U.S Sub-Prime Crisis
And
Its Global Consequences
An Ongoing Saga

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Dr. Kashmira P. Mody
Reader,
Department of Economics,
St. Andrew's College of Arts, Science and Commerce,
Bandra (W), Mumbai 400 050.o

ABSTRACT

Financial markets in the United States and some other industrialized countries have been under severe stress for more than a year. The proximate cause of the financial turmoil was the steep increase and subsequent decline of house prices in the United States, which, together with poor lending practices, have led to large losses on mortgages and mortgage-related instruments by a wide range of institutions. It is obvious that these are very turbulent and uncertain times for the global economy. The impact of the turbulence may be considered in terms of the impact on the real economy as well as the impact on state of art economic thinking.

CONTENTS

1. INTRODUCTION:

"The world economy has entered new and precarious territory."

"The financial market crisis that erupted in August 2007 has developed into the largest financial shock since the Great Depression, inflicting heavy damage on markets and institutions at the core of the financial system."
World Economic Outlook,
IMF, April 2008.

"*The global financial situation continues to be uncertain and unsettled. What started off as a sub-prime crisis in the US housing mortgage sector has turned successively into a global banking crisis, global financial crisis and now a global economic crisis."*
D. Subbarao
10 December 2008

Occurring during a period of strong world macroeconomic growth, low global inflation, accommodating monetary policy, a liquidity overhang, low interest rates and asset price inflation, ***the crisis***[1] appears to have surprised financiers and regulators alike.[2] It may be said that the turbulence was triggered by a sudden and widespread loss of confidence in securitization[3] and financial engineering,[4] and by a manifest failure of methods for assessing and pricing credit risk.

As the crisis unfolded, the world witnessed:

a. An unprecedented rate of default on AAA[5] instruments
b. Important financial institutions in the U.S. and U.K. affected
c. The first run on a U.K. bank (Northern Rock) in 150 years
d. An explicit extension of the U.S. safety net to cover major investment banks and two giant government-sponsored housing-finance enterprises (Fannie Mae and Freddie Mac).[6]

Reverberations quickly spread beyond the two financial-centre countries to other industrial countries including Australia, Ireland and Germany.

[1] The crisis or sub-prime crisis is being used as a generic term. It actually refers to a credit problem among sub-prime borrowers in the U.S. residential market. For definitions see Appendix 1.
[2] Caprio Jr. et al (2008)
[3] See Appendix 1for definitions/explanations of concepts and acronyms
[4] Ibid.
[5] Ibid.
[6] Ibid.

Thus, financial markets in the United States and some other industrialized countries have been under severe stress for more than a year.

The proximate cause of the financial turmoil was the steep increase and subsequent decline of house prices[7] in the United States, which, together with poor lending practices, have led to large losses on mortgages and mortgage-related instruments by a wide range of institutions.[8]

More fundamentally, the turmoil is the aftermath of a credit boom[9] characterized by under pricing of risk, excessive leverage[10], and an increasing reliance on complex and opaque financial instruments that have proved to be fragile under stress. A consequence of the unwinding of this boom and the resulting financial strains has been a broad-based tightening in credit conditions that has restrained economic growth.

The financial turmoil in the U.S. intensified in September-October 2008, as investors' confidence in banks and other financial institutions eroded and risk aversion increased. Conditions in the interbank lending market worsened, with term funding essentially unavailable. Withdrawals from prime money market mutual funds, which are important suppliers of credit to the commercial paper market, severely disrupted that market; and short-term credit, when available, became much more costly for virtually all firms. Households, and state and local governments also experienced a notable reduction in credit availability. Financial conditions deteriorated in other countries as well, putting severe pressure on both industrial and emerging-market economies.[11] As confidence in the financial markets declined and

[7] The current crisis has been explained in terms of the bursting of the housing bubble that had inflated to unprecedented levels since 2001.

[8] Caprio Jr. et al (2008)

[9] For too many years financial market participants were used to a macroeconomic environment with high global output growth, low inflation and very low interest rates. Macroeconomic policies led to global and domestic imbalances which became increasingly unsustainable with debt financed over-consumption in one region and high savings in other regions. An overall benign macroeconomic environment led to (i) a general carelessness or a tendency to under-price risks and (ii) to a search for yield which in turn accelerated financial innovation.

[10] See Appendix 1

[11] It is no wonder that various commentators have described the current crisis as a "systemic financial meltdown", a "financial tsunami", a "tipping point" in the world economy or even "the Very Great Depression" in the making.

concerns about the U.S. and global economies increased, equity prices have been volatile, falling sharply on net.[12]

It is commonly known that financial markets perform an indispensable task for economic well-being. They provide the services and products by which the intertemporal allocation of savings and investments is accomplished. As such, financial market stability is a precondition for macroeconomic stability and economic growth.

An efficient allocation of funds presupposes that the necessary flow of information between borrowers and lenders is sufficiently stable to overcome the inherent information asymmetries between both parties. Risks to financial stability, on the other hand, imply also risks to the real economy and to overall economic stability.

AAA, ABCP, ABS, CDO, CDS, SPV, SIV[13] – until just under a year ago, abbreviations that could only be found in the financial press, if at all. This has radically changed in the past year. What was previously only of little interest to 'outsiders' has thus moved into the limelight of public attention, within a very short time period.

What are the causes of the most recent tensions on financial markets? A cocktail of various ingredients triggered the shock waves for the financial system. A cocktail, whose individual ingredients when mixed proved to be a severe and ongoing stress test for the international financial system. The three main ingredients of this recipe are:

i. lending standards which have become more lax and less risk-oriented, especially in the real estate sector in the United States,

ii. weaknesses in credit risk transfer, especially in the originate-and-distribute model,[14] and

[12] Bernanke (2008)
[13] See Appendix 1
[14] In fact, one of the core lessons of the current financial turbulences is the failure of the "originate-and distribute" (under which loans are granted not with the objective of holding them till maturity but for securitizing them rapidly) business model. Until the sub-prime crisis, a number of experts argued that

iii. overly optimistic assessments of structured securities.

i. Lax lending standards

The notion of obtaining a real estate loan with almost no capital and with only a poor or no credit rating at all, is quite strange to us. In some countries, such mortgage loans, however, became a major feature of the real estate market in the two to three years preceding its peak.

ii. Weaknesses in credit risk transfer

The almost oblivious-to-risk approach of lending to debtors with a low credit rating was fuelled by two factors, previous house price increases and innovative financial instruments which permitted the credit risk to be passed on from the bank to yield-seeking non-bank investors. By securitizing and tranching, it appeared for a while to be possible to convert unstable individual loans to almost fail-safe securities. Some observers called this "financial chemistry"!

In principle, the possibility of transferring credit risks[15] increases the flexibility of financial market players and is an element of modern risk management.

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securitization had contributed to a stabilizing effect on the global financial system through diminishing the degree of risk on the banking sector by sharing it more widely.

Theoretically, this will be the case. But, excessive recourse to securitization in reality may create a lot of uncertainty and increase the opaqueness of the financial market.

Indeed, several financial institutions were unable to give us their real exposure to the sub-prime market. The still heterogeneous disclosure across firms raises doubts on the realism of the valuation provided by the industry. Many have to confess that *they did not understand the complexity of various financial products they use*. In addition, the impact of the US mortgage defaults has spread to other asset classes and across the global financial system. Investors did not know which parties were exposed and how big their exposures were! Uncertainty got settled and gave rise to both more market volatility as we have seen in recent months and to a sharp increase of investors' risk aversion.

[15] **Credit risk**: the risk of default is borne by the bank originating the loan. It is the risk of prospective default by a mortgage seeker. However, due to innovations in securitization, credit risk is now shared more broadly with investors. This is because the rights to these mortgage payments have been repackaged into a variety of complex investment securities, generally categorized as mortgage-backed securities (MBS) or collateralized debt obligations (CDO).

The other elements of risk are:

Asset price risk: This relates to the valuation of MBS, whether it will be able to overcome the credit risk or not. However, the valuation of MBS is subjective. These include a number of tests be satisfied on a periodic basis, such as tests of interest cash flows, collateral ratings, or market values. If the valuation falls below certain levels, the CDO may be required by its terms to sell collateral in a short period of time, often at a steep loss, much like a stock brokerage account margin call. If the risk is not legally contained within an SPE or otherwise, the entity owning the mortgage collateral may be forced to sell other types of assets, as well, to satisfy the terms of the deal.

Liquidity risk: This risk is on account of reduction of liquidity in the market due to the credit and asset price risk. Companies and SPE called structured investment vehicles (SIV) often obtain short-term loans by issuing commercial paper, pledging mortgage assets or CDO as collateral. Investors provide cash in exchange for the

However, the disruptions of the previous few months have highlighted major weaknesses in this process. It has become clear that the tradability and fairly broad dispersion of credit risks, in particular, can actually improve the resilience of the financial system only if a high quality standard is maintained at all levels of the transfer process and no new concentrations of risk arise. When transferring credit risks, one must always bear in mind that the transferred risks themselves do not vanish into thin air – they are merely elsewhere and the danger remains that they could resurface, possibly even in concentrated form. It was precisely such new concentrations of risk that led to the distress in the past few months threatening the existence of a number of financial institutions which were not themselves active players in the area of real estate lending.

iii. Overly optimistic assessment of structured securities

The previous months have shown dramatically the limited value of even professional ratings. The assumption held by many around a year ago that structured securities backed by mortgages provided a premium over government bonds at a similar (low) level of risk has since proven to be a gross misperception. The effects of the US subprime crisis meant that for a period, a general crisis of confidence spread among financial market participants. This crisis of confidence also restricted the distribution of liquidity on the interbank money market, and still continues to do so.

In a nutshell: New and complex instruments to transfer credit risks in combination with large banks engaging in an "originate and distribute" business model have amplified the consequences of the undeniable credit excesses in the US mortgage market. These new instruments exhibited several weaknesses that seriously hampered the efficient flow of information between originators and investors. In the end, the new instruments of credit risk transfer "distributed fear instead of risks" (Borio 2008). [16]

Taking a wider perspective one may say that the subprime mortgage defaults did not cause the financial crisis; they only acted as a trigger. The **financial**

commercial paper, receiving money-market interest rates. However, because of concerns regarding the value of MBS the ability of many companies to issue such paper is significantly affected leading to liquidity risk.

[16] Weber (2008)

crisis is fundamentally a consequence of three types of imbalances: wealth and income imbalance, current account imbalance, and financial sector imbalance that together with financial innovations, has dispersed and magnified risks for the whole financial system.

The financial tsunami has spread out worldwide affecting banks in Europe and Asia, though the latter are still relatively contained and healthy enough to withstand the problems. While the initial negative impact on liquidity in the money market system has been alleviated through massive liquidity injection by central banks, the problem may have escalated to one of insolvency.[17]

2. THE SUB-PRIME CRISIS: THE UNFOLDING

What happened in the financial markets may be summed up as the unfolding of events as follows:

1. Credit spreads reach record lows in the first half of 2007:

The combination of relatively low interest rates for a long period of time, the trend to lay off credit risk out of balance sheets and to securitize and an increasing focus on short-term returns led to a strong demand for credit risk, especially from non-bank investors. As a result credit spreads fell to all-time lows, leading to a mispricing of credit risks. Additionally, many investors relied greatly on credit rating agencies for the valuation of complex financial instruments and their use as collateral.

2. Strong economies and higher commodity prices were fuelling expectations of tighter monetary policy before the crisis started.

In the first half of the year 2007 the economic situation proved to be very robust. Most major central banks were normalizing interest rates. Strong demand for commodities put upward pressure on prices so that interest rates were rising in the first half of 2007.

3. Mortgage rate re-settings at higher interest rate levels caused delinquency rates to rise, most pronounced in the sub-prime mortgage market.

[17] An IMF Survey (IMF 2008d) has stated that the initial credit problem became a liquidity issue, then a solvency problem.

This led to losses in the hedge fund[18] sector and increasing difficulties in finding a fair value price for structured deals. Moreover, investment funds experienced difficulties in NAV[19] pricing, resulting in the temporary closures of some funds. Asset-backed securities with high credit ratings have proved not to be as sound, nor as liquid as they appeared. Some of those structured investment vehicles or conduits were extensively leveraged and strongly dependent on short-term funding. In the absence of liquidity, sponsoring banks had to fund off-balance-sheet vehicles from their own balance sheet. This led to de-leveraging[20] and forced asset sales.

