Draft Report of the Internal Group

on

Introduction of Credit Default Swaps for Corporate Bonds

Reserve Bank of India
Central Office
Mumbai

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LETTER OF TRANSMITTAL

Convener

Internal Working Group on CDS
Reserve Bank of India
Central Office
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Smt. Shyamala Gopinath
Deputy Governor
Reserve Bank of India
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Respected Madam

I have great pleasure in submitting the Draft Report of the Internal Working Group to finalise the operational framework for introduction of plain vanilla OTC single-name CDS for corporate bonds for resident entities. The Group, in consultation with the various market participants and taking into account international experience in the working of CDS, has finalised the operational framework for introduction of CDS in India.

On behalf of the Members of the Working Group, and on my behalf, I sincerely thank you for entrusting this responsibility.

Yours faithfully

(R.N.Kar)
Convener

(Mohua Roy) Member	(Rajinder Kumar) Member	(K.Sivaraman) Member
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Contents

Chapter No.	Details	Page No.
I	Introduction	4
II	CDS for Indian Markets - Product Design	11
III	Regulation and Risk Management in CDS	28
IV	Trade Reporting & Information Dissemination	39
V	Centralised Clearing and Settlement of CDS	43
VI	Summary of Recommendations	48
Annex I	Constitution of the Group and the Terms of Reference	55
Annex II	Credit Derivatives – Concepts	57
Annex III	Types of Risks in CDS	69
Annex IV	CDS contract reporting formats	73
Annex V	Working of CCPs for CDS in US & Europe	74
	References	80

LIST OF ABBREVIATIONS		
AS	-	Accounting Standard
BIS	-	Bank for International Settlements
BSE	-	Bombay Stock Exchange
CCIL	-	Clearing Corporation of India Limited
CCM	-	Credit Clearing Member
CCP	-	Central Counterparty
CD	-	Certificate of Deposit
CDS	-	Credit Default Swap
CFTC	-	Commodity Futures Trading Commission
CME	-	Chicago Mercantile Exchange
CP	-	Commercial Paper
CPSS	-	Committee on Payment and Settlement Systems
CRAR	-	Capital to Risk (Weighted) Assets Ratio
DC	-	Determination Committee
DTCC	-	Depository Trust & Clearing Corporation
FIMMDA	-	Fixed Income Money Market and Derivatives Association of India
FRBNY	-	Federal Reserve Bank of New York
FSA	-	Financial Services Authority, UK
ICE	-	Inter Continental Exchange
IIFCL	-	India Infrastructure Finance Company Limited
IOSCO	-	International Organization of Securities Commissions
IRDA	-	Insurance Regulatory and Development Authority
ISDA	-	International Swaps and Derivatives Association, Inc.
MTM	-	Mark-to-market
NBFC	-	Non-Banking Financial Company
NCD	-	Non-convertible Debenture
NDS	-	Negotiated Dealing System
NPA	-	Non-performing Assets
NSCCL	-	National Securities Clearing Corporation Limited
NSE	-	National Stock Exchange of India
OTC	-	Over-the-Counter
PDs	-	Primary Dealers
SEBI		Securities and Exchange Board of India
SEC	-	Securities and Exchange Commission
SPAN	-	Standardised Portfolio Analysis of Risk
SPV	-	Special Purpose Vehicle
TIW	-	Trade Information Warehouse

Chapter I

Introduction

1.1 Need for Credit Risk Mitigants

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. Financial entities can use a number of techniques to mitigate the credit risks to which they are exposed. For example, exposures may be collateralised by first priority claims, in whole or in part with cash or securities; a loan exposure may be guaranteed by a third party; through securitization of the exposure or through buying a credit derivative to offset various forms of credit risk. In the absence of credit derivatives market, the options available to the participants for controlling or transferring their credit risks are confined to the aforementioned traditional means. Besides providing hedge against credit risk in the existing portfolio, credit derivatives also facilitate price discovery in the credit market and help the banks and financial institutions in better pricing of the credit risk in future. Thus, availability of credit derivatives enables the participants to easily trade in credit risk and hive off/assume credit risk and facilitate to complete markets.

1.2 Growth of Credit Default Swaps (CDS) market

1.2.1 Since mid-1990s, growth of the credit derivatives market in global arena has been phenomenal. As per the data available on the Depository Trust & Clearing Corporation (DTCC) website, the notional outstanding amount of CDS has increased from USD 4.8 trillion in 1998 to USD 30.4 trillion in 2009. Credit derivatives have become important credit risk transfer products and are integrated with credit trading and risk management at many firms. The growth in the credit derivatives market has been driven by the standardisation of documentation, increase in product applications and diversification of participants.

1.2.2 A driver of the growth in credit derivatives is the ability of market participants to use them to express credit views which were not as easily done in the underlying bonds, such

as: views about the shape of a company's credit curve, credit volatility, capital structure, timing and pattern of defaults, etc.

1.2.3 Globally, single-name CDS is the most widely used product. As per the latest data published by DTCC (week ending July 23, 2010), Single Name CDS accounted for 58 per cent of total volume of CDS, while Credit Default Index and Credit Default Tranche accounted for 32 per cent and 10 per cent respectively.

1.3 Recent International Developments – Policy Initiatives

1.3.1 In September 2008, CDS assumed center-stage as one of the causes of Lehman Brothers' bankruptcy which accentuated the global financial crisis. In the case of Lehman collapse, market participants and supervisors were confronted with the failure of a CDS counterparty that was also an important reference entity. This was followed by near-collapse of AIG, a global insurance major and its eventual bailout which was one of the largest bailouts in the US history costing over USD 170 billion of tax payers' money. The reasons for AIG's problems were large exposures to un-hedged CDS contracts written on sub-prime mortgage securities and acceleration of collateral calls due to housing crisis leading to severe financial strain.

1.3.2 These cases along with a host of other credit events revealed a number of structural deficiencies in the OTC derivatives markets during the financial crisis. Inadequate management of counterparty risk, interconnectedness of large market participants, non-transparency of transactions and positions, complexity concerning actual risk exposures and danger of contagion, were the issues which engaged the attention of legislators, regulators and market participants.

1.3.3 Further, the OTC derivatives markets were thinly regulated in the US and Europe. In the US, bilateral transactions like CDS between sophisticated counterparties are excluded from regulation under Commodities and Futures Modernisation Act of 2000. Several concerns have been expressed with regard to CDS and its negative impact on credit markets such as the existence of perverse incentives in CDS markets, the idiosyncratic risks such as jump-to-default risk which are difficult to measure or anticipate, shallowness in terms of participation by a few big investment banks taking majority of positions with considerable power to set prices, and problems associated with moral

hazard etc. As the CDS is a bilateral over-the-counter derivative contract under minimal regulatory oversight, the possibility of building up of massive speculative positions and also the incentives for coordinated manipulation exist. Further, the informational effects of the CDS volumes and prices due to speculative activity can spill over to the cash markets with a potential to increase the borrowing costs for sovereigns / firms, making it difficult to raise funds, especially in situations of financial stress.

1.3.3.1 CDS could also impact the real sector as the viability of the firms would be threatened due to increase in borrowing costs; imposing significant economic and social costs. Several observers commented on this aspect during the recent Greek sovereign debt crisis wherein spreads on Greek sovereign CDS rose in anticipation of fiscal troubles. This made the rollover of Greek sovereign debt very costly. There exists an apprehension that unbridled speculation through CDS would, result in increasing the borrowing costs for the governments which would impose significant social / economic costs on the people. As various negative externalities were attributed to CDS, recently Germany banned European sovereign CDS in May 2010. China had also reconsidered its decision to introduce CDS

1.3.4 As these markets possess considerable systemic importance and their efficient functioning has implications for financial stability, internationally, the following initiatives have been launched in various jurisdictions to deal with the issues relating to CDS :

a) *Increased policy attention on CDS:* Considerable policy attention is focused on the OTC markets in general and CDS markets in particular. G20, European Commission, OTC Derivatives Regulators Forum and American and European legislators and regulators are taking steps to reform the OTC derivatives markets and reduce systemic risk. In the aftermath of the crisis, the US government proposed a comprehensive regulatory regime for OTC derivatives. Legislative initiatives like the Dodd Bill (which was enacted in July 2010 as Wall Street Reform and Consumer Protection Act) in the US and European Market Infrastructures Legislation (EMIL) contain proposals to regulate the markets. The European Commission (EC) is working on initiatives such as review of Financial Instruments Directive, the Securities Law Directive, which aim to harmonise legislation across the EU to regulate central counterparty operations. In line with the G20 recommendations, the EC is proposing that by the end of 2012 all standardised

OTC derivative contracts be traded on exchanges or electronic trading platforms and cleared through central counterparties (CCP). To strengthen Europe's clearing houses, measures such as introduction of common safety, regulatory and operational standards for CCPs are being contemplated.

In the US, the Dodd Bill proposed to bring transparency and accountability to the derivatives market through closing regulatory gaps by providing the Securities and Exchange Commission (SEC) and Commodities and Futures Trading Commission (CFTC) with authority to regulate over-the-counter (OTC) derivatives and curtail irresponsible practices and excessive risk-taking through regulatory oversight. The bill also mandates central clearing and exchange trading for eligible derivatives and proposed to empower regulators to impose position limits on various derivatives transactions, if required. The bill also focused on market transparency through data collection and dissemination.

b) *Increased Co-ordination*: Co-ordination between public authorities and private market participants resulted in addressing some of the issues cited above. In the US, industry had given commitments to clear by October 31, 2009, 80 per cent of the eligible dealer-to-dealer trades and 95 per cent of the eligible new trades through centralised clearing and has achieved the targets.

c) *Industry initiatives*: Several initiatives like trade compression; standardisation of CDS contracts and default handling procedures, trade processing, price transparency and improved risk management practices were taken up by the market participants. Focusing on straight-through-processing (STP) of trades and efficient back office functions, registering of trades with Trade Information Warehouse of Depository Trust & Clearing Corporation (DTCC) and dissemination of CDS volumes, trade compression to bring down the notional CDS volumes, moving towards central counterparty clearing are some of the developments impacting the CDS markets. Through trade compression, market participants brought gross exposures closer to the net risk positions and outstanding notional CDS contracts fell by around 37 per cent in 2009. Standardisation of CDS contract is another major development in CDS markets in order to facilitate their migration to CCPs. Earlier, the CDS contracts were created and traded based on the prevailing

market spreads and, therefore, each CDS contract was a unique contract with the coupon of its own. However, with standardisation, the CDS contracts will have uniform coupons and, hence, become fungible. With the standardisation of coupons (spreads), the variability of the current market spreads is captured through the upfront premium. The upfront premium is the present value of the difference in coupon i.e. fixed coupon on the standard contract and the current market spread. The settlement dates have also been standardised to four, viz., March 20, June 20, September 20 and December 20.

d) *Streamlining trading and settlement procedures*: As regards the new developments post the global financial crisis, the ISDA together with the market participants has brought out Big Bang and Small Bang protocols and supplements to streamline the CDS trading and settlement procedures. The changes in the Big Bang protocol include setting up of Determination Committees, conduct of auctions and creating Credit Event and Succession Event Backstop dates. Earlier, the mode of settlement was left to the discretion of the contracting counterparties and the parties could choose between the cash and physical settlement. The auction process was voluntary. However, keeping in consideration settlement-related issues such as CDS outstanding volumes being higher than the deliverable obligations, ISDA has hardwired the auction settlement into the documentation with a view to standardise the CDS settlements. The Small Bang protocol and its supplement extended the auction hardwiring provisions to the restructuring credit events, which were specifically excluded in Big Bang Protocol.

e) *Centralised Clearing and Central Counterparty*: In order to minimise counterparty risk, regulators are pushing for increased use of central counterparty (CCP) clearing for OTC products with close regulatory oversight as the CCP can impose robust risk management practices, aid market liquidity and reduce systemic risk. However, certain issues like the optimum number of CCPs, implications of customization and concentration risk, etc. need to be addressed.

While examining the issue of introduction of CDS in India, these global developments were studied and international experience was taken into account.

1.4 **Credit Derivatives: Initiatives in India**

1.4.1 Introduction of credit derivatives in India was actively examined in the past to provide the participants tools to manage credit risk in their portfolio. A Working Group on introduction of credit derivatives in India was constituted in 2003 with membership from banks, insurance companies and related departments in the Reserve Bank. The Group dealt with conceptual issues, examined the scope for allowing banks and financial institutions in India to use credit derivatives and submitted its report in March 2003. Based on the recommendations of the Working Group, draft guidelines on introduction of credit derivatives were brought out on March 26, 2003. However, taking into account the status of the risk management practices then prevailing in the banking system, the issuance of final guidelines was deferred.

1.4.2 Subsequently, the matter was revisited 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 liberalisation in India, credit derivatives would be introduced in a calibrated manner. To begin with, it was decided to permit commercial banks and primary dealers (PDs) to deal in single-entity Credit Default Swaps (CDS). 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 and introduction of CDS was kept in abeyance so as to be able to draw upon the experience of developed countries.

1.4.3 The matter has since been reviewed and the Second Quarter Review of Monetary Policy of 2009-10 has proposed introduction of plain vanilla OTC single-name CDS for corporate bonds for resident entities subject to appropriate safeguards. To begin with, all CDS trades will be required to be reported to a centralised trade reporting platform and in due course, they will be brought on a central clearing platform.

1.4.4 The objective of the measure is to provide credit risk transfer tool to the Indian market participants and enable them to manage credit risk in an effective manner through redistribution of risk. Introduction of credit enhancement of corporate bonds through CDS may also increase investor’s interest in corporate bonds. Since CDS have benefits like

enhancing investment and borrowing opportunities and reducing transaction costs while allowing risk-transfers, such products would be beneficial to the development of the corporate bond market in India. The development of the credit default swap market would be achieved in a calibrated and orderly fashion with focus on real sector linkages and emphasis on creation of robust risk management architecture to deal with various risks associated with the product.

1.4.5 In this context, an Internal Working Group comprising officials from various departments of the Reserve Bank, was set up to finalize the operational framework for introduction of CDS in India. The constitution of the Internal Group and the terms of reference of the Internal Group are given in Annex I. The Internal Group, in consultation with various market participants and market bodies and taking into account international experience in the working of CDS, has finalised the operational framework for introduction of CDS in India.

1.5 **Structure of the Report**

The Report is organised as follows:

- Chapter II examines various issues that merit attention in order to introduce CDS in India such as product design, accounting and valuation.
- Chapter III discusses regulation and risk management issues.
- Chapter IV describes issues regarding CDS trade reporting and information dissemination and proposed framework for CDS trade information warehouse in India.
- Chapter V discusses issues relating to centralised clearing and proposed framework for establishing CCP for CDS in India.
- Chapter VI concludes with the summary of recommendations for introduction of CDS in India.

Chapter II

CDS for Indian Markets – Product Design

2.1 The product design of CDS must keep in view the features of Indian credit markets, commercial law and recent developments in international financial markets. A description of CDS and various conceptual issues are discussed in Annex II. Some of the issues that merit attention in the introduction of CDS are those relating to the eligible participants; the nature of the underlying, i.e., bond or loan; reference entity and deliverable obligations; rating requirements; liquidity in the underlying cash markets; requirement of underlying asset for taking derivative position, accounting, etc., which are discussed below:

2.2 **Eligible Participants –** CDS as a risk management product offers the participants the ability to hive off credit risk and also to assume credit risk which otherwise may not be possible. However useful the product may be as a risk management tool, injudicious and unregulated use of the same could pose significant systemic risks as seen during the recent financial crisis. While taking note of the need for developing the financial instruments to address/manage credit risk consistent with the concerns of maintaining financial stability, the market structure of CDS may be as follows:

- *Market-makers* (entities permitted to both buy and sell protection)
- *Users* (entities not permitted to sell protection but permitted only to hedge the underlying risk by buying CDS)

2.2.1 ***Market-makers –*** To have an efficient market in CDS, it is important that there exist a large number of *market-makers* to ensure liquidity and efficient price discovery. However, it is also required that these entities must have strong financials and robust risk management practices to act as *market-makers*. It is proposed that the following entities may act as *market-makers* subject to eligibility criteria given in paragraph 2.3 below:

a) Commercial Banks;

b) Primary Dealers; and

c) NBFCs (that offer credit facilities to borrowers).

