CHAPTER 3
CONCEPTUAL FRAMEWORK
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In this chapter, the researcher captures the conceptual framework relating to global financial crisis, credit risk management, derivatives and Credit Defaults Swaps (CDS). Based on this conceptual framework one can understand the global financial crisis that occurred in 2007-2008. In addition, it gives importance to risk management practices of banks and financial institutions for upcoming development. In order to identify the roots of the crisis, the researcher deeply looked into the functioning of derivative instruments especially, CDS and its regulatory changes in the US and India, that have come up to avoid financial crisis in the future. This conceptual framework takes the current situation appropriately and can estimate a new approach to the future global financial system in effective manner.

3.1 Global financial crisis
3.1.1 Introduction

The 2007-2008 financial crisis impact the financial and real estate sectors in the United States and were also transmitted to the other global economies. It made the current economic and financial environment a very difficult time for the world economy and the global financial system. The genesis of the problem has later come to be popularly known as the subprime crisis. A subprime crisis arises due to defaults from loans to non-creditworthy borrowers. Once the economy slows down the ability of the borrowers to repay the loan became more difficult and affected were subprime borrowers.

A situation in which, the value of financial institutions or assets drops rapidly is called as financial crisis. It is often associated with a panic or a run on the banks, in which investors sell off assets or withdraw money from savings accounts with the expectation that the value of those assets will drop (investopedia.com). In general, crises have been created by factors such as, excessive leveraging of debt, credit booms, inappropriate risk management, mismatches between asset types, unsustainable macroeconomic policies, off-balance sheet operations by banks, inexperience with new financial instruments and deregulation played a significant role in the failure of key businesses and downturn in the economic activity. The financial crisis resulted in collapse of large financial institutions, the bailout of the banks and downturns in stock markets around the world.
3.1.2 Causes

The causes of financial crisis are complex and for many of the crises the human beings are responsible. A major cause for the global financial crisis was the transformation of financial systems into new models of securitization (Eric Helleiner, 2011). Financial innovations intended by brilliant computer experts to manage risk and make capital less expensive, more available and raced ahead of regulations, ultimately led to the global financial crisis. CDS were used to transfer credit risks away from the banks. Collateralized Debt Obligations (CDOs) were linked to mortgage companies, which passed on the risk. Mortgages, instead of being held by banks and mortgage companies were sold to investors shortly after the loans closed and investors packaged them as securities. Therefore, identifying the causes of global financial crisis accurately is very important. The global financial crisis was caused by the following factors, they are:

3.1.2.1 Low Interest Rates and Excess Lending

A fundamental cause of the global financial crisis was the easy availability of too much money globally. An oversupply of money created unparalleled levels of liquidity and historically low interest rates around one percent in late 2001. This low interest rates and large inflow of foreign funds created easy credit conditions for a number of years prior to the crisis, fueling a housing market boom and encouraging debt financed consumption. Low interest, encourages mindless borrowing, this was done to soften the effect of the collapse of the dotcom bubble and the September 2001 terrorist attacks and to combat the perceived risk of deflation.

3.1.2.2 Subprime Loans

Another major cause of the financial crisis was the availability of subprime loans, which were directly an outgrowth of easy credit. Subprime loans generally refer to the credit given to individuals who fail to meet precise standards usually expected by lending institutions. These individuals could not really afford their loans because of inadequate income and poor credit histories. In most cases, borrowers were not required to have a down payment. With excess liquidity globally, interest rates remained low.
3.1.2.3 **Boom in the housing prices**

Increased foreclosure rates in 2006-2007, among US homeowners led to a crisis in 2008. The collapse of the US housing bubble has a direct impact not only on home valuations, but the nation’s mortgage markets, home builders, real estate, home supply retail outlets. When US home prices declined steeply after peaking in mid-2006, it became more difficult for borrowers to refinance their loans. Bubble in the housing market is more critical than stock market bubbles.

3.1.2.4 **Easy credit conditions**

Easy credit with the assumption that housing prices would continue to appreciate, had encouraged many subprime borrowers to obtain an adjustable rate mortgage which they could not afford after the initial incentive period. Once housing prices started depreciating moderately in many parts of the US refinancing became more difficult. The additional supply of houses placed a major downward pressure on prices. As prices declined more house owners were at risk of default and foreclosure.

3.1.2.5 **Monetary policy**

Monetary policy should bear the brunt of the responsibility for stabilization. It typically works by encouraging banks to lend more and lower interest rates.

3.1.2.6 **Subprime loans**

The sub-prime mortgage loans are very risky but the profits are very high, because of this many institutions entered into this business. Loans are offered to individual who have low credit worthiness, they don’t meet the banking standards to avail loans. These loans are offered at high interest rate referred as the sub-prime rate and these home loan markets are called as sub-prime loan market.

3.1.2.7 **Predatory Lending**

It refers to the practice of dishonest lenders to enter into “unsafe” or “unsound” secured loans for inappropriate purposes. The unfair business practices and false advertising were making high cost mortgages to homeowners with weak credit, when housing prices declined the homeowners had little incentive to pay their monthly payments, since their home equity had disappeared. These situations posed to
falsify mortgage documents and the sell mortgages to Wall Street banks eager to make false profits.

