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GLOBAL FINANCIAL INNOVATIONS AND THE SUBPRIME MORTGAGE CRISIS

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Introduction

The current international credit crisis was symbolically exhibited on September 14, 2007, when long queues formed outside Northern Rock, Britain's fifth-largest mortgage lender, showcasing the first bank run in the country in 150 years. However, the first public inkling of the new crisis was unveiled in May, 2007, when a prominent Wall Street investment bank, Bear Stearns, reported huge losses at two of its hedge funds. Then, the next shoe dropped three months later in August, when the largest French bank, BNP Paribas, stopped withdrawals from its three investment funds due to heavy mortgage-related losses. The crisis soon spread to Germany as well, where the government authorities were forced to rescue two banks, IKB and SachsenLB. When the crisis led to a panic for Northern Rock depositors, the event turned into a full-blown crisis affecting the entire global financial markets. By early 2008, giant banking institutions in Wall Street and Europe have announced more than $100 billion in write-offs related to the crisis, including $22.4 billion by Merrill Lynch, $20 billion by Citigroup, $14.4 billion by Union Bank of Switzerland (UBS), and $9.4 billon by Morgan Stanley.

The crisis has affected not just giant banking and financial institutions in the West. Even small towns in Arctic Norway and some obscure municipalities in Australia lost their precious savings and had to come up with emergency funding to keep their towns in operations. State of Florida discovered that its state investment fund lost almost half of its $27 billion assets within about two weeks and had to temporarily suspend further withdrawals from the fund, and some feared that many Florida counties and municipalities would not have enough cash to pay teachers and trash collectors. A similar problem was faced by State of Maine, whose investments suffered huge losses due to the current crisis. The Indiana Children's Wish Fund, which grants wishes to children with life-threatening illnesses, was affected when some of its fund's investments suffered a heavy loss as well.

The international financial crisis and the resulting credit squeeze has also reached Asian countries such as Korea, where in November, after almost four months from the outbreak of the crisis in the summer, the drastically tightened credit market forced the Bank of Korea to inject emergency funding into the market and many Korean banks found themselves desperate to obtain necessary funds. The common thread linking Arctic Norwegian towns to the state treasuries of Florida and Maine and stretching from regional banks in Germany and Britain to commercial banks in Korea to the mightiest names on Wall Street in a chain of misery is the international financial crisis triggered by the meltdown in the U.S. subprime mortgage market.

Major Differences from Previous Financial Crises

During the past several hundred years when financial markets have existed, there have been numerous financial crises, some of which are the stuff of legend, such as the tulip boom-and-bust of 1637 in Holland and the 1720 South Sea bubble. However, it was the 20th century that witnessed the most dazzling array of financial crises like the stock market crash of 1929. The introduction of the Bretton Woods fixed exchange rate system and the establishment of the IMF and the World Bank in the immediate post-World War II era resulted in a relatively calm period as far as international financial crises were concerned. Only after the breakdown of the Bretton Woods system in the early 1970s has the world witnessed the reemergence of international financial crises, such as the oil money crises of 1973 and 1979, the LDC foreign debt crisis of the 1980s, the Mexican peso crisis of 1994, the Asian financial crisis of 1997, the Russian financial crisis of 1998, the Ecuadorian financial crisis of 1999, and the Argentine financial crisis of 2001.

The previous international financial crises during the past 35 years after the breakdown of the Bretton Woods system were mostly triggered in the developing countries, which then spread to the global financial markets eventually. In contrast, the current international financial crisis was triggered in the industrialized world, specifically in the subprime mortgage loan market in the United States. Unlike the earlier crises when the main adverse impact was felt first in developing countries, the current crisis has troubled first the financial institutions and investors in industrialized countries.

Furthermore, the main causes of earlier crises were macroeconomic in nature, such as runaway budget deficits, chronic current account deficits and excessive government debts including foreign debts, all symptoms of economic mismanagement by the governments of developing countries. In contrast, the current crisis was not due to any deliberate macroeconomic mismanagement by the U.S. or other industrialized country governments but more a result of abusive operational behaviors of numerous financial institutions or other private sector entities. In other words, the current crisis was the direct result of inappropriate or abusive microeconomic behavior among some financial institutions in the industrialized world, as will be detailed in this paper.