In addition to the above entities, Insurance companies and Mutual Funds may also be permitted to sell CDS subject to their having strong financials and risk management capabilities as prescribed by their respective regulators (IRDA and SEBI).

Commercial Banks / PDs / NBFCs who have credit/investment appraisal skills are equipped to write CDS. Commercial Banks, by nature of their business, would typically be both buyers and sellers of credit risk in the market and would stand to benefit from CDS mainly due to two reasons – efficient utilisation of capital and flexibility in developing/managing a target risk portfolio. Protection sellers who are interested in having exposures to highly-rated entities but may be finding it difficult due to funding/balance sheet issues can sell CDS and gain exposures to such entities. Commercial banks / PDs / NBFCs selling CDS can diversify their portfolio by gaining exposure to sectors they have no exposure hitherto.

2.2.2 ***Users –*** CDS can be used to hedge the credit risk in a portfolio comprising loans and corporate bonds. In addition to providing protection against credit losses, CDS also provides regulatory capital relief. Ideally, all investors in corporate bonds may require CDS to protect themselves against the credit events associated with the reference entity. However, given the early stages of development and the requirement of reporting, etc. it is proposed to permit, to start with, only institutional investors to buy protection. As regards corporates, it is observed that they have considerable exposure in corporate bonds and may require credit default protection. Therefore, listed corporates may be permitted to buy CDS as *users*. The CDS markets may be developed in a calibrated manner and the issue of allowing other entities to sell / buy protection may be examined later, depending on the development of the market and state of risk management practices.

2.2.3 To sum up, the Group recommends the market participant structure as under:

Market-makers (both protection sellers and buyers, subject to fulfilment of regulatory stipulations) - ***permitted to hold short CDS positions***	a) Commercial Banks, b) Primary Dealers, c) NBFCs having sound financials and good track record in providing credit facilities to borrowers, d) Insurance Companies and e) Mutual Funds.

Users (only protection buyer to hedge underlying exposure) - ***not permitted to hold short CDS positions / sell CDS***	Commercial Banks, Primary Dealers, NBFCs, Mutual Funds, Insurance Companies, Housing Finance Companies, Provident Funds, listed Corporates, and any other institution permitted by the Reserve Bank.
All CDS trades shall have an RBI regulated entity at least on one side of the transaction.*	

* *As* per the provisions of Section 45 V of the RBI Act, 1934, transactions in CDS, which is an OTC derivative, shall be valid, if at least one of the parties to the transaction is a scheduled bank, or such other agency falling under the regulatory purview of the RBI under the Reserve Bank of India Act, 1934 the Banking Regulation Act, 1949 (10 of 1949), the Foreign Exchange Management Act, 1999 (42 of 1999), or any other Act or instrument having the force of law, as may be specified by the Reserve Bank from time to time.

2.3 **Eligibility norms for *market-makers* –**

2.3.1 Commercial banks who intend to sell CDS protection shall fulfill the following criteria:

a. Minimum CRAR of 12 per cent with core CRAR (Tier I) of at least 8 per cent;

b. Net NPAs of less than 3 per cent

2.3.2 NBFCs having financial strength, good track record and involved in providing credit facilities to borrowers can be allowed to sell CDS, subject to approval by the concerned regulatory department. NBFCs allowed to function as *market-makers* shall fulfil the following criteria:

a. Minimum Net Owned Funds of Rs. 500 crore;

b. Minimum CRAR of 15 per cent;

c. Net NPAs of less than 3 per cent; and

d. Have robust risk management systems in place to deal with various risks.

The regulatory approval to NBFCs would be accorded on a case-by-case basis on application.

2.3.3 PDs intending to sell CDS protection shall fulfil the following criteria:

a. Minimum Net Owned Funds of Rs. 500 crore;

b. Minimum CRAR of 15 per cent; and

c. Have robust risk management systems in place to deal with various risks.

The regulatory approval to PDs would be accorded on a case-by-case basis on application.

2.3.4 The eligibility criteria for Insurance Companies and Mutual Funds shall be prescribed by the respective regulators.

2.4 **Reference entity** – In a CDS transaction, the credit protection is sought against the default of the reference entity. The reference obligation/asset is used for facilitating the valuation of CDS (and for facilitating delivery). In the Indian context, **it is proposed that the reference entity in a CDS contract shall be a single legal resident entity and direct obligor for the reference asset/obligation and the deliverable asset/obligation.**

2.5 **Requirement of minimum rating for the reference entity**

2.5.1 Theoretically, there is no requirement of rating for the corporate bonds to be eligible as underlying for CDS. The CDS market should be able to provide credit protection even to the low/unrated bonds. An underlying credit rating is not a pre-condition for trading in CDS on reference names in the US and Europe. In markets where CDS on the reference name is liquid and is an indicator of the creditworthiness of the reference name, credit rating is considered redundant. For any specific contract, the ISDA documentation itself pre-specifies the reference obligations for specific obligors and the deliverable obligations thereon (the latter a subset of the former) rendering usage of rating in this regard superfluous.

2.5.2 However, it is generally observed that CDS activity is largely confined to rated and listed entities/reference assets due to ease of pricing. It is also observed that most of the CDS transactions are concentrated in BBB to A-rated companies, as it is perceived that there is hardly any need for protection for underlying obligations of entities rated AA and above, while the cost of CDS for non-investment grade obligations is generally prohibitive. The issue of whether minimum rating requirement needs to be prescribed in Indian markets, merits attention in the context of development of financial markets and prudential regulations. A regulatory prescription of minimum rating would protect investors / protection sellers from potential losses. Another feature of prudential regulation in India is the restriction on banks against holding unrated bonds. If rating requirement is not prescribed for CDS, there is a possibility that banks by selling CDS would assume credit risk on unrated bonds and on occurrence of credit events, would receive unrated bonds in settlement thereby violating the extant regulation. The downside to prescribing a minimum

rating would be that it excludes a segment of bonds from the purview of CDS thus denying them the required protection.

2.5.3 After deliberations on the issue, **it is recommended that the CDS can be written only on obligations of rated entities, but no minimum rating needs to be specified.** This will enable better price discovery and more transparency. Moreover, for the purpose of market transparency as well as to ensure that all the deliverable bonds for a specific obligor are *pari passu* in terms of their seniority, a readily observable credit metric, viz., rating should be utilized. Hence, to begin with, bonds of reference entities which have a current rating, maintained by the rating agency and published in the monthly bulletin of rating agency will only be eligible as underlying of a CDS contract. However, with a view to provide a fillip to infrastructure financing, **it is proposed that CDS may also be written on corporate bonds issued by unrated Special Purpose Vehicle (SPV), provided they are set up by rated infrastructure companies.**

2.6 **Nature of the underlying obligation –** Credit default swaps can have a number of underlying reference obligations like loans, bonds, asset-backed securities, equity securities, mortgage backed securities, etc. and must be specified in advance. In the specific case of loans, transferability is an issue under the current legal framework. It has also been acknowledged that pricing and transferring of loans is a very complex process which also requires standardisation of loan documentation. It is also seen internationally that the volume of CDS on loans is much less than the volume of CDS on bonds. On the other hand, if only bonds are permitted as underlying to CDS, it may result in distortions in the pricing of loans relative to bonds (as the risk on loans cannot be transferred/hedged). In view of the complexity and legal risks involved in CDS on loans, the Group felt that the introduction of plain vanilla product in corporate bonds is a practical way to approach introduction of CDS in India. **Therefore, it is proposed to introduce CDS only on corporate bonds as reference obligations in India.** For the purpose of transparency and wider dissemination of information, the eligible underlying of a specific obligor covered by the CDS contract should be specified *a priori* and reviewed periodically. Further, ***market-makers* should ensure not to sell protection on reference entities/obligations on which there are regulatory restrictions on assuming exposures (in the cash market).**

2.7 Requirement of the underlying in CDS

2.7.1 Allowing 'CDS without underlying cash market positions' ('naked CDS') is one of the most contentious issues facing the regulators today. The recent international events relating to CDS have resulted in attempts to ban buying protection without valid underlying. Recently, Germany has imposed ban on sovereign CDS and short-sale in financial instruments of select financial institutions. China has reconsidered its decision to introduce CDS and deferred the same in light of the news that CDS poses risks to the financial system and is causing sovereign borrowing difficulties. There are compelling arguments on both sides; those seeking the ban and those opposing any restrictions on CDS.

2.7.2 A CDS without an underlying is one where the buyer of protection has no risk exposure to the underlying entity. This enables market participants to go short on credit risk. Such CDS position, i.e., holding long CDS positions while not having the underlying credit exposure, permits participants to speculate on the future credit events and also increases market liquidity. For example, if the participants expect the credit rating on a particular corporate to worsen due to bad financial results, they may purchase CDS and reverse the position when the credit event actually happens. Naked CDS improves market liquidity and inability to take naked CDS positions would limit participation to only a handful of counterparties having underlying exposure, thus impeding market liquidity and development. The market participants who argue in favor of naked CDS opine that apart from aiding market liquidity and price discovery, naked CDS would enable market participants to find proxy hedges to manage credit risk. Further, it is argued that it is time-consuming and expensive to monitor adherence of financial institutions and corporate clients to supervisory restrictions on naked CDS.

2.7.3 Arguments for restrictions on naked CDS are also compelling. Allowing purchase of CDS without having the underlying risk exposure may result in huge build-up of CDS positions that have systemic implications. A scenario where the amount of outstanding CDS is significantly higher than the total bonds outstanding is fraught with settlement risks. The risk of moral hazard (i.e., protection sellers like banks and insurance companies taking too much credit risk without adequate risk appraisal and monitoring) also exists. Allowing naked CDS may also lead to perverse incentives to engineer defaults by the

speculators holding large short positions in cash markets and having no stake / very little stake in the survival of the reference entity. There may be an incentive for coordinated manipulation. Cases such as failure of restructuring of BTA (Bank Tura Alam of Kazakhstan) liabilities are said to have been engineered by CDS buyers. Indiscriminate buying of protection would also result in the rise of CDS premia leading to escalation in borrowing costs of the reference entity as it normally cannot issue at a rate that will not cover the cost of insuring the exposure. Thus, such positions in shallow CDS market can have a significant adverse bearing on interest cost of debt issues.

2.7.4 *Empty Creditor hypothesis*: Historically, banks and other creditors have had incentives to restructure troubled debt and avoid tipping solvent companies into bankruptcy by withdrawing funding or not conducting debt restructuring / recast. The creditors, who bought CDS protection, retain little economic exposure to the firm because they simultaneously hold bonds and matched maturity CDS ("empty creditors" or basis holders). These creditors do not have the same incentives as other bank lenders or bond-holders and, therefore, these creditors with CDS protection may have no incentive to agree for initiatives such as restructuring and may find it more expedient to push troubled companies into bankruptcy. While normal bond-holders may be reluctant to proceed to a bankruptcy filing that can take years to get the bonds settled, CDS holders can immediately cash in on their CDS positions, as CDS are typically settled quickly.

2.7.5 To summarise, arguments for and against permitting CDS without having an underlying are discussed below:

A. Arguments for permitting CDS without having an underlying

i. *Market liquidity*: The limited liquidity in corporate debt markets as well as concentration of corporate debt holdings among a handful of institutional participants imply that the pre-condition of having a long position in the underlying prior to purchasing the protection would limit such transactions only to a handful of counterparties severely impeding market liquidity and development.

ii. *Price discovery*: In order to have a complete and efficient market, there is a need to have speculators in addition to hedgers. Restricting purchase of protection only to the hedgers would not ensure adequate volumes consequently affecting the price discovery process.

iii. *Proxy Hedges*: Banning naked CDS would completely remove the ability to find proxy hedges for the huge array of credit risk that cannot be sold or directly hedged. Through naked CDS, the participant can hedge credit risk of its investment by purchasing CDS of a similar issuer (from the same industry), if that CDS is more liquid.

iv. *Lower Cost of Hedging*: Hedging through CDS would be more expensive and less liquid if naked CDS are banned, as it would make protection sellers demand a bigger premium for liquidity. Increased liquidity in CDS markets may result in decreased hedging costs.

B. *Arguments against permitting CDS without having an underlying*

i. *Excessive Leverage and Systematic Risk*: If participants are permitted to purchase CDS without having the underlying risk exposure, there could be huge build-up of positions resulting in a scenario where the amount of protection purchased is higher than the total bonds outstanding. Such a position, if concentrated among a handful of participants, can have systemic implications and build up of risks.

ii. *Perverse Incentives*: Allowing naked CDS may lead to perverse incentives and moral hazard problems. It may provide incentives to engineer defaults to profit from the collapse of the entity/manipulate prices of fresh issuances in shallow markets by accumulation of short credit positions. Illustratively, a market participant or group of market participants can buy huge amount of CDS protection on a reference entity which may lead to perception in the market that the reference entity is vulnerable. Market participants can simultaneously short the bond. Such a situation will push down the price of the underlying bond of the reference entity. This will also lead to increase in CDS spreads. Thus, the protection buyer, without having an insurable interest in the reference entity, takes a profit from both, i.e., decrease in bond prices and increase in CDS spread. There may also be an incentive for coordinated manipulation.

iii. Destabilising Cash markets: Due to excessive buying of CDS, the CDS spread on a reference entity can artificially rise to unjustifiable level. Thus, CDS will not only reflect the inherent credit risk but may also reflect liquidity and technical positioning which can have a deleterious impact on underlying cash bond market. Though some amount of speculative activity is believed to improve pricing, such activity beyond a point may distort the pricing. Speculative actions must be prevented from causing uncertainty in the market that prices no longer provide accurate information and financing reaches a

fundamentally unjustifiable high level. This would increase market volatility and also have destabilising effect on credit markets. Illiquidity in corporate bond market in the wake of Lehman Brothers' failure provides a vivid illustration of negative feedback of CDS markets to corporate bond liquidity. Liquidity and market-making are essential for price discovery and investor protection. However, unregulated financial products entail significant negative externalities.

2.7.6 Therefore, it is recommended as under:

(i) Restricting *users* to purchase CDS only to the extent (tenor & quantum) of underlying risk held by them, would provide credit protection and yet keep the CDS positions within regulatory oversight. **The *users* can buy CDS for amounts not higher than the face value of credit risk held by them and for periods not longer than the tenor of credit risk held by them**. The CDS protection is for the credit risk assumed due to investment in corporate bonds.

(ii) ***Buying Protection by users without having an underlying***: Sale of underlying by the *users* when the protection is in force, which leads to the protection becoming naked, was also deliberated. There are circumstances where the *user*, after having purchased a protection on an eligible underlying bond may decide to dispose off the bond, considering the market conditions. **Since the *users* are envisaged to use the CDS only for hedging their credit risks, the Group recommended that the *users* shall not, at any point of time, maintain naked CDS protection. The *users* can, however, unwind their bought protection by terminating the position with the original counterparty. The original counterparty (protection seller) may ensure that the protection buyer has the underlying at the time of unwinding. *Users* are not permitted to unwind the protection by entering into an offsetting contract.**

(iii) **In order to restrict the *users* from holding naked CDS positions i.e. CDS is not bought without underlying; physical delivery is mandated in case of credit events. Further, *users* are prohibited from selling CDS. Proper caveat may be included in the agreement that the protection seller, while entering into CDS contract / unwinding, needs to ensure that the**

protection buyer has exposure in the underlying. This may also be subject to rigorous audit discipline.