3.1.2.8 Shadow banking system

A set of institutions operating as banks, without being banks, was not subject to the same safety and soundness regulations as depository banks. Shadow banking is one which originates the trade loans, assemble them into diversified portfolios and finance these portfolios extremely with riskless debt. It typically describes financial changes occurring outside the regulated banking sector. The shadow banking system threatened and dominated traditional commercial banks and helped banks break out of their traditional mode and join the feverish growth. So shadow banks and commercial banks were becoming co-dependent competitors. The collapse of the shadow banking in 2007-2008 arguably played a dangerous role in deflating the regulated banking sector and in bringing about the financial crisis. (Nicola Gennaioli, Andrei Shlel and Robert W Vishny, 2013)

3.1.2.9 Credit Ratings

Credit Rating Agencies (CRAs) are one of a large set of institutions and people who seek to forecast certain aspect in future. The main principles of rating agencies are the quality and integrity of the rating process, interdependence and conflicts of interest, transparency and timeliness of ratings disclosure and disseminate confidential information. The main role of CRAs is that they lag badly behind events in adjusting ratings in response to subsequent changes in the condition of such instruments and key enabler of the financial meltdown. CRAs are key players in the process between the issuers of securities and investors of securities.

3.1.2.10 Securitization

Securitization was one of the most brilliant financial innovations of the 20th century (Rokakis, 2011). It was designed to benefits of lenders, investment banks and investors. Lenders earned fees for originating and selling loans. Investment bankers earned fees for issuing Mortgage Backed Securities (MBS). Securities were customized to investors' needs. However, financial engineering behind these investments made them harder to understand of the innovative securitization.
3.1.2.11 Regulatory failure

The regulations could not go hand in hand with the financial innovations, increasing pseudo banks, off balance sheet financing. The self-regulation of investment banks and over the counter derivatives market such as CDS, CDOs and MBSs can be used to speculate against particular credit risks.

3.1.2.12 Toxic Mortgages

A toxic loan does not have sufficient collateral to meet the outstanding debt obligation when the borrower defaults. The lender is left with a large loss on the balance sheet and no way to recover the debt.

3.1.2.13 Poor corporate Governance

The financial crisis in the US is the cumulative result of many suspicious and debatable practices adopted by banks, earnings of top managers were exceeded salaries, dominant politicians in the US, encouraging lending to poor consumers by relaxing lending norms, changes in the international financial architecture have enabled and encouraged big players in the financial industry and obtain substantial benefits. The private players adopted unconventional strategies the same followed by the government sponsored entities and public banks because they don’t want to lose their business and retain public confidence.

3.1.2.14 Moral hazards

Moral hazard is equivalent to the privatization of gains and socialization costs. The major financial crisis arising in recent history due to lax credit, excessive risk taking, speculation and poor corporate governance have resulted in the banking and financial sector repeatedly going through a crisis.

3.1.3 Impacts

The financial system is the heart of the modern economy. The consequences and effects of the economic crisis are different from one country to another and from one region to another, depending on a whole range of factors, including financial capabilities and demography. It is a situation where macro indicator like, GDP, employment, capital utilization, household incomes and business profit fall and
bankruptcies and unemployment rates are rising. The global economic slowdown has severe consequences on policy formulation among emerging market.

3.1.3.1 Impact on the US economy

The crisis brought severe and unfavorable impacts on the US economy especially, in the banking and financial industry. During the crisis, the finance-related industries had been badly hit by mortgage bonds because the subprime mortgages had reduced in value. The result of the global financial was seen in the sharp drop in global economic activity and in 2009, most major developed economies found themselves in a deep recession. The fallout of global trade, both in volumes and the pattern of trade has been affected (Warwick J McKibbin, Andrew Stoeckel, 2009). In the third quarter of 2007, subprime Adjustable Rate Mortgages (ARMs) only accounted for 6.8 per cent of the total outstanding, but it is accounted for 43 percent of all foreclosures in October 2007 (Joan Clos, 2011)

3.1.3.2 Impact on other developed countries and emerging economies

All countries were impacted by the 2008 to 2009 recession through falling exports, rising unemployment and hence falling incomes. The global recession leads to decline in the capacity of trade growth in 2009. According to United Nation’s Committee on Trade and Development (UNCTAD) world trade declined 4.5 percent in 2009 as a direct result of the global recession. The financial institutions in developing countries could be negatively affected depending on the extent to which they hold assets infected by subprime mortgages. The International Monetary Fund (IMF) expected growth in world trade to decline from 9.4 percent in 2006 to 2.1 percent in 2009. The International Labor Organization (ILO) found that the global financial crisis could increase world unemployment by an estimated 20 million. This would bring the total number of unemployed in the world to over 200 million in 2009. The OECD predicted world trade volumes could shrink by 13 percent in 2009 from 2008 levels (OECD, 2009).

3.1.3.3 Impact on India

India felt the tremors of the tectonic shocks in the global system. The global financial crisis began to affect India from early 2008 through a withdrawal of capital from India’s financial markets this lead to sudden stop of capital flows affecting the
equity market. The inflow of capital was over $108 billion in 2007-08, a net increase of only $9.1 billion capital flows was recorded in 2008-09. So, Indian firms had difficulties in raising money from abroad (Rangarajan, 2010). The net result was a high degree of pressure on financial markets; it includes equity, debt, money and foreign exchange markets. The financial crash resulted in a sharp decline in export demand for goods and services due to the fact that India’s trade and financial system is integrated with the global system. Exports grew at 25 percent during the period 2005-2008 and decelerated to 12.2 percent in the year 2008-2009 (Subbarao, 2011). The crisis also caused interest rate instability and increased unemployment rate in India (Ratnayake, 2008). The financial market instability reflected an economic slowdown that clearly revealed that the GDP growth rate which was 9.5 percent during the years 2005-2008 dropped to 6.8 percent in the year 2008-2009 (Subbarao, 2011).