Consequently, the role of such premier international financial institutions as the IMF and the World Bank is quite different in the current crisis. In previous international financial crises that were triggered in developing countries, these international financial institutions, especially the IMF, played a prominent and active role to resolve the crises. For example, the IMF and the World Bank in conjunction with the U.S. Treasury Department were instrumental in developing the so-called Washington Consensus in order to cope with the LDC debt crisis of the 1980s and the Asian financial crisis of 1997. The Consensus was composed of three pillars of fiscal austerity, liberalization and privatization, given the fact that macro-economic mismanagement by the affected developing countries was the main culprit of such crises.

In contrast, both the IMF and the World Bank have played absolutely no role in the current crisis. They have been relegated to the status of bystanders, as they are keenly aware that the current crisis is not due to any macroeconomic mismanagement of affected countries but the result of abusive market practices of private financial institutions and investor groups.

Causes of the Current Crisis

The root cause of the current international financial crisis is the abuse of various innovative financial techniques and new investment instruments that have been developed in recent decades. The world financial markets have experienced a sharp acceleration in the pace of financial innovations over the years. Major innovations have emerged in the fields of new financial products, funding and investment tools, and trading and risk management techniques. Both the richness and complexity of these new financial products and techniques bear a testimony to the robust spirit of financial innovations that has pervaded international financial markets over the past decades. While these innovations have improved the market efficiency in general, some of them have been misused and abused by certain market participants out of ignorance and/or outright greed.

A careful observer has to conclude that the current crisis is the result of the abuse of some of the latest and most innovative financial techniques. Many crises are a byproduct of the cycle of financial innovations. First, new sophisticated financial products or techniques are developed and utilized exclusively among the few early innovators to a great advantage. At the second stage, as the innovation is copied and spread to a wider circle of market participants, some of the participants start to abuse them either due to ignorance or outright greed. At this stage, regulatory authorities have not caught up with the full implications of the new innovation and there appears a regulatory vacuum as far as the new innovative product or technique is concerned, which tends to embolden the early abusers to push the envelope to an extreme limit. At the next stage, such abusive practices are further copied and imitated by a wider circle of market participants, resulting in a full-blown crisis. At the final stage, both government authorities and general market practitioners start to take corrective actions, including introduction of new regulations and new risk control tools. By this time, however, the damage has already been done to a significant sector of the financial market.

The seed of the current crisis was planted several decades ago when Government National Mortgage Association (GNMA, known as Ginnie Mae) in the United States pioneered in 1970 securitization of residential mortgage loans, by bundling hundreds and thousands of long-term mortgage loans into marketable bonds known as mortgage-backed securities, or MBS. MBSs are so-called pass-through securities, which are new types of bonds whose investors retain ownership interest in the collateralized assets that in this case are home mortgage loans. The emergence of the MBS market injected new liquidity in the entire mortgage loan industry, as many lenders were able to sell their mortgage loans to Ginnie Mae and other Wall Street firms that specialize in pooling and securitizing these mortgage loans. In the process, the original mortgage lenders could then make more new mortgage loans with the fresh cash that they obtained by selling the earlier mortgage loans to Ginnie Mae and others.

Mortgage loan securitization was given an added impetus in 1983, when Federal National

Mortgage Association (FMNA, known as Fannie Mae) came up with the first collateralized mortgage obligations (CMOs). Unlike MBS, CMOs are so-called pay-through securities where the investors of these securities do not have any ownership interest in the loan collaterals but their new securities (CMOs) are serviced by the cash flows generated by the collateral assets. In other words, while pass-through securities such as MBS are certificates of ownership in the collateralized assets such as mortgage loans, pay-through securities like CMOs are simply collateralized debt obligations whose debt service is satisfied by the cash flows generated by the collateral pool. The advantage of pay-through securities such as CMOs lies in the fact that the new securities can be issued in different tranches categorized by the degree of risk exposure, with the safest tranche usually accorded the highest credit rating of triple-A and the lowest tranche, known as the "toxic materials", being normally un-rated due to its high credit risk but instead carrying high yields.

