

GLOBAL FINANCIAL CRISIS

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INTRODUCTION

For a quarter of century, beginning in early 1980s, finance enjoyed its golden age. As an Economist article put it: “As financial globalisation spread capital more widely, markets evolved, businesses were able to finance new ventures, and ordinary people had unprecedented access to borrowing and foreign exchange. Modern finance improved countless lives.”

But more recently something went seriously wrong and that led to an unprecedented global financial crisis. It surfaced in the subprime mortgage sector in the U.S. in August 2007 and, following the collapse of Lehman Brothers in September 2008, snow balled into a global financial crisis. It led to the bankruptcy or rescue of the top five investment banks on Wall Street, the biggest insurance company (AIG), the biggest bank (Citibank), the biggest automobile company (General Motors), and the biggest mortgage underwriters (Fannie Mae and Freddie Mae). It is widely regarded as the greatest crisis in the history of financial capitalism because of the speed and intensity with which it simultaneously propagated to other countries. Apart from its huge financial cost, its adverse impact on the real economy has been severe. According to IMF, in 2009 the world GDP declined by 0.8 and the world trade volume contracted by 12 percent.

Contributory Factors

A confluence of factors seems to have caused the global financial crisis. The major ones are discussed below:

1. Macro-economic Imbalances

Last decade has witnessed an explosion of macro-economic imbalances in the world, with a very high savings rate in countries like China and very low savings rates in countries like the U.S. The high savings rate resulted in a fall in the real risk-free interest rate to historically low levels. For example, in 1990 the risk-free index-linked government bonds in U.K. or U.S. provided 3 percent real rate. In recent years it fell below 2 percent and at times to about 1 percent.

The fall in real interest rates has led to rapid growth of credit in some developed countries (which fuelled a property boom) along with a decline in credit standards. It also drove investors to search for improvement in yield, however slight that might be. Any product that appeared to increase yield by 10, 20, or 30 basis points, without adding measurably to risk, seemed attractive.

2. Unbridled Financial Innovation

The demand for yield enhancement was met by a wave of financial innovation, focused on securitised credit instruments.

Securitisation involves packaging a designated pool of assets (mortgage loans, consumer loans, hire purchase receivables, and so on) and issuing securities which are collateralised by the underlying assets and their associated cash flow streams. Securitisation gained in importance from the early 1980s and was regarded as a major financial innovation that reduced the risk of the banking system as credit risk was transferred to the end investors.

But when the crisis broke, it was realised that most of the holdings of securitised credit instruments were in the books of highly leveraged banks and financial institutions and not in the books of end investors. As the *Turner Review* noted: “The evolution of the securitised credit model was accompanied by a remarkable growth in the relative size of the wholesale financial services within the overall economy, with activities internal to the banking system growing far more rapidly than end services to the real economy.” For example, in the U.K. the debt of the financial sector as a proportion of GDP increased from 30 percent in 1987 to nearly 250 percent in 2007. Naturally, the growth of the relative size of the financial sector, and in particular the activities in securitised credit instruments, increased systemic risk, contributing to the credit boom during the upswing and accentuating the subsequent downswing.

A worrisome aspect of this growth was the fact that Collateralised Debt Obligations (CDOs) loomed large in this wave of financial innovation. A CDO is a product backed by a diversified pool of debt obligations such as corporate bonds, bank loans, emerging market bonds, asset-backed securities, mortgages, and other CDOs. When the underlying pool of debt obligations represents bond-type instruments, a CDO is called a collateralised bond obligation (CBO); when the underlying pool of debt obligations represents bank loans, a CDO is called a collateralised loan obligation (CLO).

The problem with CDOs is that they have a very high and imperfectly embedded leverage and are very difficult to value. As Emanuel Dreman of Goldman Sachs says: “With Black-Scholes model you know what you are assuming when you use the model, and you know exactly what has been swept out of view, and hence you can think clearly about what you may have overlooked.” With CDOs he says, “you don’t know how to adjust for its inadequacies.” It appears that the sophisticated U.S. financial services overwhelmed the relatively unsophisticated financial services elsewhere.

3. Misplaced Reliance on Sophisticated Maths

The expansion of financial sector and the complexity of securitised credit products was accompanied by the development of sophisticated mathematical models for measuring and managing risks. But these models were based on the assumption that the distribution of future prices would be similar to their past distribution. This was indeed a fragile assumption that caused massive damage.

As Warren Buffett notes: “Indeed, the stupefying losses in mortgage-related securities came in large part because of flawed, history-based models used by salesmen, rating agencies, and

investors.” He warns “Investors should be skeptical of history-based models. Constructed by a nerdy-sounding priesthood using esoteric terms such as beta, gamma, sigma, and the like, these models tend to look impressive. Too often, though, investors tend to forget to examine the assumptions behind the symbols.”