3.2 Credit risk management

3.2.1 Introduction

Credit risk management is a major area of concern for financial stability. So today’s managing financial risk systematically and professionally becomes an even more important task. The foremost thing is to understand the risks run by the banks and financial institutions and to ensure that the risks are properly confronted, effectively controlled and rightly managed. Hence providing real time risk information is one of the key challenges of risk management exercise.

3.2.2 Credit risk management in banks and financial Institutions

Business grows mainly by taking risk, the greater the risk higher the profit and hence, the business unit must strike a trade-off between the two. Risk is inherent in any walk of life in general and in financial sector in particular. “Profiting in business without exposing to the risk is like trying to live without being born”. The risk management system is a proactive action in the present for the future. Managing risk is nothing but managing the change before risk manages. Hence, the banks and financial institutions should have an efficient management framework to mitigate all internal and external risks. (Ragavan R. S. 2003)
The risk arises due to uncertainties, which in turn arise due to changes taking place in prevailing economic, social and political environment and non-availability of information concerning such changes. In the traditional banking model, lending risk was not excessive. In the event of a customer default on a loan, the financial institution could seize pledged customer assets and obtain at least a partial recovery. Today’s banking activities have some similarities to the traditional model, but the nature of financial services has changed. Financial institutions also participate in a variety of other financial market activities. These changes have necessitated adoption of new techniques for managing credit risk.

3.2.3 Credit Risk Management Process

Effective management of credit risk has become increasingly critical for banks’ and other financial institutions’ risk management strategy to ensure that their financial health remains sound. Credit risk management encompasses identification, measurement, monitoring and control of the credit risk exposures (RBI).

3.2.3.1 Risk Identification: The risk identification involves the understanding the nature of various kinds of risks, the circumstances which lead to a risk situation and causes due to which the risk can arise.

3.2.3.2 Risk Quantification: Risk quantification is an assessment of the degree of the risk which a particular transaction or an activity is exposed to. Though the exact measurement of risk is not possible, the level of risk can be determined with the help of risk rating models.

3.2.3.3 Risk Monitoring and Control: Risk control is the stage where the bank or institutions take steps to control the risk with the help of various tools. Through effective review mechanism and portfolio management

3.2.4 Tools for credit risk control

Financial institutions have grown to being a financial intermediary in the past to a risk intermediary at present. So risk management has emerged as a new and challenging area in financial institutions. The effectiveness of risk measurement in financial institutions depends on efficient Management Information System (MIS). Computer networking of the branch activity offers its products at a better price than
its competitors, strictly adhere to “KYC” (Know your Customer) rules and diversified their funds in an efficient and effective way (Krishn A. Goyal, Sunita Agrwal, 2010).

3.2.5 Credit risk consists of two components, such as the following:

3.2.5.1 Quantity of Risk: This is nothing but the outstanding loan balance as on the date of default.

3.2.5.2 Quality of Risk: The Severity of loss defined by both probability of default as reduced by the recoveries that could be made in the event of default. So the credit event is a combined outcome of default risk and exposure risk.

3.2.6 Financial innovation

The financial services industry has been witnessing a number of innovations. One such innovation is financial derivatives, which initiated a number of changes in the risk management activities. The recent global financial crisis has highlighted the limitations and hazards of financial innovation while dimming the light of its core benefits for an economy. The main reason is that many complex financial instruments associated with innovation such as collateralized debt obligations (CDOs) and credit default swaps (CDS) were extensively used as vehicles in the credit expansion that led to the crisis. The financial innovation enhances the way in which finance and the financial system are modernized. The innovative financial products contribute to the expanding of financial markets and encouraged economic development. The financial innovations are sufficiently transparent, understandable by the market participants to work efficiently and society can continue to benefit from an unceasing modernization of finance and the financial system (Manuel Sánchez, Banco de México, 2010).

3.2.7 Risk mitigation technique

A technique to actively mitigate credit risks is possible by taking measures to enhance the quality of credit exposure. The following are the credit risk mitigation techniques viz., collateral, netting, guarantees and credit derivatives.

3.2.7.1 Collateral Security: Any asset which is given as a form of guarantee towards a loan is a collateral security. This asset can be liquidated in case of non-repayment of a loan. The categories of loans that require collateral security are typically home
loans, business loans, auto loans and long tenure loans. The Credit exposure is calculated by a commonly used procedure called MTM (marked to market).

3.2.7.2 Netting: Netting agreements that reduce the size of counterparty exposures by requiring the counterparties to offset trades so that only a net amount in each currency is settled and provide for a single net payment upon the close out of all transactions in the event of a default or termination event. Netting of cash flows or obligations is a means of reducing credit exposure to counterparties.

3.2.7.3 Guarantee: A guarantee is from a lending institution, ensuring that the liabilities of a debtor will be met. In other words, if the debtor fails to settle a debt, the bank will cover it. A bank guarantee enables the customer (debtor) to acquire goods, buy equipment, or draw down loans, and thereby expand business activity. This risk-reduction strategy can help to secure the future to a large extent.

3.2.7.4 Credit derivatives: Credit derivative market will help to improve financial stability by facilitating the dispersion of credit risks. Credit derivatives are financial contracts that allow the transfer of credit risk from one party to another. The primary role of derivative instruments is to act as a hedge against price risk in the future and it will be driving force in many of the global financial markets.