4. Higher default rates caused the first bankruptcies in the US and credit spreads started to rise. Risk aversion spread to all asset classes.

Forced sales to cover margin requirements saw volatility rise sharply (VIX[21] doubled from 15 to 30 %). The unwinding of riskier positions caused stock markets to fall (Stoxx50[22] -11 %) and carry trades were liquidated. As markets fell, margin requirements rose further. The uncertainty about the pricing of some instruments added additional pressure.

5. As the credit crisis spread further short-term liquidity evaporated.

Short-term funding in the interbank market became unavailable, causing casualties amongst banks and funds. In Europe, IKB and Landesbank Sachsen were rescued from insolvency. Northern Rock followed later. Funding in the primary market was impossible for banks. Trading in the secondary market stopped, with the exception of government issues.

6. The effective shut-down of the refinancing pipeline left banks to rely on short-term funding from central banks.

Neither primary issues nor short-term papers, such as ABS or ABCP, could be placed in the market. Banks hoarded liquidity in order to be safe from unexpected outflows or the unknown extent of write-downs. Because the usual market refinancing possibilities were blocked banks relied on highly rated collateral

[18] See Appendix 1
[19] Ibid.
[20] See Appendix 1
[21] Ibid.
[22] Ibid.

for their funding and the liquidity provided by the central bank. The spread between EONIA and three-month Euribor[23] rose to the highest level ever at 70 bps[24] and has remained high. Unsecured trading in the money market beyond one week effectively ceased to exist.[25]

The aforementioned events can further be classified into four distinct phases.

Phase 1: *Emergence of market liquidity problems and decrease of investors' risk appetite*

From August 2007 until December 2007 the emergence of market liquidity problems and decrease of investors' risk appetite. Individual actions of central banks combined to coordinated liquidity operations since December 2007 to ease short term strains in money and interbank markets (i.e. short term market liquidity constraints) and contribute to diminishing the risk to financial stability of the downward market turbulences! Notwithstanding the improvement in conditions in short term money and banking markets, there are indications that funding markets continue to be a cause of concern for several banking groups.

Phase 2: *Emergence of problems closer to solvency issues.*

Given the magnitude of the sub-prime shock, the second phase relates to the emergence of problems closer to solvency issues. The impact was indeed less pronounced in the EU compared to the US, but, in some cases and without public interventions, as in Germany and the UK, a few banks would have been in serious trouble.

At a conference at Banque de France, Professor H. Rey of London Business School assigned the contagion from relatively small losses in the U.S. sub-prime market of a magnitude of USD 200 billion into a global financial turmoil to three major market dysfunctionalities:

a) the first one is due to the originate and distribute model;

b) the second one can be explained by a process referred to as the CDS vicious circle; and the third one

c) is attributed to mark to market asset valuation.

[23] Ibid.
[24] Ibid.
[25] Mersch (2007)

Phase 3: *Insurance companies and their monoline*[26] *financial guaranty activities*

Since December 2007, attention has been drawn to insurance companies and their monoline financial guaranty activities. The monoline insurers became the next potential victim of both sub-prime crisis and financial market turmoil. Until the recent turbulences, monoline insurers were very successful at avoiding losses and their business model exhibited a very high operating leverage with a fairly low capital base and reserve positions compared to the amount of insured risk. This common practice was allowed in the past, but has become a major source of concern at present. Extending their activities through insuring ABS structures coupled to current market conditions are putting pressure on their capital cushions. In addition, banks may exhibit numerous types of exposures to monoline insurers. In the case of materialization of these risks, banks are likely to face more provisioning or write-offs.

Phase 4: *Credit Default Swaps vicious circle*:

As for the CDS vicious circle some banks with no exposure to sub-prime saw a sharp rise of the spread of their traded CDS from 30 basis points in July 2007 to 700 basis points during the recent turbulences. This was mainly due to a pronounced increase of doubts and uncertainties. In this context, banks could not raise as much funds on the market as they needed because of both rising costs and fierce competition for collecting customer deposits. As a consequence, the balance sheets of banks deteriorated. The CDS spreads widened further and downgrading loans and intensified the negative impact on capital cost and balance sheets. Overall, the procyclical spiralling down of asset values stems from the implementation of the so called fair value accounting methodology. In distressed times, the mark-to-market valuation[27] is even worse for illiquid and/or senior asset classes with long maturities. The recent experience shows that this is typically the case for most of the assets hold by financial intermediaries, banks and insurers. The impact on banks' net worth has henceforth been more noticeable. This is due to falling mark to market investment values rather than to impaired credit quality or defaults.[28]

[26] See Appendix 1
[27] See Appendix 1
[28] Mersch (2008)

3. THE SUB-PRIME CRISIS: UNDERLYING FACTORS/TRENDS

At the base of the American sub-prime mortgage crisis are certain long term trends in the financial sector.[29]

First, the financial sector has experienced a tremendous amount of *technological and financial innovations*. For example, real-time gross settlement (RTGS) systems with electronic book-entries have become state-of-the-art. RTGS systems reduce credit risk exposure in settlement, whilst increasing the demand for intraday liquidity and collateral.

Financial innovation has also triggered a significant rise in the number of derivatives[30] (exotic credit derivatives such as CDS, SIV etc.) and the associated trading volume, including over-the-counter derivatives markets.

The dramatic rise of financial assets and derivatives all over the world is the result of these innovations. At the end of 2005, total financial assets stood at an astonishing level of 3.7 times the world GDP.[31] The notional amount of total derivatives was double than the volume of total financial assets, which means 11 times global GDP. Remember that only thirty years ago, financial derivatives did not exist.

There has been a growing weight of stocks and bonds as a percentage of total financial assets (therefore the decrease of loans by banks and other financial intermediaries). At the world level (and in the European Union), bank loans account for 50% of total financial assets, but in the US and Japan the ratio is much lower. In the US, only 1 dollar out of five is borrowed from a bank.

The decrease of government bonds (i.e. risk-free assets) in total debt securities. While the average ratio at the world level is 50%, in Europe is 35% and in North America 26%, with a downward trend.

[29] Tumpel-Gugerell (2008)
[30] See Appendix 1
[31] IMF (2007)

The last two points mean that households' portfolios are more and more made of securities bearing both market and credit risk.[32]

Second, financial globalization has become manifest in the amount of cross-border financial flows and cross-border banking. The increased global integration has strengthened the natural tendency towards concentrated provision of infrastructural services, a tendency that is further accentuated in the context of the European single market.

Third, the trend of *increased concentration* has not been limited to market infrastructures themselves. The emergence of key global players in banking has also led to increased internalization of payment flows in correspondent banks. Correspondent banks perform payment and custody services for other banks and have in some cases reached a similar size to some national payment systems. Thus, correspondent banking begins to blur the distinction between intermediaries and infrastructure providers. The networks of interoperable systems can also be seen as intermediate steps towards concentration or as alternatives.

All these developments have contributed to lower financing costs, new investment and business opportunities, and general welfare gains for all citizens. At the same time, these trends have increased the relevance of market infrastructures and pose considerable challenges for liquidity managers and central bankers, at all their time horizons.

4. THE SUB-PRIME CRISIS: THE CAUSES IN SUM

Reams of paper, several thousand bytes in the media and endless analyses have been dedicated towards discovering 'the cause/s' behind the subprime crisis. At the base of it all is excessive leverage, particularly with respect to

[32] These are the ingredients of the magic of financial innovation of the last decades: in a nutshell, banks created an astonishing volume of debt, packaged it into various kinds of securities, with different degrees of guarantees. These securities have been purchased by a wide range of smaller banks, pension funds, insurance companies, hedge funds, other funds and even individuals, who have been encouraged to invest by the generally high ratings given to these instruments. According to an important school of thought, this "arm-length" financing is the most efficient to allocate resources. Others can recall Dickens who many years ago defined credit as a system "whereby a person who cannot pay gets another person who cannot pay to guarantee that he can pay"!!

subprime mortgages and the securities based on them. We can identify four causal factors:

First, excess liquidity that resulted in asset bubbles, particularly in housing and mortgage-based securities. These asset bubbles encouraged speculators to borrow, while the (rising) asset value of collateral comforted the lenders.

Second, there were clear gaps in regulatory and accounting standards regarding the treatment of "off-balance sheet" financial vehicles and lending practices.

Third is the key role rating agencies have played in the securitization process. Normally banks assess credit and retain it as private information. But to sell these credits into the capital markets requires external ratings to allow investors to assess the risk-return profiles of these assets. The now well-known transformation of riskier securities into vehicles with prime and triple-A ratings greatly smoothed the way for the boom in a whole range of structured products, like collateralized debt obligations, asset-backed commercial paper conduits and so on.

Fourth, notwithstanding all of this, there were notable failures in the corporate governance of financial intermediaries. Some banks stayed clear of these high risk products, and some managed to reduce their exposures significantly prior to the crisis, but others rushed headlong into major exposures, lured by fast profits and fees.[33]

In sum,[34] the underlying problem that triggered the crisis was that the credit losses in the financial sector turned out to be much larger than anticipated. *However, as the crisis has evolved over the last one and half years, the problems have come to be less about credit risks and more about the adverse consequences of a global financial industry experiencing a quite substantial deleveraging process.*

[33] Blundell-Wignall (2008)

[34] For a slightly different point of view see Snooks (2008). An opinion about the cause of the crisis, that states that economists have failed to develop a realist general dynamic theory of human society to analyze financial crises and economic downturns. To the degree that the real global economy is in trouble, it is due not to financial mismanagement, but to the misconceived policy of inflation targeting pursued for the past decade or so. Once again, our compulsion to intervene exceeds our capacity to understand the implications of our actions.

The huge credit expansion and financial asset growth that preceded the crisis was facilitated by that many financial institutions were assuming high levels of debt, in many cases obviously at unsustainable levels. These institutions are now trying to decrease their leverage either by injecting more capital – or if that is not possible – by shrinking in size.

To shrink institutions simply must sell off assets. This is currently being done on a huge scale by institutions all over the world and explains why financial markets are so strained at the moment. On the supply side there are a lot of sellers trying to get rid of assets, but on the demand side – due to low credit supply and high risk aversion – there are hardly any buyers. As a result, pricing is disrupted and liquidity drastically decreased, which in turn implies falling asset values and further losses in the financial industry.

The fact that the problems to a large extent have been driven by financial markets breaking down, rather than by individual institutions credit risk exposures, explains the unprecedented international impact of the crisis. Globally interconnected markets have resulted in a situation in which financial institutions everywhere have been hit, even if not exposed to the institutions or assets at the core of the crisis.[35]

5. THE SUB-PRIME CRISIS: THE IMPACT

As is commonly known the crisis took policy makers by surprise. In Spring 2007, there was only mild concern about the risk of a storm As incredulous as it may seem, Chairman Ben Bernanke announced in June 2007 that the crisis in the subprime sector, "seem(s) unlikely to seriously spill over to the broader economy or the financial system." [36]

The impact of the turbulence may be considered in terms of the impact on the real economy as well as the impact on state of art economic thinking!

[35] Nyberg (2008)
[36] Bernanke (2007a)

5.1 The Sub-Prime Crisis: The Impact of Turbulences on the Real Economy

"The financial market crisis that erupted in August 2007 has developed into the largest financial shock since the Great Depression, inflicting heavy damage on markets and institutions at the core of the financial system."
International Monetary Fund,
World Economic Outlook,
April 2008

"The financial crisis is beginning to have serious effects on the real economy, … the extent of that is not, in my opinion, yet fully recognized."
George Soros,
Reuters (New York),
9 April 2008

It is obvious that these are very turbulent and uncertain times for the global economy. The world economy is entering a major slowdown, driven by the worst financial crisis in 75 years.[37]

The impact of turbulences on the real economy is increasingly the current focus of attention. Economic literature reveals that financial turbulences involving the banking or financial sectors may lead to disruptions in the real economy.[38] The damage is usually both in terms of direct fiscal costs relating mainly to managing the crisis and loss of economic activity. Uncertainty stemming from this situation gave rise to the risk of a domino effect, affecting one financial institution after the next. Fears that this effect could be fuelled by price manipulations and speculation resulted in a restriction of short selling, first in the United States and then in many other countries including France, the United Kingdom, Belgium, the Netherlands, Italy, Germany, Austria and Australia.[39]

The global economy is in a major slowdown, and there is a risk that it could turn into an outright downturn. Global growth is slowing sharply. In the first half of 2008 growth had slowed to 3½ percent (annualized), down from the 5 percent annual pace sustained over the four previous years.[40] The fallout from the current financial crisis is expected to be without precedent, at least in monetary terms.