2.8 **CDS transactions between related parties –** RBI has been allowing transactions between the banks and their subsidiaries on the principle of 'arms' length relationship', i.e., the transactions should be on the basis of market-related rates and based on free availability of information to both the parties. As the CDS market in India may take time to develop, it would be difficult to have an objective and transparent price discovery mechanism at the initial stages and, therefore, it would be difficult to determine whether an 'arms' length relationship' exists or not. **Therefore, *users* and *market-makers* would not be permitted to enter into CDS transactions having their 'related parties' either as counterparties or as reference entities.** Related parties for the purpose of these guidelines will be as defined in 'Accounting Standard 18 – Related Party Disclosures'. In the case of foreign banks operating in India, the term 'related parties' shall include an entity which is a related party of the foreign bank, its parent, or group entity.

2.9 **Other Requirements –** The single-name credit default swaps on corporate bonds in India should satisfy the following requirements:

(i) the reference entity shall be a single resident legal entity, (the term resident will be as defined in Section 2(v) of Foreign Exchange Management Act, 1999);

(ii) the reference entity shall be the direct obligor for the reference asset/obligation and the deliverable asset/obligation;

(iii) the protection buyer and the protection seller shall be resident entities;

(iv) the reference asset/obligation and the deliverable asset/obligation shall be to a resident and denominated in Indian Rupees;

(v) the CDS contract shall be denominated and settled in Indian Rupees;

(vi) underlying reference obligations like asset-backed securities/mortgage-backed securities and convertible bonds shall not be permitted;

(vii) CDS shall not be written on entities which have not issued any bonds and have only loan obligations;

(viii) one of the objectives of CDS is to facilitate the infrastructure financing and overall development of corporate bond markets. The objective will not be served if the activity is concentrated in short term instruments. Hence, CDS shall not be written

on securities with original maturity up to one year e.g., CP, CD and NCD with original maturity up to one year;

(ix) the reference and deliverable assets/obligations shall be those which are (a) of rated entities; (b) the rating is current and maintained by the rating agency; and (c) the rating is published in the monthly bulletin of the rating agency;

(x) the CDS contract must represent a direct claim on the protection seller;

(xi) the CDS contract must be irrevocable; there must be no clause in the contract that would allow the protection seller to unilaterally cancel the contract;

(xii) the CDS contract should not have any clause that may prevent the protection seller from making the credit event payment in a timely manner, after occurrence of the credit event and completion of necessary formalities in terms of the contract;

(xiii) the protection seller shall have no recourse to the protection buyer for losses;

(xiv) the identity of the parties responsible for determining whether a credit event has occurred must be clearly defined *a priori* in the documentation;

(xv) dealing in any structured financial product with CDS as one of the components shall not be permitted;

(xvi) dealing in any derivative product where the CDS itself is an underlying shall not be permissible;

(xvii) the protection seller shall not transact in CDS with reference assets/ obligations or deliverable assets/obligations which they are not permitted to undertake, as per extant RBI instructions; and

(xviii) it is mandatory for the CDS buyers to have bonds in 'de-materialised' form as underlying. Seller may ensure that the user is having exposure in the underlying bond while buying/unwinding the CDS and that the bond is in demat form.

2.10 Standardisation of the CDS Contract

2.10.1 Standardisation improves tradability of the derivative. In case of CDS, it also would enable migration to clearing through central counterparties and helps participants to reduce counterparty risk. A product eligible for CCP clearing must be standardised, have regular availability of prices and sufficient market liquidity. Introduction of standardised coupons has facilitated the CDS market to move towards CCP clearing in both the U.S and Europe.

2.10.2 The standardised contracts have several advantages:

(i) *Consistency*: With the introduction of fixed coupon CDS trades would be consistent and can be better understood by the market participants.

(ii) *Efficiency*: The standard assumptions used to calculate upfront payments and spreads would reduce disagreements (like possibility of disputes, delays and uncertainty regarding credit events that trigger payments, the amount of the protection seller's loss which differs depending upon differences in the timing, frequency and market conditions, etc.) and improve operational efficiency.

(iii) *Transparency*: The factors listed above, viz., consistency and efficiency should make the market more transparent and easier to understand for investors.

(iv) *Regulation*: As the standardisation of contracts enables clearing of the CDS transaction through a CCP, availability of complete information about individual trades would make regulation more effective.

2.10.3 Considering the advantages**,** the Group recommends that the CDS contracts in India may also be standardised, so that the migration to a centralised clearing platform would be easier. The standardisation of CDS contracts in India may be achieved in terms of coupon, coupon payment dates, etc. as under:

i. **The CDS contracts could have standard payment dates**, for instance, March 20, June 20, September 20, and December 20; these standard payment dates would also serve as standard maturity dates, in line with the international practice for CDS contracts.

ii. **The CDS contracts could have standard coupons (can be decided by market participants)**.

iii. Details relating to standardisation of CDS contracts may be decided by the market participants and market bodies like FIMMDA, keeping in view the international practices and the objective of ultimately moving to central clearing platform.

2.11 Credit Events

2.11.1 The definitions of credit events are provided in the 2003 ISDA Credit Derivatives Definitions (read with the ISDA March 2009 and ISDA July 2009 supplements). The credit events identified in the ISDA definitions attempt to make a comprehensive list of events that may have an adverse impact on the credit quality of the reference entity or cause an

adverse impact on the price of the reference obligation. Internationally, market participants have been using the credit events identified in the ISDA document. The contracting parties to a CDS may include all of those events or select only those that they feel are the most relevant. The credit events specified in the CDS contract may cover:

(i) ***Bankruptcy***: includes insolvency, appointment of administrators/liquidators, and creditor arrangements.

(ii) ***Failure to pay***: includes payment failure on one or more obligations after expiration of any applicable grace period; typically subject to a materiality threshold (e.g., USD 1 million for North American CDS contracts).

(iii) ***Repudiation/moratorium***: authorised government authority (or reference entity) repudiates or imposes moratorium and failure to pay or restructuring occurs.

(iv) ***Obligation acceleration***: one or more obligations have become due and payable before they would otherwise have been due and payable as a result of, or on the basis of, the occurrence of a default, event of default or other similar condition or event (however described), other than a failure to make any required payment, in respect of a reference entity under one or more Obligations in an aggregate amount of not less than the default requirement.

(v) ***Obligation Default:*** one or more obligations have become capable of being declared due and payable before they would otherwise become due and payable as a result of, or on the basis of, the occurrence of a default, event of default, or other similar condition or event (however described), other than a failure to make any required payment, in respect of a reference entity under one or more obligations in an aggregate amount of not less than the default requirement.

2.11.2 Given the requirement of an India specific CDS contract, the Group felt that the credit events as defined by ISDA may need some modification to be in consonance with Indian laws. Further, the definition of various credit events should be clearly defined in order to avoid any confusion.

2.11.3 **Restructuring**: Restructuring, as a credit event, has been one of the most contentious issues in the credit derivatives market. There are still differences of opinion about treating restructuring as a credit event. There may be situations where a debt restructuring has not resulted in financial loss to the debt holder. Protection sellers

sometimes object to making payment to a protection buyer under such circumstances. In the Indian context, the prevalence of frequent restructuring of obligations by banks may trigger CDS payments if restructuring is classified as a credit event. India-specific aspects like restructuring of loan and their impact on CDS should be assessed before its inclusion in list of credit events. Hence, the Group recommends that restructuring may not be permitted as credit event in the initial stages. A view may be taken at a later stage, based on development of the CDS market.

2.11.4 **Determination Committee:** Internationally, Determination Committees are set up to deliberate and resolve CDS related issues such as Credit Events, CDS Auctions, Succession Events, Substitute Reference Obligations, etc. The decisions of the Committee on when contracts are to be triggered would be binding on CDS market participants. In India, the Determination Committee shall be based in India and populated by Indian participants. The Committee may adopt the best practices to base their decisions on issues such as credit events, triggering auctions etc. **It is recommended that eligible market participants and FIMMDA may form a Determination Committee (DC) of dealers and investors on the lines of such committees established in other markets**. **FIMMDA may take an active role in coordinating market initiatives in this regard**. **Further, 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.**

2.12 Settlement methodologies

2.12.1 The parties to the CDS transaction determine upfront the procedure and method of settlement to be followed in the event of occurrence of a credit event. The common modes of settlement of the CDS are physical and cash settlement. While the physical settlement requires the protection buyer to transfer any of the deliverable obligations against the receipt of its full notional / face value, in cash settlement, the protection seller pays to the protection buyer an amount equivalent to the loss resulting from the credit event of the reference entity. The recent ISDA protocols such as ‘Big Bang’ and ‘Small Bang’ have incorporated auction settlement in those cases as deemed fit by the Determination Committee. Auction specific terms (e.g. auction date, times, market quotation amount, deliverable obligations, etc.) will be set by the Determination Committee on a case by case

basis. If parties do not select Auction Settlement and do not adhere to the new Settlement Protocol, they will need to bilaterally settle their trades in accordance with the Settlement Method in the executed confirmation (unless otherwise freshly negotiated between the parties). While the auction settlement is a predominant method under the Big Bang protocol, fallback to physical settlement comes into effect, however, when the Determination Committee decides not to hold an auction. The Determination Committee could decide against holding auction in other cases where a reference obligation is not very liquid and it would be very difficult to hold an auction. Even under the Big Bang protocol, counterparties desirous of physical settlement can still obtain the same economic outcome by submitting a Physical Settlement Request into the auction.

2.12.2 The Group deliberated on the settlement methodology and concluded that it would be in the interest of the financial system to devise a robust settlement system. **For *users*, physical settlement is mandatory. *Market-makers* can opt for any of the three settlement methods (physical, cash and auction), provided the CDS documentation envisages such settlement.**

2.13 **Documentation –** The market for credit derivatives is highly dependent upon legal enforceability and, thus, requires stringent documentation standards. Globally, market participants enter into ISDA Master Agreement and are governed by the ISDA Credit Derivatives Definitions 2003 (as amended in 2009) and subsequent supplements to definitions, as amended or modified from time to time. It would be necessary to customize the agreement to suit Indian laws. **Market organisations like FIMMDA, in association with ISDA, may devise a master agreement for Indian CDS. As a distinction is made within the participants by categorising them as *users* and *market-makers*, it may be appropriate to have two sets of documentation: one set covering transactions between *user* and *market-maker* and one set covering transactions between two *market-makers*. 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.** While drafting documents, it would be absolutely necessary for the participating institutions to ensure that transactions are *intra vires* and re-characterisation risks are reduced to the maximum possible extent.

2.14 **Accounting**

2.14.1 Normal accounting entries for credit derivative transactions depend on cash flows that take place at various points in time during the tenor of the transaction. For example, in a CDS transaction, there will be periodic payment of fees by the protection buyer to the protection seller. At any point of time in the life of the CDS contract, if a credit event happens, the protection buyer will receive a credit event payment from the seller.

2.14.2 **The accounting norms applicable to CDS contracts shall be on the lines indicated in the 'Accounting Standard (AS) 30 – Financial Instruments: Recognition and Measurement', approved by the Institute of Chartered Accountants of India (ICAI).** Further, applicability of 'AS 31, Financial Instruments: Presentation' and 'AS 32 on Disclosures' are also relevant. As the accounting standards on derivatives are still evolving, the accounting treatment and possible impact on balance sheets through a scenario analysis may be attempted. Market participants may adopt appropriate norms for accounting of CDS which are in compliance with the Indian accounting standards from time to time, with the approval of their respective boards.

2.15 **Pricing/Valuation methodologies for Credit Default Swaps**

2.15.1 Credit Default Swaps require the development of sophisticated risk modelling techniques in order to be marked-to-market. There are multiple valuation models available to price / value CDS contracts. Theoretical models used in pricing/valuation of CDS including CDS pricing through 'cash market replication' by way of creating an arbitrage-free, risk-less hedge are given in Annex II (Para 4.7). Internationally, as the CDS contract was a bilateral transaction, there were no regulator-prescribed valuation models. However, with the clearing and settlement of CDS contracts migrating to centralised platforms, there is an emergence of common valuation models brought out by entities like Markit / ISDA. In the Indian context, while most of the participants uniformly use FIMMDA valuation prices for valuing their G-sec portfolio, no similar uniform valuation model is available for Interest Rate Swaps.

2.15.2 **Market participants need to put in place appropriate and robust methodologies for marking to market the CDS contracts on a daily basis and as also to assess the hedge effectiveness, wherever applicable. These methodologies need**

to be validated by external validators / modelers periodically for reliability. As regards end of day valuation of positions, Markit plays a crucial role in European and the US markets by polling the end-of-day rates from dealers and ensuring that the rates polled are indeed reflective of market prices. The role is specialized as it requires sieving the data for outliers, checking the consistency between similar risk grades and valuation of positions. A similar role may be performed by FIMMDA in the Indian context so as to ensure the integrity of pricing and MTM processes.

2.15.3 **The Group, after due deliberations proposed that it would help the market if all the participants value their contracts on a single model which would facilitate the migration eventually to a centralised clearing and settlement platform. Hence, FIMMDA may coordinate with service providers/ISDA and come out with a daily CDS curve. Day count convention may also be decided by the market participants and FIMMDA. However, if a proprietary model results in a more conservative valuation, the market participant can use that proprietary model.**

Chapter III
Regulation and Risk Management in CDS

Regulation of CDS market

3.1 The role of the regulator in development of financial markets and products is to establish a supportive infrastructure, address systemic stability issues and also support market development through regulation and supervision. Asymmetries in information (and also expertise, resources and power) between market participants, and the externalities stemming from the failure of financial agents to live up to their contractual obligations create a need for public regulation and supervision of markets and financial institutions.

3.2 There needs to be a balance between systemic stability and financial market development. Therefore, the emphasis of regulatory intervention lies in correcting market failures and dealing with externalities and distortions that prevent financial markets from developing. The key tasks for the regulators are development of an early warning system to detect systemic weaknesses and creation of a robust regulatory/supervisory framework.

3.3 Credit risk transfer through products like CDS has the potential to change institutions' risk profiles and their role in the financial system significantly. The recent crisis has accentuated certain characteristics in the CDS markets that increased systemic risk and this issue engaged considerable regulatory attention. From a financial stability perspective, it is important that these changes be addressed through regulation and disclosure standards, as well as changing incentives that influence the behavior of individual firms.

3.4 The market failures that need to be addressed in case of introduction of CDS are asymmetric information, moral hazard and principal-agent problems. The issue of information asymmetry can be addressed by stipulating accounting and disclosure standards as well as regulatory reporting system. There is a need to ensure that disclosure standards embody the right incentives for all concerned and coordinated adoption of such standards. It may not be out of place to state that appropriate incentives/disincentives may be placed to streamline the behavior of market participants for orderly functioning of the market, especially in the context of CDS product

characteristics, such as lack of transparency in contracts and the existence of perverse incentives.

3.5 Therefore, efforts must be focused on designing reporting requirements that minimise information asymmetries and allow regulators to make appropriate assessments of financial activities and institutions - conduct of business, profitability, risk measurement and management systems, capital sufficiency, etc. Despite design of the disclosure standards, regulators face information gaps with regard to knowledge about the internal risk management of financial firms and whether firms are following the rules. This information asymmetry makes it especially difficult to mitigate the agency problem through monitoring. The supervisory assessment of the regulated entities must be designed to minimise these gaps. Moral hazard may occur in cases where lending institutions may take decisions without due diligence because of availability of protection, or protection sellers may offer protection indiscriminately. Robust risk management practices must be mandated to address the issue. The issue of the protection seller's moral hazard could be addressed through capital charge on the exposures; placing exposure limits, etc. The regulatory guidelines must be complemented by robust reporting standards as well as supervisory oversight through on-site inspections.

3.6 In this context, the regulatory objectives with regard to CDS must be well defined and institutions need to be assessed on the basis of the impact their products / processes / procedures have on the regulatory objectives, which may be broadly defined as under:

(i) Prevention of systemic risk and promote financial stability,
(ii) Promotion of transparency and disclosure as well as efficiency,
(iii) Prevention of market manipulation, fraud and abuse thereby protecting unsophisticated investors,
(iv) Establishing sound market infrastructure, and
(v) Financial market development.

