

ADVANCE PRAISE FOR CREDIT DERIVATIVES

‘a really comprehensive [and] thorough treatise. ... an essential road map for students, investors, traders, and regulators of credit derivatives anywhere in the world, especially in new markets, where these securities are being introduced. ... accessible for readers coming at the subject at different levels of quantitative training, and for practitioners of varied viewpoints. There is something here for everyone interested in the credit markets.’

—**Professor Sanjiv Das**, William and Janice Terry Professor of
Finance, Santa Clara University

‘a very well-written introduction to credit derivatives, with an emphasis on credit default swaps. ... covers a wide swath of material on the topic and includes recent developments and regulations in India, in addition to its usage in more mature, developed markets. The reader can see how useful these instruments are; while, at the same time, understand their ability to magnify bad outcomes. ... It covers all the essentials in a very easy to follow, structured, conversational style. I strongly recommend the book.’

—**Professor Suresh Nair**, Professor and Ackerman Scholar,
University of Connecticut

‘a timely and much-needed volume about a key and less-than-widely-understood class of instruments of financial risk sharing that can only gain in importance in the years to come. A must-read for all serious students and practitioners of finance as well as policymakers.’

—**Professor Rajesh Chakrabarti**, Executive Director,
Bharti Institute of Public Policy, Indian School of Business

'This book is a significant contribution to finance literature. It explains Credit Derivatives market in detail and in simple terms including its specifications, valuation, accounting and legal issues. I am sure, a wide cross-section of market participants would be able to come up to speed and would benefit immensely from this book.'

—**G. Gopalakrishna**, Director, Centre for Advanced Financial Research and Learning (CAFRAL), Reserve Bank of India

'The timing of the book is very apt as it comes closely on the heels of policymakers and market participants grappling with what is the right way to get Credit Derivatives going in the onshore market. ... This book does justice by bringing into attention the goodness of the product as well as the red herring of the product. ... a very well timed book, quite comprehensive in its scope and a must-read for someone who intends to understand the subject. ... Vaidya blends concepts and practice very well and makes full justice of his background.'

—**Anup Bagchi**, Chief Executive Officer and Managing Director,
ICICI Securities Limited

'This book takes up a complex topic and succeeds largely in simplifying it for the reader. It is essential reading for those wanting an introduction to credit derivatives.'

—**Anantha Nageswaran**, Former Chief Investment Officer
and Head of Research, Julius Baer, Singapore

'The book systematically explains product mechanics and lucidly places them in the context of regulatory frameworks. It would be of value to market practitioners, policymakers, academics and regulators alike.'

—**Dr Ranjan Chakravarty**, Former Chief Risk Officer, Singapore
Mercantile Exchange and Clearing Corporation

‘the book has tremendous learning value. Vaidya provides an easily comprehensible, building-block approach to credit derivatives, starting from the basics to discussion on esoteric instruments. Recent developments such as Big Bang have also been discussed at length. To complete the picture, Vaidya provides guide to ISDA documentation, regulatory issues as well as accounting treatment. Vaidya not only explains the subject, but concludes the book by providing his take on the policy implications on the subject. Vaidya’s book would be a great read and a reference for anyone interested in this fascinating subject.’

—**Vinod Kothari**, internationally renowned Author
and Expert on credit derivatives

‘The appealing part of the book ... is the lucid style of presentation of a complex subject like credit derivatives. The coverage is full, even though the complex mathematical pricing issues have been avoided. This book will be useful to students as well as practitioners. With India opening the market for credit derivatives, this book is a very timely addition in enhancing the knowledge on this subject.’

—**Professor B.B. Chakraborty**, Director,
Indian Institute of Management, Ranchi

‘Bankers have been searching for a book like this. ... a comprehensive book on credit derivatives. It discusses the credit default swap instrument as it is used in India and risk management along with the pertinent RBI guidelines. This book addresses a long-felt need for a complete handbook for credit derivatives.’

—**N.S. Venkatesh**, Executive Director, IDBI Bank
Former Managing Director and Chief Executive Officer of IDBI Gilts

‘This is a compulsory read for entry level professionals whose work concerns credit derivatives. The book covers in sufficient depth and detail, financial, accounting and legal aspects related to credit default swaps in India. The policies and guidelines in the appendix are impressive and informative.’