Securitization soon spread from home mortgage loans to other financial assets such as commercial mortgage loans, auto loans, credit card receivables, equipment leases, home equity loans, manufacturing loans, student loans and others. By early 2007, 53% of all non-financial debt in the United States was securitized, compared to only 28% in 1980. By the end of 2006, the outstanding volume of securitized instruments in the U.S. alone reached over $9 trillion, composed of $7 trillion in MBS and CMOs and $2.1 trillion in other asset-backed securities (ABS). The widespread practice of securitization has enriched the financial markets all over the world, allowing a number of homeowners and other market participants a greater access to lower-cost credits that would otherwise have been unavailable. Securitization provides a "secondary" market for traditional illiquid bank loans and other financial assets, thereby pushing down borrowing costs for consumers and companies alike. That is why securitization was called "democratization of capital" by Michael Milken, of junk-bond fame. There have been other systemic gains as well. Subjecting bank loans and other debt to valuation by capital markets encourages the efficient use of capital, and the broad distribution of credit risk through securitization reduces the risk of only few creditors shouldering all the credit risk.

While securitization all over the world has in general made a positive contribution to the global financial markets, it has also implanted a seed of abuse and misuse. The concept of pay-through securities like CMOs has provided major market players such as Wall Street firms and credit rating agencies a great opportunity to increase fee income by bundling all kinds of debt instruments into various tranches of securities, some of whose upper tranches can carry prime credit ratings to satisfy the investment requirements of many institutional investors such as pension funds and insurance companies, while the lower-rated tranches carrying higher yields prove attractive to such risk takers as hedge funds and other specialized investors.

Abuse and Misuse of Innovations: Subprime Mortgages, CDOs, Conduits, SIVs, ABCP

Securitization has become a major source of fee income for those institutions related to its business, such as loan originators (mortgage lenders and mortgage brokers), Wall Street firms acting as underwriters and placement agents for newly created securities, large commercial banks and insurance companies acting as credit enhancers for the securitized instruments, credit rating agencies, and investors eager to pick up additional yields by obtaining exotic new securities. In order to satisfy the growing demand for new mortgage loans that have become the most crucial raw materials for the securitization process, originators of mortgage loans became bolder by expanding subprime mortgage loans. The subprime market in the United States barely existed ten years ago, but it exploded during the past three years of 2004-06, growing from 6.9% in 2002 and 7.9% in 2003 to 18.2% in 2004, 20% in 2005 and 20.6% in 2006. Originally subprime loans were either for refinances or debt consolidation, with fewer than 5% used for actually purchasing homes. The role of subprime loans in securitization also increased sharply from 9% of newly originated securitized mortgages in 2001 to 40% in 2006.

Five years ago, home purchase loans accounted for only one-third of all subprime originations. During the past several years, however, subprime lenders relaxed underwriting standards and offered mortgages with almost no down payment, little or no documented evidence of the borrower's ability to pay, and adjustable-rate mortgages with built-in large increases in the monthly payment after initial few years. Then, these subprime mortgage loans were sold quickly to Wall Street firms eager for new raw materials for securitization. When several state governments in the United States tried to enact laws limiting abusive practices in mortgage lending during the housing boom, the subprime industry engaged in aggressive lobbying to sabotage any such efforts. For example, Ameriquest Mortgage Company, one of the nation's largest subprime lenders until recently, handed out more than $20 million in political donations and played a major role in persuading New Jersey and Georgia to relax tough new laws.

While mortgage loans have been the traditional raw materials for MBS and CMOs, the securitization industry, ever hungry for more business, launched in late 1990s collateralized debt obligations (CDOs) whose collaterals are not new mortgage loans but already existing MBS, CMOs, ABS backed by mobile home loans, car loans, airplane leases and credit card receivables, as well as other CDOs and even derivatives known as credit default swaps (CDS) linked to these mortgage securities. The key advantage of such CDOs over conventional MBS or CMOs is that they do not need a supply of new mortgage loans, since their raw materials need not be confined to new mortgage loans as in the case of MBS and CMOs. Thus, the securitization industry was able to create a brand new category of securities in the form of CDOs utilizing as collaterals existing securitized instruments or even derivatives linked to them, while in the process making huge sums of additional fee income. Investment banks underwriting CDOs earned fees of 1% to 1.5%, implying as much as $15 million income for a typical $1 billion CDO issue. For example, Merrill Lynch launched almost $150 billon worth of CDOs during the four-year period of 2004-07, earning hundreds of millions of dollars in fee income.