3.7 **Risk Management**

3.7.1 **Risks in CDS –** One of the biggest challenges for the CDS market is proper assessment and management of 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. Limited availability of data restricts the ability of the participants to accurately analyse the risks inherent in CDS. Many of these risks are very sensitive to default correlations which may result in dramatic losses of liquidity following a major credit event. Some of the risks faced by the market participants in CDS are summarised in Annex III. **The market participants need to take various risks associated with CDS into account and build robust risk management architecture to manage the risks.**

3.7.2 **Prudential norms for risk management in CDS –** Increasing concentration risk (In Europe, according to European Central Bank, the top ten counterparties account for around 65 per cent of the CDS exposures, measured in terms of gross market value) and interconnectedness among participants increases systemic risk and are causes of concern to the regulators. There is 'risk circularity' within the CDS market which is a concern for financial stability, as market participants would be replacing one type of risk (i.e., credit risk) with another risk(i.e. counterparty risk). Systemic risk could be prevented by limiting the build-up of risky positions and promoting robust risk management practices. The build-up of risky positions can be limited by imposing appropriate position limits and restrictions on leverage as well as imposing increased capital requirements.

3.7.2.1 Internationally, neither the US nor the European laws authorise any regulator for setting position limits. Consequently, US regulators have not prescribed any regulatory limit for CDS trades. However, banks have fixed their own internal risk limits like PV01, VaR limit, net notional amount for each counterparty, net notional amount for each reference entity, counterparty exposure limit, etc. The methodologies used for calculating the limits are approved by the regulators based on the details submitted by the banks. The recently enacted Dodd Bill has proposed authorizing regulators to set aggregate position limits, collateral and margin requirements etc..

3.7.2.2 The sale of CDS amounts to assuming credit risk, broadly similar to investments in corporate bonds *albeit* with leverage. It needs to be ensured that CDS are not used to build up excessive leveraged exposures to credit risk. While regulations such as capital adequacy requirement address credit risk through requiring higher capital, the same may not be adequate in containing the risks, as seen during the recent global crisis. Further, it

has been emphasised in the 'Basel Committee on Banking Supervision Joint Forum: Review of the Differentiated Nature and Scope of Financial Regulation - January 2010' that inadequate management of risks associated with various types of credit transfer products has been one of the contributing factors to the recent financial crisis. The Joint Forum has identified the following factors to have contributed to the recent crisis or posed cross-sectoral systemic risk.

(i) *Inadequate risk governance***:** Sellers of credit protection did not and often could not (given their existing risk management infrastructure) adequately measure the potential losses on their credit risk transfer activities. Buyers of protection did not properly assess sellers' ability to perform under the contracts, and they permitted imprudent concentrations of credit exposures to uncollateralised counterparties.

(ii) *Inadequate risk management practices:* Poor management of large counterparty credit risk exposures with CDS transactions contributed to financial instability and eroded market confidence. CDS dealers ramped up their portfolios beyond the capacity of their operational infrastructures.

(iii) *Insufficient use of collateral:* The absence of collateral posting requirements for highly rated protection sellers (e.g. AAA-rated monoline firms) allowed those firms to amass portfolios of over-the-counter (OTC) derivatives – and thus create for their counterparties excessive credit exposures – far larger and with more risk than would have been the case had they been subject to normal market standards that required collateral posting.

(iv) *Lack of transparency:* Lack of transparency in the CDS markets made it difficult for supervisors and other market participants to understand the extent to which credit risk was concentrated at individual firms and across the financial system. Market participants could not gauge the level of credit risk assumed by both buyers and sellers of credit protection.

(v) *Vulnerable market infrastructure:* The concentration of credit risk transfer products in a small number of market participants created a situation in which the failure of one systemically important firm raised the probability of the failure of others.

3.7.2.3 In view of the above, it is necessary to put in place prudent norms in terms of position limit, risk indicators, collateralisation and risk governance for the participants to

mitigate the risks of CDS contracts. A CDS contract creates two types of exposures for the parties' concerned, viz., counterparty credit exposure and market risk exposure.

3.7.3 **Counterparty Credit Exposures**

3.7.3.1 The counterparty exposure for the protection buyer is the potential credit event payment to be made by the protection seller on account of depreciation in the value of the underlying due to occurrence of credit events. The maximum counterparty exposure for the protection seller is the amount of any unpaid premiums, which does not change. Hence, the volatility in the potential future exposure for the protection buyer is much higher.

3.7.3.2 The Group considered requirement of protection seller having counterparty credit risk limits on account of CDS contracts. **It is recommended that protection seller in the CDS market shall have in place internal limits on the gross amount of protection sold by them on a single entity as well as the aggregate of such individual gross positions. These limits shall be set in relation to their capital funds. Protection sellers shall also periodically assess the likely stress that these gross positions of protection sold, may pose on their liquidity position and their ability to raise funds, at short notice.**

3.7.3.3 **Computation of Credit Exposure to Individual/Group Borrowers –** Exposure ceilings for all fund-based and non-fund based exposures along with off-balance sheet exposures will be computed in relation to total capital as defined under the capital adequacy standards. This practice will be applicable to determining the exposure arising out of CDS transactions as well. **The protection seller shall treat his exposure to the reference entity (on the protection sold) as his credit exposure and aggregate the same with other exposures to the reference entity for the purposes of determining single / group exposure limits. The protection buyer shall replace his original exposure to the reference entity, with that of the protection seller.**

3.7.3.4 **Other issues related to exposure norms –** The issue of whether the benefits available under special category of assets such as priority sector lending/export finance should be made available to the credit protection seller (bank) when protection is sold on such assets is examined and it is decided that such **benefits may not be given to the**

protection sellers as they do not incur any fund-based exposure and providing such benefit may adversely impact flow of credit to priority sectors and would defeat public policy objectives.

3.7.4 **Collateralisation and Margining**

In view of the potential for large build-up of counterparty exposures particularly for the protection buyers, it is considered necessary for the market participants to have a robust and frequent margining and collateralisation system. While a switch-over to CCP system would take care of concerns regarding margining to a great extent, there is a greater need, before the operationalisation of CCP arrangements, to ensure that the OTC transactions are marked to market frequently and adequately collateralised.

Since it would take time to set up a CCP in India, until then the margins would be maintained by the individual market participants. The following requirements shall be met by market participants in regard to margins on CDS transactions:

a) All market participants should lay down a separate margin policy for managing the counterparty credit risk on account of CDS transactions. Margin policy should prescribe the minimum level of margin to be called for.
b) Margins may be maintained on net exposure to each counterparty on account of CDS transactions.
c) The positions should be marked-to-market and re-margined on a daily basis.
d) Participants may maintain margins in cash or government securities.

3.7.5 **Market Risk Exposure**

i) **General Market Risk**

Since CDS is an off-balance sheet exposure to both credit and market risk, the following is proposed to capture general market risk:

a) CDS sold position shall be taken as actual exposure to the entity and thereby would be covered under the relevant exposure limits indicated by the regulator.

b) The CDS participants must adhere to the comprehensive guidelines on derivatives issued vide circular RBI / 2006 – 2007 / 333 DBOD.No.BP.BC.86 / 21.04.157 / 2006-07, dated April 20, 2007.

ii) **Specific Risk**

As the distribution of changes in credit spreads is not normal, the potential for significant downside is much larger than potential gains through narrowing of credit spreads. In view of the general asymmetry in payoffs between potential buyer and seller, the risk for the protection seller is much greater than that for the protection buyer. Hence, there is a need to place limits on exposures on account of protection selling. The driver of the limit would be the volatility of the credit spreads of the asset class to which the reference entity belongs. Internationally, the limits are fixed by individual banks in terms of Risky PV01 and the portfolio risk is generally controlled through placing Risky PV01/Risky Duration[1]/risky annuity limits. Risky PV01 refers to the expected present value of 1 basis point paid on the premium leg until default or maturity, adjusting for default risk.

Risky Duration (DV01) is the change in mark-to-market of a CDS trade for a 1basis point shift in the CDS curve. Generally, the trading desk limits of Risky Annuities are composite for cash bonds and CDS. However, these limits are aimed more at restricting the build-up of positions by the traders, rather than putting an entity-wide limit on the exposures to CDS contracts. Internationally, the extent of exposure to CDS contracts an entity intends to assume, is a function of its risk appetite. In this regard, following **is recommended in the Indian context:**

a. **Protection sellers, with the approval of their Board, may fix a limit on their Net Long[2] risk position in CDS contracts, in terms of Risky PV01, as a percentage of the their Total Capital Funds.**
b. **Since CDS represents idiosyncratic risk on individual obligors, no netting of Risky PV01 across obligors may be allowed.**
c. **The Board may periodocally review these limits and details of the limits alongwith the rationale may be submitted to the concerned regulatory departments of the Reserve Bank.**

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[1] DV01 (or risky duration or risky annuity) for a CDS is defined as $DV01 := \sum_i SP_i \tau_{i-1,i} DF_i$ [where SP denotes the cumulative survival probability until time i, $\tau_{i-1,i}$ the day count fraction between times i-1 and i and DF the risk-free discount factor at time i.] This is the risky present value of 1 bp spread change on a notional amount of 1 currency unit.

[2] Net long position is the total CDS sold positions netted by the CDS bought positions of the same reference entity.

d. **Further, the gross PV01 of all non-option rupee derivatives should be within 0.25 per cent of the net worth of the bank / PDs as on the last balance sheet date (in terms of circular DBOD. No.BP.BC.53/21.04.157/2005-06 dated December 28, 2005). It is suggested that similar limits may be placed on derivatives positions of other protections sellers by the respective regulatory authorities in order to limit risks to the financial system.**

3.7.6 **Issues Relating to Capital Adequacy Requirement**

Before granting capital relief to any form of credit derivative, the supervisors must be satisfied that the market participants fulfill the minimum conditions relating to risk management processes and that the CDS is direct, explicit, irrevocable and unconditional. As regards banks, the Basel II guidelines have prescribed the regulatory treatment for CDS transactions. Taking into consideration the developments in the area of capital adequacy requirements, **detailed guidelines on capital adequacy for CDS for banks may be issued by DBOD; for NBFCs by DNBS and for Primary Dealers by IDMD. As regards Insurance Companies and Mutual Funds permitted to sell CDS , the respective regulators may consider imposing necessary prudential safeguards including capital adequacy requirements as part of risk management , in the interest of financial stability.**

3.7.7 **Risk Management – Role of Board and Senior Management**

3.7.7.1 The participants should consider carefully all related risks and rewards before entering into CDS transactions. They should not enter into such transactions unless their management has the ability to understand and manage properly the credit and other risks associated with these instruments. They should establish sound risk management policy and procedures integrated into their overall risk management.

3.7.7.2 Participants which are protection buyers should periodically assess the ability of the protection sellers to make the credit event payment as and when they may fall due. The results of such assessments should be used to review the counterparty limits.

3.7.7.3 Participants should be aware of the potential legal risk arising from an unenforceable contract, e.g., due to inadequate documentation, lack of authority for a counterparty to enter into the contract (or to transfer the asset upon occurrence of a credit

event), uncertain payment procedure associated with bankruptcy proceedings or inability to determine market value when required. They should consult their legal experts on these and other related legal aspects before engaging in CDS transactions.

3.7.8 **Policy requirements**

Before actually 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.** The policy should lay down the internal guidelines which should include, *inter alia,* various risk limits on CDS positions, procedures, risk management practices, the internal control systems to ensure adherence to the regulatory and internal guidelines, reporting of CDS activity to the Board and the regulators, procedure to deal with violations, etc. Participants shall also put in place a system to detect violations, if any, immediately, certainly within the same trading day. Additionally, the Board approved risk management policy should cover at the minimum:

a) The strategy – i.e., whether for hedging or for trading, risk appetite and limits for CDS;
b) Authorisation levels for engaging in such business and identification of those responsible for managing it;
c) Procedure for measuring, monitoring, reviewing, reporting and managing the associated risks like credit risk, market risk, liquidity risk and other specific risks;
d) Appropriate accounting and valuation principles for CDS;
e) Determination of contractual characteristics of the products; and
f) Use of best market practices.

3.7.9 **Risk Management Architecture**

3.7.9.1 **Systems and Controls**

Senior management of the market participants should establish an independent framework for reporting, monitoring and controlling all aspects of risks, assessing performance, valuing exposures, monitoring and enforcing position and other limits. The systems and controls should:

(i) Ensure that the senior-most levels of management at the counterparty are involved in transactions by methods such as obtaining from the counterparty a copy of a

resolution passed by their Board of Directors, authorising to transact in credit derivatives.

(ii) Ensure that (a) the CDS contract confirmations are received promptly and verified for accuracy; (b) appropriate systems to track the delays in confirmations and to escalate the delays in such confirmations to the appropriate levels within the bank; and (c) the systems provide for an appropriate authority (preferably the CEO) to decide on cessation of dealing with the counterparties where the confirmations are in arrears beyond a reasonable number of business days.

(iii) Ensure adequate Management Information Systems (MIS) to make senior management aware of the risks being undertaken, which should provide information on the types of transactions carried out and their corresponding risks, the trading income/losses, realized/unrealised from various types of risks/exposures taken by the market participant, contribution of derivatives to the total business and the risk portfolio, and value of derivative positions. The MIS should be timely, accurate and comprehensive and adequately controlled and secured. Internal information systems used should ensure adequate segregation of duties and security controls so as to ensure that data integrity is maintained.

(iv) Assess and account for the possibility of default correlation between reference asset and the protection provider.

(v) The risk management system is stress-tested and participants may also factor in the CDS- related adverse scenarios as part of their stress-testing processes.

(vi) Ensure that activities in the CDS market, if undertaken, are properly supervised and are subject to an effective framework of internal controls and audits so that transactions are in compliance with regulations and internal policy of execution, recording, processing and settlement.

3.7.9.2 In addition to the internal control mechanisms, the concurrent auditors should specifically verify compliance with these instructions, as well as with internal guidelines and report violations, if any, within a reasonably short time, to the appropriate internal authority. As part of their monthly reporting, concurrent auditors may verify whether the independent back/mid-office has taken cognisance of lapses, if any, and whether they have reported the same within the required time- frame to the appropriate internal

authority. Any violation of regulatory guidelines noticed in this regard should immediately be reported by the participants to their respective regulators.

3.7.10 **Procedures**

The market participants should have adequate procedures for:

(i) Measuring, monitoring, reviewing, reporting and managing the associated risks,

(ii) Analysis of all credit risks to which the market participants will be exposed, the minimisation and management of such risks,

(iii) Ensuring that the credit risk of a reference asset is captured in the bank's normal credit approval and monitoring regime. This function in no case should be entrusted to the desk dealing with CDS,

(iv) Management of market risk associated with CDS held by participants in their trading books by measuring portfolio exposures, at least daily, using robust market-accepted methodology,

(v) Management of the potential legal risk arising from unenforceable contracts and uncertain payment procedures.

3.7.11 **Prevention of mis-selling and market abuse**

It is important, from a regulatory perspective, to protect the interests of those participants who might be less informed about credit derivatives. It needs to be ensured that the *users* are protected from mis-selling and market abuse. From the protection buyer's side, it would be appropriate that the senior management is involved in transactions to ensure checks and balances.

Towards this end, the following is recommended:

a) Banks and other *market-makers* that enter into CDS transactions shall not be permitted to do so without obtaining from the counterparty, a copy of a resolution passed by their Board of Directors, authorising the counterparty to transact in CDS.

b) The product terms are transparent and clearly explained to the counterparties along with risks involved.

