. The idea was that as house prices grew, the increased value of houses would be fed into the BBB buffer, increasing it via refinancing of the mortgages, analagous to the way equity grows if the firm value increases while debt is kept constant. In the case of the 2005 issue, the BBB-layer subordination (i.e., the buffer junior to this layer) grows from 2.95% in 2005 to 9.06% in 2007, providing a lot more protection. In the case of the 2006 issue, however, the BBB-layer subordination only fell from 1.6% to 1.1% because housing prices had started falling. As a result, there was no credit enhancement in the 2006 vintage. The 2005 vintage subprime securities have weathered the initial storm much better than the 2006 vintage, as documented in the paper.

Rather than providing a big enough protective layer up front, the MBS structure hoped to build the layer over time, relying on increasing housing prices and favorable refinancing. It was a novel idea that worked wonders initially. Subprime lending boomed, and the returns on the associated securities were attractive due to the high leverage. But the dynamic credit enhancement model only worked as long as house prices were rising, a point that seems obvious in retrospect. Moreover, having a debt instrument move with the aggregate housing price reduces the risk of default, but it makes default much more costly when it happens, since the shock hits everyone at the same time. It is possible that market participants failed to see the correlation of risk induced by securitization, but it is more plausible that they succumbed to a free-rider problem. No individual player had an incentive to care about systemic risk.

What lessons can be drawn from this discussion of transparency?

First, it calls into question the rush to increase transparency in markets for liquidity provision. Increased transparency will never reach the level of full information, and as we have seen, going half-way may induce parties to acquire information that makes adverse selection worse and markets less liquid. Marking assets to market may not be such a good idea for liquidity-providing institutions.

The second lesson is about leverage. I assume that the idea of dynamic credit enhancement was borne out of the need to finance marginal borrowers with little or no collateral and earnings power. Perhaps there is a way to make it work, but the evidence suggests that the problem can be disguised with complex securities only for so long. If the desire is to help marginal borrowers buy houses, it would seem better to be explicit about the subsidies.

The third lesson concerns the systemic risks induced by securitization. The problems with highly correlated securities and free-riding need careful scrutiny. Also, the inability to identify the location of toxic assets is a major obstacle for a rescue operation. This has to be factored into the assessment of social risk, and the cost has to be passed in some way onto the originators of loans. For instance, one could have stricter rules on what kinds of structured securities qualify for BIS regulated capital adequacy requirements and how they should be counted. But there are obviously many other possibilities, too.

Finally, the general point that markets for liquidity provision are fundamentally different from markets for risk sharing raises important questions. Securitization unwittingly moved some of the banking business into investment banks that were unregulated and could expand fast. The rents of traditional banks were threatened, which led to an increased appetite for risk—a new banking era that supposedly required a different business model. It may still be revived, but for now it seems that a clearer boundary between regulated banks that are in charge of securing and distributing liquidity and the rest of the capital markets, including the former shadow banking system, should be drawn. Had the riskier tranches of the MBSs been held outside the banking sector, the drop in housing values would probably not have caused a big crash, as evidenced by the LTCM crisis and the burst of the tech bubble in 2000. Risk should be shared in equity markets, not in liquidity providing markets.

Why did subprime lending and mortgage securitization grow so big?

The political desire to expand home ownership, paired with new financial engineering technology, gave birth to the subprime market.

Fannie Mae and Freddie Mac, which were set up to assist poorer households, were encouraged to buy mortgages with capital that was cheaper because it was implicitly secured by government. This may have fueled the growth in subprime. Yet, the fact that broker-dealers were eagerly competing with Freddie and Fannie and in the end held onto a lot of the subprime debt that they originated, because the business was so lucrative (Adrian and Shin, 2008), suggests that government pressure may have been less of an issue than often claimed. For this reason, one must look for another driver.

Caballero (2008) has suggested an explanation that sounds more compelling and could account for the strong investor interest in subprime lending as well as home equity loans. In short, they argue that foreign money, especially from emerging economies like China, was looking for a safe haven. The manufacturing boom had generated high incomes, and the savings rates were also high. Because financial markets in developing countries were poorly developed, there was a shortage of domestic savings instruments. The Anglo-Saxon world, especially the US, with their highly developed financial markets, could meet the foreign savings. So, huge amounts of capital began flowing into the US after the turn of the century. The inflow of capital is often interpreted as the result of US consumption greed, but in this story it is the capital account surplus that drives the current account deficit and not the other way around. The evidence that supports this interpretation over the conventional one is the behavior of interest rates. They went down rather than up as the current account deficit widened, suggesting that money was being pushed rather than pulled into the US.