Abetting this new securitization frenzy, rating agencies were unseemly accommodating in rating of these CDOs. For example, a $1.5 billon CDO called Norma was issued in March 2007, whose collateral was composed of other securities and derivatives with average triple-B ratings. But 75% of Norma CDOs was rated the highest triple-A by all three rating agencies of Moody's, Standard & Poor's and Fitch Ratings and all but the bottom $50 million out of $1.5 billion was rated triple-B or above. Their rating resulted from a risk management model looking backward only to a time period when rising house prices and easy credit had kept defaults on subprime mortgages low. Barely eight months later in November 2007, however, all the Norma CDOs were downgraded to well below the junk bond level at single-B and lower. During the past couple of months when the credit market crisis has deepened, rating agencies have downgraded hundreds of CDOs and other securitized instruments in their belated recognition of the inherent risks of such securities.

Credit ratings are a public good, and many institutional investors are limited to investing in only those securities rated double-A or above. Thus, the seal of approval by rating agencies is an important signal to the financial market participants. Nevertheless, the credit rating environment for securitized instruments such as MBS, CMOs and CDOs has been fecund with conflicts of interest for rating agencies. The securitization mania is based on obtaining satisfactory ratings, and credit rating agencies are usually consulted by Wall Street underwriting firms *before* actually issuing the securities on how to structure the deal in order to obtain satisfactory ratings. Rating agencies are also paid *after* the securities are successfully issued. Thus, almost an incestual relationship has emerged between major Wall Street investment banks and credit rating agencies. Such partnership has been very lucrative to rating agencies. For example, Moody's net income rose from $289 million in 2003 to $754 million in 2006 as securitization expanded rapidly.

CDOs were also highly lucrative to investors since they offered comparatively high returns. For example, when Norma CDOs were issued in March 2007, its triple-B tranche offered a yield of over 10%, while comparable triple-B corporate bonds yielded only 6% returns at that time. Such yield enhancement was made possible through the magic of combining "tranching" and ratings inflation. We can illustrate this magic with the example of Norma CDOs, which were created with the collaterals carrying average triple-B credit ratings and average yields of 6.5%, which was already 0.5% higher than the comparable triple-B corporate bond yield at that time due to tranching. Out of $1.5 billion Norma CDOs, the lowest 3.3% tranche of $50 million was un-rated due to its high risk and the next lowest 7.7% tranche of $115 million was rated triple-B, the same credit rating as carried by the entire $1.5 billion collaterals. The remaining 89% tranches were all assigned credit ratings higher than triple-B. The highest tranche of triple-A accounted for 75% ($1,125 million) of the total and the remaining 14% tranche ($210 million) was rated either double-A or single-A. This meant that 89% of the Norma CDOs were assigned credit ratings higher than the triple-B, even though their raw materials (collaterals) carried the average triple-B ratings. Since those upper-tranche CDOs (accounting for 89% of the entire CDOs), which were assigned ratings higher than triple-B, would naturally be carrying a yield much lower than 6.5% generated by the entire $1.5 billion collateral pool, those investors in the triple-B rated Norma CDOs could be offered a yield much higher than the original 6.5% average yield of the collateral pool.