Chapter IV

Trade Reporting & Information Dissemination

4.1 Transparency in CDS markets through reporting & disclosures

4.1.1 CDS can have a material impact on institutions' risk profiles and has the potential to engender significant losses due to leveraged positions and risk concentration. In the interest of financial stability, these effects need to be properly captured by disclosures. However, internationally, inadequate disclosure by banks and insurance firms are a cause for concern, as firms' balance sheets and financial statements do not, at present, provide a clear picture of the impact of their CDS portfolios. This concern was expressed in the Report on Credit Risk Transfer submitted by the Working Group established by the Committee on the Global Financial System in January 2003 and was reiterated in various forums. It is observed that the information available at the onset of financial crisis in 2008 was not adequate to track the redistribution of credit risk through the use of CDS or identify any risk concentrations. As CDS was a bilateral contract, such disclosures were not mandatory in the US and Europe. These limitations were severe and created a high degree of systemic risk, characterised by the inability of regulators to monitor CDS exposures amongst market participants, resulting in failure to quantify the impact of certain negative events (e.g., credit rating downgrades) on market participants and to prevent pockets of risk developing to the detriment of market stability. The problem was further accentuated by the participation of unregulated entities which made it difficult for both supervisors and market participants to understand the extent of credit risk assumed or transferred and identify the firms with significant CDS exposures.

4.1.2 Subsequently, reporting of CDS trades by the market participants, through Trade Information Warehouse (TIW) of Depository Trust & Clearing Corporation (DTCC), improved data availability significantly. TIW, initially originated for matching of trades, has now been extended to act as a trade information repository and is being used extensively by all the Central Counterparties as their information base for novation. TIW provides centralised information on member-specific exposures (on account of both client and proprietary accounts). It also provides aggregate information like gross and net notional values of contracts on the underlying CDS single-name reference entities. TIW also releases weekly/monthly reports on CDS trade volumes and values. DTCC has agreed to

provide the data including the names of the counterparties, required by various regulators, if the regulators have the necessary remit to obtain the data under their regulatory purview.

4.2 Framework for Trade Reporting and Information Dissemination in India

4.2.1 In India, the importance of data collection, both for regulatory surveillance and market dissemination, is well-acknowledged, as the trade reporting systems for government securities transactions (both outright and repo) have been in place since 2002, followed by reporting platforms for Interest Rate Derivatives (2007), corporate bonds (2008) and CDs and CPs (2010). Keeping in view the criticality of data dissemination, both for the market participants as well as regulators, and in line with the international developments in this regard, following is recommended:

a. **A centralised CDS trade 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**.

b. **The reporting platform may collect and make available data to the regulators for surveillance and regulatory purposes and also publish, for market information, relevant price and volume data on CDS activities such as notional and gross market values for CDS reference entities broken down by maturity, ratings etc., gross and net market values of CDS contracts and concentration level for major counterparties.**

4.2.2 The proposed centralised CDS trade repository shall have a robust infrastructure that provides market participants with a wide range of automated operational capabilities. The services that may be offered by the repository are detailed as under:

4.2.2.1 Trade Information Repository – The Repository must maintain centralised electronic database for all CDS contracts outstanding in the marketplace. The Repository must also maintain comprehensive database for the most current CDS contract details. The repository needs to store key information on market participants' positions and help regulators and market participants gain a clear and complete snapshot of the market's

overall risk exposure to CDS. The repository may provide weekly/fortnightly/monthly reports on its website, on current and historical data on the notional amounts of contracts outstanding and contract turnover and various other reports to the regulators.

4.2.2.2 Lifecycle Event Processing – The CDS trade repository must also provide Lifecycle Event Processing services to manage all phases of the CDS post-trade process:

- ***Payment calculation and bilateral netting***: The trade repository shall calculate coupon to be paid on all confirmed CDS contracts. It shall also create real-time bilateral netting for each trade.

- ***Event processing*****:** The trade repository shall provide a comprehensive electronic service that automates lifecycle processing for successor events such as reorganisations and renaming of corporate entities and credit events.

4.3 Development of Trade Reporting Platform – Certain Issues

Currently there are trade reporting platforms for government securities, interest rate derivatives, money market transactions and corporate bonds. While the trade reporting of government securities and money market transactions is done on NDS, the interest rate derivative transactions are reported on the CCIL's reporting platform. The outright transactions in corporate bonds are being reported on BSE, NSE or FIMMDA platforms. The Annual Policy 2010-11 had announced setting up of a comprehensive reporting platform for all OTC derivatives. Considering the synergies involved in housing all OTC derivative trade reporting at one place, and also keeping in view the eventual migration to the centralised clearing and settlement of CDS transactions, **the Group recommends that the reporting platform for CDS transactions may be developed and housed along with the reporting platform for all OTC derivatives. The reporting platform may be developed taking into consideration the permitted participant base and the future scalability.**

4.4 Supervisory Reporting

One of the key weaknesses noticed during the financial crisis was the lack of information providing regulators with a clear aggregate picture of the interconnectedness of positions held by the firms they supervised and their potential exposures to market counterparties. Providing position transparency to regulators via the use of a trade repository would help

identify potential sources of concentration risk and market instability and would support financial stability planning. Information from trade repositories can be used by regulators to assess risks on the books of their regulated entities, and would enable the market as a whole to identify aggregate risks for specific asset classes. **In addition to the trade reporting done by the participants on the proposed trade reporting platform, the participants may report to their regulators information as required by them such as risk positions of the participants' *vis-à-vis* their networth and adherence to risk limits, etc. As regards the Reserve Bank regulated entities, the information shall be reported on a fortnightly basis, within a week after the end of fortnight, as per the proforma given in Annex IV, to the concerned regulatory department of the Reserve Bank.**

Chapter V

Centralised Clearing and Settlement of CDS

5.1 International Experience regarding Centralised Clearing of CDS

The need and importance of centralised clearing and settlement of OTC transactions was emphasised during the global financial crisis which has prompted the regulatory authorities to extend central counterparty (CCP) clearing to OTC derivatives, in general, and CDS, in particular, so as to address the counterparty risk arising due to default event. In order to limit the counterparty risk and strengthen present market infrastructure for Credit Default Swaps (CDS), European and US regulators have encouraged central clearing of CDS transactions and central counterparties (CCPs) to guarantee settlement. CCP system takes care of settlement risk through process of novation and robust risk management systems. Consequently, 2009-10 has seen introduction of CCPs such as ICE Trust and CME in US and Eurex, ICE Clear Europe and LCH.Clearnet in Euro Zone. Membership criteria, risk management and other features of the CDS Clearing houses in the US and Europe are summarised in Annex V.

5.2 Challenges in Introduction of CCPs for OTC Derivatives in India

Based on the international experience in operationalising CCPs for CDS transactions, the following issues merit attention, while operationalising a CCP in India:

5.2.1 Prerequisites for central clearing include sufficient contract standardisation and reliable, tradable prices, which facilitate risk management. With regard to product offering, internationally, clearing houses are presently clearing CDS indices (reason being that it is easier than the single names and has healthy volumes) and constituent single names. The lack of liquidity and volumes in single-names may impact the efficacy of the CCP in India. Failure of CCP due to inefficient credit and operational risk management could threaten the stability of financial markets. Hence, it is essential for the CCP to have adequate financial resources and put in place effective risk control measures. Though comprehensive standards for CCPs have been published by Committee on Payment & Settlement Systems (CPSS) and the International Organization of Securities Commissions (IOSCO) in 2004, applying them to CCPs for CDS involve interpretation of issues like margin requirement, defining default event, etc. CPSS and IOSCO have established a Joint Working Group to promote consistent interpretation, understanding and

implementation of the RCCP (Recommendations for CCPs) across the arrangements for the OTC derivative transactions. A consultative report has also been brought out in May 2010 together by Bank for International Settlements (BIS) and International Organisation of Securities Commissions (IOSCO) in the light of global crisis and the lessons to be learnt. Further, many issues like provision of liquidity for the CCP by the central banks or public sector support in the event of failure of one or more members are also being debated.

5.2.2 In addition, if jump-to-default risk is not sufficiently managed through margin requirements and other methods, it has the potential to create significant losses for the clearing-houses. Jump-to-default risk posed by CDS makes determination of margin requirements extremely difficult.

5.2.3 The advantage of a CCP is facilitating multilateral netting across different counterparties resulting in large reduction of positions and thereby minimising counterparty and operational risks. However, this requires that CCPs are adequately capitalised and they have the required financial resources to enable absorption of potential losses. In order to reduce counterparty risk, the CCP will need to demand adequate margins, ask for an *ex-ante* commitment to cover the costs, if one of the clearing members fails, and be adequately capitalised.

5.3 **Standardisation of the Product**: Standardisation of the product enables easier clearing and settlement since it would be operationally easier for the CCP to set up and fine tune the risk management processes suiting standardised products as against a plethora of customized products. In this regard, internationally, there has been a conscious migration towards standardization of CDS facilitated by ISDA. Hence, the Group has recommended standardisation of CDS contracts so that the eventual migration to centralised clearing and settlement could be easier.

5.4 **Availability of Prices and Valuation**: The valuation of CDS positions is a quantitative and technical process and therefore the CCP can liaise with the market bodies like FIMMDA and other service providers and devise necessary valuation models. In this regard, availability of reliable prices is a major concern; especially in the context of single name CDS. The single name CDS is not as liquid as index swaps and, therefore,

the CCPs might find it difficult to operationalise the clearing and settlement of single-name CDS. In the Indian context, the illiquidity of underlying corporate bond market which could spill over to the CDS market poses further concerns for CCP framework. In absence of liquid CDS market, the CCP would be finding it difficult to value and liquidate the positions, when needed. Illiquid markets also result in higher margin requirements adding to the transaction costs. While appreciating the benefits of CCP in terms of significantly addressing the counterparty risk and enhancing the market efficiency, **the Group recommends a gradual approach to setting up a CCP in India. A suitable framework for operationalising CCP may be based on the international experience, but suiting to the specific features of Indian markets after examining the development of domestic CDS market.**

5.5 **Risk Management of CCPs –** In contrast to many other derivatives products that are cleared by the CCPs, the CDS have very different risk profiles and, therefore, require the CCPs to have risk management systems to address, *inter alia*, special risks such as jump-to-default risk. CCPs handling CDS clearing are exposed to greater and special risks, warranting robust risk management process, default handling mechanisms and the necessary resource base. **The Group therefore recommends that the CCP identified for the purpose may be encouraged and required to set up necessary risk management systems and resource arrangements commensurate with the risks undertaken**.

5.6 **Models of CCPs**

5.6.1 The clearing and settlement agency / CCP shall be an entity registered under Payment and Settlement Act, 2007. The aspect of synergies involved in clearing the OTC derivatives may be taken into consideration while designing the CCP arrangement.

5.6.2 Guaranteed settlement of CDS transactions could take some time, since idiosyncratic risks associated with guaranteeing single name CDS need to be fully understood and necessary systems need to be built. Further, a critical amount of market activity and liquidity are required to operationalise the guaranteed settlement in CDS. **In the interim, however, an identified clearing house (like CCIL/NSSCL, etc.) can**

operationalise the settlement on non-guaranteed basis, covering the following features:

- Collection of trade data from the trade reporting platform/repository;
- Furnishing the MTM value of the positions (gross/net) to the participants;
- Advising the participants of the daily margin requirements; and
- Collecting and maintaining margins / collaterals on behalf of the participants.

CCP arrangements adhering to robust risk management systems and enhanced resource base for centralised clearing of CDS trades with guaranteed settlement may be put in place, in due course depending on the state of risk management systems.

5.7 **Legal Status**

Internationally, CCPs differ in their legal status. LCH.Clearnet SA is licensed as a credit institution in France and is categorised as a systemically important institution in the financial system regulated by the Banque de France. Eurex is also a licensed credit institution overseen by BaFin in Germany. ICE Clear-Europe is a recognised clearing house under supervision of the FSA. ICE Trust is a limited purpose banking company in New York and CME is a derivatives clearing organization under regulatory purview of CFTC. These differing regulatory and legal treatments have implications for issues like subjecting them to different regulatory directives with regards to capital adequacy, differing regimes of consumer protection, etc. Capital adequacy requirements have a direct bearing on the capacity of the CCPs to absorb systemic risk as well as provide competitive advantage. Harmonisation of regulation in this regard is of critical importance.

Clearing Houses/CCPs have to ensure that they hold sufficient liquid assets to effectively undertake central clearing. In the United Kingdom, central bank is not the lender of last resort to a central counterparty. Liquidity support is sourced through contingent credit lines from commercial banks which in turn have credit lines from the central bank. In France, the CCP is treated as a credit institution and has access to central bank liquidity. In India, we may adopt the model of liquidity management, wherein the commercial banks could provide liquidity support (in form of cash and government securities) at commercial rates as in case of CCIL.

5.8 **Regulation of the CCP**

The regulation involves assessment of risk management capabilities of the CCPs and their financial strength. The parameters examined include risk management, adequacy of margins and margining methodology, effectiveness of default management procedures, adequacy of guarantee fund, capital adequacy, governance issues and compliance with the IOSCO recommendations for central counterparty clearing. The examination is both on-site and off-site. Clearing houses submit data on clearing activities, stress test results, margining, positions, etc. periodically to the regulators. Similar approach may be followed for the proposed CCP for CDS in India.

Chapter VI

Summary of Recommendations

The recommendations of the Group are summarised chapter-wise, as under:

Product Design

1. *Eligible participants:*

(i) The participants in CDS market may be categorised as (i) *Market-makers* - who are permitted to both buy and sell protection and (ii) *Users* - who are not permitted to sell protection but are permitted only to hedge the underlying risk by buying protection. (Para 2.2)

(ii) Commercial banks, Primary Dealers and NBFCs (that offer credit facilities to borrowers) can be allowed to act as *market-makers*, subject to eligibility criteria given in 2 below. Insurance companies and Mutual Funds may also be permitted to sell CDS on single name corporate bonds subject to their having strong financials and risk management capabilities as prescribed by their respective regulators (IRDA and SEBI). *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 a RBI-regulated entity at least on one side. (Para 2.2.3)

2. *Eligibility norms for market-makers:*

(i) Banks who intend to sell CDS protection shall fulfill the following criteria:

a) Minimum CRAR of 12 per cent with core CRAR (Tier I) of at least 8 per cent,
b) Net NPAs of less than 3 per cent

(ii) NBFCs which are allowed to function as *market-makers* shall fulfil the following criteria:

a) Minimum Net Owned Funds of Rs. 500 crore;
b) Minimum CRAR of 15 per cent;
c) Net NPAs of less than 3 per cent, and
d) Have robust risk management systems in place to deal with various risks.

(iii) PDs intending to sell CDS protection shall fulfil the following criteria:

a) Minimum Net Owned Funds of Rs. 500 crore;
b) Minimum CRAR of 15 per cent; and

c) Have robust risk management systems in place to deal with various risks.