3.3 Derivatives

3.3.1 Introduction

In the early 1980’s, the word “derivative” was used mainly in chemistry or mathematics. Today, it is most commonly used in the context of financial market. The most exciting developments in derivatives markets since the late 1990s have been in the credit derivatives area. In 2000 the total notional principal for outstanding credit derivatives contracts was about $800 billion. By June 2007 this had grown to over $42 trillion. (John C. Hull, Sankarashan Basu, 2010).

A derivative is a financial contract whose value is “derived from,” or depends on, the price of some underlying asset. Equivalently, the value of a derivative changes when there is a change in the price of an underlying related asset. (David A. Dubofsky, Thoms W. Miller, JR.2007). It is a financial instrument that is based on the value of an underlying asset or instrument (Hunt & Kennedy, 2004). A derivative is a
financial instrument or more simply, an obligation to deliver underlying assets at a certain time (Arnold G, 2008).

### 3.3.2 Derivative Markets

In the financial markets in recent years, derivatives are playing a vital role in the risk management process in banks and financial institutions and in sustaining growth of the economy. It facilitates risk management, investments and enhances asset management capabilities, in trade or commodities market. Derivatives are financial instruments whose returns are derived from those of other financial instruments. Derivatives serve a valuable purpose in providing a means of managing financial risk. It is broadly used by corporations, financial institutions, professional investors and individuals (Don M Chance, 2001).

### 3.3.3 Misuse of derivatives

Derivatives help financial markets become more efficient and provide better opportunities for managing risk. However, to use derivatives without having the requisite knowledge and in inappropriate situations is dangerous and also having excessive confidence in one’s ability to forecast prices or interest rates, then acting on those forecasts by using derivatives can be extremely risky (Don M Chance, 2001).

### 3.3.4 Growth of derivative market

The growth of derivative market mainly depends on volatility in prices, globalization of markets, technological advancements and development in financial theories.

### 3.3.5 Derivative Trading

Derivatives are traded in the following two ways:

#### 3.3.5.1 OTC traded derivatives

OTC derivatives are traded directly between private parties, rather than being traded through an exchange (Smith. R. & Walter L, 2003). Derivative instruments are best traded Over the Counter, because of their custom nature (Chorafas D, 2008).
3.3.5.2 Exchange traded derivatives

In which derivatives are listed on exchange for buyers and sellers in much the same fashion as stock or bond market.

3.3.6 Derivative product

Forwards, Futures, Options and Swaps have been referred to as the four basic building blocks of derivative instruments.

3.3.6.1 Forward Contract: A contract that obligates one counterparty to buy and the other to sell a specific underlying asset at a specific price, amount and date in the future is known as forward contracts. All these terms were fixed at the time the parties enter the forward contract. The specified future price is called the exercise price. Most of the forward contracts are customized and are traded over the counter (OTC) market.

3.3.6.2 Future Contract: A transaction that obligates its owner to buy a specified underlying asset at a specified price on the contract maturity date or settle the value of cash is known as “Future Contract”. The future contract is just like a forward contract, except that it is a standardized, exchange traded instruments. Future contracts are settled through a clearing house and unlike a forward contract, the gains and losses on future contracts are released daily. The total notional amount of all the outstanding positions at the end of June 2004 stood at $53 trillion. That figure grew to $81 trillion by the end of March 2008 (Source: Bank for International Settlements (BIS)).

3.3.6.3 Option Contract: An option contract gives its holder the right (but not the obligation) to purchase or sell a specified underlying asset at a stated price (exercise price or strike price) on or before a specified expiration date. It is an exchange traded derivative products. There are two types of options viz., Call option and put option. A call option conveys the right to buy the underlying asset at a future date. They make profit through buying the underlying asset at a lower current price and selling a higher future price. A put option conveys the right to sell the underlying asset at a future date. They make profit through selling underlying asset at a higher current price and buying a lower future price.
3.3.6.4 **Swap contract:** A contract whereby two parties agree to exchange (swap) payments, based on some notional principal amount is known as “swap.” Only the payment flows are exchanged and not the principal amount. Swaps may be carried out directly between two liability holders or may involve a bank as an intermediary. Today, swaps are among the most heavily traded financial contracts in the world: the total amount of interest rates and currency swaps outstanding is more than $426.7 trillion in 2009, according to the International Swaps and Derivatives Association (ISDA).

3.3.7 **Traders in derivative markets**

There are generally three types of traders in the derivative market. They are as follows:

3.3.7.1 **Speculators:** A speculator takes an option position based on some forecasts in hope to gain from the future market price movements. Speculators are vulnerable to both the downside and upside movements of the markets, thus speculation is extremely risky but at the same time extremely profitable.

3.3.7.2 **Arbitrageur:** Arbitrage involves making a profit from relative mispricing. They are getting risks less profits. They get Profit from the price difference between two markets by the simultaneous establishment of short and long positions.

3.3.7.3 **Hedgers:** A mechanism through which loss of a transaction can be minimized is known as “hedging” Hedgers are those who protect themselves from the risk associated with the price of an asset by using derivatives.