—**K. Selvaraj**, Former Chairman FIMMDA and Head of Forex,
Financial Engineering & New Products, State Bank of India

'This book is a well written text on the subject and covers most of the aspects required to be known by the Traders as well as Risk Managers, and is a good piece of reference.'

—**Ashutosh Khajuria**, President – Treasury, Federal Bank

'The book has excellent coverage of Credit Derivatives and is quite pertinent in the Indian Financial Markets context. I would recommend it as a mandatory reading for all capital market professionals and as a reference book for senior bankers in India.'

—**Ashish Agarwal**, Chief Risk Officer, Yes Bank

'one of the masterpiece works. The release of the book is both topical and timely ... a refresher book for treasury managers, risk managers, traders and investment bankers and a "must-read" book for students and teachers of finance.'

—**V. Sriram**, General Manager, SIDBI

CREDIT DERIVATIVES

Focusing on the
Indian Credit Derivatives Market

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Indian Credit Derivatives Market

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FOREWORD

Credit risk represents the key risk that commercial banks assume. In recent years, new instruments for managing credit risk have evolved in emerging financial markets. Credit Default Swap (CDS) is one such instrument that has been introduced in the last couple of years in India and China by their respective Central Banks.

CDS allows banks to separate credit origination from credit risk. From an economic point of view, this separation generates benefits as banks can extend their lending without being constrained by their risk-taking capacity. By buying or selling credit protection, banks make the credit risk tradable and shift the credit risk out of their balance sheets to other market participants who are better able to bear this risk or who wish to diversify their portfolios.

In India, the Reserve Bank of India (RBI) introduced CDS for banks and security houses in November 2011. Subsequently, the Securities and Exchange Board of India (SEBI) allowed Mutual Funds to use CDS in November 2012. In December 2012, Insurance Regulatory and Development Authority (IRDA) permitted the use of CDS for insurance companies in India. Since credit derivatives are relatively new to Indian financial markets, a clear understanding of this instrument is a must for practitioners, regulators, academics and students. Vaidya's book fulfils this important need as it covers the essential body of knowledge to provide a good understanding of this newly introduced asset class.

Vaidya has been a practicing professional who honed his craft at one of the leaders in credit derivatives market. The book reflects this practitioner orientation: it covers the essential nuts and bolts of this asset class in a lot more detail when compared to standard textbooks. Features of CDS contracts are explained in detail; these include their standard fee structure, payment dates, standardization of accruals, frequency, scheduled termination dates, day count conventions, maturity, reference entities, reference obligations, etc. The book covers the valuation of both

liquid and illiquid CDS taking the CDS conventions into account, as is the market practice. Investor strategies and indices are discussed, as also the new conventions in the global credit derivatives market such as the big-bang and the small-bang protocols. The book describes in reasonable detail the settlement of CDS contracts in case there is a credit event; both eventualities of physical and cash settlement are covered. In the case of physical settlement, the conditions for payment, such as the credit event notice period and Notice of Physical Settlement (NoPS) are covered in necessary detail. In case of cash settlement, the process that would be followed by the Indian Credit Derivatives Determinations Committee set up by the RBI nominated entity—FIMMDA (Fixed Income Money Market and Derivatives Association of India) is included in appropriate detail. Regulatory treatment of Credit Derivatives under the Basel III framework as well as the simpler framework used by the RBI is reviewed. The accounting treatment for CDS, more specifically, hedge accounting for CDS under the FAS, IFRS and Indian Accounting standards are covered. The last three chapters deliberate on the evolution of the market for credit derivatives, their real effects on the economy, and their policy implications.

Vaidya's book provides a complete treatment of this important and innovative asset class. I foresee it being a standard reference for all stakeholders of this financial product in India.