The regulatory approval to NBFCs / PDs would be accorded on a case-by-case basis. (Para 2.3)

3. *Reference Entity:* The reference entity in a CDS contract shall be a single legal resident entity and direct obligor for the reference asset/obligation and the deliverable asset/obligation. (Para 2.4)
4. *Rating of the reference entity:* The CDS can be written only on obligations of rated entities. No minimum rating needs to be specified. However, CDS can also be written on corporate bonds issued by unrated Special Purpose Vehicle (SPV) of rated infrastructure companies. (Para 2.5)
5. *Nature of underlying obligation:* CDS only on corporate bonds as reference obligations would be permitted in India. *Market-makers* should ensure not to sell protection on reference entities/obligation on which there are regulatory restrictions on assuming exposures. (Para 2.6)
6. *Requirement of Underlying in CDS:*

(i) The *users* can purchase CDS only to the extent of underlying risk held by them. The *users* can buy CDS for amounts not higher than the face value of credit risk held by them and for periods not longer than the tenor of credit risk held by them. (Para 2.7.6 (i))

(ii) *Requirement of the underlying*: The *users* shall not, at any point of time, maintain CDS protection without underlying bond. The *users* can unwind their bought protection by terminating the position with the original counterparty. The original counterparty (protection seller) may ensure that the protection buyer has the underlying at the time of unwinding. The *users* are not permitted to unwind the protection by entering into an offsetting contract. (Para 2.7.6 (ii))

(iii) Proper caveat may be included in the agreement that protection seller, while entering into CDS contract/unwinding, needs to ensure that CDS protection buyer has exposure in the underlying. This may also be subject to rigorous audit discipline. (Para 2.7.6(iii))

7. *CDS transactions between related parties: Users* and *market-makers* would not be permitted to enter into CDS transactions having their ‘related parties’ either as counterparties or as reference entities. (Para 2.8)

8. *Other Requirements:* The single-name credit default swaps on corporate bonds in India should satisfy the following requirements:
    a) the protection buyer and the protection seller shall be resident entities;
    b) the reference asset/obligation and the deliverable asset/obligation shall be to a resident and denominated in Indian Rupees; the CDS contract shall be denominated and settled in Indian Rupees;
    c) underlying reference obligations like asset-backed securities/mortgage-backed securities and convertible bonds shall not be permitted;
    d) CDS shall not be written on entities which have not issued any bonds and have only loan obligations;
    e) CDS shall not be written on securities with original maturity up to one year e.g., CP, CD and NCD, etc.
    f) the reference and deliverable assets/obligations shall be those which are (a) of rated entities; (b) the rating is current and maintained by the rating agency; and (c) the rating is published in the monthly bulletin of the rating agency;
    g) the CDS contract must represent a direct claim on the protection seller; must be irrevocable and contain no clause that would allow the protection seller to unilaterally cancel the contract;
    h) the CDS contract should not have any clause that may prevent the protection seller from making the credit event payment in a timely manner after occurrence of the credit event and completion of necessary formalities in terms of the contract;
    i) the protection seller shall have no recourse to the protection buyer for losses;
    j) the identity of the parties responsible for determining whether a credit event has occurred must be clearly defined *a priori* in the documentation;
    k) dealing in any structured financial product with CDS as one of the components and any derivative product where the CDS itself is an underlying shall not be permitted;

l) the protection seller shall not transact in credit derivatives with reference assets/ obligations or deliverable assets/ obligations which they are not permitted to undertake, as per extant RBI instructions.

m) it is mandatory for the CDS buyers to have bonds in 'de-materialised' form as underlying. (Para 2.9)

9. *Standardisation of the CDS Contract:* The CDS contracts in India may also be standardised in terms of coupon, coupon payment dates, etc. Details relating to standardisation of CDS contracts may be decided by the market participants and market bodies like FIMMDA. (Para 2.10)

10. *Credit Events:* The credit events specified in the CDS contract may cover bankruptcy, failure to pay, repudiation/moratorium, obligation acceleration and obligation default. Restructuring may not be permitted as credit event in initial stages. Credit events as defined by ISDA may need some modification to be in consonance with Indian laws. (Para 2.11)

11. *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.(Para 2.11.4)

12. *Settlement methodologies:* For *users*, physical settlement is mandatory. *Market-makers* can opt for any of the three settlement methods (physical, cash and auction), provided the CDS documentation envisages such settlement. (Para 2.12)

13. *Documentation:* Market organisations 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. (Para 2.13)

14. *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 Disclosures' approved by the Institute of Chartered Accountants of India (ICAI). Market participants may adopt appropriate norms for accounting of CDS

which are in compliance with the Indian accounting standards from time to time, with the approval of their respective boards.(Para 2.14.2)

15. *Pricing/Valuation methodologies:* Market participants need to put in place appropriate and robust methodologies for marking to market (MTM) the CDS contracts on a daily basis. These methodologies need to be validated by external validators/modelers periodically for reliability. The market participants may value their CDS contracts on a single model which would facilitate the migration eventually to a centralised clearing and settlement platform. FIMMDA may coordinate with service providers/ISDA and come out with a daily CDS curve. If a proprietary model results in a more conservative valuation, the market participant can use that proprietary model. (Para 2.15)

Regulation and Risk Management in CDS

16. *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. (Para 3.7.1)

17. *Credit Exposures:*

(i) Protection sellers in the CDS market shall have in place internal limits on the gross amount of protection sold by them on a single entity as well as the aggregate of such individual gross positions. These limits shall be set in relation to their capital funds. Protection sellers shall also periodically assess the likely stress that these gross positions of protection sold may pose on their liquidity position and their ability to raise funds, at short notice. (Para 3.7.3.2)

(ii) The protection seller shall treat his exposure to the reference entity (on the protection sold) as his credit exposure and aggregate the same with other exposures to the reference entity for the purposes of determining single / group exposure limits. The protection buyer shall replace his original exposure to reference entity, with that of the protection seller. (Para 3.7.3.3)

(iii) The benefits available under special category of assets such as priority sector lending/export finance shall not be made available to the credit protection seller. (Para 3.7.3.4)

18. *Collateralisation and Margining:* All market participants should lay down a separate margin policy for managing the counterparty credit risk on account of CDS transactions. Participants may maintain margins in cash or Government securities. (Para 3.7.4)

19. *Market Risk Exposure:*

(i) CDS sold position shall be taken as actual exposure to the entity and thereby would be covered under the relevant exposure limits indicated by the regulator. The CDS participants must adhere to the comprehensive guidelines on derivatives issued vide circular RBI/2006-2007/333 DBOD.No.BP.BC.86/21.04.157/2006-07, dated April 20, 2007. (Para 3.7.5 (i))

(ii) Protection sellers, with the approval of their Board, may fix a limit on their Net Long risk position in CDS contracts, in terms of Risky PV01, as a percentage of the Total Capital Funds of the entity. Since CDS represent idiosyncratic risk on individual obligors, no netting of Risky PV01 across obligors may be allowed. The gross PV01 of all non-option rupee derivatives should be within the 0.25 per cent of net worth of the bank / PD as on the last balance sheet date. (Para 3.7.5(ii))

20. *Policy Requirements:* Before actually 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. (Para 3.7.8)

21. *Prevention of mis-selling and market abuse:* Banks and other *market-makers* that enter into CDS transactions shall not be permitted to do so without obtaining from the counterparty, a copy of a resolution passed by their Board of Directors, authorising the counterparty to transact in CDS. It may also be ensured that the product terms are transparent and clearly explained to the counterparties along with risks involved. (Para 3.7.11)

Trade Reporting & Information Dissemination

22. *Framework of Reporting and Trade Dissemination:*

(i) A centralised 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. The reporting platform may collect data and make them available to the regulators for surveillance and regulatory purposes and also publish, for market information, relevant price-volume data on CDS activities. (Para 4.2.1)

(ii) Reporting platform for CDS transactions may be developed and housed along with the reporting platform for all OTC derivatives. (Para 4.3)

(iii) The participants may report to their regulators information as required by them such as risk positions of the participants *vis-à-vis* their Networth and adherence to risk limits, etc. As regards the RBI-regulated entities, the information shall be reported on a fortnightly basis, within a week after the end of fortnight, as per the prescribed proforma to the concerned regulatory departments of the Reserve Bank. (Para 4.4)

Centralised Clearing and Settlement of CDS

23. The Group recommends a gradual approach to setting up a CCP in Indian context. A suitable framework for operationalising CCP may be based on the international experience, but taking into account the specific features of Indian markets and examining development of domestic CDS markets. The CCP may be required to set up necessary risk management systems and resource arrangements commensurate with the risks undertaken. The clearing and settlement agency/CCP for CDS may be an entity registered under the Payment and Settlement Systems Act, 2007. (Para 5.4& 5.5)

24. In the interim, an identified clearing house (like CCIL/NSSCL, etc.) can operationalise the settlement on non-guaranteed basis, with services such as: collection of trade data; furnishing the MTM value of the positions to the participants; advising daily margin requirements and maintaining margins / collaterals on behalf of the participants. (Para 5.6)

Annex I

Constitution of the Group and the Terms of Reference

1. **Constitution of the Group**

An Internal Group was constituted with the following members within RBI to work out the operational modalities for introduction of plain vanilla OTC single-name CDS for corporate bonds for resident entities.

S.No	Name of Official
1.	Shri Rudra Narayan Kar – Convener General Manager, Internal Debt Management Department, Reserve Bank of India
2.	Dr. (Smt.) Mohua Roy Director Monetary Policy Department, Reserve Bank of India
3.	Smt. Ranjana Sahajwala* General Manager Department of Banking Operations & Development, Reserve Bank of India
4.	Shri K. Sivaraman General Manager Department of Payment & Settlement Systems, Reserve Bank of India
5.	Shri R. Subramanian General Manager Department of External Investments & Operations, Reserve Bank of India
6.	Shri Unnikrishnan A Deputy Legal Adviser Legal Department, Reserve Bank of India
7.	Shri G. Seshsayee Deputy General Manager Financial Markets Department, Reserve Bank of India

* substituted by Shri Rajinder Kumar, GM, DBOD

2. **Terms of Reference**

The Terms of Reference for the Internal Group are as under:

i. To suggest the design of the product in terms of eligible underlying, minimum rating, etc.

ii. To suggest the eligibility criteria for participants to undertake transactions in CDS.

iii. To examine the issues in settlement of CDS and suggest the settlement methodology.

iv. To suggest the modalities for surveillance and information dissemination of trading, in terms of centralised reporting systems and issues of transparency.

v. To make recommendations regarding the accounting, legal and risk management framework for CDS.

vi. To examine the international work regarding centralised clearing of CDS and suggest mechanism for introduction of centralised clearing for CDS in India.

vii. Any other items germane to the issue.

Annex II

Credit Derivatives – Concepts

1. **The Basics**

1.1 Credit derivatives are financial contracts that allow credit risk transfer, generally on bonds or loans of a sovereign or corporate entity. Credit derivatives are used to express a positive or negative credit view on a single entity or a portfolio of entities, and reduce risk arising from ownership of bonds or loans. Transfer of credit risk may be for the whole life of the underlying asset or for a shorter period. The transfer may be for the entire amount of the underlying asset or for a part of it. A credit derivative may be referenced to a single entity or to a basket of several entities. Credit derivatives may also include cash instruments (e.g. credit-linked notes) where repayment of principal is linked to the credit standing of a reference asset/entity.

1.2 Credit derivatives may be used for a variety of reasons. These reasons include:

a) To reduce capital required to support credit risk exposures;
b) To release credit exposure limits to a counterparty;
c) To reduce concentrations by shedding exposures to a counterparty and without affecting the relationship with the borrower since there is no transfer of title of the asset or to a sector; and
d) To assume exposures to a counterparty or to a sector to diversify risks or to fill gaps in credit quality spectrum.

1.3 Therefore, credit derivatives can be classified on the basis of their use as under:

(i) Hedging instruments, which allow an institution to hedge its risk on counterparty and, at the same time, meet its capital requirements without really affecting its existing commercial interests with the counterparty.
(ii) Investment instruments, which permit a participant to acquire counterparty risk without having to provide funding or enter into a commercial relationship with the counterparty.
(iii) Trading instruments, designed to generate a short-term capital gains over the expected path of credit risk. [Prato, 2002]

2. **Types of credit derivatives**

The credit derivative products can be broadly classified under the following four types and may range from plain vanilla products to complex structures.

a) Credit default swaps
b) Total return swaps
c) Credit-linked notes
d) Credit spread options.

3. **Credit Default Swaps**

3.1 Credit Default Swaps (CDS) are a class of credit derivatives that can be used to transfer credit risk from the investor exposed to the risk (the protection buyer) to an investor willing to assume that risk (the protection seller). While dealing in CDS, both buyer and seller of credit protection specify a reference entity, reference obligation, maturity of the contract, notional amount, credit events, etc.

3.2 CDS is a bilateral derivative contract on one or more *reference assets* in which the protection buyer pays a premium through the life of the contract in return for a *credit event payment* by the protection seller following a *credit event* of the reference entities. In most instances, the protection buyer makes quarterly payments to the protection seller. The periodic payment (premium) is typically expressed in annualised basis points of a transaction's notional amount. If any one of the credit events occurs during the life of the contract, the protection buyer will receive from the protection seller, a credit event payment, which will depend upon whether the terms of a particular CDS call for a physical or cash settlement. Generally, the legal framework of CDS – i.e., the documentation evidencing the transaction – is based on a confirmation document and legal definitions set forth by the International Swaps and Derivatives Association, Inc. (ISDA). If a credit event occurs, the contract is settled through one of the types of settlement specified in the contract.

3.3 In option terminology, the CDS protection buyer (long put) is short the credit risk and pays the premium or CDS spread to the protection seller (short put) who is long the credit risk. If there is no credit event by the contract expiration date, the protection buyer loses the premiums paid. On the other hand, if there is a credit event during the term of

the contract, the protection seller will make a contingent payment to the protection buyer. Thus, procedure following the credit event is analogous to exercising an ‘in-the money’ put option.

3.4 Credit default swaps can be conceptualised as a piece of a debt obligation consisting of the credit spread (i.e., the interest beyond the risk-free rate) and the default risk of the instrument, both of which are transferred to the protection seller. A hedge buyer of a credit default swap essentially transforms part or all of his existing exposure on a debt obligation into something close to a high-quality government bond – the "closeness" varying with the credit risks associated with the counterparty to the swap. Conversely, the seller of a credit default swap buys a slice of the original debt obligation, taking on the role of a lender but without incurring any funding costs or interest rate risks. The seller has acquired an instrument that will turn almost entirely on the firm-specific risks of the reference debtor. [Lubben,2007]

3.5 *CDS and Credit Guarantee*: The credit default swap structure is very close to that of a guarantee but differs in three important ways: the range of credit events that trigger payment is much broader under CDS; the protection buyer is not required to prove that it itself had suffered a loss, in order to receive payment; and CDSs are based on standardised documentation and are traded. Credit default swaps are traditionally traded over-the-counter (OTC), rather than on an exchange. These are customised risk transfer instruments that are negotiated and executed bilaterally between counterparties. CDS counterparties typically post collateral to guarantee that they will fulfill their obligations. Post-crisis, the regulators and market participants are moving towards centralised clearing of these instruments.

3.6 *Single Name, Index and Basket CDS:* There are three types of CDS. First, the ’single-name CDS’ offers protection for a single corporate or sovereign reference entity. Second, CDS indices are contracts which consist of a pool of single-name CDSs, whereby each entity has an equal share of the notional amount within the index. The standardisation and transparency of indices has contributed strongly to the growth of index contracts. Third, basket CDS is a CDS on a portfolio with many reference entities. The

payoff trigger can be the first default (1st-to-default), the second default (2nd-to-default) or the nth default (nth-to-default).

3.7 The features of a credit default swap are:

(i) Reference Entity: CDS generally references to the credit quality of the issuer and not the obligation. Credit default swap contracts specify a reference obligation (a specific bond or loan) which defines the issuing entity through the bond prospectus. Following a credit event, bonds or loans *pari passu* with the reference entity bond or loan are deliverable into the contract. Typically a senior unsecured bond is the reference obligation, but bonds at other levels of the capital structure may be referenced.

(ii) Notional amount: The amount of credit risk being transferred. This amount is agreed between the buyer and seller of CDS protection.

(iii) Spread: The payments (cost of CDS to the buyer) quoted in basis points paid annually. Payments are paid quarterly, and accrue on an actual/360 day basis. The spread is also called the fixed rate, coupon, or price.

(iv) Maturity: The expiration of the contract, usually on the 20th of March, June, September or December in case of standardised contracts.

3.8 *Credit Events:* A credit event is a pre-specified event that triggers a contingent payment on a credit default swap. Credit events are defined in the 2003 ISDA Credit Derivatives Definitions and include the following:

(i) ***Bankruptcy***: includes insolvency, appointment of administrators/liquidators, and creditor arrangements.

(ii) ***Failure to pay***: includes payment failure on one or more obligations after expiration of any applicable grace period; typically subject to a materiality threshold (e.g., USD 1million for North American CDS contracts).

(iii) ***Restructuring***: refers to a change in the agreement between the reference entity and the holders of an obligation (such agreement was not previously provided for under the terms of that obligation) due to the deterioration in creditworthiness or financial condition to the reference entity with respect to reduction of interest or principal / postponement of payment of interest or principal.

(iv) ***Repudiation/moratorium***: authorised government authority (or reference entity) repudiates or imposes moratorium and failure to pay or restructuring occurs.