[37] Lipsky (2008)
[38] Mersch (2008)
[39] Whalen (2008)
[40] Lipsky (2008)

5.1.1 The Sub-Prime Crisis: The Impact of Turbulences on the Real Economy

The Advanced Economies – A macro view

Advanced economies were contracting at end-2008. Advanced economy growth slowed to a standstill during this year's first half. Momentum subsequently has been falling, with leading indicators already dropping to levels last seen during 2001-2002. Indeed, the U.S. economy has slowed sharply and recession risks are looming, while activity in the euro area and Japan had weakened earlier.[41]

The IMF estimates that expected losses and write downs on US assets could total $945 billion -- bigger than the entire GDP of Australia -- making it the most expensive financial crisis in history.[42] Even so, some analysts believe this is an understatement.[43]

The IMF has warned that the US economy may shrink by 0.7% over the 1-year period ending the fourth quarter of 2008, despite aggressive rate cuts by the Federal Reserve and a fiscal stimulus package. Recovery would be slight in 2009 with growth expected to be only 1.6%. These estimates have been revised downwards several times and may still prove to be overstated as the crisis unfolds.[44]

As the US falls into recession, the rest of the global economy[45] is being sucked downwards with it. The collapse of credit instruments originating in the U.S. is also weakening the financial balance sheets of banks and other overseas holders of these investments, affecting not just the banking sector but also major stock markets abroad. Hence the U.S. has exported a credit crunch overseas and pushed the entire global economy towards recession.[46]

The IMF has estimated that the euro zone's growth will fall to just 0.9% between the fourth quarter of 2007 and the fourth quarter of 2008. Japan's growth

[41] Ibid.
[42] Quintos (2008a)
[43] The rescue package may actually amount to $9 trillion!
[44] Ibid.
[45] As of mid-November 2008 banking systems in the following countries have put in bank system rescue plans Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States (Fender and Gyntelberg 2008)
[46] Quintos (2008b)

would slow down to 1.4% this year and 1.5% next year, while Canada's growth would fall back to 1.3% this year and pick up slightly to 1.9% next year. On the whole, "the IMF staff now sees a 25% chance of growth slowing to 3% or less in 2008 and 2009, equivalent to a global recession."[47]

The International Labour Organization has warned that the global economic slowdown in 2008 will add at least 5 million workers to the ranks of the unemployed worldwide, raising the global unemployment rate to 6.1%. This is based on a more optimistic scenario of 4.8% growth in global GDP, which has since been revised downwards by the IMF. A deeper recession would add millions more to the 189.9 million unemployed as of 2007[48] across US, Europe and even in the emerging economies it is the temporary staff that is and will bear the brunt of job cuts.

5.1.2 The Sub-Prime Crisis: The Impact of Turbulences on the Real Economy

The Advanced Economies – A Micro (sector specific) View[49]

1. *Housing*: As is widely recognized, the underlying loci of global economic weakness stems from asset price deflation - especially in housing and other real estate markets.

Housing-related conditions are weak -- and weakening -- in the United States and several other advanced economies**.** In the United States, housing activity and prices continue to decline, though the inventory overhang is beginning to moderate. At the same time, however, foreclosures continue to rise, amid a weakening labour market. Rather than finding a floor, as we expect will occur in 2009, there is a risk of deeper and more prolonged housing correction in the U.S. In Europe, the housing correction began later and may have some ways to go. Of course, asset values in many emerging market economies increased in recent years at a faster pace even than in advanced economies, creating obvious risks.

It is worth noting that housing prices are generally lagging indicators, suggesting that the bottom in the U.S. housing market probably lies in 2009. No

[47] IMF (2008c)
[48] Quintos (2008a)
[49] This and the following sub-sections draw on Lipsky (2008), Whalen (2008) and articles in the Financial Times from www.FT.com

amount of Fed interest rate ease can change that fact that reviving the housing market means that affordability must be restore to home valuations; that is, prices must fall substantially in many markets.

2. *Financial Markets- the collapse of internationally reputed institutions*[50] *and the meltdown of stock markets*: Not surprisingly, asset price deflation has been hard on financial markets, creating concentric circles of crisis that have propagated globally at a pace that by and large has taken market participants and policymakers by surprise. The bankruptcy of the investment bank Lehman Brothers (with $639 billion in assets- the biggest bank failure in U.S. history) on 15 September 2008 marked a crucial turning point – it took the financial markets from a period of turmoil to a major crisis. That has resulted in a breakdown of trust in inter-bank and inter-institutional lending.

Moreover, financial flows are moderating. Pressure on banks in advanced economies-including even those receiving public capital injections and therefore subject to taxpayer oversight-could curtail lending in foreign markets; banks and firms in emerging economies that rely on global wholesale funding markets appear to be facing significant distress and rollover risks; hedge funds and other institutional investors under pressure to unwind positions as a result of tighter financing constraints and redemptions are undermining market liquidity and asset prices more broadly.

3. *Credit Crunch – freezing of the money markets and the increase in credit spreads*: One reason the economic slowdown could get worse is that banks and other lenders are cutting back on how much credit they will make available, insisting on bigger deposits for house purchase, and looking more closely at applications for personal loans. The problem is one of diminished supply of credit primarily due to a lack of confidence in the financial system. And the evaporation of the trust between agents because of uncertainty about exposure to mortgage related assets. The inability of firms to raise capital in the commercial paper market similarly

[50] These include the Lehman Brothers (Investment bank), Freddie Mac and Fannie Mae (Mortgage Govt. Sponsored enterprise), AIG, Merrill Lynch (Investment bank), Bear Stearns (Investment bank), Wachova Group, Goldman Sachs, Northern Rock, Barclays Capital (Investment bank), Deutsche Bank(Bank), Citigroup(Investment bank), HSBC(Bank), UBS AG(Investment bank), Morgan Stanley(Investment bank) and many many more.

reflects an unwillingness of banks and the public to supply finance to firms that were believed to be exposed to toxic assets.

4. *The Banking Industry*: The immediate effect has been that the sub-prime crisis has affected volume and income while limiting ALM[51] options. Net effect is large reduction in credit available.

The long-term effect will be that loan origination will imply retention of the asset as default option. Banks will have limited funding and revenue options. The earnings reported by major banks are adversely affected by defaults on mortgages they issue and retain. Companies value their mortgage assets (receivables) based on estimates of collections from homeowners. Companies record expenses in the current period to adjust this valuation, increasing their bad debt reserves and reducing earnings. Rapid or unexpected changes in mortgage asset valuation can lead to volatility in earnings and stock prices. Besides, the ability of lenders to predict future collections is a complex task subject to a multitude of variables.

5. *Mark-to-Market losses of mortgages - Mortgage Lenders and Real Estate Investment Trusts* face similar risks to banks. In addition, they have business models with significant reliance on the ability to regularly secure new financing through CDO or commercial paper issuance secured by mortgages. Investors have become reluctant to fund such investments and are demanding higher interest rates. Such lenders are at increased risk of significant reductions in book value due to asset sales at unfavorable prices and several have filed bankruptcy.

The mortgage market has been particularly badly affected, with individuals finding it very difficult to get non-traditional mortgages, both sub-prime and "jumbo" (over the limit guaranteed by government-sponsored agencies). The banks have been forced to do this by the drying up of the wholesale bond markets and by the effect of the crisis on their own balance sheets.

6. *Special Purpose Entities (SPE)*: Like corporations, SPE are required to revalue their mortgage assets based on estimates of collection of mortgage

[51] See Appendix 1

payments. If this valuation falls below a certain level, or if cash flow falls below contractual levels, investors may have immediate rights to the mortgage asset collateral. This can also cause the rapid sale of assets at unfavorable prices. Other SPE called structured investment vehicles (SIV) issue commercial paper and use the proceeds to purchase securitized assets such as CDO. These entities have been affected by mortgage asset devaluation. Several major SIV are associated with large banks.

Other effects include:

6. *Investors and Risk Preference:* The subprime crisis has changed investor and lender preferences dramatically. Structured assets of all ratings grades are being shunned in favor of simpler cash securities. Also a sharp decrease in leverage used by all market participants. The stocks or bonds of the entities above are affected by the lower earnings and uncertainty regarding the valuation of mortgage assets and related payment collection.

8. *Litigation*: The subprime crisis has made lenders and their advisers extremely vulnerable to a number of different types of claims. Borrowers are bringing claims against lenders for in loan suitability rules. End-investors are likewise suing lenders, dealers and rating agencies for fraud, and KYC suitability of complex structured assets.

9. *Low carbon technologies*: another casualty of the financial crisis is the investment in low carbon technologies which is suffering its first reversal after several years of record growth. Worldwide investment in energy companies and new clean energy capacity fell sharply in the 3rd quarter of 2008 compared with the previous quarter according to the new Energy finance, a market analyst company.

10. In November 2008, the growing credit crisis has claimed more victims with AIG, Fannie Mae reporting huge losses (and getting huge government bail-outs). MNCs such as Nortel and DHL are cutting `1000's of jobs.

11. Another victim of the sub-prime crisis has been higher education with endowment funds of major Ivy League institutions such as Harvard taking a blow.

5.1.3 The Sub-Prime Crisis: The Impact of Turbulences on the Real Economy

The Emerging Market Economies and Developing Economies

According to the World Bank President R. B. Zoellick, the ground for the financial crisis (which seemed to come out of the blue!) was laid by financial sector privatization, liberalization and deregulation all of which started in the advanced countries and has spread to the developing world. The latter installed financial practices, instruments, institutions and imbalances that that have triggered the current financial crisis.

It may thus be said that the current crisis was shaped in the U.S. by its unique complex financing structures – structures generally not found in emerging countries. But emerging countries in Latin America, Asia and Europe have been hit by the drying up of credit, reduced remittances, and lower export demand. The poorest of the world were also recently hit by a food and fuel shock. The consequent financial and fiscal shock may carry severe consequences.[52]

In the midst of all this, counterparty risks[53] are emerging starkly in the international financial markets and the volatility of price variables such as share prices and exchange rates has grown greatly. A severe credit crunch has thus erupted in response to credit risk reappraisal and the ongoing deleveraging by financial institutions. In consequence, emerging countries now face difficulties in securing foreign currency liquidity, as they are perceived to have relatively higher credit risk. Emerging economies, which had for some time seemingly decoupled[54] from the advanced ones, are now also showing signs of slowdown.[55]

Emerging market (EM) countries have not been at the forefront of the crisis, but emerging and developing economies are feeling the impact of the global financial crisis, with their money, exchange and equity markets being affected, their growth is decelerating rapidly. In particular, intensified financial deleveraging is having a global reach, including to emerging economies**.** The confluence of a decline in external demand, receding commodities prices, and a sharp moderation in capital

[52] Klein (2008)
[53] See Appendix 1
[54] Ibid.
[55] Lee (2008)

flows is likely to dampen activity notably in the coming quarters. More intense capital account pressures, in turn, could seriously harm growth in these economies.

According to the World Bank President Zoellick, global trade is projected to contract for the first time since 1982 while developing countries growth which had been expected to reach 6.45% in 2009 is now projected to be 4.5%. The World Bank estimates that with each percentage point decline in developing country growth rates pushes an additional 20 million people into poverty.[56]

Given that the financial crisis has spread rapidly to emerging economies; and the IMF has moved swiftly from talk about "decoupling" to a situation where these economies are at substantial risk. Emerging markets -as an asset class- are coming under increasing strains. According to Lipsky,[57] emerging equity markets already have absorbed greater losses than mature markets, reflecting investors' flight to safety in the face of high uncertainty and risk aversion. Anticipating a significant growth slowdown, emerging equity markets have declined around 50 percent year-to-date. This can, in turn, affect consumption and investment in emerging markets, although such macro financial linkages are found to be small and they tend to play out gradually.

5.1.4 The Sub-Prime Crisis: The Impact of Turbulences on the Real Economy

The Emerging Market Economies-Asia-The Macro View

One might identify two major forces playing out at the moment and their effect on emerging markets – the problems of financial institutions and the recessionary forces that have now spread across the world.

First, in recent months stock markets in emerging markets have fallen drastically and second, currencies have depreciated significantly. Though, the exchange rate of smaller economies with less developed financial markets have hardly budged.

