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Structured Finance, Risk Management, and the Recent Financial Crisis

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Abstract: Structured finance is often mentioned as the main cause of the latest financial crisis. We argue that structured finance per se did not trigger the last financial crisis. The crisis was propagated around the world because of poor risk management such as agency problems in the securitization market, poor rating and pricing standards, rating agency incentives, lack of market transparency, the search for higher yields by top decision makers and the failure of regulators and central banks to understand the implications of the changing environment.

Keywords: Structured finance, risk management, financial crisis, collateral debt obligation (CDO), asset back commercial paper (ABCP), rating, pricing, securitization, regulation of financial markets.

JEL Classification: D81, D82, D86, E5, G01, G12, G14, G32, G33

Résumé: La finance structurée est souvent mentionnée comme la cause de la dernière crise financière. Nous argumentons que la finance structurée, en soi, n'est pas en cause. La crise qui s'est étendue au monde entier est plutôt due à une mauvaise gestion des risques, soit des problèmes d'agence dans la titrisation des dettes hypothécaires, des mauvais critères de notation et de tarification de produits structurés, des problèmes de conflit d'intérêt des agences de notation, un manque de transparence dans les marchés, la recherche de rendements élevés par les hauts dirigeants des institutions financières et la faiblesse des banques centrales et des agences de réglementation à comprendre toutes les implications du nouvel environnement financier.

Mots clés : Finance structurée, gestion des risques, crise financière, CDO, ABCP, notation, tarification, titrisation, réglementation des marchés financiers.

Introduction

Structured finance includes all advanced financial arrangements that serve to efficiently refinance and hedge any economic activity beyond the scope of conventional forms of traditional financial instruments (debt, bonds, and equity). Structured finance has changed the role of banks and the functioning of financial markets. In Canada, structured finance is now a very important activity that has completely modified the links among borrowers, lenders, and investors. Structured finance is, however, often mentioned as the main cause of the latest financial crisis.

The objective of this article is to show that structured finance (and its complex products) per se did not trigger the financial crisis. However, its risk management in recent years was problematic. The latest financial crisis was propagated around the world because of poor risk management such as agency problems in the securitization market, poor rating and pricing standards for very complex financial products, rating agency incentives, lack of market transparency, the search for higher yields by top decision makers that were not motivated by the financial stability of their firm, and the failure of regulators and central banks to understand the implications of the changing environment.

Some large banks went bankrupt, while several governments and central banks had to rescue many other financial institutions. These bailouts were intended to protect the financial markets in the short run, but do not solve the underlying problems. In this article we emphasize the role of risk management in restoring confidence in markets.

Structured finance

Structured finance is a multifaceted concept. For many years, it was associated with derivative products and viewed as fairly insignificant in the economic and financial markets. Yet structured finance has become an important hidden side of the economy since the 1990s, and an increasingly pertinent topic of discussion since the onset of the recent crisis.

The influence of structured finance on the trading of financial products has produced several notable effects on the organization of retail credit and financial markets, which are starting to be understood and explained. Structured finance has improved the liquidity of transactions and the management of credit risk. These effects have varied over time and have complex consequences.

Structured finance has greatly affected financial products. It has spawned increasingly complex products of all kinds, in particular those linked to securitization of credit risk such as collateral debt obligations (CDOs). These financial products introduce sophisticated mathematical instruments and complex security and contract design that demand the collaboration of actors from various disciplines. They also require high-powered computational capacities and the competent management of large databases. Because of their liquidity, these products call into question the historical methods of regulating financial markets and the traditional management of monetary policy.

Structured finance was mainly motivated by the transfer of credit risk through the use of credit derivatives (e.g. credit default swaps, or CDSs) and banks' securitization of loans to investors. For example, the selling of bank loans to trusts serves to transfer banks' credit risk via structured products to various groups of investors such as pension funds, industrial and service corporations, hedge funds or even other banks. The market of collateral debt obligations (CDOs) has grown very rapidly since 2000. Banks are the most active players on this market, although insurance companies, pension funds

and hedge funds are gaining in prominence. With the growth of hedge funds and their demand for higher yielding securities, sellers improved their ability to transfer their credit risk, particularly the more risky tranches (or equity tranches) of the structured products.