3.3.8 **Credit derivatives**

Credit derivatives have been around for just over a decade, since their public introduction in 1992 at the annual meeting of ISDA in Paris. The emergence of credit derivatives represents a new mechanism for diversifying a portfolio of credit risk, permitting unwanted risk transferred to another organization. Credit derivatives allow market participants, especially financial institutions, to manage credit exposures that arise from their core business and also investor to reduce or eliminate default risk. Credit derivative is a contract between two parties that allows transferring the credit risk from one party to another. The party transferring risk away has to pay a fee to the party that will take the risk.
Credit derivative is Over the Counter (OTC) financial contracts. They are usually defined as “off balance sheet” financial instruments that permit one party (beneficiary) to transfer credit risk of a reference asset, which it owns, to another party (guarantor) without actually selling the asset. In other words, it is a bilateral agreement between the seller and buyer where the seller sells protection of referred assets against default, and counterparty buys that protection. A credit derivative is a securitized derivative whose value is derived from the credit risk on an underlying bond, loan or any other financial asset.

ISDA is a global trade association for the derivatives industry. It can facilitate more efficient credit derivatives transactions and provide efficient documents to better support these OTC trades (Udo Broll, B. Michael, et.al, 2008). Credit derivatives allow banks and financial institutions to actively manage their credit risks and hence free up capital, which can be used in productive opportunities (Namita Sharma, 2011). It continues to play an important role in today’s global economy and its market keeps on growing even in the recent financial crisis. The notional amount had grown to $26.5 trillion by July 2009 according to DTCC (Eraj Shrivani, 2009). Credit derivatives can be categorized as single name or multi-name. The most popular single-name credit derivative is a Credit Default Swap (CDS). The multi name credit derivative is a Collateralized Debt Obligation (CDOs) (John C Hull, Sankarshan Basu, 2011)

Credit derivatives are primarily a mechanism to transfer a risk of person who wants to avoid the risk associated with the underlying asset to another person who has the appetite for it. The credit derivatives by region wise as follows:

![Credit Derivatives by region](source)

Source: FIMMDA – PDAI 13th Annual Conference 2012
Figure 3.1, clearly depicts that credit derivatives are highly used by London region that is 43 percent and next highly participated in derivative market was US that is 39 percent. Further, it is found that Asia and Australia region are using credit derivatives at 10 percent and 5 percent to be used by Europe ex-London. Only a least percent that is 3 percent of credit derivative is used by other regions.

3.3.9 Types of credit Derivatives

Credit derivatives are fundamentally divided into two categories: funded credit derivatives and unfunded credit derivatives.

3.3.9.1 Funded credit derivative

It involves the protection seller (the party that assumes the credit risk) making an initial payment that is used to settle any potential credit events. The protection buyer, however, still may be exposed to the credit risk of the protection seller itself. This is known as counterparty risk. In this way, the buyer is not exposed to the credit risk of the seller. Transactions are commonly rated by rating agencies, which allows investors to choose their credit risk. Funded credit derivative products include credit linked notes and synthetic collateralized debt obligations.

Funded credit derivative products include the following products:

- Credit linked note (CLN)
- Synthetic Collateralized Debt Obligation (CDO)
- Constant Proportion Debt Obligation (CPDO)
- Synthetic Constant Proportion Portfolio Insurance (Synthetic CPPI)

3.3.9.2 Unfunded credit derivative

An unfunded credit derivative is a bilateral contract between two counterparties, where each party is responsible for making its payments under the contract (i.e. Payments of premiums and any cash or physical settlement amount) itself without recourse to other assets. The most popular unfunded credit derivative is the Credit Default Swap (CDS).
Unfunded credit derivative products include the following products:

- Credit default swap (CDS)
- Total return swap
- Constant maturity credit default swap (CMCDS)
- First to Default Credit Default Swap
- Portfolio Credit Default Swap
- Secured Loan Credit Default Swap
- Credit Default Swap on Asset Backed Securities
- Credit default swap
- Recovery lock transaction
- Credit Spread Option
- CDS index products

Table 3.1 depicts the different types of derivatives for different underlying assets:

<table>
<thead>
<tr>
<th>Underlying Asset</th>
<th>Exchange-traded futures</th>
<th>Exchange-traded options</th>
<th>OTC swap</th>
<th>OTC forward</th>
<th>OTC option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity</td>
<td>DJIA Index future</td>
<td>Option on DJIA Index future</td>
<td>Equity swap</td>
<td>Back-to-back</td>
<td>Stock option</td>
</tr>
<tr>
<td></td>
<td>Single-stock future</td>
<td>Single-share option</td>
<td></td>
<td>Repurchase agreement</td>
<td>Warrant</td>
</tr>
<tr>
<td>Interest rate</td>
<td>Eurodollar future</td>
<td>Option on Eurodollar future</td>
<td>Interest rate swap</td>
<td>Forward rate agreement</td>
<td>Swap option</td>
</tr>
<tr>
<td></td>
<td>Eurobor future</td>
<td>Option on Eurobor future</td>
<td></td>
<td>Bond option</td>
<td></td>
</tr>
<tr>
<td>Credit</td>
<td>Bond future</td>
<td>Option on Bond future</td>
<td>Credit Default Swap</td>
<td>Repurchase agreement</td>
<td>Credit default option</td>
</tr>
<tr>
<td>Foreign exchange</td>
<td>Currency future</td>
<td>Option on currency future</td>
<td>Currency swap</td>
<td>Currency forward</td>
<td>Currency option</td>
</tr>
<tr>
<td>Commodity</td>
<td>WTI crude oil futures</td>
<td>Weather derivatives</td>
<td>Commodity swap</td>
<td>Iron ore forward contract</td>
<td>Gold option</td>
</tr>
</tbody>
</table>

Source: Computed information
3.4 Credit Default Swaps

3.4.1 Introduction

Credit Default Swaps (CDS) have existed since the early 1990s, but its use has become increasingly popular over time. CDS was initially designed as an essential risk management tool for financial institutions to prevent risks and it was used commonly by financial professionals, institutional and retail investors. It allows financial institutions to manage their exposures in better way and investors benefit from amplified investment opportunities and more capital available for financing. In recent times, however, CDS has been increasingly used for speculative purposes. The global financial crisis is the result of a loosely regulated and complex mortgage lending system. This lax regulatory framework created a CDS market detonated over the past decade. Brealey, et.al, (2006) describe a CDS as a credit derivative which protects lenders against the credit risk that a borrower will default.