However, emerging market economies which did not have direct or significant exposure to stressed financial instruments and institutions are

[56] Dombey (2008)
[57] Lipsky (2008)

experiencing the indirect impact of the financial crisis which is neither insignificant nor trivial and could intensify in the future.

South Asian countries have been experiencing macroeconomic problems during the past year: inflation in Sri Lanka is over 17%, in Bangladesh 11%; Pakistan's current account deficit is at 5% of GDP; the Maldives' fiscal deficit is likely to be about 12% of GDP; and the Indian economy showed signs of overheating in mid-2007, with inflation rising above 6%. Although the rate has come down since then, capital flows remain buoyant, posing challenges for macroeconomic management. India's trade deficit is forecast to be 8% of GDP.[58]

It is generally expected that bank-related flows would decline in view of the losses many international banks are incurring.

Western banks that have entered emerging markets are concerned on two counts:

i) That economic growth will stall with a consequent effect on earnings and

ii) High levels of indebtedness, ballooning national deficits and fragile currencies could conspire to weaken financial stability particularly in East Europe.[59]

It is quite likely that investors will start differentiating among countries to a much greater extent than has been the case in recent years. However, large stocks of reserves, even a generalized exit from emerging markets would not create serious payments difficulties for most Asian countries, and the impact would be felt primarily in domestic credit and asset markets. Such an exit could be triggered by a widespread flight toward quality, with investors taking refuge in the safety of government bonds in advanced countries,[60] or a need to liquidate their holdings in emerging markets in order to cover mounting losses and margin calls. In other words, the region may be susceptible to common adverse external financial shocks, quite independent of specific circumstances prevailing in individual countries.[61]

Interestingly, the decoupling debate is often carried out in terms of linkages between trade and growth; that is, how the trade between Asia and the

[58] Devarajan (2008)
[59] Gwinner and Sanders(2008)
[60] Note the increasing $ price.
[61] Akyuz (2008)

United States would be affected and what impact this would have on growth in Asia. These are contentious issues, but the weight of arguments leans towards the view that trade linkages would not result in a major adverse impact on growth in Asia, even allowing for a high degree of dependence on the United States market.

This line of thinking clearly focuses on the impact of exports on aggregate demand, rather than on the foreign exchange constraint. It is implicitly assumed that the countries affected can continue to maintain growth of imports despite reduced export earnings. This would pose no major problem for those running large current account surpluses such as China, Malaysia and Singapore. Others with deficits, such as India, however, would need to rely increasingly on capital inflows and/or draw on their reserves in order to finance the widening gap between imports and exports.

A recession in the U.S. will have only a mild effect on South Asia because the U.S.'s share in the subcontinent's trade has been declining. China has replaced the U.S. as India's largest supplier of imports. Sri Lanka is shifting its garment exports to Europe. Analysis by the Hong Kong and Shanghai Bank estimates that a one percentage point drop in U.S. economic growth will translate to a 0.2 percentage fall in India's growth. So even in the worst case of a major recession in the U.S. (a 5 percentage point drop in GDP growth, say), the effect on India will be of the order of one percentage point which, from a base of 8% growth, is not devastating. Finally, a recession in the U.S. may slow the increase in oil and other commodity prices, which would have a favorable effect on South Asian countries, all of whom are net importers.

This simple conclusion is complicated by a number of factors.

First, the impact of a slowdown in the United States also depends on how Asian export markets elsewhere are affected. The effect on growth in Europe can be significant because of its direct exposure to the subprime crisis. Indeed, growth in the European Union is already falling below the levels of earlier projections. Since exports to the European Union are about 7% of GDP in China and even more in other Asian emerging markets, a sharp slowdown in Europe could

have a relatively large impact. The Asian trade balance with the European Union could deteriorate even further if currencies in the region start rising against the euro.

Second, for some countries indirect exposure to a decline in growth of exports to the United States can be just as important because of relatively strong intra-regional, intra-industry trade linkages. More than two-thirds of Chinese imports consist of intermediate goods, and about a third of these are provided within the region, notably by Korea and Taiwan which individually account for around 10% of total imports by China. This means that a decline in Chinese exports to the United States would bring about a corresponding decline in imports of intermediate goods from the region. Thus countries exporting these goods to China would be affected by cuts not only in their direct exports to the United States, but also in their indirect exports through China. In these countries cuts in exports of intermediate goods to China would not entail an important offsetting decline in imports. Consequently, they could be affected even more than China by import cuts in the United States even when their direct exports to the United States are relatively small. For instance it has been estimated that a 10% slowdown in United States imports would reduce China's exports by 2.1% and Korea's exports by 1.5%. The consequent drop in China's imports from Korea would lower exports of that country by another 1.3%. Thus, Korea might be more vulnerable to a United States slowdown not only because its exports have higher value added, but also because it is indirectly exposed through exports to China. This is likely to be true for Taiwan as well.

Finally, domestic components of aggregate demand are not independent of exports. This is particularly true for investment. A deceleration in exports can lead to sharp drop in investment designed to cater for foreign markets, which can, in turn, aggravate the impact of contraction in exports on aggregate demand. This effect can be particularly strong in China where investment is a large component of aggregate demand and an important part of investment is linked to exports. This includes Greenfield FDI[62] which has been channelled to export sectors through various restrictions and incentives, including tax rebates and foreign-exchange balancing requirements as part of an aggressive export strategy (Yu

[62] See Appendix 1

2007). The likelihood of a large drop in investment would be greater if contraction in export markets is accompanied by currency appreciations and asset price declines.

5.1.5 The Sub-Prime Crisis: The Impact of Turbulences on the Real Economy

The Emerging Market Economies-Asia-Specific Concerns

1. *Instability of capital flows*: Under current strained global financial conditions, the risk of sudden interruptions (or reversals) in capital flows has risen appreciably. Countries with large external financing needs and highly leveraged financial systems face more intense strains in both credit and equity markets. This underscores their more limited room for maneuver in dealing with spillovers from financial and economic stress in advanced economies. Especially vulnerable in this regard are countries where households have contracted large foreign currency denominated loans.

The conclusion reached is that while most Asian countries have successfully avoided unsustainable currency appreciations and payments positions, and accumulated more than adequate international reserves to counter any potential current and capital account shocks without recourse to multilateral financial institutions, they have not always been able to prevent capital inflows from generating asset, credit and investment bubbles or maturity and currency mismatches in private balance sheets. This is in large part because they have been unwilling to impose sufficiently tight controls over capital inflows, even when they posed dilemmas in macroeconomic policy and generated fragility. These now expose them to certain risks, but not of the kind that devastated the region in the 1990s.

What matters for vulnerability to instability in capital flows is not simply currency denomination and maturity but also liquidity of liabilities. A run by non-residents away from domestic equity and bond markets could create significant turbulence in currency and asset markets with broader macroeconomic consequences, even though declines in asset prices could mitigate the pressure on the exchange rate, and losses from asset price declines and currency collapses fall on foreign investors. This potential source of instability naturally depends on the

relative importance of foreign participation in local financial markets.[63] Extensive foreign participation not only increases market volatility, but also raises exposure to adverse spillovers and contagion from financial instability abroad. That such exposure has been on the rise is suggested by increased correlation between global and emerging-market equity returns since 2004.

There is also strong evidence that the entry and exit of foreigners to Asian equity markets are subject to a bandwagon effect - that is, foreign investors tend to move in and out of several Asian markets simultaneously - suggesting strong contagious influences across the region. Although equity inflows into this group of countries appear to have been driven not so much by gains from anticipated currency appreciations as by local market returns, they have put a strong upward pressure on exchange rates.

Further, funds undertake a manoeuvre called flight to safety. This is where developing economies like India get hurt. India, and such economies classified as emerging markets, are still seen by developed country fund managers as risky propositions. So the flight to safety means that some funds pull out of countries like India. This could lead to a stock markets slide in these economies, loss of confidence and slowdown of the real economy. This is one source of disruption.

2. Housing and Equity Markets: Recent booms in housing and equity markets in Asia are a source of concern because of their potential adverse macroeconomic consequences. Ample liquidity, low equity costs and loan rates together have made a strong impact on investment spending, occasionally pushing it to levels that may not be sustained over the longer term. While major Asian emerging markets have not been able to prevent capital inflows from leading to asset and investment bubbles.

The crisis has raised questions in the minds of many as to the wisdom of extending mortgage lending to low and moderate income households in emerging economies where mortgage finance is a luxury good, restricted to upper income households. However, it is important to note, that prior to the growth of subprime

[63] Equity flows have been particularly strong in China and, more recently, India. But in the latter country much of these are in portfolio equity rather than FDI.

lending in the 1990s, U.S. mortgage markets already reached low and moderate-income households without taking large risks or suffering large losses.[64]

3. *Banking Industry*: Banks from the underdeveloped countries have less exposure to sub-prime loans and the housing market bust in the US. It is generally expected that bank-related flows would decline in view of the losses many international banks are now incurring. India in particular had very little exposure to mortgage securities. Even if there is a global credit crunch, there is a fair amount of liquidity in the domestic economy. However, there could also result widespread bank consolidation as weaker players go under or get nationalized.

4. *Capital Market Development*: The sub-prime crisis will have a negative impact on capital market development in emerging economies. In part because foreign investors from the U.S. and Europe who are playing significant roles in merging market development are likely to retreat.

5. *Stock Markets*: Asian economies do not appear to have large direct exposure to securitized assets linked to subprime lending, even though some losses have been reported in the region. The impact of the financial turmoil is likely to be transmitted through changes in the risk appetite and capital flows, in conditions of bubbles in domestic credit and asset markets in the larger economies of the region. The question of sustainability of these bubbles had been raised before the subprime turmoil, and they have now become even more fragile.

There is considerable uncertainty about the impact of the crisis on asset markets and capital flows in emerging markets as financial markets have shown signs of both decoupling[65] and recoupling in recent months. However, large drops in western equity markets caused by occasional bad news about financial losses have often been mirrored by similar changes in Asian markets seen as changes in the Sensex, the Kospi etc. Should such difficulties continue unabated, the likelihood of a sharp and durable correction in Asian markets is quite high. By itself this may not lower growth by more than a couple of percentage points in China and India, and should not pose a serious problem since the recent pace of growth in

[64] Gwinner and Sanders (2008)
[65] See Appendix 1.

these countries is generally viewed as unsustainable. However, if combined with a sudden stop and reversal of capital flows and/or contraction of export markets, the impact on growth can be much more serious.

As financial instruments and stock markets become less attractive to financial investors, speculative capital shifts more into commodities trading such as oil, minerals and agricultural commodities. This is contributing to the precipitous rise in food and energy prices beyond what conditions in the real economy warrant, thereby rapidly eroding the real incomes of the vast majority especially in the third world. Food accounts for 30-40% or more of the consumer expenditure.

6. *Inflation*: In mid-2008, the Economist estimated that two-thirds of the world's population suffers double-digit rates of inflation. This is pushing millions of people deeper in poverty. In the Philippines, for instance, the Asian Development Bank estimates that "for every 10% increase in food prices, about 2.3 million more fall into poverty." They will be joining nearly three billion people — half the world's population -- who are living on less than two dollars a day. Thus, what began as a sub-prime crisis in the US housing market in 2006 exploded into a global financial crisis in 2007 and is now giving rise to the spectre of global stagflation -- that dreaded combination of no growth and high inflation of the 1970s.

7. *Aid and Poverty Alleviation*: *Foreign aid and the initiative to lower poverty.* Two things need to happen for the crisis to lead to a significant reduction in foreign aid. First, the financial crisis has to lead to a major recession in donor countries. Second, the recession leads to such fiscal constraints that foreign aid is cut. According to the World Bank attitudes toward aid are influenced by religiosity, beliefs about the causes of poverty, awareness of international affairs, and trust in people and institutions. [66]

8. C*onstruction-led Growth*: The other source of disruption is construction-led slowdown in the US. This could hit developing economies that export a lot to the US. Around 40% of Chinese exports, for example, go to the US.

[66] World Bank (2008)

About 22% of Indian goods exports go to the US and a significantly larger share of India's service exports.

8. *Microfinance*: Professor Yunus has suggested that microfinance is the "sub-sub-subprime" market, and the securitization of microfinance debt has helped draw investment capital to the sector. In that context it is possible that micro-finance could be one of the casualties of the turbulence.