(v) ***Obligation acceleration***: one or more obligations have become due and payable before they would otherwise have been due and payable as a result of, or on the basis of, the occurrence of a default, event of default or other similar condition or event (however described), other than a failure to make any required payment, in respect of a Reference Entity under one or more Obligations in an aggregate amount of not less than the Default Requirement.

(vi) ***Obligation Default:*** one or more obligations have become capable of being declared due and payable before they would otherwise become due and payable as a result of, or on the basis of, the occurrence of a default, event of default, or other similar condition or event (however described), other than a failure to make any required payment, in respect of a reference entity under one or more obligations in an aggregate amount of not less than the default requirement.

However, recently in the US market restructuring has been excluded from credit events. Further, there are several versions of the restructuring credit event that are used in different markets (e.g. modified restructuring in the Euro zone).

3.9 *Monetising the CDS:* It is not necessary that a credit event must occur to enable credit default swap investors to capture gains or losses. Credit default swap spreads widen when the market perceives credit risk has increased and tightens when the market perceives credit risk has improved. Investors could monetise unrealised profits using two methods. First, investor could enter into the opposite trade, selling/ buying protection for effectively locking in profits till contract maturity. The second method to monetise trades is to unwind them with another investor and receive the present value of the expected future payments.

4. CDS Pricing

4.1 *CDS premium* – also known as fees or default swap spreads – are quoted in basis points per annum of the contract's notional value. The premium is paid until an event of default occurs. A CDS spread of 593 bps for five-year ABC debt means that default insurance for a notional amount of USD 1 million costs USD 59,300 per annum. This premium is paid quarterly (i.e., USD 14,825 per quarter). The protection seller receives

CDS spread and if credit event occurs, either buys bond at face value from the protection buyer or pays the difference between the face value and residual value. The residual value is a bond's market value immediately after a default (actual value or polled value) or derived from auction.

4.2 The premium on a CDS represents the market's view of the reference entity's credit risk over the duration of the CDS transaction. Obviously, such views are also reflected in the yield spreads of the reference entity's debt. This means that CDS pricing is highly linked to bond spreads. In fact, arbitrage trading between the CDS and bond markets drives pricing in the two markets to a common range. But there are significant structural differences between a CDS and a bond. A CDS is unfunded, meaning that, unlike a bond, there is no initial outlay of the notional amount, nor any principal repayment at maturity. There is only a stream of periodic premium payments until the earlier of a credit event or maturity, and if a credit event occurs, a settlement payment of (1 - recovery rate) * notional amount is made.

4.3 The liquid market quotes of CDS premiums are mainly driven by the arbitrage relationship with bond spreads, rather than priced from a model. Pricing off-market CDS which do not have any observable market quotes is to be generated from a quantitative model.

4.4 In developed markets, contracts are concentrated in the USD 10-20 million lot sizes with maturities ranging from 1-10 years, although the five-year contracts are the most common as counterparty credit quality concerns frequently limit the liquidity for longer tenors. Further, for the credit risks of corporates or financial institutions, five-year tends to be the benchmark maturity, where greatest liquidity can be found. While publicly-rated credits enjoy greater liquidity, ratings are not necessarily a requirement. The maturity generally depends on the credit quality of the underlying reference entity with longer-dated contracts written on the very highly rated names. There are differences in quotes given by protection sellers on issuers of the same grade. The reasons for such differences include parameters such as the likelihood of default, the actual loss incurred and the recovery rate, liquidity, regulatory capital requirements as well as the market sentiment and perceived volatility and shape of the yield curve.

4.5 The most significant inputs in the pricing of CDS contracts are -

- Probability of Default (PD)
- Recovery rate (RR), or Loss Given Default (LGD)

Therefore, a key task of the pricing model is to predict the Probability of Default and the Recovery Rate. Recovery Rates[3] are mostly based on historical experience of similar claims – claims of the same priority in the given environment. Estimating the Probability of Default is difficult due to various uncertainties that pervade credit markets.

4.6 *Variables that affect CDS prices* - In a risk-neutral valuation, the price of a single-name CDS over time will be given by:

- Marginal Probability of Default
- Timing of Default
- Recovery Rate

The important thing is to ensure that the assumptions in the model are:

- Realistic
- Periodically reviewed and changed, if necessary

4.7 *Some CDS Pricing Models*

(i) **No-Arbitrage Pricing Model**

The model compares:

(a) The return achieved by one who invests in a risky bond B (Rs. 100) maturing at time T and

(b) the return achieved by one who invests Rs.100 at the risk-free interest rate, until time T, and simultaneously sells protection via a CDS on Bond B.

Clearly, both positions have a similar risk, i.e., the issuer of Bond B goes into default. In case of (a) the investor gets only the recovery rate attached to Bond B and in case of (b) the seller of the CDS must purchase Bond B for its face value,

[3]Market convention overseas is to assume a fixed recovery rate of 40 per cent for investment-grade debt and 20 per cent for lower-rated debt. However, actual recovery rates on senior unsecured debt on the 32 credit events that have settled since 2005 have ranged from 0.125 to 99.9 per cent. Banks, for example, tend to be associated with low recovery values because they have few tangible assets, and this is true for both senior and subordinated debt. Firms with more tangible assets tend to have higher recovery rates, and subordinated debt recovery rates are usually lower. Senior bondholders do not always receive more than subordinated bondholders do, as was the case in the Fannie Mae and Freddie Mac conservatorships.

Rs.100, which entails liquidating the risk-free investment and selling Bond B at its recovery value. An arbitrage argument suggests that similar risks should be compensated by a similar return. Thus, the premium received by the seller of the CDS should be approximately equal to the spread of the bond which can be easily known from the market. To facilitate pricing, premium on a CDS is paid at a similar frequency to that in the swap and the bond market (say quarterly).

Note *– this pricing method ignores the credit risk of the CDS seller, who may be unable to make the credit event payment in the event of a default (suppose, in an extreme case, the seller is also the issuer of the bond which is protected).*

(ii) **Pricing of Single-Name CDS – Hull Model**

This pricing model equates the probability adjusted present value of cash flows i.e. the premia payments ('payments') made by the protection buyer and the credit event payments ('pay-off') made by the protection seller, to arrive at the CDS spreads. Hull Model specifically assumes that the default, if any, of the reference entity occurs exactly in the middle of the year.

The steps involved in the valuation are:

1. ***Calculation of the probability adjusted present value of payments***: The total periodic premia payments at the CDS spread rate 's' are multiplied by the reference entity's survival probabilities for each year and discounted, for arriving at the present value.
2. ***Calculation of the probability adjusted present value of the accrual payment in the event of default***: Since the payments are made in arrears, an accrual payment is required in the event of default to account for the time between the beginning of the year and the time when the default actually occurs. Since it is assumed here that the default occurs exactly in the middle of the year, the payment will be 0.5 s. Such accrual payments are multiplied by the default probabilities and discounted for arriving at the present value.
3. ***Calculation of the probability adjusted present value of the expected payoff in the event of default***: In the event of the default, the protection

seller is required to make the credit event payment (pay-off) to the protection buyer. The amount of pay-off is multiplied with the default probability of the reference entity and discounted to arrive at the present value.

4. ***Calculation of the CDS spread***: Since the probability adjusted PV of the payments made by the protection buyer (including accrual payments) should equal the probability adjusted PV of the payoff made by the protection seller, the CDS spread is calculated as per the formula:

CDS spread = Probability adjusted PV of pay-off / Probability adjusted PV of payment

(iii) Cash Market Replication to Price/Value A Pure Credit Default Swap

Generic derivatives pricing/valuation can be based on 'cash market replication' by creating an arbitrage-free, risk-less hedge. This generic derivative pricing principle is also called in the literature "law of one price" / "no arbitrage argument". The pricing principle applies equally to pricing of Options/Futures/Interest Rate Swap and all manner of specific derivative products which can be described as under:

A short position in a Credit Default Swap (CDS) is equivalent to, a long position in a "reference bond". To replicate a CDS in the cash market, therefore, the following is done :

A long position in 'reference bond', with a par value of Rs.100, is funded in the repo market i.e. by pledging the reference bond of par value of Rs.100 as a collateral to borrow Rs.100 at the repo rate of L- x where L is the overnight floating index of the IRS and x is the spread below the OIS floating leg. This long position in the reference bond is hedged with a short position in the equivalent maturity IRS. The following are the resulting cash flows:

Transaction	Pay	Receive
Borrow Rs.100 in the repo market	L-x	Rs.100
Buy a bond	Rs.100	T + S_c (coupon)
Hedge with IRS	T + S_s	L

Net receive = $S_c - S_s + x$ (Fair value of the CDS premium/fee)

Where T is fixed rate G-Sec yield and S_c and S_s are credit risk spreads of the 'reference bond', and IRS, respectively, over risk-free G-Sec yield of corresponding maturity.

Thus, this synthetic cash market replication through a risk-less (arbitrage free) hedge gives the fair value/premium of a Credit Default Swap in spread terms that CDS seller must receive.

If actual CDS premium/price spread is higher than the above theoretical model price, then an arbitrageur will sell a CDS and receive this actual spread and short the reference bond and receive fixed in an IRS and do the opposite arbitrage if the actual CDS spread is lower than the theoretical model spread/price until the arbitrage opportunity disappears and the theoretical model and actual market prices align again.

Marked to Market (MTM) valuation of a CDS can be fairly accurately proxied by applying the Modified Duration (MD) formula to actual spread changes. Thus, if a CDS MD is 5 years and CDS spread changes from 2% (200 bps) to 3% (300 bps), then change in CDS price will be 5 x 1% = 5%.

5. Benefits and Risks of CDS

5.1 Potential benefits of these instruments:

(i) CDS help complete markets, as they provide an effective means to hedge and trade credit risk.

(ii) CDS allow financial institutions to better manage their exposures, and investors benefit from an enhanced investment universe.

(iii) CDS spreads provide a market-based assessment of credit conditions.

(iv) CDS help to shift risks from those who hold highly concentrated portfolios to those who benefit from taking on additional exposure. As a result, risks are distributed across institutions leaving the individual institution better diversified and thus more robust to the failure of an individual borrower. For instance, during the years 2001 and 2002, when a high number of corporate bankruptcies threatened the stability of the financial sector, CDS are said to have helped to ease the strains put on the financial system by corporate failures such as Enron, Swissair, etc. This is attributed to the fact that the protection sellers were able to assume the exposure at a lower cost than the original lender (because of a differently structured credit portfolio) and the overall costs of bearing the risk was reduced.

(v) By enhancing risk distribution, CDS potentially reduce borrowing costs and increases credit supply for corporate and sovereign debtors.

(vi) Credit risk transfer across institutions would use capital more efficiently as players having excess capital can take up credit risks, allowing capital-scarce players to shed risk leading to improvement is risk profiles. Since credit risk can be transferred, credit spreads may narrow as illiquidity is no longer a significant risk.

(vii) CDS pricing is intimately related to the cost of funds on corporate borrowing and, hence, provides a most liquid and transparent benchmark for pricing of new issuances (both bonds and loans).

5.2 Negative Externalities/Risks from the CDS market:

(i) CDS injudiciously transacted can result in a concentration of risk across a few systemically important entities. In the recent financial crisis, CDSs have contributed to an alignment of risk profiles across financial institutions, thereby increasing the institutions' vulnerability to common (systemic) shocks.

(ii) Credit risk, by its very nature, can be significantly correlated, i.e., default by counterparty A can have a significant impact on the solvency of counterparty B. Hence, holding both A and B in the portfolio may lead to concentration rather than diversification of risk. CDS, by making it easier to assume credit risk can, hence, lead to concentration of risk while at the same time leaving market participants largely uninformed about this hidden correlation, thereby making the system vulnerable to exogenous shocks.

(iii) Availability of CDS has enhanced the risk appetite of financial institutions resulting in excessive risk-taking. For instance, Instefjord (2005) finds that banks with access to a richer set of credit derivatives tend to be more aggressive in taking on risk. Similarly, Haensel and Krahnen (2007) suggest that credit securitisation goes hand-in-hand with an increase in the risk appetite of the issuing bank.

(iv) CDS coupled with securitisation has increased instances of moral hazard wherein the risk assessments were not stringent enough due to availability of credit protection/transfer of assets.

(v) The existence of perverse incentives to profit from failure of financial firms instead of restructuring debt to sustain them was also alleged in connection with CDS. As the CDS is a bilateral over-the-counter derivative contract under minimal regulatory oversight, the possibility of building up of massive speculative positions and incentives for co-ordinated manipulation exists. If the amount of credit protection

bought is much higher than the underlying risk exposure, the protection buyer is better off if the firm becomes insolvent. This may lead to the protection buyers triggering credit events to cash in CDS. The informational effects of the CDS volumes due to speculative activity have a potential to spill over in to the cash bond markets, thereby increasing the borrowing costs for firms and making it difficult to raise funds, especially in situations of financial stress. This would impact the real sector as the viability of the firms would be threatened leading to either public sector stepping in or firms becoming insolvent – both imposing significant economic and social costs.

(vi) Pro-cyclicality is another issue that has impact on systemic risk. The payoff on a CDS depends on the default of a specific borrower, such as a corporation, or of a specific security, such as a bond. The value of these instruments is especially sensitive to the state of the overall economy. If the economy moves toward a recession, for example, the likelihood of defaults increases and the expected payoff on credit default swaps can rise quickly.

(vii) Risk circularity & interconnected nature of CDS market are other factors of risk which may lead to potential systemic consequences as was seen in the recent financial crisis. The 'risk circularity' within the CDS market means banks/PDs replacing one type of risk (i.e., credit risk) with another – counterparty risk. It has been observed that the high degree of interconnectedness between market participants has also resulted in an increase in the correlation between their spreads following Lehman Brothers' failure. In active CDS markets, not only do leading CDS players trade primarily among themselves, but they also increasingly exchange guarantees against their own default. In other words, dealers are guaranteeing dealers on a risk incurred on the dealers' community. This circularity implies that the transfer of risk has become more limited than expected. (Noyer, 2009).

Annex III

Types of Risks in CDS

1. Basis Risk

Basis risk arises from imperfect hedges when there is a risk of a loss due to differences in the underlying position and the hedge. In CDS, it is caused by a maturity mismatch wherein a CDS covering the exact remaining maturity of a bond may not be readily available. Non-standardised and illiquid CDS being expensive, market participants may choose a standard CDS with a maturity that is only very close to the bond maturity which results in basis risk. Basis risk may also arise from differences in the terms of the bond position and the reference obligation that is specified in the CDS. There may be differences in seniority, maturity and coupon payments. This may result in different recovery rates. Therefore, in the case of default of the reference entity, the bond's market price may drop by more than the reference obligation of the CDS resulting . This results in a loss to the bank due to an imperfect hedge.

2. Counterparty Risk – Credit Risk

2.1 Counterparty risk is the risk that the counterparty to a CDS contract will default and not meet its contractual payment obligations. For CDS, as with other OTC derivatives, counterparty risk is an important risk that needs to be managed.

2.2 Although they represent two distinct analytical concepts, counterparty risk and credit risk of the reference entity are not independent of each other. This is due to credit risk – by the very nature of a CDS contract – affecting the two contractual parties asymmetrically. An increase in credit risk of the underlying entity would lead to a reduction of the CDS market value for the protection seller, while increasing it for the protection buyer. The protection buyer is left with a larger amount at stake, when the probability of its counterparty to fail rises.

2.3 In addition to this direct channel of credit risk impacting counterparty risk, there is an indirect channel through the obligation to post collateral, i.e., to fulfil margin requirements. Margin requirements are intended to reduce the risk that a default of the parties poses to his or her counterparty. The protection seller will have to post additional collateral if either its own rating or the rating of the reference entity declines. For the

protection seller, such additional collateral posting means that rising margin requirements would entail significant liquidity risk as well as default risk.