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PREFACE

In November 2011, the Reserve Bank of India (RBI) introduced Credit Default Swaps (CDS) by placing the final guidelines on introduction of CDS. The RBI has been considering introducing credit derivatives since 2003, so as to provide market participants with an effective tool to manage credit risk. It issued the first draft guideline in 2003. However, considering the risk management practices in domestic banks way back in 2003, it decided to defer the issuance of the final guidelines to a later date. Then, while it was deliberating on launching credit derivatives again in 2007, the subprime crisis had set in motion. RBI had to place the introduction of credit derivatives on the back burner, till such time it wasn't clear if, and in what measure, did credit derivatives contribute to the crisis. There is a developing consensus currently that credit derivative per se wasn't at fault, but the lack of regulation around credit derivatives was the real culprit. The central bank of China introduced credit derivatives domestically in December 2010. RBI followed suit by introducing the most basic credit derivative instrument called the Credit Default Swap (CDS) a year later. In November 2012, Securities and Exchange Board of India (SEBI) allowed Mutual Funds to use CDS and a month later, Insurance Regulatory and Development Authority (IRDA) permitted the use of CDS for insurance companies in India.

CDS serve a similar purpose like that of insurance. One of the reasons why insurance is useful and popular is because it helps an individual or an organization, hedge against extensive loss. For instance, I do not mind spending on home insurance because if my house gets damaged, it would have a substantial impact on my financial well-being. Moreover, buying insurance gives me peace of mind for a certain cost which I am happy to pay even though, I wish that the eventuality when I receive anything back from the insurance company, does not arise at the first place. CDS works similarly. Consider a mutual fund which has a sizeable amount of corporate bonds in its portfolio. CDS allows the mutual fund to insure against

possible default of corporate bonds. Consequently, investors in mutual funds would not lose money if those corporate bonds default. Thus, a CDS could help in hedging credit risk. It is not difficult to appreciate that credit derivatives are useful financial instruments.

Globally, credit derivatives have brought a completely new approach to management of credit risk. The enormous growth in the size and reach of this market underscores its impact. The credit derivatives market has grown at an annual rate of more than 50% over the past decade. Its estimated size was more than US \$25 trillion at the beginning of 2014. Because they provide an efficient way of transferring credit risk, the RBI has been keen on introducing this asset class in India.

Since, the product has been introduced now, there is a need for a textbook which explains the essential aspects of this product to not just market participants but also to students of finance. To fulfil this need, this book focuses on the basics of credit derivatives, its applications, benefits and risks. The treatment is kept intuitive and largely non-quantitative to appeal to the broad-based audience for whom credit derivatives would be of interest.

K. VAIDYANATHAN

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CHAPTER 1

CREDIT DERIVATIVES OVERVIEW

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1.1 SYNOPSIS

Credit risk presents arguably the largest and the most potent risk in the financial system. It pervades the banking system and financial markets across the world and is inseparable from most financial instruments. However, credit risk is largely unmanaged. It is very specific and consequently illiquid.

In this chapter, credit risk has been introduced first. We will discuss the credit derivatives by drawing a parallelism with an instrument that we all are familiar with insurance. We will examine the market forces that propelled their growth and scope. We will look at the gains that credit derivatives have provided to the economy, in general, and to the market participants, in particular.

1.2 WHAT IS A CREDIT RISK

Credit risk can be described as the risk of a promised payment not made. The risk includes both likelihood of default and the loss that might happen if a default were to happen. For instance, if a friend borrows \$100 from you today and promises to pay it to you tomorrow, you face credit risk. If a company gets goods or services from a supplier and promises to pay in future, the supplier faces credit risk. Credit risk is composed of two separate, though often interdependent, aspects. First, the *Probability of Default* (PD), which is the chance that your friend fails to pay you \$100. Second, the *Loss Given Default* (LGD), which is whether your friend makes a partial payment or nothing at all.

Credit risk is as old as the history of human promises. Unlike other risks like equity or foreign exchange, which are relatively more recent,