5.1.6 The Sub-Prime Crisis: The Impact of Turbulences on the Real Economy

The Emerging Market Economies-India-Specific Concerns

As indicated by the RBI India's fundamentals are not heading towards a recession though growth will slow down to 6% per annum. Even so, India is experiencing the knock-on effects of the global crisis, through the monetary, financial and real channels. The macro effects have so far been muted due to the overall strength of domestic demand, the healthy balance sheets[67] of the Indian corporate sector, and the predominant domestic financing of investment.[68],[69]

1. *Financial – Money, Credit and Forex - Markets*: The money and credit markets in India have so far remained relatively insulated from the international financial market developments. The Indian banking system is not directly exposed to the U.S. mortgage market or to the failed institutions or stressed assets.[70] There are thus no systemic implications either in terms of solvency or liquidity.

Our financial markets – equity, money, forex, and credit markets – have all come under pressure mainly because of what we have begun to call "the substitution effect". As credit lines and credit channels overseas dried up, some of the credit demand met earlier by overseas financing is shifting to the domestic credit sector, putting pressure on domestic resources. This reduces supply of non-bank (bonds and equity) has led to the sharp increase in the demand for bank credit which

[67] The Business Standard reported that India's top 20 business houses have seen 65% value (market capitalization) erosion in 2008. (31 December 2008)
[68] Subbarao (2008b)
[69] Mohan (2008)
[70] Subbarao (2008b)

has probably been squeezed due to crowding out with banks lending to the government to finance the loses of oil companies.

The reversal of capital flows taking place as part of the global de-leveraging process has put pressure on our forex markets. Together, the global credit crunch and de-leveraging were reflected at home in the sharp fluctuation in the overnight money market rates in October 2008 and the depreciation of the rupee.

Although the equity market in India has been impacted by global uncertainties and the trends in equity markets in advanced and other EMEs, the overall conditions in financial markets have, by and large, remained orderly.[71]

It seems that the direct effects of subprime on the Indian markets will be limited. Consider:

(i) The collateral dimension, if there is any. Collateral damage can come in two forms; one is through a generalized slowdown in the global economy, more specifically in the US. If the US slows down, then the decoupling for emerging markets cannot be too far away. We are already facing a slowdown in the Indian economy as the GDP growth rate has declined to 7.9% by August 2008.

(ii) The other channel is typically through our greater financial integration across the world. Capital market integration means that if there is a liquidity crisis coming out of the sub-prime crisis, then that can affect us in some fashion. The liquidity crisis in the foreign market is reflected in the Indian markets as the FII's inflows have started drying up. Reduced investor interest in emerging economies could impact capital flows substantially.

(iii) In India, the adverse effects have so far been mainly in the equity markets, because of the reversal of portfolio equity flows and the concomitant effects on the domestic forex market and liquidity conditions.

2. *Real Estate:* There was a certain amount of FDI investments by Merrill Lynch in various India companies which would have a major effect on their future operations. Among them are two major real estate firms of India- 'DLF' &

[71] RBI (2008)

'Unitech'. The net investments by Merrill Lynch which was wiped out turned out to be about $400 million.

3. *Trade*: The good part of the story is that unlike China, which had an export oriented economy, the Indian economy was based on the domestic market. The India's trade theory is changing a lot as it is turning out to be more of a manufacturing export oriented country. The net trade of services done by India accounts to about just 22% just reflecting the risk on trade services is tried to be minimized. Also in the current scenario the trade of India with US has decreased and on the other hand has relatively increased with China reflecting out that the risk of US recession has been deflected. *On 10 November 2008 a report in the press stated that Indian exports will decline[72] by 15% for the first time in 5 years.*

4. *IT Industry*: As the crisis widens in the US, the companies, including outsourcing units and IT entities that heavily depend on their overseas clients for getting their revenues, may get affected in days to come. US-based companies, having their back-office operations in India, will be compelled to lower their budget, which will further have a cascading impact on Indian companies. These IT companies will be affected in the short term and so also their revenues in their future quarter results. Indian IT employees mainly outsourced to US by various companies will be reduced. The growth in the employment in the IT sector in the year 2008 was 44 % up till August 2008. It may drop to about 28% net growth for this financial year.[73]

5. *Exchange Rate*: As the U.S. economy slows down the US dollar is suppose to get weaker which it has started when compared to pound and has beaten a seven year record but not when compared with the Indian Rupee, which has turned up weak. Much more weakening of Indian Rupee beyond Rs 48 would lead RBI to take some monetary measures to support Indian Economy.

6. *Banking:* The Indian Banking Industry is not well known in the foreign market specially and there are no big players of India among the top world banks where as other developing countries like China has few banks among the top

[72] Not surprising since slowing worldwide growth has curtailed intraregional and extra regional exports, a main driver of economic activity in many Asian countries. (Subramanian 2008)
[73] Parekh (2008)

World Bank list. This gives a green signal to Indian banks like SBI which are not much affected to the subprime crisis and thus can readily expand their services in the international markets.

7. *Corporate Sector and Growth*: Indian corporations could face higher costs of borrowing through this channel due to increasing credit market spreads. Firms would have to tap into the domestic credit market as an alternative, thereby exerting upward pressure on domestic borrowing costs. This could whittle down the economic growth rate.

In sum, major sectors in India that would be affected out to a certain extent due to the current crisis are, the Banking Industry, IT and IT enabled services, Real Estate, Oil and Gas; and FMCG.

At the time of submitting this paper (Nov.2008) it was interesting to note that given the global economic slowdown small and medium firms in the US be exploring the opportunity of doing business in India. They see excellent opportunities due to India's average annual growth rate of more than 7% (greater than the negative growth in the US), its fast growing middle class and the observation of India's favourable impression of US products and services.

8. *Interest Rate Policy:* Remittances and NRI inflows which are known to be interest sensitive could be affected if interest rates are lowered. It could also lead some public to take money out of the banking system to put in other assets or hold as liquid cash or even find its way abroad via direct/indirect (trade) channels. All of these could aggravate the credit crunch.

5.2 The Sub-Prime Crisis: The Impact of Turbulences on the State-of-Art Economic Thinking

It is now more than a year since the sub-prime lending crisis in the US mortgage sector came to light. The unprecedented and still unfolding financial crisis in the developed world brings with it the end of the illusion of the market being "efficient". This is the time for a fundamental rethinking on financial liberalization in order to reduce systemic and global instability.

The financial liberalization of the past two decades across the world was based on two mistaken notions. First is the "efficient markets" hypothesis,[74] which asserts that financial markets are informationally efficient, in that prices on traded financial assets reflect all known information and therefore are unbiased in the sense that they reflect the collective beliefs of all investors about future prospects. Second, is the notion that financial institutions, especially large and established ones, are capable of and good at self-regulation, since it is in their own best interests to do so. And therefore external regulation by the state is both unnecessary and inefficient.

Both of these presumptions are now in tatters, completely destroyed by the waves of bad news that keeps coming from the financial markets.

Several American economists, including Joseph Stiglitz and Paul Krugman (Nobel Laureate 2008), have already called for more controls on finance, most of all the separation of different types of financial activity of banks and others. It seems that deregulation has reached its limits.

Volcker recently stated, “I don’t think we can sit back passively on the financial system. There are too many points of vulnerability. One point of view is that Adam Smith[75] will take care of all this. The free workings of the market will teach those who took too many risks a lesson. They’ll behave in the future. … I would remind you that even Adam Smith had a rather long passage in his book saying that banks won’t necessarily be able to take care of themselves. They need a little

[74] In investment finance, Eugene Fama is generally regarded as the father of efficient market theory, also known as the "efficient market hypothesis (EMH)." He wrote his 1964 doctoral dissertation on it titled "The Behavior of Stock Market Prices" in which he concluded stock (and by implication other financial market) price movements are unpredictable and follow a "random walk" reflecting all available information known at the time. Thus, no one, in theory, has an advantage over another as everyone has equal access to everything publicly known (aside from "insiders" with a huge advantage). That includes rumored and actual financial, economic, political, social and all other information, all of which is reflected in asset prices at any given time.

In simple terms the hypothesis states that markets are efficient especially stock markets. The hypothesis states that stock movement today is independent of its movement yesterday. The stock market prices are supposed to reflect all known information and only new information will move markets. If you buy something on the stock market, it is correctly priced and your return is depends on the risk you're taking. Economists believe that stock prices follow a random walk with an upside bias and investors cannot predict the movement of stock prices.

[75] In 1958 Milton Friedman (in his “I, Pencil” essay) had explained the notion of Adam Smith's invisible hand and conservative economist Friedrich Hayek's teachings on the importance of "dispersed knowledge" and how the price system communicates information to "make (people) do desirable things without anyone having to tell them what to do."

special attention. He thought that was true in 1776, and I think that lesson remains true."[76]

Long before the current market turbulence Hyman Minsky[77] showed financial market exuberance often becomes excessive, especially if no regulatory constraints are in place to curb it. He constructed a "financial instability hypothesis" building on the work of Keynes' "General Theory of Employment, Interest and Money." He provided a framework for distinguishing between stabilizing and destabilizing free market debt structures he summarized as follows:

"Three distinct income-debt relations for economic units....labelled as hedge, speculative and Ponzi finance, can be identified."

-- "Hedge financing units are those which can fulfill all of their contractual payment obligations by their cash flows: the greater the weight of equity financing in the liability structure, the greater the likelihood that the unit is a hedge financing unit."

-- "Speculative finance units are units that can meet their payment commitments on 'income account' on their liabilities, even as they cannot repay the principle out of income cash flows. Such units need to 'roll over' their liabilities - issue new debt to meet commitments on maturing debt."

-- "For Ponzi units, the cash flows from operations are (insufficient)....either (to repay)....principle or interest on outstanding debts by their cash flows from operations. Such units can sell assets or borrow. Borrowing to pay interest....lowers the equity of a unit, even as it increases liabilities and the prior commitment of future incomes."

"....if hedge financing dominates....the economy may....be (in) equilibrium. In contrast, the greater the weight of speculative (and/or) Ponzi finance, the greater the likelihood that the economy is a deviation-amplifying system.... (based on) the financial instability hypothesis (and) over periods of prolonged prosperity, the economy transits from financial relations (creating stability) to financial relations (creating) an unstable system."

[76] Volcker (2008)

[77] He developed his theories in two books - "John Maynard Keynes" and "Stabilizing an Unstable Economy" as well as in numerous articles and essays.

"....over a protracted period of good times, capitalist economies (trend toward) a large weight (of) units engaged in speculative and Ponzi finance. (If this happens when) an economy is (experiencing inflation and the Federal Reserve tries) to exorcise (it) by monetary constraint....speculative units will become Ponzi (ones) and the net worth of previous Ponzi units will quickly evaporate. Consequently, units with cash flow shortfalls will be forced to (sell out). This is likely to lead to a collapse of asset values."

Minsky developed a seven stage framework showing how this works.[78]

Further, the subprime crisis leads one to consider two important streams of economic thinking.

One relates to the transmission channels through which crises spread through one economy and to the rest of the world.

A recent survey in the IMF Survey magazine[79] stated that:

i. New conduits for liquidity shocks help explain rapid spread of subprime crisis

ii. Important financial institutions in the United States, Europe were affected.

Spreading the effects: There were several important channels through which the crisis that began in the subprime market was passed on:

1) ***Asset-backed commercial paper (ABCP) funding liquidity***. Special entities, such as structured investment vehicles (SIVs) and conduits, bought asset-backed securities and funded the purchase by selling short-term commercial paper. Since the commercial paper was repaid from the income from the asset-backed securities, the increasing uncertainty with regard to the value of underlying securities made investors such as money market mutual funds unwilling to roll over the ABCP.

2) ***Bank funding liquidity***. The SIVs, many of them sponsored by banks, had to call on contingent credit lines with those banks to replace the

[78] Lendman (2007)
[79] IMF (2008d)

commercial paper funding. The balance sheets of those financial institutions were strained, and the strains were exacerbated because of the declining values of the underlying asset-based securities. As a result, the level of interbank lending declined—both because banks had to fund their SIVs and because banks worried about the credit risk of lending to other institutions.

3) ***Market liquidity and volatility***. As turbulence from U.S. subprime mortgages increased, financial markets more generally showed signs of stress, because investors moved from complex structured securities products in a flight to the safest and most liquid assets, such as U.S. treasury bonds. Furthermore, lenders increased margin requirements on hedge funds that held asset-backed securities and other structured products, adding to the burden on those large investors and, in turn, to greater market volatility.