2.4 The case of AIG is an example of credit risk adversely impacting on counterparty risk. Before September 2008, AIG had the fourth-highest rating (AA-) and according to ISDA standards had to post relatively little collateral. During that time AIG had sold CDS referenced to a huge variety of different assets, among them, CDS on CDO that mostly consisted of US mortgage debt including subprime mortgages. When the US subprime crisis unfolded, AIG had to mark down its assets at the same time as it was incurring more liabilities to fulfil collateral claims. In September 2008, the rating agencies cut its credit rating and, as a consequence, AIG's counterparties demanded even more collateral. At one point, the collateral calls on CDS exceeded AIG's ability to pay, with the company not being able to honour its contractual commitments to other financial firms. Since AIG was not able to raise additional liquidity by itself, it had to turn to the US Federal Reserve for assistance. Finally, AIG was bailed out by the U.S Government as its failure would spark a contagion.

3. Counterparty Risk – Pre settlement Risk

Pre-settlement risk arises when protection seller does not receive contractual premium payments if protection buyer goes bankrupt. CDS protection buyer may also be exposed to pre-settlement risk if it's counterparty fails and suddenly be left without protection. As such, a buyer could either have to replace the CDS contract at current, higher market values or go without protection.

4. **Wrong way Risk**

It is the probability of simultaneous default of both the reference entity and the protection seller. It is dependent on the default correlation between the protection seller and reference entity and the marginal probability of default of either the reference entity or the protection seller. Wrong way risk is a source of risk for the protection buyer and not for protection seller. It is also called the double default risk.

5. **Credit Spread Risk**

Credit spread risk is a measure of the sensitivity of the marked-to-market changes, i.e., the impact of a one basis point shift of the spread curve on the position due to the underlying credit spread risk factors of the primary bond and the single-name CDS.

6. **Concentration Risk**

Concentration risk results from disproportionately large net exposure in similar types of CDS. This has been evident in recent financial crisis when few large entities underestimated the risk and sold significant amount of CDS protection on related reference entities without holding offsetting positions and did not have sufficient capital to manage this risk. Additionally, if a protection seller holds a large concentrated position, it could experience significant losses if a credit event occurred for one or more reference entities. Similarly, concentration risk can also create problems for market participants even without a credit event. A situation may arise where one participant may face obligations to post collateral on a large net exposure of CDS if its financial condition changes due to, say, credit rating downgrade, resulting in liquidity crisis for the dealer.

7. **Operational Risk**

CDS involves a number of steps to process the trade which are prone to operational risks. One of the major risks is related to outstanding trade confirmation. The backlog of unconfirmed trades may allow errors to go undetected that might subsequently lead to losses and other problems. Other source of operational risk in CDS is related to valuation of CDS contract, physical settlement, related IT infrastructure and non-availability of skilled manpower. CDS operation also exposes market participants to model risk and legal risks.

8. **Jump-to-Default Risk**

8.1 It is the risk that the sudden occurrence of a credit event will cause an abrupt change in a firm's CDS exposure. Increase in CDS exposure may lead to requirement of additional margin/collateral requirement at short notice resulting in funding problem for the concerned market participants.

8.2 The adverse impact of sudden default/large changes in spreads (jump-to-default risk) is contained through mark-to-market modelling of positions with zero recovery if default happens overnight (to take care of losses on account of protection sold). Adverse

impact due to movement in the shape of the credit spread curve is managed by bucketing of exposures across the CDS tenors and testing the sensitivity of portfolio by subjecting it to a shock of the spread curve moving by ±10 bps in each of the buckets and having an aggregate limit on losses due to such steepening/flattening of the spread curve.

8.3 The asymmetric nature of the pay-off in CDS implies that the underlying leverage needs to be carefully monitored and managed. In the specific context of credit default swap with cross default clauses (implying that a default on a single obligation is treated as default on all outstanding obligations), any measure of the underlying credit risk of the portfolio (whether such exposure is assumed through CDS or through corporate bonds) ought to be controlled.

9. Legal Risk

Legal risks in CDS may arise due to non-adherence to the legal framework (laws, guidelines, etc.) prevailing in the country. The key legal risks in CDS are associated with the transfer of the assets from the originator to the issuer and refer to the degree with which the credit default risk is actually legally transferred. The complexity of the documentation is another source of legal risk. The lack of standardization and clarity in the definition of credit events and settlements can also lead to misunderstandings and legal problems. Entering into transaction with counterparties which do not have the legal capacity to enter into a CDS transactions may also lead to legal risk. Wrong interpretation of tax laws may also be source of legal risk.

Market participants and stake holders have to take these risks into account while entering/transacting in CDS markets.

Annex IV

CDS Contract Reporting Formats

CDS Form I: Trade Reporting

Name of the reporting entity:
Date:

(Amount in Rs. crore, Tenor in years)

Name of the Counter-party	Reference Entity			Details of the underlying			Protection			Cash/Physical settlement
	Name	Rating	Sector	Issuer	Amount (FV)	Residual Maturity	Bought /Sold	Amount	Tenor	
ABC	XYZ	AAA	Infra	XYZ	500	5 year	Bought	300	2	Physical

CDS Form II. Fortnightly Regulatory Reporting

Name of the Entity	
Date of Reporting	

Sl.No.	Name of the Counterparty	Tenor	Protection Bought		Protection Sold		Net Position	Risky PV01
			Face Value	Market Value	Face Value	Market Value		
1								
2								
3								

Sl.No.	Name of the Reference Entity	Tenor	Protection Bought		Protection Sold		Net Position	Risky PV01
			Face Value	Market Value	Face Value	Market Value		
1								
2								
3								

Annex V

Working of CCPs for CDS in the US & Europe

The recent financial crisis has brought increased policy attention on design of arrangements to create sound market infrastructure for OTC derivatives markets. In United States, President's Working Group on Financial Policy advocated the use of CCPs to clear CDS trades. There is a broad consensus among regulators and the industry on the use of central counterparties (CCPs). Consequently, the past one year has seen introduction of several new CCPs as detailed in Table I:

Table 1: Current projects for CCPs clearing for CDS

Name of Clearing house	Regulator	Country	Products Available	Status
ICE US Trust	NY Fed, NY State Banking Dept.	US	US indices & select Single Name CDS	Live
CME Citadel	FSA & CFTC	US	US indices.	Live
LCH. Clearnet Ltd/NYSE Euronext (Liffe)	FSA	UK	European indices and European single names as components of Itraxx, in the case of restructuring credit events	Live
ICE Clear Europe	FSA	UK	European Indices & select Single Name CDS	Live
Eurex	FSA, BaFin, Bundesbank	Germany	European Indices and constituent single names	Live
LCH. Clearnet SA	European regulators	France	European indices and constituent single names.	Live

1.1 Clearing Process: The CCPs are relying upon the key existing infrastructure currently used by market participants in the OTC segment, such as the DTCC's Trade Information Warehouse (TIW), ISDA (for definitions, Big and Small Bang protocols) and Markit for product definition and prices. Contracts to be cleared will be negotiated bilaterally through existing platforms such as Bloomberg, etc. which are then reported to DTCC's Trade Information Warehouse for registration. During the trade execution users select the name of the CCP they intend to use for clearing and settlement. The CCP collects confirmed trades from DTCC (Golden records). The trades are then novated and

registered by the CCP. Based on multilateral netting process, the positions of clearing members are determined and margin calls are made to clearing members. In Europe, cash settlement of clearing transactions is occurring through Target 2 in case of LCH.Clearnet and through Continuous Linked Settlement (CLS) in case of Eurex and ICE Clear Europe. The existing DTCC-TIW framework for OTC markets relies on /money settlement through CLS. CCPs acquire Power of Attorneys from clearing members to debit/credit the relevant accounts for money settlements

1.2 Guaranteed settlement: The perimeter of the guarantee offered by CCP will encompass any movement which will occur in the lifetime of a CDS contract under clearance, such as upfront premium, coupons and cash or physical settlement following credit events.

1.3 Trade management: The centralised clearing of CDS also offers the benefit of multilateral netting to the market participants. However, a trade-by-trade management is also provided for clearing members ,if they so desire. Off-setting facility is also offered to clearing on demand. The trade compression has been undertaken across the maturity spectrum for given obligors through agencies like Tri-optima and Creditex and has been instrumental in bringing down outstanding CDS volumes substantially, thereby significantly reducing operational risk.

1.4 Credit Event Management: In the context of U.S/European index CDS contracts cleared through them, CCPs are presently undertaking the management of the credit events such as failure to pay, bankruptcy and restructuring following the existing ISDA procedures and DTCC workflows.

1.5 Physical Settlement: Clearing Houses can also facilitate physical settlement (in case no auction, i.e., cash settlement is offered by the market) on instructions of clearing members. CCPs like LCH.Clearnet are providing such customised solutions.

1.6 Novation: The novation process in CDS clearing occurs when CCP interposes itself between the two traders and registers the new contracts in its own database. The contracts registered with TIW of DTCC are accessed, novated terminating the previous bilateral contracts and the novated contracts are sent back to the DTCC for registration in

the TIW. LCH.Clearnet is performing novation on T+1 basis whereas ICE Clear and Eurex are performing weekly novation..

1.7 Information to clearing members: The information provided to clearing members by CCPs contains details of CDS trades which are being subject to offsetting, trades subject to transfers (change of sponsor), novated trades and new trades collected from DTCC for clearing in next session. Such reporting will also include trades resulting from succession event management, e.g., in the case of credit events. Details on positions, accrued coupon, margin account, upfront premium, etc., are also disseminated to the clearing members.

1.8 Market prices: The CCPs are generally relying on Markit data for end of day prices used to process valuations and margining. The price data is being used to arrive at settlement price. In this regard, practices followed by CCPs are diverse. LCH.Clearnet SA considers the settlement price as a 'market' and 'external' price, (i.e., Markit price is accepted) and no contribution (on prices for indexes or spreads on single names constituents) will be required from clearing members. However, ICE Clear and Eurex seek polled prices from the dealers. ICE Clear Europe establishes a daily settlement price for all cleared CDS instruments, using a pricing process developed specifically for the CDS market by ICE Clear Europe. ICE Clear Europe clearing members are required to submit prices on a daily basis. Eurex and ICE Clear Europe ensure data quality by ensuring potential trade execution at the prices reported.

1.9 Product and Price Reporting: Price reporting is private and never made public, while the volumes cleared and open interest positions are disclosed in public domain. With regard to regulatory reporting, CCPs provide detailed positions of CDS trades, financial position of clearing members, risk management models and any internal files sought by the regulator. In addition, detailed aggregate view of contract volume and open interest; aggregate view by clearing firm and origin of CDS financial settlements and margin requirements; stress testing results; back testing results; risk management reports; counterparty credit monitoring report; minutes of various meetings; incident reports;, etc., are submitted to regulators at periodic intervals.

1.10 Governance: The efficacy of Clearing Houses and CCPs depends on good governance, financial soundness and adequacy of capital, adherence to market standards, and robust risk management practices. Governance arrangements for CCPs must be clear and transparent to fulfill public interest requirements and to support the objectives of stakeholders. In particular, they should recognise the CCP's role and responsibilities in the markets it supports. The issues like conflict of interest, effective risk management, etc., need to be addressed while designing the governance structure for CCP.

1.11 Membership eligibility criteria: In US, Federal Reserve Bank of New York (FRBNY) and other regulators such as CFTC and SEC have not prescribed any specific eligibility criteria for participation in the CDS market and banks only inform FRBNY before participating in CDS market. However, major dealers in CDS who participate in central clearing and repository services are required to adhere to the membership eligibility criteria prescribed by the clearing houses. To participate in CDS Clearing in US, the eligibility criteria includes Adjusted Net Capital of $500 M, initial guarantee fund of either $50M or $500/Number of clearing members whichever is higher, possessing a license for red-codes, ability and commitment to meet various operational and risk requirements prescribed by regulators, ISDA and the clearing house. The capital requirements also appear to be quite stringent in case of both Eurex and LCH.Clearnet in Europe. The entry requirements for becoming a Credit Clearing Member (CCM) with Eurex Clearing include domicile in the EU, Switzerland or the US and license by a local authority with initial equity capital requirement of EUR 1 billion. The ongoing equity capital requirement is dynamic depending on the average margin requirement. Equity capital can be substituted in part by third party bank guarantee or collateral provided in cash or securities. The CCM must also be under supervision of a responsible local authority. A separate dedicated clearing fund for CDS business will be required with a minimum contribution of EUR 50 million. The contribution is dynamic depending on the risk exposure of the CCM. In case of LCH.Clearnet, Clearing Member's eligibility criterion is a capital requirement of Euro 3 billion and a credit rating of A. If rating is A-then guarantee contribution would be 10 per cent more , if rating BBB+, guarantee would be 100 per cent more and if rating is BBB, guarantee is 150 per cent more. If the rating of the entity is downgraded to below BBB, then that entity's membership is terminated.

As the existing shareholders of CCPs are clearing members, there is a possibility of conflict of interest which may impinge on corporate governance. LCH.Clearnet has dedicated committees with representatives of clearing members, set up to deal with specific issues (legal, business strategy, default management etc.) which are governed by clear terms of reference.

1.12 Buy-Side Clients: Buy-side firms can either be sponsored by a clearing member or direct clients of the clearing members. There is a clear segregation of position accounts and collateral deposited along with portability of clients in case clearing member defaults. Such segregation is done to ensure transfer of position accounts and collateral accounts of clients to a non-defaulting clearing member, in case a clearing member defaults.

1.13 Risk Management: Credit Default Swaps are challenging for CCP risk management due to their event-driven binary nature, asymmetric risk position and discontinuous pay-off structure. The primary objective of a CCP is default protection. The first line of defense against losses in case of a member default is the margin, which Clearing Members deposit as collateral for open positions. Other lines of defense comprise position close-out, collaterals of defaulting Clearing Member, clearing fund contribution of defaulting Clearing Member, Remaining Clearing/Guarantee Fund and, finally, CCP equity capital.

a) *Margins:* The margining procedures followed by various CCPs clearing CDS contracts, differ significantly from one another. However, it is generally stipulated that the margining methodology of CCP has to be approved by the regulators and is also subject to third party validation. The initial margin requirements are also high. Members can maintain the margin in the form of cash or Euro securities/US Treasury Bills. The margin is generally high for CDS trades and sell-side trades have to post more collateral than for the buy-side trades. Generally, CDS positions are marked to market on a daily basis. An option-style margining is applied and the daily mark-to-market of the positions is included in the initial margin. A specific charge is levied on the CDS buyer to cover the buyer's obligation to pay the full coupon every quarter or the accrued coupon in case of a credit event. The charge equals the accrued coupon. Initial margin is generally based on two components:
   a) price risk coverage based on standard derivatives margining principles and

relying on the SPAN (Standardised Portfolio ANalysis of risk) framework, and b) a specific requirement for short positions (short charge), which reflects the credit event risk arising on the sell-side only. This short charge is designed to take into account both default risk and concentration risk. The margining models are validated by the respective regulators after a rigorous process of consultation. The divergence in methodologies and the resultant margin requirements have considerable impact on costs of clearing members and the tendency to move to CCP imposing lower margins can also be observed. This may have implications for systemic stability. As on date, there is no mechanism in the EU to harmonise margining procedures across different CCPs.

b) *Minimum Deposit:* CCPs require a Minimum Deposit for each clearing member. This Minimum Deposit (MD) is determined prior to the start of the membership and will be reviewed on a periodic basis. Minimum Deposit will not be assimilated with other margin calls.

c) *Dedicated clearing fund:* A dedicated default fund is set up by CCP to deal with default of clearing members. Generally, margin framework is used with a different set of parameters to compute un-margined risks.

d) *Waterfall:* Waterfall model is used while dealing with default of a member. Once a member defaults, client positions are transferred to another clearing member and house (proprietary) positions are liquidated. The defaulting member's margin is first appropriated followed by the member's deposit, member's contribution to clearing fund, non-defaulting members' contributions to clearing fund and, finally, equity of the CCP. The waterfall procedures adopted by various CCPs differ substantially.

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