3.4.2 Evolution of CDS

The different stages of the evolution of CDS markets globally are discussed below:

3.4.2.1 Inception (1995 – 2000): 1995-1996 the concept of a credit protection instrument was created by JP Morgan and Single name CDS starts to trade in 1998. First basket trade is made in 1999-2000. ISDA 1999 Credit derivative definitions cleared up a number of issues in documentation, definition and mechanisms.

3.4.2.2 Expansion (2001 – 2005): ISDA “2003 CDD”- clarity deliverable obligations in Restructuring credit event – clarity succession in mergers, etc., Enhance the criteria for Repudiation and default settlement process. In 2004 – They were merged to form iTraxx for Asia and Europe and the DJCDX for North America and in 2005 – ISDA creates definitions for CDS on ABS

3.4.2.3 Tribulation (2006 – 2010): 2009 – Comprehensive CDS Performs more standardization mainly in valuation with the Big Bang and Small Bang Products and remove restructuring US standard credit event in North America CDS, establish the central clearing facility. In 2010 -The Chinese market open for Credit mitigation instruments with Credit Risk Mitigation Agreements (CRMA) and Credit Risk Mitigation Warrants (CRMW)
3.4.2.4 Maturation (2011 onwards): Dec 2011 an Indian market sees first INR-denominated CDS trades with Rural Electrification Corporation and India Railway Finance Corporation (Ben Davies, Gigi P Tan, Zhang, 2012).

3.4.3 CDS mechanism

CDS market has developed much faster than other derivatives markets since its commencement. Its growth has affected the stability of the financial system. CDS was formerly designed as a risk transfer tool to allow investors to hedge their position in the debt of a reference entity, but much of the activity in this market is also speculative (Olléon-Assouan, 2004). CDS facilitated companies make well investment decisions because they were able to utilize CDS prices as a tool to measure credit risk (Gary B. Gorton 2008). The prices of CDS contracts also give investors unique information about the credit risks associated with various companies or particular debt instruments (Laura Mandaro, 2009). The following CDS mechanism, Figure 3.2 clearly explains how CDS works and who are the persons involved in CDS transactions.

Figure: 3.2

CDS Mechanism

Sources: Computed Figure
In the CDS mechanism as depicted in Figure 3.2 that the financial institution has bought bond from company which in CDS parlance known as reference entity. The company issuing bonds for the purpose of raising finance is called reference entity. The financial institution now has exposure to the company. If there is risk of company may default on repayments or its prospects are declining. So, the financial institution does not keep this risk and wants to diversify its assets - it has two choices, sell the bond or transfer the credit risk. For a variety of tax reasons financial institution does not want to sell the bond, but it is able to eliminate the credit risk of the company by entering a CDS. For this purpose the protection buyer pays a premium to the protection seller in order to exposure to a reference entities credit risk. The amount of protection that protection buyers purchase is called the “notional amount”. If the credit event occurs the protection seller makes a contingent payment to the protection buyer. If the company does not default, the protection seller gains from the financial institution and pays nothing out.

3.4.4 CDS as tool of credit risk management

Credit risk management is the vital for modern risk management. Risk management plays a dynamic role in achieving profitability and stability of banking and financial institutions. One way to effectively manage credit risk is the transfer of risk through the credit derivatives. CDS is one of the credit derivative instruments that can be used to transfer credit risk from the protection buyer to the protection seller. It is insurance for debt securities. CDS is a contract which offers liquidity and risk shifting opportunities. But the contract is useful only to the extent that market participants internalize the risk inherent in CDS transactions. The deregulation generated a CDS market in which market participant does not accurately internalize the systemic risk (European Central Bank). Systemic risk may be defined generally as the risk that default of a firm or group of firm will result in the failure of the financial system as a whole. CDS have actually contributed to intensifying systemic risk by concentrating exposure on a handful of highly interconnected players that are simultaneously buyers, sellers and underlies (Brunnermeier, 2008).
3.4.5 Uses of CDS

CDS are useful in the following ways:

- CDS have created a liquid market place for trading. The development of the CDS enables more capital to be available for financing.
- Through CDS increased capacity to expand their lending.
- There is a way to avoid or reduce the risk of losing potential clients by buying a CDS.
- CDS can be considered as an opportunity to portfolio diversification and increasing its returns.
- CDS is a contract which is a pure credit risk transfer mechanism isolating the credit risk from the interest risk exchange risk and liquidity risk.
- CDS provided a better price discovery mechanism
- Distribute risk widely throughout the system and prevent concentrations of risks
- Provide important information about credit conditions
- CDS can be used to protection sellers to participate in credit markets, without actually owning assets.