4) ***Financial institution solvency***. The crisis brought to the forefront concerns about the soundness of some of the largest banks, as witnessed by the collapse of the New York investment banks Bear Stearns and Lehman Brothers; Merrill Lynch & Co.'s sale to Bank of America; and insurance company AIG's crisis. The values of the securitized mortgages and structured securities on the balance sheets of financial institutions declined, resulting in extensive write downs. Funding liquidity pressures forced rapid sales of assets at depressed asset prices. Moreover, refinancing costs increased due to rising money market spreads, amplified by banks' increasing reliance on wholesale funding.

Second, is the much debated issue of how should central banks deal with bubbles. The sub-prime crisis has once again opened up this debate which has largely has remained within the covers of academic journals.

In the context of the current crisis it may be pointed out that liquidity-driven bubbles have their roots in distortions somewhere in the world economy. Thinking about causality it helps to look at the exogenous drivers. The starting point for subprime in this broad context focuses on three interrelated distortions:[80]

[80] Blundell-Wignall and Atkinson (2008)

a. **1% US interest rates:** following the tech bust (causing a weaker $ from 2002).

b. **Chinese industrialization, foreign reserves accumulation and Sovereign Wealth Fund[81] (SWF) growth**: High saving and current account surpluses; a strongly managed exchange rate in the face of FDI inflows resulting in huge foreign exchange intervention; the low administered energy prices that do not permit the rising oil price to have a demand-slowing effect, and result in even higher global oil prices and unprecedented revenue to oil producing countries and their SWF's; and the recycling of Asian and OPEC surpluses and reserves back into western financial markets, affecting interest rates and the cost of capital (while at the same time disguising inflation pressure as a current account deficit, with cheap manufactures causing import competition, etc).

c. **Japan's near zero interest rate and (low) exchange rate policy**: as it tries to adjust to new competitive challenges from Chinese and other industrializing countries. This reinforces the low global cost of capital in financial markets via carry trades.

The ex-ante excess of saving over investment and nominal flows to which these trends gave rise resulted in financial price responses to equate ex-post savings and investment. The search for yield contributed to financial bubbles and excess leverage. Liquidity driven bubbles and a too-low global cost of capital lead to excess risk taking, and asset prices get driven out of line with fundamentals based on realistic future cash flows. Excess leverage results from the reduction of nominal constraints on borrowers (cash flow impact of the servicing burden) and because collateral values, as measured at a point in time, are directly linked to loan size.

So what does one do about bubbles?[82]

[81] See Appendix 1

[82] Two polar points of view may be represented in the articles by Bernanke, B. and Gertler, M. (2001), Should Central Banks Respond to Movements in Asset Prices?, *American Economic Review*, May, pp. 253-57 and Cecchetti, S., H. Genberg, J. Lipsky and S. Wadhwani (2000): *Asset Prices and Central Bank Policy*, Geneva Report on the World Economy 2, CEPR and ICMB. Among the major central banks it is remarkable that the ECB has defended the view that central banks should lean against the wind when asset bubbles arise. (See Monthly Bulletin, April 2005).

1. Pricking the Bubble: The suggestion is that central bank should aggressively increase interest rates to counter the asset price rise. The problem with this is first it is difficult to identify a bubble and some assets may actually be adequately priced.

Second, there is not a very precise relation between interest rates and asset prices and large interest rate increases may be needed to calm asset prices which would put entire economy under stress.

2. Leaning against the Wind: This approach is increasingly becoming the most accepted in the policy arena. It means a central bank adopts a hawkish stance to rising asset prices early on. This would dispel the notion that central banks would only act in times of distress.

Central banks are primarily concerned with managing the rate of inflation and avoiding recessions. They are also the *"lenders of last resort"* to ensure liquidity. They are less concerned with avoiding asset bubbles, such as the housing bubble and dotcom bubble. Central banks have generally chosen to react after such bubbles burst to minimize collateral impact on the economy, rather than trying to avoid the bubble itself. This is because identifying an asset bubble and determining the proper monetary policy to properly deflate it are not proven concepts. There is significant debate among economists regarding whether the central banks should play an important role in avoiding such asset bubbles and whether the current strategy adopted by them of *cure rather than prevention* is the correct one or not.

This issue opens up the topic of **Future Challenges and the Role of Monetary Policy in Crisis Prevention.**

Perhaps the most influential view of how monetary policy should respond to a rapid increase in the price of an asset is that monetary policy should respond only if the central bank's forecasts indicate that it will lead to problems such as overheating and excessively high inflation. If this is not the case, the central bank should wait and see, but be prepared to quickly ease monetary policy if the asset market were to collapse and aggregate demand in the economy were to fall drastically.

The main argument for such an “asymmetric” response would be that central banks are not especially good judges of whether there actually is an asset bubble or not.

However, this approach of “wait and see” and “clean up the mess afterwards” is increasingly being called into question, not least because “the mess afterwards” might be quite severe if the central banks have been passive during the build-up phase. This is especially true if the price bubble has been associated with an expansion of credit. In most cases it is credit – not asset prices as such – that is the main worry.[83]

Another reason why the hands–off approach has been found to be wanting is related to hedge funds. During the last few years, a significant part of liquidity and credit creation has occurred outside the banking system. Hedge funds and special conduits have been borrowing short and lending long, and as a result, have created credit and liquidity on a massive scale, thereby circumventing the supervisory and regulatory framework. As long as this liquidity creation was not affecting banks, it was not a source of concern for the central bank. However, banks were heavily implicated. Thus, the central bank was implicitly extending its liquidity insurance to institutions outside the regulatory framework. It is unreasonable for a central bank to insure activities of agents over which it has no oversight, very much as it would be unreasonable for an insurance company selling fire insurance not to check whether the insured persons take sufficient precautions against the outbreak of fire.[84]

However, monetary policy is perhaps not the most efficient instrument for preventing crises from happening. Though a too loose monetary policy may *contribute* to the build-up of a bubble, it is less clear to what extent monetary policy can *prevent* such a build-up. A more capable line of defence to prevent financial crises is to have proper rules and effective supervision in place. Of particular interest is:

a. central bank financial regulation of commercial banks and credit markets and counter parties

[83] Nyberg (2008)
[84] De Grauwe (2007)

b. the issue of clearing and settlement arrangements in the unregulated credit derivative markets

c. regulation of credit rating agencies

d. higher degree of international co-ordination and harmonization for comprehensive global surveillance of financial stability.

Sensible reform of the global financial system must go hand in hand with wider regulatory reform if periods of financial turbulence are to be avoided (exchange rate Regulation cannot and should not have to compensate for serious macro distortions that drive rolling liquidity bubbles.[85]

6. THE SUB-PRIME CRISIS : THE RESPONSE[86]

"It is not the responsibility of the Federal Reserve — nor would it be appropriate — to protect lenders and investors from the consequences of their financial decisions," Bernanke said. "But developments in financial markets can have broad economic effects felt by many outside the markets, and the Federal Reserve must take those effects into account when determining policy."[87]

It was against this backdrop that the idea of an "overall solution" emerged, marking a change in strategy compared to the case-by-case approach that had prevailed until then. This was the underlying rationale for the Paulson Plan[88]

[85] Blundell-Wignall and Atkinson (2008)

[86] One academic response has been the book; "The Subprime Solution: How Today's Global Financial Crisis Happened, and What to Do about It," By R. J. Shiller, Princeton University Press, 2008. Shiller blames the subprime crisis on the irrational exuberance that drove the economy's two most recent bubbles-- stocks in the 1990s and housing between 2000 and 2007. He shows how these bubbles led to the dangerous overextension of credit now resulting in foreclosures, bankruptcies, and write-offs, as well as a global credit crunch. He calls for an aggressive response--a restructuring of the institutional foundations of the financial system that will allow people once again to buy and sell homes with confidence, and will create the conditions for greater prosperity in America and throughout the deeply interconnected world economy.

To restore confidence in the markets, Shiller argues, bailouts are needed in the short run. But he insists that these bailouts must be targeted at low-income victims of subprime deals. In the longer term, the subprime solution will require leaders to revamp the financial framework by deploying an ambitious package of initiatives to inhibit the formation of bubbles and limit risks, including better financial information; simplified legal contracts and regulations; expanded markets for managing risks; home equity insurance policies; income-linked home loans; and new measures to protect consumers against hidden inflationary effects.

[87] Bernanke (2007b)

[88] The general idea behind the Plan is for the Treasury to purchase currently illiquid assets. It aims to rid banks of the bad assets weighing on their balance sheets, and to eliminate uncertainty about their real value and, in turn, about that of the banks themselves. Indeed, under the current accounting framework, these assets are marked to market, which means that any uncertainty about their value affects that of the financial institutions themselves. (Noyer 2008)

adopted on 3 October 2008. It has been estimated that the bailout package is close to US$9 trillion![89]

In financial markets, notwithstanding bold policy actions announced thus far, conditions remain exceptionally volatile and uncertain. Modest declines in interbank spreads, along with sharp falls in bank CDS spreads, suggest some tentative improvement in market sentiment. Solvency concerns have eased in light of the commitment to use public funds to recapitalize financial institutions, but money market funds continue to face large redemptions.[90]

The sub-prime crisis has tended to be contagious with the contagion spreading from the credit market to the money market affecting the liquidity and the foreign exchange market; spreading from the U.S. to the Euro Area and to the rest of the world.

For the IMF, the current epidemic of spreading financial market strains reflects a challenge that they have faced many times before in many different guises. What is novel is the scale, scope and complexity of the current difficulties. Earlier experience warns that sudden stops in capital flows potentially can transform a liquidity shock into a solvency crisis. The needed remedial action - including helping to minimize the risk of a sudden stop, and/or standing ready to compensate for one - is a key IMF responsibility. In addition the IMF has realized that incorporating the considerations of regulation, and macro-prudential aspects will neither be quick nor easy.

According to the IMF efforts to restore confidence in the financial system should incorporate three basic aspects:[91]

a. Preserving short-term liquidity,

b. Removing damaged assets from bank balance sheets, and

c. Recapitalizing banks.

In the advanced economies, bold financial measures announced in October 2008 will need to be implemented effectively and quickly.[92]

[89] Prominence has been given to attempts by policy makers to avoid systemic failures in institutions by means of liquidity injections and regulatory reforms. But the crisis also posed new problems for policy makers in setting interest rates in order to steer the economy towards stable inflation and output levels. (Martin and Milas 2008)
[90] Lipsky (2008)
[91] Lipsky (2008)

Bank recapitalization should proceed swiftly; central bank liquidity support should continue to be provided generously; and comprehensive approaches should be pursued to deal with distressed assets in the financial sector. However, therein lies the problem as maintenance of financial stability conflicts with the price stability objective of banks.

More broadly, policies need to decisively contain both financial disruptions and the possible growth implications, which will include reliance on traditional macroeconomic tools. With the global slowdown undermining commodity prices, the scope for monetary policy to support economic activity has increased, particularly in advanced economies that until recently have been dealing with containing inflation risks.

Fiscal measures are being used more comprehensively to address solvency issues in systemically important financial institutions, to purchase distressed assets, and to recapitalize the system. At the same time, further support to aggregate demand may be needed, given the loss of private sector confidence.

In fact, most of the economies may have to increasingly resort to fiscal policy since most of the channels through which monetary policy affects the real economy are still blocked e.g., the bank lending channel. Most of the channels go through the money market since neither the households nor companies have direct access to central bank money. To the extent that the money markets are not working properly, monetary policy is correspondingly ineffective.

There is also the concern that banks may not pass on the interest rate cuts. Perhaps an even bigger problem than high rates of interest is the fall in credit volumes. Banks have been cutting down on credit volumes. Banks have been cutting down on all types of loans for mortgages, consumer credit and business. Interest rate cuts have no short term effect on volumes.

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[92] Both the US and the EU have delivered financial support plans committing governments and central banks to providing the necessary support to the financial industry. These plans (government capital injections and takeovers) contain the necessary measures to solve the most critical issue right now, namely to restore market confidence by providing guarantees to creditors that their money will be repaid. (Nyberg 2008) also see footnote 45. However, regular and assured intervention raises the danger of "moral hazard" - the danger that central banks, by providing cash in a pinch, are encouraging speculators to begin planting the seeds of the next crisis, and offering them a safety net not available to the average consumer.