The foreigners' desire to place their money in the US raised asset prices and lowered interest rates, both of which gave financial firms the incentive to create additional means to save. There are three ways to increase the supply of savings instruments: (i) one can build new assets; (ii) one can turn privately held assets into marketable assets; and (iii) one can make better use of the available assets by creating richer state-contingent claims.

All three channels were used. And importantly, as they were used, money was necessarily put into more marginal projects. The boom

in subprime lending is the prime example. Of course, the foreigners' desire to invest in the US also happened to match perfectly the government's wish to expand home ownership, but this may be less important. The flow of money into housing was aided by excess capacity in the US corporate sector; there was little corporate demand for the new funds. In the prevailing low-interest environment, home-equity loans were aggressively peddled, especially to owners who had small or no mortgages. Foreign money was looking for a safe home—literally.

It may be more of a stretch to claim that structured securities were created to absorb more foreign investment, except to the extent that such claims made subprime lending feasible. But in theory at least, the contingent use of collateral, which the complex chains of structured securities enabled, was more efficient. Higher efficiency raised the value of collateral, allowing it to absorb more savings.

The fact that global imbalances may have played a big role in setting the stage for the crisis does not make the current crisis any easier to deal with. But it puts this painful episode in a very different light when considering regulatory measures to prevent future crises. The desire to blame Wall Street is understandable, and much of it may be warranted. Yet, it is important to realize that the huge profits and bonuses probably came from legitimate efforts to create economic value by satisfying the demand for new financial assets. The crisis is no proof against this hypothesis.

Furthermore, and this is really the important point, if the underlying driver was an increase in the foreign demand for US financial assets, we need to think about remedies and counter-measures that go beyond structural changes in financial markets. The US is confronting problems that commonly are associated with emerging markets: how to deal with a burst of foreign investment. The difference is that the money flowing into the US is not likely to be hot money. So far, there are no signs that foreigners are pulling out the money abruptly as typically happens in emerging markets. The other difference, of course, is that the US debt is in dollars, not in foreign currency. That will obviously eliminate many problems. Yet, the fact that the flow of foreign money could so thoroughly throw the US financial system into turmoil

is shocking and requires careful study. Macroeconomic measures that could have prevented the trouble should also be explored.

Concluding remark

One of the dangers of managing a crisis is that the political and regulatory attention is too much focused on the proximate causes of the crisis. It is evident that the originate-and-distribute model of selling mortgages and the attendant chain of structured securities built around it has been discredited and will take much of the blame. Greater transparency and simplicity in the financial sector is a likely consequence. Gorton's paper appears consistent with such a response. Yet, it would be important to go beyond the proximate causes and try to develop a deeper understanding of the events before major regulatory changes are made. In my discussion I have tried to illustrate why seemingly obvious recommendations, like increased transparency, may be far off-target once the role of liquidity providing markets is better appreciated. Likewise, knowing what caused the increased demand for subprime securities makes a big difference for regulatory decisions. Of special concern is the tendency to demonize or ban innovations that backfired, not because they were fundamentally wrong, but because the particular implementation was flawed. The originate-and-distribute model and MBSs will certainly have an important place in the future. Gorton's paper, with its detailed narrative, can help identify the critical errors in contracting that occurred and thereby bring about an improved version of this business model.

Endnotes

¹See Milgrom and Roberts (1992) for a more detailed description.

²Debt payoffs also depend on public information, like interest rates, but being public, this does not usually cause serious information asymmetries.

³Gorton and Pennacchi (1990) have made the same point by showing theoretically that claims that do not move much with the underlying assets are less susceptible to adverse selection. Consequently, liquidity providing intermediaries are focused on creating such claims, deposits being the most obvious example. They also note that securitization (by pooling assets) creates a more liquid claim, because it becomes less sensitive to variations in the values of underlying assets. Money is the ultimate securitized asset. It is highly opaque, because it is a claim on all the productive assets of the economy. It is very information insensitive: The value of money moves slowly, except in states of hyperinflation. Since information about the value of money is so symmetric, money is very liquid.

References

- Adrian, T. and H. S. Shin (2008), "Financial Intermediaries, Financial Stability and Monetary Policy," this volume.
- Caballero R., E. Fahri and P-O. Gourinchas (2008), "An Equilibrium Model of Global Imbalances and Low Interest Rates," *American Economic Review*, 98 (1), 358-93.
- Gorton, G. and G. Pennacchi (1990), "Financial Intermediaries and Liquidity Creation," *Journal of Finance*, Vol XLV (1), 49-71.
- Milgrom P. and J. Roberts (1992), *Economics, Organization and Management*. Englewood Cliffs, New Jersey: Prentice Hall.