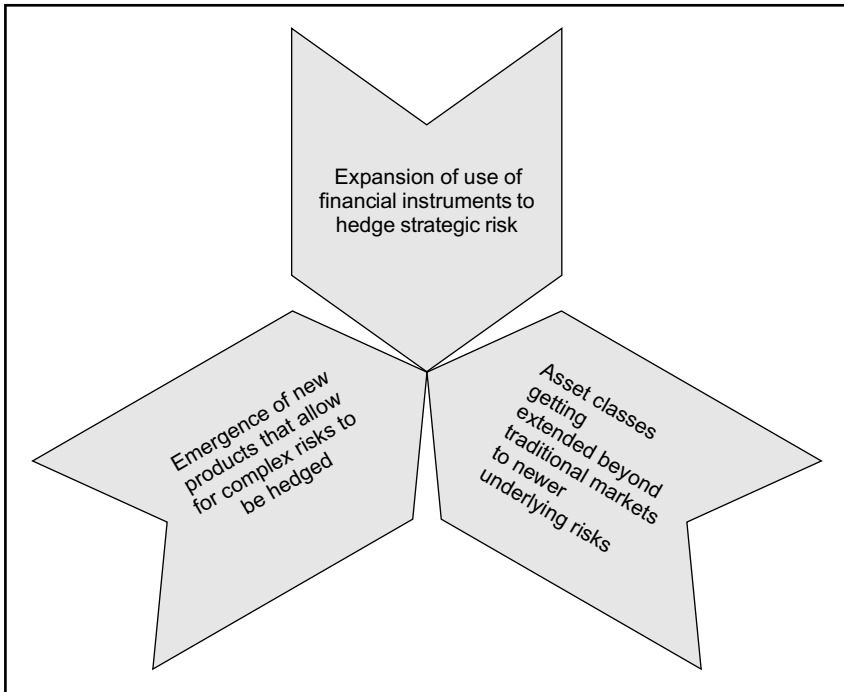
credit risk has been a part of doing business for many centuries. However, the markets and financial instruments to trade credit risk have evolved much later. This evolution has been driven by a few interrelated developments that have taken place in the global financial markets over the past two decades. We will discuss these developments in the next section.

1.3 EVOLUTION OF A MARKET TO TRADE CREDIT RISK

First, financial instruments are being used in such ways today that were not possible or thought to be feasible earlier. For instance, today a corporate can separate its financing decision from the problem of liability management. A company can raise debt in those markets where it can borrow competitively and, depending on its risk appetite, synthetically change the profile of its liabilities. An Indian corporate can issue a bond in Euros and synthetically, using a financial instrument, swap this bond obligation into a potentially lower cost Japanese Yen (JPY) liability. Similarly, a corporate can employ credit derivatives to hedge the credit risk of the accounts receivable. Moreover, the use of derivatives to enhance shareholder value is expanding beyond the management of specific risks such as price risk to a more comprehensive management of portfolio risk, including risks embedded in the entire balance sheet and income statement of the corporate. Increasingly, financial instruments today can be employed for distinctive purposes such as managing the risk exposures stemming from specific transactions or transforming the risks on either the assets or the liabilities side of the balance sheet. Such advances have propelled the growth and development of the credit derivatives.

Second, asset classes are getting extended beyond the traditional ones such as equity and bonds to include asset categories that depend upon variables such as commodities, electricity, catastrophe, weather, carbon credits and macroeconomic variables. The evolution of credit derivatives can be seen as an upshot of this phenomenon.

Third, financial engineering has evolved to such heights that sophisticated financial institutions can now price, structure and trade complex risks including contingent and path-dependent risks as well as risks arising from correlation among different markets and instruments. Since the 1990s, extensive developments in the know-how underlying financial engineering have led to a speedy evolution of credit derivative instruments such as indices, options on credit risk and synthetic securitization. In fact, the expertise employed in managing and trading credit derivatives is

Exhibit 1.1: Catalysts for Growth in Credit Derivatives Market.

derived substantially from the body of knowledge that got developed in the securitization and fixed-income derivatives domain.

The way credit derivatives as an asset class began, has to do with the above three forces and is depicted in Exhibit 1.1. There is an interesting anecdote about the genesis of credit derivatives. It is widely accepted that the asset class was originated and popularized by JP Morgan. There is a folklore that goes in the Dealing Room of New York Office of JP Morgan Bank, where I used to work. JP Morgan had two women who accidentally conceptualized the most basic product of credit derivatives. In 1995, Exxon asked for a \$4.8 billion dollar Line of Credit¹ (LC) from JP Morgan to cover for a possible oil spill. Obviously, JP Morgan was not going to outsource the LC. In any case, which bank would want to miss-out on Exxon as a client? But JP Morgan was not too keen to allocate capital for this enormously large LC, which in this case turned out to be \$384 million for the LC. This was needed because according to the then prevailing Basel Guidelines, JP Morgan would have to reserve \$8.00 on every \$100.00

¹A line of credit is a credit source extended to a business by a bank. It is effectively a bank account that can readily be tapped at the borrower's discretion. Interest is paid only on money actually withdrawn.

of credit exposure. So the young ladies tried to find a novel method by which the credit risk of Exxon can be transferred to a counterparty in the event the LC became a loan. As luck would have it, they were able to find an off-shore government entity that was happy to receive an annual payment, much like an insurance contract and assume the risk of a possibility of Exxon defaulting. The government was quite sure that Exxon will not default and hence did not want the loan to be transferred even in the event of an LC actually converting into a loan.