In a similar vein, Edmund Phelps, Nobel Laureate in Economics, says: “Risk assessment and risk-management models were never well-founded.” He adds: “There was a mystique to the idea that market participants know the price to put on this or that risk. But it is impossible to imagine that such a complex system could be understood in such detail and with such amazing correctness. The requirements of information have gone beyond our abilities to gather.”

4. Flawed VAR Calculations

An important abuse of quantitative analysis has been with respect to value at risk (VAR) calculation. VAR reflects a limit on the loss of value of a portfolio, on account of normal market movements, which will be exceeded only with a small pre-specified probability. Thus if VAR is Rs. 10 million (or whatever) with a confidence level of 95 percent, it means that there is only a 5 percent probability that the loss in portfolio value will exceed Rs. 10 million. Quantifying risk in this fashion requires sophisticated analytical modeling and simulation analysis. The typical VAR analysis is based on the assumption that the underlying market movement follows a normal distribution.

Benoit Mandelbrot, the polymath who invented fractal theory, calculated the theoretical changes (under normal distribution) and the actual changes of the Dow Jones Industrial Average (DJIA) over the period 1916 to 2003, as shown below:

Theory	Reality
More than 3.4 percent on 58 days	More than 3.4 percent on 1001
More than 4.5 percent on 6 days	More than 4.5 percent on 366 days
More than 7 percent once in 300,000 years	More than 7 percent on 48 days

Mandelbrot argues that the market movement is characterised by fat-tail distribution and not normal distribution. The market should have been “mildly stable” but it was actually “wildly stable.”

This presents a conundrum. As an *Economist* article put it: “On the one hand, you cannot observe the tails of the VAR curve by studying extreme events, because extreme events are rare by definition. On the other hand, you cannot deduce very much about the frequency of rare extreme events from the shape of the curve in the middle.” Put differently, while VAR is good at predicting small losses in the middle of the distribution, it is unreliable in predicting severe losses that are much rarer, but matter the most.

Modern finance perhaps has made the tails fatter. When all kinds of specific risks in foreign exchange, interest rates, and stock prices are traded away the portfolio may appear safer. But in reality every day risk may be swapped for an exceptional risk like the failure of the insurer, as it happened with AIG.

5. Explosive Growth in Derivatives

Since the early 1970s financial prices – exchange rates, interest rates, commodity prices, and equity prices – have become more volatile. To cope with these risks corporations and banks resorted to the use of derivatives like options, futures, forwards, and swaps.

Another force that fuelled the explosion in derivatives was a powerful combination of mathematics and computing. Before the development of Black-Scholes model, option pricing was more or less educated guesswork. The Black-Scholes model instilled confidence in buyers and sellers to trade heavily in derivatives. Explains Emanuel Derman of Goldman Sachs: “In a thirsty world filled with hydrogen and oxygen, someone had finally worked out how to synthesise H₂O.”

A significant portion of trading in derivatives takes place in the OTC (over-the-counter) market. In June 2008, the volume of outstanding OTC derivatives contracts was of \$530 trillion (interest rate derivatives accounted for \$460 trillion, credit default swaps accounted for \$60 trillion, and equity derivatives accounted for \$ 10 trillion). The staggering size and complexity of derivatives market and the fact that it is mostly an OTC market increases the potential danger of market disruption.

John Shad, former chairman, Securities Exchange Commission, expressed concern about this phenomenon. He said: “Futures and options are the tail wagging the dog. They have escalated the leverage and volatility of the markets to precipitous, unacceptable levels.” Warren Buffett echoed a similar warning: “Charlie and I are of one mind in how we feel about derivatives and the trading activities that go with them: we view them as time bombs, both for the parties that deal in them and the economic system.”

Warren Buffett had expressed his concern in 2003 itself: “Many people argue that derivatives reduce systemic problems, in that participants who can't bear certain risks are able to transfer them to stronger hands. These people believe that derivatives act to stabilize the economy, facilitate trade, and eliminate bumps for individual participants. And, on a micro level, what they say is often true. Indeed, at BH, I sometimes engage in large scale derivatives transactions in order to facilitate certain investment strategies. Charlie and I believe, however, that the macro picture is dangerous and getting more so. Large amounts of risk, particularly credit risk, have become concentrated in the hands of relatively few derivatives dealers, who in addition trade extensively with one another. The troubles of one could quickly infect the others.”

Unfortunately, the bulk of the financial community, enamoured of the derivatives revolution, did not appreciate the systemic implications of the explosive growth of derivatives.