Securitization of credit risk by banks was also motivated by regulatory arbitrage under Basel I because banks were prompted to sell their lower-risk assets. With the new accord for credit risk (Basel II), the motivation for regulatory arbitrage became less important but regulated capital rules for AAA products have distorted the allocation of capital for banks.

Bad Risk Management

After 2001, a major, rapid transformation of financial markets occurred, as US banks and other retail institutions extended their loans to risky borrowers (subprime loans) and transferred these risks to the overall financial market using credit risk transfer instruments via securitization. CDOs of these mortgages were the most popular structured instruments for credit risk transfer. The AAA ratings that were initially attributed to many of these structures by the rating agencies were clearly erroneous, as many of these products defaulted when the underlying subprime loans started to default in 2005. Subsequently, many of these structured products were downgraded by the rating agencies. By then, however, most of the damage had already been done.

During this period, securitization transformed low-grade assets into investment-grade assets via complex financial instruments such as asset-backed commercial papers (ABCP) and CDOs whose effective default risk was much higher than that of traditional AAA bonds. The crisis was accelerated because banks were under pressure from the financial market to increase the supply of high risk mortgages in order to generate assets with high yields in a period of low interest rates. This repackaging was very lucrative, which encouraged these CDO equity holders to issue a second generation of CDOs with lower yield, which in turn increased the demand for first-generation and mortgage-backed securities (MBSs). When the subprime loans started to default, these financial products externalized the damage to the international markets. This financial crisis has caused external damage to the real economy (unemployment) and the monetary economy (low credit conditions for consumers and business firms even if the prime rates of the Central Banks were very low). It has eroded confidence in financial institutions and rating institutions that induced consumers and investors to take large risks. There are four major risk management issues relating to the structured finance market.

Incentive contracting under asymmetric information: Banks and mortgage brokers had little incentive to be vigilant and carefully monitor borrowers' risk because a large fraction of loans were securitized without appropriate or optimal contracting clauses under potential moral hazard. The same incentive problem was present for insurers and other market participants that diversified their risk portfolio and managed their capital via securitization. The potential loss was transferred to the market, which explains the lack of incentive to be vigilant. Adverse selection was also present: some BBB products sold by banks to trusts (minimal rating for packaging CDOs) were in fact mostly BB.

Evaluation of structured products by rating agencies: As part of securitization, special investment vehicles (SIV) purchase long-term assets such as loans and insurance contracts and finance them with asset-backed securities such as ABCP and CDOs. Having a high rating from rating agencies is essential for making money. When the credit crisis started in 2007, asset-backed commercial papers were downgraded, and the SIVs could no longer roll over their commercial papers. This led them to seek

funding from their sponsors (investment banks). This triggered the decline of many investment banks and sparked a liquidity shortage for many markets, such as the ABCP market in Canada, which was contaminated by these US products (in fact, few trust funds involved in the Montreal Accord were contaminated, representing about 6% of the exposure). At a more sophisticated level, CDOs make profits by repackaging a pool of loans and selling them in the form of bond tranches. The profits associated with the structuring activity are higher when the products obtain a high evaluation by the market via a high credit rating. The problem, however, was that it became increasingly difficult for rating agencies to model these complex assets without good data. It was also very difficult for market participants to monitor and replicate the rating of these products because no data were available.

Pricing of complex financial products: Another cause of the current crisis was that prices of these sophisticated instruments were often too low and did not reflect their true risk exposure. There was also a systemic risk component in these products that was not taken into account in the current pricing. Systemic risk happens when events in a market affect other markets. When difficulties arose in asset-backed commercial paper, for example, many money market managers transferred their orders to the Treasury bill market, inducing an increase in prices and a decrease in yields. These external effects were amplified because of the lack of transparency. In the case of ABCP in Canada, many investors were not sure whether the collateral of these products contained US subprime loans or not. This forced many investors such as pension funds and hedge funds to sell good assets, which further reduced the prices of these assets.

Regulation of structured finance: It is important to emphasize that the current regulation of risks is limited to banks and investment banks. Pension funds and hedge funds are not regulated. Basel II regulation is partly to blame because it reduced the required regulated capital significantly for AAA grade assets. Banks were then attracted to the new AAA assets, while sellers were motivated to obtain the AAA rating for these structured products, which put undue pressure on rating agencies. The AAA credit rating of these products also affected the purchasing behaviour of pension funds, insurance companies, mutual funds and hedge funds, particularly because regular bonds with the same rating paid lower interest rates when Central Banks reduced their target interest rates.