This is the magic resulting from tranching in the creation of CDOs, and this magic has been made possible by the ratings inflation that somehow converted the average triple-B collaterals into mostly (89%) triple-A and other higher-rated CDOs. Such trick is equivalent to converting instantly a class of 100 students with average B grades into a new class of 89 students with A+ or A grades, with only 8 students with B grades and 3 students with C grades. The rationale of this ratings inflation is the following: since the historical average default rate of long-term bonds carrying triple-B and below is only 1.25%, setting aside 3.3% of the entire CDO pie as un-rated would more than adequately satisfy any probable default risks inherent in the triple-B rated collateral pool. Furthermore, the next-lowest tranche of 7.7% of Norma CDOs with the triple-B rating could further safeguard complete debt servicing of the remaining tranches of 89%, so the latter tranches would deserve triple-A and other higher credit ratings. This kind of magic is possible only with tranche-embedded pay-through securities such as CDOs and CMOs, but not for traditional pass-through securities like MBS. Financial innovations can indeed be sweet for those fortunate practitioners.

The high returns on CDOs triggered further innovative ventures in the form of conduits and structured investment vehicles (SIVs). Large commercial banks set up conduits as separate legal entities, which then issued short-term commercial paper backed by such collaterals as auto loans and leases, equipment leases, corporate loans, and eventually mortgage loans or MBS or CMOs. The cost of issuing such assets-backed commercial paper (ABCP) is very low due to its short-term maturity, and conduits in turn invested the low-cost funds thus raised in the higher-yielding long-term MBS or CMOs and later even more lucrative CDOs. Conduits were "off balance-sheet vehicles" that allowed the sponsoring banks to be exposed to complex and lucrative bonds without requiring them to hold capital reserves against these assets as these assets belonged technically and legally to conduits which are separate legal entities. At their peak, the combined assets of conduits stood at $1.4 trillion in the middle of 2007.

Then, large banks went a step further by setting up SIVs. Unlike conduits that have full credit back-up facilities from the sponsoring banks, SIVs do not always have to carry a full credit backup from the sponsoring banks. Some SIVs have some partial backup facilities from a few banks and some do not. But just like conduits, SIV assets would stay off the sponsoring bank's balance sheet and the sponsor bank would profit by collecting fees managing the SIV. From the late 1980s when the first SIV was launched by Citigroup, a number of SIVs have been created by banking giants such as Citigroup and HSBC as well as by some less well-known banks such as Germany's IKB and SachsenLB that were mentioned earlier, and their combined total assets stood at $400 billion as of summer 2007, when they peaked. Of this amount, almost one quarter of SIV assets belonged to those affiliated with Citigroup. There were even some SIV-lites that specialized in a high degree of leverage by borrowing up to 40 to 70 times their equity through ABCP and then investing the funds in highly lucrative but risky subprime CDOs.

Until the summer of 2007, both conduits and SIVs relied heavily on the ABCP market, whose outstanding volume peaked at $1.2 trillion. However, as the U.S. subprime sector started to crumble, investors shied away from ABCP, thus triggering funding scares among conduits and SIVs. If they could not renew their maturing ABCP, they would be forced to dump their assets composed mostly of CDOs and other high-risk securities whose secondary market was disappearing fast. With the blessing of the U.S. Treasury, therefore, large banks led by Citigroup, Bank of America and J P Morgan Chase tried to set up a Super SIV in late 2007 in order to purchase assets from distressed SIVs and conduits for the purpose of preventing massive dumping of assets by them in the secondary market. But other banks were reluctant to join in the desperate rescue efforts and the Super SIV idea was finally abandoned. Instead, many sponsoring banks have started to bail out their affiliate SIVs by directly taking over their assets onto their own balance sheet or by extending full credit backing to them, thus effectively forcing the sponsor banks to move these assets on the book instead of hiding them off the book. It appears that such market-based solution is the right way to go, since the sponsoring banks have to own up to their moral and reputational obligation to their affiliate conduits and SIVs.

Government Responses

The current credit market crisis was caused by the abuse and misuse of financial innovations in the environment of greed and ignorance. Regulatory authorities were kept in the dark for a long time as the market abuse utilized newest financial techniques and instruments whose implications were not clear to outside observers including regulatory authorities, thus creating a regulatory vacuum. When the first signs of crisis emerged with long queues of depositors forming in front of Northern Rock branches and with abrupt cutoff of credit lines to affected banks such as IKB and SachsenLB, the immediate response by governments was to make emergency credit lines available to the affected banks.