6. Regulatory Laxity

The general euphoria about the contribution of modern finance to economic performance seems to have induced complacency in regulators. For example, in 2004, the Securities Exchange Commission (SEC) exempted the brokerage units of investment banks from a regulation that limited the amount of debt they could take in return for a greater oversight of the investment activities of the banks by the SEC. The SEC merely relied on the firms' own computer models for determining the riskiness of investments. And it hardly did anything to

follow up on the risky activities uncovered by its examiners. Thanks to the connivance of the regulators, investment banks could increase their debt equity ratio to such preposterous levels as 30:1.

A conspicuous example of regulatory laxity was the introduction of 'Commodity Futures Modernisation Act' on the last day of the last session of a lame duck 106th session of the U.S. Congress in 2000. This Act removed the various capital constraints on lending and exempted derivatives and credit default swaps from legislative purview. This had a far-reaching impact on the U.S. financial system. As an example, in 2000 when the U.S. Congress introduced the new legislation the size of the CDS (credit default swaps) market was \$100 billion; in late 2008 the size of the CDS market was \$62 trillion. Charlie Munger finds CDS inherently objectionable: "Do you think it would be desirable if everybody in America could buy life insurance on any person they wanted to buy life insurance on? He continues "That would be pretty dangerous for the person who was insured. Some of that danger exists once you get people who have a vested interest in the destruction of some business." Even if CDS are not used to destroy good companies, they induce cynicism and sloppiness in bank lending. As Cristine Richard says: "In the end, the \$62 trillion CDS market allowed Wall Street to lend without having confidence in the men and women it lent to. Wall Street hedged away the risk of lending and in the process undermined the entire system."

7. Flaw in the Business Model of Investment Banks

Investment banks originally started off as brokerage firms and then diversified into underwriting of securities and advisory services. None of these businesses requires huge amounts of capital.

When commissions on their traditional businesses declined, investment banks further diversified into proprietary trading and then to private equity, businesses which require large amounts of capital to be committed to risky and illiquid assets. To finance these risky businesses they recklessly levered themselves. In August 2008, even after additional equity infusions, Lehman Brothers had a debt-equity ratio of 20:1. With such vulnerability, the acquisition of a property investment company at the height of the property bubble was sufficient to kill Lehman Brothers.

There were serious flaws in the model followed by investment banks. First, their assets were financed in the wholesale markets. If there is uncertainty about the value of the assets, access to funds is cut off, triggering a collapse. Second, high leverage incentivises managers to take huge risks. If the bets succeed, managers get outsized rewards; if the bets fail, shareholders get screwed up.

One can argue that the irresponsible behaviour of financial institutions is a manifestation of moral hazard to a certain extent. The involvement of the Federal Reserve Bank of New York in rescuing Long Term Capital Management perhaps prodded large financial institutions to assume more risk.

8. Excessive Leverage in European Banks

While Europeans criticised the U.S. investment banks for their casino capitalism, their own banks such as UBS, Credit Suisse, ING, Dexia, and B N P Paribas had debt-equity ratios nearing 50:1. Using the Basel norms European banks justified their high leverage by arguing that their assets (including much sovereign debt) were of high quality.

Yet the crisis of late 2008 taught some sobering lessons. First, even the highest rated assets can get tainted in a crisis thereby inflicting huge losses on highly leveraged banks. Second, in a panic, even the biggest financial institutions are vulnerable to a run on deposits or panic sales of securities. Third, practices like capital adequacy norms and mark-to-market are pro-cyclical, not anti-cyclical.

9. Reverse Natural Selection in Finance

In financial services, there is always a temptation to play. This tendency has been heightened with the evolution of financial services from a guild of small partnerships to a hoist of gigantic multinational corporations and clashing egos. As Chuck Prince, CEO of Citigroup in 2007, said: "As long as the music is playing you have got to get up and dance." A bank of Citi's size cannot sit on the sidelines without inviting criticism from investors and commentators.

The perturbing message in Prince's words is that bit by bit boom induces excessive risk taking, thereby causing reverse natural selection. As an *Economist* article says: "The end of partnerships turned private rivalries into a public tournament. The senior managers' wealth, careers and status were completely wrapped up in their firm's pre-eminence. League tables, quarterly results, daily share-price movements, total shareholder returns, all are ways of keeping score." It adds: "If you did not compete you were a dullard. If you pulled back your career may be cut short."

To paraphrase Keynes, the market can stay irrational longer than you can stay in your job. So in the last 35 years it appeared that everyone in finance tried to be someone else. As an *Economist* article put it: "Hedge funds and private equity wanted to be as cool as a dotcom. Goldman Sachs wanted to be as smart as a hedge fund. The other investment banks wanted to be as profitable as Goldman Sachs. America's retail banks wanted to be as cutting edge as investment banks. And European banks wanted to be as aggressive as American banks. They all ended up wishing they could be back precisely where they started."

SUMMARY

The Financial crisis has called for re-examining the dominant tenets in macroeconomics. It has challenged the belief in the self-correcting nature of financial markets and brought to focus the role of finance in economic growth.

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