3.4.6 Drawbacks of CDS

Following are the drawbacks of CDS:

- Lack of regulation
- The downturn in the housing markets leading to insolvency and systemic failure
- Poor understanding of the risk associated with complex financial instruments
- As long as banks and financial institutions use derivative products, such as CDS for hedging purpose only it is useful, but it is used for speculative purposes
- Excessive reliance on leverage to enhance returns
- Regulatory gaps and insufficient institutional risk controls lead to systemic risk (ICE, 2010)
3.4.7 CDS Vs Insurance

The CDS appears a lot like an insurance contract because the protection buyer pays a premium and in return, receives a sum of money if credit event occurs. But it is not actually equivalent of insurance policies (Suresh Chandra Bihari, 2011). There are some differences and reasons which indicate that CDS and insurance are two different things.

- In the case of CDS, the protection buyer does not have to own the underlying security or other form of credit exposure. While in the case of insurance, to purchase insurance, the insured is expected to have an insurable interest like owning a debt obligation.
- The CDS provides an equal payout to all holders, according to market-wide method. And an insurance provides an indemnity against the losses which actually suffered by the policy holder.
- The protection seller does not have to be a regulated entity.
- The protection seller is not required to maintain any reserves to pay off buyers, but the major CDS dealers are subject to bank capital requirements.
- CDS differ from insurance with regard to tax, accounting and in regulatory jurisdictions.
- To cancel the insurance contract the buyer can simply stop paying premium and in the case of CDS the protection buyer need to unwind the contract which might give profit or loss.
- Insurance contract require the disclosure of all kinds of known risks involved. And unlike insurance companies, protection sellers of CDS are not required to maintain any capital reserves to guarantee payment of claims.
- The majority of insurance contracts are not tradable and CDS is traded on the OTC market.

3.4.8 Regulatory Framework - in global perspective

CDS contracts have come under the regulation of the Commodity Futures Trading Commission (CFTC) of the Federal Government but, there was an act of Congress passed and signed into law in the year 2000 by William Clinton which specifically omitted CDS's from regulation by the CFTC. The use of CDS by certain banks and insurance companies to trade mortgage related risks exacerbated losses from the financial crisis. The recent efforts to upturn the stability and transparency of derivatives markets by market participants acting under supervision of the Federal Reserve Bank of New York (Houman B. Shadab, 2009).
The Dodd-Frank Wall Street financial regulatory Reform and Consumer Protection Act mandated that the CDS should be traded through a centralized counterparty and a clearinghouse for providing market-based solutions to mitigating counterparty risk. This reform decreases risks to the financial system by reducing interconnections and dispersing losses (Rama Cont, 2010).

The financial crisis exposed several limitations of the CDS market, in particular, the lack of transparency about CDS positions, insufficient management of counterparty credit risk and settlement backlogs. During 2009, ISDA published two industry protocols which implemented significant changes to credit derivative contracts it included, Big Bang and Small Bang protocols as well as the introduction of new CDS trading conventions. The aim of these changes is to enrich the infrastructure of the CDS market in order to realize same day trade matching, the elimination of offsetting trades, and centralized clearing (Shikhagupta, 2012).

Improper use can be harmful to the financial health. For that concern, derivatives have recently led the U.S treasury to propose a comprehensive regulatory framework to bring greater transparency to the derivatives market. It includes, restriction on derivatives trading and imposing close supervision on derivative market participants to reduce systemic risk. And also the proposals call for amending the Commodity Exchange Act (CEA) and securities laws to prevent market manipulation, fraud and other market abuses (U.S department of treasury, 2009).

The credit derivatives industry has responded to the regulators’ guidance with the establishment of the International Swaps and Derivatives Association (ISDA). ISDA is a global trade association for the derivatives industry. ISDA can facilitate more efficient credit derivatives transactions and provide streamlined documents to better support the OTC trades. Credit derivatives have been an important focal point for the ISDA which provides standardized documentation for swaps and other derivatives transactions (Lily Tijoe, 2007).

At a summit of leaders from the G-20 nations including the G-8, the European Union, Australia and 10 major emerging economies agreed to continue taking steps to stabilize the global financial system and improve the international regulatory framework. It includes, address weaknesses in accounting and disclosure standards for off-balance sheet vehicles, the Credit Rating Agencies (CRAs) meet the highest

### 3.4.9 Credit Derivatives: Initiatives in India

Introduction of credit derivatives in India was to provide participants the tools to manage credit risk in their portfolio. A Working Group on introduction of credit derivatives in India was founded in 2003 with membership from banks, insurance companies and related departments in the Reserve Bank. Based on the recommendations of the Working Group, draft guidelines on introduction of credit derivatives were brought out on March 26, 2003. Subsequently, the matter was reassessed in the Annual Policy Statement for the year 2007-08 wherein it was indicated that as a part of the gradual process of financial sector liberalization in India, credit derivatives would be introduced in a standardized manner. To begin with, it was decided to permit commercial banks and primary dealers (PDs) to deal with single-entity Credit Default Swaps (CDS). The purpose of introduction CDS was to enhance the development of the corporate bond market in India. Accordingly, draft guidelines were issued on CDS on May 16, 2007 and based on the feedback received, a revised draft was again placed for comments on October 24, 2007 for a second round of consultation. However, the status was reviewed in the wake of the global financial crisis in 2008. This was to enable to draw upon the experience of developed countries. The RBI finally published the draft report on the introduction of CDS for corporate bonds on its website on August 4, 2010 and subsequently its final report on February 23, 2011. Credit derivatives have been introduced from Nov-2011, in India in the name of Plain Vanilla Single Name Credit Default Swaps (CDS) for corporate bonds subject to appropriate safeguards (RBI, Report of the Working Group and Guidelines on CDS, 2011).