As the crisis has spread to the all-important interbank market where the short-term interbank rates stayed unusually high indicating a near-panic credit crunch, central banks around the world have aggressively injected funds into the banking system. The European Central Bank (ECB) has been especially active, injecting over $500 billion into the interbank market in mid December alone. The U.S. Federal Reserve also adopted innovative new techniques to supply enough funds to the banking system. For example, the Fed engaged in two loan auctions of $20 billion each in December and has allowed broader types of collaterals for its discount window loans in an attempt to calm the jittery money markets. Both Bank of England and the Fed also lowered the key overnight fund rates to help out in the credit crisis.

For the longer-term horizon, regulatory authorities have embarked upon much-needed corrective actions. For example, the Fed has made proposals for new regulations on abusive and deceptive mortgage lending that has precipitated the current crisis. The proposed reforms fall into three groups. First group is targeted at controlling abusive practices in subprime mortgage loans. Second group of reforms aims to make the fees and commissions attached to subprime mortgages fairer and more transparent. The third group deals with the advertising practices of subprime mortgages.

There is also an increasing demand to tighten regulations and supervision of credit rating agencies. The State of Connecticut issued subpoenas to the three major credit rating agencies as part of its antitrust investigation. Some experts are advocating separation of rating and advising functions of rating agencies, echoing a similar movement to separate auditing and consulting services of major CPA firms in the aftermath of the Enron bankruptcy. There seems to be an emerging consensus on the need to devise a way to control the obvious conflicts of interest that have manifested themselves in the behavior of major rating agencies during the recent securitization frenzy.

Some of the abusive practices by major financial institutions are also under scrutiny. The U.S. Securities and Exchange Commission (SEC) has launched enquiry into how financial firms including hedge funds and Wall Street investment banks have been pricing their mortgage-related and other securitized instruments. Specifically, SEC would like to examine whether financial firms should have told investors earlier about the declining value of mortgage securities they held and managed and how they priced them on their books. Certainly, a more transparent investment behavior and pricing practices are called for in order to protect market participants in such securities.

Implications for Global Financial Markets

It has been noted that the current international financial crisis is different from other previous crises that have affected the international financial system during the past several decades. The recent abusive behavior of many financial institutions is not only the result of greed and ignorance but also due to the excess liquidity in the world financial markets and the intense competition to enhance the investment returns. In a world of low yields due to the ample liquidity in global search of higher returns, investment managers have been subject to intense pressure to obtain higher yields just to stay in competition. In such an environment, a difference of dozen basis points (one hundredth of one percent) in investment returns can make a world of difference for the investment managers.

For example, a Credit Suisse money market fund was able to achieve in 2006 an investment return on its fund of just 31 basis points higher than the industry average. As a result, the size of the fund ballooned from $1 billion at the start of 2007 to $26 billion by July 2007. As the fund investment yield dipped a little during the following six months, the size of fund was then reduced to $10 billion. In such a roller-coaster environment of international investment management, many financial institutions are willing to take advantage of latest innovative techniques to improve their investment performance.

It is no wonder then that both bank conduits and SIVs were able to market their ABCP to the tune of $1.2 trillion at its peak, because there were so many money market fund managers eager to purchase such paper as long as they pay ten or fifteen basis points higher than comparable securities. The global financial markets have also created a "shadow banking system" apart from the traditional banking system which binds banks and clients on an ongoing basis, with the banks retaining the client credit risk on their books. In recent decades, however, banks have been turned into loan originators, shoveling the loans out immediately to other loan packagers and securities underwriters. Traditional relationship banking between banks and clients is replaced by transactional banking where banks are eager to generate as many transactions as possible so that they can off-load them to securitization packagers and underwriters.

Some have characterized this transactional banking as "vehicular finance" under which banks pass on their loans to new vehicles such as conduits and SIVs which then bundle them and dissect them into diverse tranches to be sold to investors all over the world, ranging from the towns in the Arctic Norway to the municipalities in the backcountry of Australia. It is a challenge now facing both regulators and market participants how a proper balance can be restored between modern finance of globalized innovations and prudent financial risk management.

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