At this juncture monetary policy can at best play a supportive role during this crisis. However, it should be noted that many of the lower and middle income countries do not have much fiscal space; much of it has been used up in trying to buffer the effects of the food crisis. It's a question of whether the financial crisis is going to make life desperate or difficult!

Policy requirements may also require greater multilateral efforts-inclusive of emerging economies.

These include:

(i) Liquidity injection by the central banks e.g. by cutting overnight rates. As well as coordinated actions by central banks.

(ii) Widening the list of collaterals to include otherwise not permissible assets

(iii) Substitution of toxic assets/contaminated assets with government securities so that markets function normally

(iv) Government guarantee / deposit insurance

(v) Ban on short selling

(vi) THE BAIL OUT PACKAGE

The policy measures adopted by advanced economies may impart unintended effects-notably, since financial institutions in emerging economies in general are not covered under the umbrella of the liquidity operations in advanced economies. Also, domestic banks in emerging economies do not necessarily have the same level of protection through deposit guarantees and such measures as public capital injections. Thus, they may feel pressured to put in place their own programs, even where the resources needed to create credible policies of this nature may not be available. For instance, institutions in India holding US mortgage-related securities are likely to suffer losses. e.g., ICICI Bank in India.

The Fund, for its part, is moving quickly and playing an active role to help emerging economies battered by the financial crisis and by the sharp slowdown in advanced economies. The International Monetary Fund stands ready to disburse more than $200 billion of loanable funds and can draw on additional resources through standing borrowing arrangements with groups of IMF member countries. It is

already close to committing a quarter of its $200bn (£130bn) reserve chest, with loans to Iceland ($2bn), Ukraine ($16.5bn), and talks underway with Pakistan ($14.5bn), Hungary ($10bn), as well as Belarus and Serbia.[93]

The World Bank's Annual Global Economic Prospects (GEP) 2009 finds the global economy transitioning from a long period of strong developing-country led growth to one of great uncertainty as the financial crisis in developed countries has shaken markets worldwide. In light of the crisis, the Bank is increasing its support for developing countries, including through new IBRD commitments of up to $100 billion over the next three years as well as via its private sector arm, the IFC, in the form of facilities for trade finance, banking recapitalization, and for privately-funded infrastructure projects facing financial distress; amid fears that the spreading effects of the financial crisis could devastate poor and middle income states whose projected growth rates have been slashed in the wake of the current crisis.

Since halting economic and financial crises requires timely measures, the Fund is actively considering the launch of a new short-term liquidity lending facility to address problems of fundamentally sound countries temporarily exposed to funding pressures.

In emerging economies,[94] policy actions to deal with sudden interruptions (or reversals) of capital flows will be needed. Emerging countries are also more prone to suffer the contagion to different markets. In most of the episodes financial crisis are accompanied by balance of payment distress (given the tendency of agents to withdraw deposits and use the proceedings to buy FX) and/or fiscal constraints (because of the potential impact on government accounts of financial bailout, or an FX depreciation in a context of currency mismatches on public debt). [95]

[93] Neil Schering, emerging market strategist at Capital Economics, said the IMF, led by Dominique Strauss-Kahn, has the power to raise money on the capital markets by issuing `AAA' bonds under its own name. It has never resorted to this option, preferring to tap member states for deposits.

The nuclear option is to print money by issuing Special Drawing Rights, in effect acting as if it were the world's central bank. This was done briefly after the fall of the Soviet Union but has never been used as systematic tool of policy to head off a global financial crisis.

[94] On 10 November 2008 the Chinese government unveiled a huge fiscal stimulus package designed to prevent its economy from slumping in the next year.

[95] Redrado (2008)

In this sense emerging countries need to use of a broad set of policy measures in developing economies to try to limit the impact to the financial markets in an attempt to avoid contagion. Namely;

1. Sustaining liquidity

2. Reducing volatility in FX rate

3. Allowing capital inflows

4. Keeping domestic and external financing available

Of course, in many cases the improvement in monetary, fiscal and structural policies in recent years represents an important protection, as has the build-up in international reserves. Nonetheless, these may not offer complete protection.

7. CONCLUSION and LOOKING AHEAD

The sub-prime crisis and its effects point to three observations:

(i) Financial turmoil can happen in any market regardless of whether it is large or small or whether it is emerging or emerged!

(ii) The financial sector plays a central role in the boom-bust cycle. It can contribute to and trigger a crisis.

(iii) The risk of systemic instability can be greater with financial globalization and that raises the questions of an appropriate monetary policy framework for maintaining macroeconomic stability. [96]

In hind sight it maybe said that the sub-prime crisis was the result of under pricing of risks, maturity mistakes, a high credit to GDP ratio, too much leveraging on the asset side resulting in a credit boom, an unprecedented increase in credit derivatives, excessive speculation activities and the slowdown of productivity. The casualties were the investment banks, the commercial banks, the insurance companies, the hedge funds, the NBFI, the rating agencies.

The lessons have been painful. In particular:

(i) Deleveraging is very painful

[96] Nijathaworn (2008)

(ii) The sub-prime crisis is a regulatory / supervisory failure. Though in all fairness it must be stated that central banks have no control over CDOs and CDS and investment banks. There is thus a regulatory gap.

(iii) Sources of vulnerability may lie outside the economy

(iv) Contagion effects are pervasive

(v) The lender of last resort cannot be adequate to deal with systemic problems

(vi) Recapitalization (as recommended by Krugman) is essential rather than buying up toxic assets

(vii) What is needed is alert monitoring of economic conditions and timely action

(viii) Low probability but high impact events should be taken seriously

(ix) Co-ordination among multiple regulators may prompt swift corrective action.

In conclusion, these are very uncertain times and the risks to the global economy are large. According to the IMF given a comprehensive and collaborative approach globally, across the full range of policy instruments, the worst can (and will) be avoided and that a more resilient and sounder financial system will eventually emerge.

An extreme view towards elimination of financial crisis is to fully eliminate risks!! It is simple: eliminate financial institutions but that means no expected returns!![97]

How well macroeconomic and financial policies jointly respond to containing the disruption will determine the global economy's near-term outlook.

Unfortunately, there are two key risks to the outlook; one is that asset values - especially housing - will substantially undershoot reasonable long-term levels. The second is that financial market dysfunction will produce reinforcing rounds of real economic distress, especially in emerging economies.

[97] Wyplosz (2007)

In many countries' housing markets, the apparent boom-time overshooting in valuations already has damaged financial markets and the real economy, but an equally-scaled undershooting would compound the damage.

Once the emergency is over, the present international financial architecture[98] will have to be examined carefully, in terms of its extreme dependence on the decisions of more advanced countries, its governance and its surveillance role, particularly in the financial system. [99]

In the mean time there are two broad tasks ahead:[100]

1. Dealing with the immediate fallout of the financial crisis, including the adoption and coordination of policy responses to restore confidence and growth, while restoring financial sector soundness. (By Implementing Policies to Sustain Demand, Providing Liquidity Support to Emerging Economies, Protecting Low-Income Countries.)

2. Designing and implementing reforms so as to decrease the risk of such crises in the future. (needed in at least three areas: (i) the design of financial regulation; (ii) a better way of assessing systemic risk; and (iii) mechanisms for more effective, coordinated actions, both to reduce the risk of crises, and to address them when they occur.)

The financial system and regulatory authorities need to make certain that the costs of the financial turbulence are kept as low as possible by providing key markets and sound institutions with the liquidity needed to ensure that the financial system can function properly.

From the standpoint of central banks, recent events have underscored not only their role in monetary policy, but also their important function in the stability of the financial system. [101]

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[98] The economy's financial architecture is a function of the relationship among financial institutions and market participants that transfer capital and risk between borrowers and savers. It is necessarily broader than the government's regulatory and supervisory response. Ideally it should account for the dynamic relationship between private-market actions and public-sector strictures.

[99] Warsh (2008)

[100] Blanchard (2008)

[101] De Gregorio(2008)

From the standpoint of surveillance and financing the tasks ahead include:[102]

(a) The Design of More Effective Early Warning Systems

(b) Strengthening transparency and accountability

(c) Enhancing regulation including underwriting standards

(d) Need for coordinated actions and reinforcing international cooperation between countries and multilateral institutions e.g. G7, IMF, IBRD, WTO.

(e) Reinforcing international institutions

(f) Assessing the role of sovereign wealth funds as providers of capital in the context of inadequacy of financial institutions' capital cushions

(g) Examining the role of rating agencies in structuring and rating securities

(h) Good central bank governance and effective public communication

(i) Continuous evaluation and effectiveness of policy tools.

8. APPENDIX 1: Abbreviations and Select Glossary

Sub-prime: When banks lend money to people, they broadly classify them into prime and sub-prime debtors, where the former are people who are considered creditworthy and the latter,[103] less so. These debtors are considered less creditworthy for reasons such as low income etc, banks usually lend to them at higher rates of interest.

A subprime lender: is an institution that offers loans to borrowers with a poor credit history who do not qualify for standard, lower-interest loans. The practice of sub-prime lending is controversial.

Subprime lending: is a general term that refers to the practice of making loans to borrowers who do not qualify for market interest rates because of problems with their credit history or the ability to prove that they have enough income to support the monthly payment on the loan for which they are applying.

Sub-prime loans: (also known as B-paper/near prime/ second chance loans) involve higher interest rates and riskier borrowers than normal (A-paper) loans. Many sub-prime lenders have been accused of predatory lending practices such as lending to individuals who have little chance of being able to meet their debt responsibilities. This often then leads to default, seizure of collateral and foreclosure.

Subprime loans or mortgages are risky for both creditors and debtors because of the combination of high interest rates, bad credit history, and murky financial situations often associated with subprime

[102] See Stark (2008)

[103] Also known as NINJA borrowers (that is, No Income, Job or Assets)

applicants. A subprime loan is one that is offered at an interest rate higher than A-paper loans due to the increased risk.

Sub-prime crisis: is being used as a generic term, it actually refers to a credit problem among sub-prime borrowers (they account for 8% of total mortgages in the US) in the residential market in the US. Like borrowers anywhere in the world, the interest paid on residential mortgages in the US is linked to the central bank's benchmark and in this case, the US Federal Reserve's Fed Funds Rates.

One of the defining features of the sub-prime crisis is to see it as an outgrowth of a policy of utilizing public funds and regulatory pressure to increase home ownership especially by minorities such as African-Americans and Latinos.[104]

ABS	Asset Backed Security
ABCP	Asset-Backed Commercial Paper
ARM	Adjustable-Rate Mortgage
bps	Basis points
CDOs	Collateralized Debt Obligations
CDS	Credit Default Swaps
CMO	Collateralized Mortgage Obligation
ECB	European Central Bank
Fed	Federal Reserve
LCDS	Loan Credit Default Swaps
LOLR	Lender-Of-Last-Resort
LTRO	Long-Term Refinancing Operation
LTV	Loan-To-Value
MBS	Mortgage-Backed Securities
MOF	Ministry Of Finance
MRO	Main refinancing operations
OMO	Open Market Operations (a transaction undertaken at the initiative of the central bank)
PDCF	Primary Dealer Credit Facility
PDs	Primary Dealers
PRA	Purchase and resale agreement
RMBS	Residential Mortgage Backed Security
RMP	Reserve Maintenance Period
SF	Standing Facility (a transaction available at the initiative of a commercial bank)
SIV	Structured Investment Vehicle
SLS	Securities Lending Facility
SPE	Special Purpose Entities
SPV	Special Purpose Vehicle
TAF	Term Auction Facility
TSLF	Term Securities Lending Facility

AAA: Top rating awarded to qualifying corporate bonds by the bond rating agencies such as Standard & Poor's (AAA) and Moody's (Aaa). These ratings mean: (1) the bonds are of the highest quality (are 'gilt edged'), (2) carry the least degree of investment risk, and (3) are fully expected to pay both interest and principal on time. Other rating agencies use different designations.

[104] Swan (2008)

ALM: Asset/Liability Management: A technique companies employ in coordinating the management of assets and liabilities so that an adequate return may be earned. It is also known as "surplus management." By managing a company's assets and liabilities, executives are able to influence net earnings, which may translate into increased stock prices.

Alt-A loans: are those with reduced documentation requirements or other features that make them riskier than prime loans, but which have performed better than subprime loans.