Lessons for risk management

Why did investors purchase these products and why were they offered? Prior to 2007 there were very few defaults for structured securities and no apparent reason for concern. However, given the extremely low interest rate environment, investors were increasingly drawn to higher yields offered by AAA structured products causing yield spreads to narrow. Although these products still offered slightly higher yields than more traditional short term securities, they no longer properly compensated investors for the risk they were bearing. Prices did not reflect the embedded systematic risk exposure of these products.

As documented above, the market grew exponentially and banks made large profits by charging high fees for originating and structuring these products. It is well documented that rating agencies made mistakes. There were also incentive problems because the issuer pays for the ratings, and some suspect that rating agencies were part of the underwriting process. The regulators and Central Banks did not anticipate these problems either.

Many investors lost money during the financial crisis because they did not apply the basic principles of risk management: 1) risk appetite was not well stated in many firms; 2) enterprise risk management

was not well defined or used; 3) relevant risk management policies were not supported by the top decision makers. In many organizations, focus on risk management seems cyclical, peaking after a crisis.

Prior to the financial crisis, the underestimating of the default and the liquidity risks of the new structured financial products were signs of bad risk management. Several products were introduced in the years leading up to the crisis, and many investors adopted them without sufficiently understanding their risk because they did not have the proper tools to evaluate them. They consequently evaluated these complex financial products as they would for standard ones. There was no tail analysis, no back testing and no stress testing related to the risk of these complex products. The risk management function became obsolete for top decision makers that have delegated their credit risk analysis to rating agencies with incentive problems. Many lessons have to be documented.

For the structured finance system, originators of structured products must be more responsible. They must keep a large fraction of the pool they sell: possibly the complete junior tranche and even fractions of more senior tranches. This would give them a greater incentive to apply better risk management in their credit decisions and obtain better portfolios to sell.

We need more transparency in the tranching of the structured products. As for any security, participants in the market and researchers must be able to replicate the composition of these products. Public data sets must be available for studying these products. The increasing complexity of structured finance creates challenges in terms of efficient management and dissemination of information. More transparency is needed in the credit market, particularly when loans are securitized. There is also a need for more transparency regarding both the packaging of assets by trusts and the assets held by financial institutions, such as pension funds and hedge funds.

We need more transparency in the rating of these products. Any good researcher or investor is able to verify the rating of any standard bond in the market because data are available and rating methods can be replicated. The same must apply for structured products. We also need more transparency in the pricing of these products as well.

Institutional changes in many countries, including Canada, are necessary to foster independence and reduce vulnerability to externalities from international markets, particularly the US. Institutions must understand the available technology. The design of data collection, processing technologies, and inexpensive communications between financial institutions would provide effective tools to replicate and verify rating agencies' analyses and trust packaging from various sources. These data must be available to any investor or group of investors. The ABCP market in Canada would not have collapsed in a transparent market with only 6% contamination.

For the investors, when making decisions, senior management and the board must rely more on risk management: they must obtain detailed information on the enterprise-wide risk and weigh this risk accordingly. The board must be composed of individuals that understand the management of these risks. The risk management committee must be very active in the risk oversight of the firm. The risk appetite of senior managers must be defined, known and monitored by the board.

The CRO (Chief Risk Officer or equivalent) must be granted more authority rather than simply being a passive officer that monitors, measures and analyses risk. He must report to the CEO and meet

periodically with the board. Some even suggest that the CRO should have veto power over some transactions. The CRO office must be independent of all business units.

All important transactions must be robustly analyzed ex ante with appropriate data and models for rating, pricing and testing the products (CVaR instead of VaR). This implies greater investment in risk management for many investors, along with greater transparency and appropriate disclosure to all constituencies. These recommendations may seem difficult to apply for investors in the money market that must manage many assets with 30 days maturity. Risk management is even more important for these investors. New forms of risk analysis must be developed in collaboration with transparent and independent agencies exempt of incentive problems. To summarize, more due diligence with respect to risk is necessary.