### 3.4.10 Regulatory framework in India

The RBI has issued certain guidelines for regulating the CDS in 2007 and some observations have been made in this regard to improve these regulations. The goal of any regulatory framework is managing systemic risk and maximizing economic efficiency within the financial system (Steven L. Schwarcz, 2009). The RBI has taken both monetary and regulatory actions to prevent the impact of the global financial crisis (Rakesh Mohan, 2009). Credit derivatives, the fastest growing segment of the
market globally, are absent in India and require regulatory action if they are to develop. (AsaniSarkar, 2007). In this context, the Internal Group, in consultation with various market participants and market bodies along with taking into account international experience in the working of CDS, has finalized the operational framework for introduction of CDS in India (RBI, Report of the Working group and guidelines on CDS, 2011).

3.4.10.1 Product Design - Eligible participants

(i) Market-makers – The market makers are permitted to both buy and sell protection. Commercial banks, Primary Dealers and NBFCs (that offer credit facilities) can be allowed to act as market-makers. Insurance companies and Mutual Funds may also be permitted to sell CDS on single name corporate bonds subject to their having strong financial and risk management capabilities as prescribed by their respective regulators (IRDA and SEBI)

(ii) Users – The users are not permitted to sell protection, but are permitted only to hedge the underlying risk by buying protection. The Users category would comprise Commercial Banks, Primary Dealers, NBFCs, Mutual Funds, Insurance Companies, Housing Finance Companies, Provident Funds and listed corporates. All CDS trades shall have an RBI-regulated entity at least on one side of the transaction.

3.4.10.2 Eligibility norms for market-makers:

The eligibility norms in the case of commercial banks: Minimum CRAR of 12 per cent with core CRAR (Tier I) of at least 8 per cent and net NPAs of less than 3 per cent. For NBFC minimum Net Owned Funds of Rs. 500 crore minimum CRAR of 15 per cent and net NPAs of less than 3 per cent, and for PDs minimum Net Owned Funds of Rs. 500 crore and minimum CRAR of 15 per cent

3.4.10.3 Reference Entity: The reference entity in a CDS contract shall be a single legal resident entity.

3.4.10.4 Reference obligation: The CDS can be written only on listed corporate bonds as eligible reference obligations in India. CDS also permitted on unlisted but rated bonds of infrastructure companies.
3.4.10.5 **Standardisation of the CDS Contract:** The CDS contracts in India standardized in terms of coupon, coupon payment dates, etc. Details relating to standardization of CDS contracts may be decided by the market participants and market bodies like FIMMDA.

3.4.10.6 **Credit Events:** Credit events as defined by ISDA may need some modification to be in consonance with Indian laws. The six categories of credit event are as follows: viz., bankruptcy, failure to pay, obligation acceleration, obligation default, repudiation/moratorium and restructuring. There is still different opinion about treating restructuring as a credit event.

3.4.10.7 **Determination Committee:** Eligible market participants and FIMMDA may form a Determination Committee (DC) of dealers and investors. DC would resolve issues pertaining to Credit Events, CDS Auctions, Succession Events, etc. In order to provide adequate representation to CDS users, it is recommended that at least 25 per cent of the members may be drawn from the users i.e. buy-side.

3.4.10.8 **Settlement methodologies:** For users, physical settlement is mandatory. Market-makers can opt for any of the three settlement methods such as physical, cash and auction.

3.4.10.9 **Documentation:** Market organizations like FIMMDA in association with ISDA may devise a master agreement for Indian CDS. The users/market-makers should consult their legal experts about adequate documentation and other legal requirements on issues concerning credit derivative contracts before engaging in any transactions.

3.4.10.10 **Accounting:** The accounting norms applicable to CDS contracts shall be on the lines indicated in the ‘Accounting Standard (AS) 30 – Financial Instruments: Recognition and Measurement’, (AS) 31 on Financial Instruments: Presentation’ and (AS) 32 on documentation Disclosures’ approved by the Institute of Chartered Accountants of India (ICAI).

3.4.10.11 **Pricing/Valuation methodologies:** In Indian context, the market participants uniformly use FIMMDA valuation prices for valuing their G-sec portfolio. Appropriate and robust methodologies for marking to market (MTM) the CDS contracts on a daily basis.
3.4.12 **Risks in CDS**: As CDS markets are exposed to various risks such as sudden increases in credit spreads resulting in mark-to-market losses, high incidence of credit events, jump-to-default risk, basis risk, counterparty risks, etc., which are difficult to anticipate or measure accurately, market participants need to take these risks into account and build robust and appropriate risk management architecture to manage the risks.

3.4.13 **Policy Requirements**: Before undertaking CDS transactions, participants shall put in place a written policy on CDS, which should be approved by their respective Boards of Directors. The policy may be reviewed periodically.

3.4.14 **Framework of Reporting and Trade Dissemination**: A centralized CDS repository with reporting platform may be set up for transactions in CDS and it may be made mandatory for all CDS market-makers to report their CDS trades on the reporting platform within 30 minutes from the deal time.

3.4.15 **Centralized Clearing and Settlement of CDS**: It is based on international experience, examining the development of domestic CDS markets and suggests a mechanism for the introduction of centralized clearing for CDS in India.

**Conclusion**

This chapter the foregoing paragraphs deals with the conceptual framework based on which the research study is designed. The following chapter is dedicated to the various statistical analysis viz., Trend analysis, Karl Pearson Coefficient of Correlation and Multivariate General Linear Model of different variables relating to the financial crisis and CDS based on the secondary data.

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