CDO: Collateralized Debt Obligation: Typically, a structured finance product where a SPV issues notes backed by, or referenced to, a portfolio of underlying assets. The notes issued are tranched by seniority into senior, mezzanine and equity. The underlying assets could be corporate bonds, loans or structured finance securities (such as mortgage-backed securities or notes issued by other CDOs), and they might be owned either directly or synthetically via credit default swaps.

A CDO, essentially, is a repacking of existing debt, and in recent years MBS collateral has made up a large proportion of issuance. In exchange for purchasing the MBS, third-party investors receive a claim on the mortgage assets, which become collateral in the event of default. Further, the MBS investor has the right to cash flows related to the mortgage payments. To manage their risk, mortgage originators (e.g., banks or mortgage lenders) may also create separate legal entities, called special-purpose entities (SPE), to both assume the risk of default and issue the MBS. The banks effectively sell the mortgage assets (i.e., banking receivables, which are the rights to receive the mortgage payments) to these SPE. The SPE then sells the MBS to the investors. The mortgage assets in the SPE become the collateral.

CDO squared: A CDO invested in CDO tranches, typically mezzanine tranches of synthetic CDOs.

CDPC: Credit Derivative Product Companies: A highly-rated limited purpose company, with permanent capital, that sells credit protection on individual names or synthetic CDO tranches. CDPCs differ from monolines in that they write protection only via credit default swaps. They are in some respects akin to synthetic banks.

Closed-End Fund: An investment company that issues shares to investors and invests the proceeds in a pool of assets typically stocks and/or bonds. Recently some funds have invested in "alternative" assets such as hedge funds, private equity and infrastructure, and structured credit. Shares in closed-end funds are traded like other equities. The funds may issue their own debt to obtain leverage. They may also issue different classes of shares with different entitlements to income or capital receipts from the underlying investments.

CP (Commercial Paper) conduit: A SPV that issues CP backed by financial assets originated by one or more sellers. They are generally supported by liquidity facilities provided by their sponsor or a third-party bank.

Counterparty Risk: Also known as default risk, it is the risk to each party of a contract that the other party may in the agreement will default or not live up to its contractual obligations.

Deleverage: A company's attempt to decrease its financial leverage. The best way for a company to deleverage is to immediately pay off any existing debt on its balance sheet. If it is unable to do this, the company will be in significant risk of defaulting.

Companies will often take on excessive amounts of debt to initiate growth. However, using leverage substantially increases the riskiness of the firm. If leverage does not further growth as planned, the

risk can become too much for the company to bear. In these situations, all the firm can do is deleveraging by paying off debt.
Any sign of deleverage shown by a company is a red flag to investors who require growth in their companies.

DPC: Derivative Product Company: A bankruptcy-remote structure that houses credit risk from long-dated derivative transactions. They are typically wholly-owned subsidiaries of financial services companies. In general, DPCs sit between their sponsor and an external counterparty in derivative transactions and protect the counterparty from the potential default of the derivative seller (the sponsor).

Economic Decoupling: In general, economic decoupling can be defined as growth in one area of the world economy becoming less dependent on (less coupled with) growth in another area – thus GDP growth rates might tend to appear less correlated than they previously were (although we note the critique mentioned above about indirect linkages to the US and the problems in defining decoupling on the basis of GDP correlations alone). More specifically, the term is used to refer to the possibility that, in contrast to a marked weakening in US (and thus OECD) demand, emerging-market economies (especially China) may continue to enjoy high growth rates and sustain robust global growth. If decoupling is defined in this way, there clearly has already been at least a temporary experience of decoupling over 2006–08.

Eonia® (Euro OverNight Index Average) is the effective overnight reference rate for the euro. It is computed as a weighted average of all overnight unsecured lending transactions undertaken in the interbank market, initiated within the euro area by the contributing banks. **Eonia**® is computed with the help of the European Central Bank.

Euribor® (Euro Interbank Offered Rate) is the benchmark rate of the large euro money market that has emerged since 1999. It is sponsored by the European Banking Federation (EBF), which represents the interests of some 5000 European banks and by the Financial Markets Association (ACI).

Euribor® is the rate at which euro interbank term deposits are offered by one prime bank to another prime bank and is published at 11.00 a.m. CET for spot value (T+2). **Euribor**® was first published on 30 December 1998 for value 4 January 1999. The choice of banks quoting for **Euribor**® is based on market criteria. These banks are of first class credit standing. They have been selected to ensure that the diversity of the euro money market is adequately reflected, thereby making **Euribor**® an efficient and representative benchmark.

Fannie Mae, Freddie Mac: The Federal National Mortgage Association, nicknamed Fannie Mae, and the Federal Home Mortgage Corporation, nicknamed Freddie Mac, have operated since 1968 as government sponsored enterprises (GSEs). This means that, although the two companies are privately owned and operated by shareholders, they are protected financially by the support of the Federal Government of USA. Government-sponsored enterprises are financial institutions that provide credit to specific groups or areas of the economy, such as farmers or housing.

Financial Engineering is a multidisciplinary field involving economic and financial theory, the methods of engineering, the tools of applied mathematics and statistics, and the practice of computer programming. It is the application of mathematical methods to the solution of problems in finance. It is also known as financial mathematics, mathematical finance, and computational finance.

It involves a. the creation of new and improved financial products through innovative design or repackaging of existing financial instruments; and b. Creating new financial instruments by combining other derivatives, or more generally, by using derivatives pricing techniques.

Green Field Investment: A form of foreign direct investment where a parent company starts a new venture in a foreign country by constructing new operational facilities from the ground up. In addition to building new facilities, most parent companies also create new long-term jobs in the foreign country by hiring new employees. This is opposite to a brown field investment.

A component of FDI, it is foreign investment primarily related to the acquisition of new assets. Green field investments occur when multinational corporations enter into developing countries to build new factories and/or stores. Developing countries often offer prospective companies tax-breaks, subsidies and other types of incentives to set up green field investments. Governments often see that losing corporate tax revenue is a small price to pay if jobs are created and knowledge and technology is gained to boost the country's human capital.

Leverage: The degree to which an investor or business is utilizing borrowed money. Companies that are highly leveraged may be at risk of bankruptcy if they are unable to make payments on their debt; they may also be unable to find new lenders in the future. Leverage is not always bad, however; it can increase the shareholders' return on their investment and often there are tax advantages associated with borrowing. Financial leverage is measured by the debt/equity ratio.

Leveraging (U.S.) = Gearing (U.K.): For an investor, it means using debt or borrowed funds to invest in a security in the hope of obtaining a higher investment return. For a company, it is using debt to finance capital purchases, stock repurchases or other projects. The more debt that is used, the higher the risk of default.

When a bank extends loans that are many times the value of its capital base – the hallmark of a "leveraged" institution – the result is that when a bank's capital loses value, it must reduce its loans *by much more* in order to maintain its capital- asset ratio. In numeric terms, for a bank seeking to maintain a 10% capital-to-asset ratio, the bank would need to reduce assets – like loans – by Rs.10 for every Re.1 lost in capital.

Mark-to-Market Valuation: The act of assigning a value to a position held in a financial instrument based on the current market price for that instrument or similar instruments. For example, the final value of a futures contract that expires in nine months will not be known until it expires. If it is marked to market, for accounting purposes it is assigned the value that it would fetch currently in the open market.

Monoline insurers (also referred to as "monoline insurance companies" or simply "monolines") guarantee the timely repayment of bond principal and interest when an issuer defaults. They are so named because they provide services to only one industry. They provide protection against a specific type of risk (typically credit risk).

The term "monoline" was coined in 1989 when the State of New York -home state of most guarantors at the time- introduced new requirements for the capital structure of these insurers and restricted the type of risk they could take on to only one business line, i.e. the insurance of repayment of third-party debt. These restrictive business policies earn monoliners typically a AAA-rating. In the in the 1970s they were developed to provide US municipal bond holders with credit guarantees (or "wraps"), over the past few decades they have diversified into the ABS and CDO markets (particularly the highly-rated senior tranches).

The monoline bond insurance industry provides services to one industry - the capital markets. The complex nature of the capital markets requires that all participants develop a deep understanding of the strategic, tactical, regulatory, and technical aspects of the industry.

By providing credit enhancement to capital markets transactions, monoline insurers provide investors and issuers with financial security and liquidity. Core benefits of monoline credit enhancement include:

1. confidence that an insured security will pay in full, even under worst-case stress scenarios,
2. an expertise in credit analysis allowing for the application of conservative, zero-loss underwriting criteria to insured transactions,
3. monitoring of collateral and servicer performance in order to take any action necessary to avoid deterioration of assets or underlying credit quality,
4. a level of scrutiny and analysis beyond the rating agencies, ensuring that most transactions are believed to be investment-grade before they are wrapped

Net Asset Value (NAV): represents a fund's per share market value. This is the price at which investors buy ("bid price") fund shares from a fund company and sell them ("redemption price") to a fund company. It is derived by dividing the total value of all the cash and securities in a fund's portfolio, less any liabilities, by the number of shares outstanding. An NAV computation is undertaken once at the end of each trading day based on the closing market prices of the portfolio's securities.

Securitization is a structured finance process, which involves pooling and repackaging of cash flow producing financial assets into securities that are then sold to investors. The name "securitization" is derived from the fact that the form of financial instruments used to obtain funds from the investors are securities.

All assets can be securitized so long as they are associated with cash flow. Hence, the securities which are the outcome of securitization processes are termed asset-backed securities (ABS). From this perspective, securitization could also be defined as a financial process leading to an issue of an ABS.

Securitization strategy of finance capitalists. This refers to the now rampant and unregulated practice of investment banks and financial institutions of issuing loans, slicing and dicing these loans, then repackaging them as "mortgage-backed securities", "asset-backed securities", "collateralized debt obligations" (CDO), "collateralized loan obligations" and other synthetic financial instruments which are then sold to other capitalists in search of investment opportunities for their surplus capital. This allows the originators of these loans to transfer the risks associated with these loans while securing greater returns on their portfolio investments. This encouraged risky lending throughout the system. It also magnified the likelihood of system-wide contagion in the event of widespread credit defaults. Indeed as house prices started to plateau in 2005 and as interest rates started to rise, default rates and home foreclosures in the US started to climb in the latter part of 2006. This led to the collapse of scores of mortgage brokers and a number of mid-sized lending institutions with a large share of sub-prime mortgages in their loan portfolio.

SIV: Structured Investment Vehicle: A SPV that funds a diversified portfolio of highly rated assets by issuing short-term commercial paper, medium-term notes etc. In general, there is a maturity mismatch between their assets and liabilities. They aim to generate a positive spread between their return on assets and funding costs.

Sovereign Wealth Fund: Pools of money derived from a country's reserves, which are set aside for investment purposes that will benefit the country's economy and citizens. The funding for a Sovereign Wealth Fund (SWF) comes from from central bank reserves that accumulate as a result of budget and trade surpluses, and even from revenue generated from the exports of natural resources. The types of acceptable investments included in each SWF vary from country to country; countries with liquidity concerns limit investments to only very liquid public debt instruments. Some countries have created SWF to diversify their revenue streams

SPV: Special Purpose Vehicle: A bankruptcy-remote company created for the sole purpose of acquiring assets or derivative exposures and issuing liabilities linked to these assets. Also known as a special purpose entity.

STOXX 50: The Dow Jones EURO **STOXX 50** Index, Europe's leading Blue-chip index for the Eurozone, provides a Blue-chip representation of supersector leaders in the Euro zone.

VIX - CBOE Volatility Index: VIX - The ticker symbol for the Chicago Board Options Exchange (CBOE) Volatility Index, which shows the market's expectation of 30-day volatility. It is constructed using the implied volatilities of a wide range of S&P 500 index options. This volatility is meant to be forward looking and is calculated from both calls and puts. The VIX is a widely used measure of market risk and is often referred to as the "investor fear gauge".

There are three variations of volatility indexes: the VIX tracks the S&P 500, the VXN tracks the Nasdaq 100 and the VXD tracks the Dow Jones Industrial Average.

The first VIX, introduced by the CBOE in 1993, was a weighted measure of the implied volatility of eight S&P 100 at-the-money put and call options. Ten years later, it expanded to use options based on a broader index, the S&P 500, which allows for a more accurate view of investors' expectations on future market volatility. VIX values greater than 30 are generally associated with a large amount of volatility as a result of investor fear or uncertainty, while values below 20 generally correspond to less stressful, even complacent, times in the markets.

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