The women lawyers had to make sure that the contract was not construed as a gambling on Exxon's credit. Once the contract was drafted, only the risk of default was covered. The terminology that was used was "Credit Default." Since the actual loan will not be transferred to the government entity by JP Morgan even in the event of the LC becoming a loan, the actual foreclosure in the event of a default still had to be done by JP Morgan in the event of a default by Exxon. That was how the name of Credit Default Swap (CDS) originated. These contracts later became the basic building block of the credit derivatives.

1.4 WHAT IS A CREDIT DERIVATIVE

Credit derivatives are economic instruments whose price and returns originate from the value of credit assets and the risks underlying them. To understand the mechanics of credit derivatives, consider a car insurance contract where the protection buyer makes a payment to the insurance company. In lieu of paying such a fee, the insurance company compensates the insurance purchaser for damages incurred if the car suffers some harm in an accident. In essence, credit derivatives serve a similar purpose. The concept of credit derivatives is depicted through analogies in Exhibits 1.2, 1.3, 1.9 and 1.11.

The most basic credit derivative, called a CDS, is a privately negotiated agreement that explicitly transfers credit risk of an entity to a counterparty. To extend the insurance analogy for understanding the terminology of a CDS contract, the insurance purchaser, called the "Protection Buyer," pays a fee called the "Premium" to the party providing the insurance, called the "Protection Seller." The premium receiver provides protection to the premium payer against losses due to damage to the insured asset called the "Reference Entity" up to an amount for which the asset is insured, called the "Notional amount."

To understand the several new terms that we have introduced in the above definition, consider the following example of a CDS. Say, *Loaning Bank* made a loan of \$100 million for a 5-year period to *Risque Corp.* To

Exhibit 1.2: Let's understand Credit Derivatives.



manage the risk of losing money in the event that *Risky Corp* defaults on its debt, *Loaning Bank* buys a CDS from *Deriv Bank* for an amount equal to the loan, \$100 million. Say, to buy protection on the CDS, the fee is 2%. In this example, *Loaning Bank* is the protection buyer while *Deriv Bank* is the protection seller. *Risky Corp* is the reference entity underlying the CDS. The notional amount of the CDS contract is \$100 million while the premium is 2%, which in the language of CDS market participants is 200 basis points.² Thus, in return for the credit protection offered by *Deriv Bank*, *Loaning Bank* pays 2% of \$100 million, i.e., \$2 million, in quarterly installments of \$500,000 to *Deriv Bank*.

If *Risky Corp* does not default on its loan, then as obligated by the CDS contract, *Loaning Bank* continues making quarterly payments of \$500,000 to *Deriv Bank* for 5-years. Recall that on its loan contract with *Risky Corp*, *Loaning Bank* would receive \$100 million back after 5 years. However, if *Risky Corp* were to default on its debt obligation, say, 3 years into the loan contract, then *Loaning Bank* would suffer losses due to the default if it had not hedged its credit risk. In this example though, because *Loaning Bank* has hedged its credit risk, it would stop making premium payments to *Deriv Bank* and *Deriv Bank* would be obligated, as part of the CDS contract, to refund *Loaning Bank's* loss in the loan. Therefore, though the premium

²Basis point = one-hundredth of a percent (0.01%) and is usually represented in its abbreviated form as bps.

that *Loaning Bank* pays reduces its returns, the risk of loss stemming from a potential default by *Riskey Corp* is hedged.

There are different kinds of CDS that are traded in the market. Of course, the most common is CDS which commonly refers to those contracts that reference a corporate or a sovereign entity. The underlying reference obligations of these entities are typically senior unsecured bonds. Slightly higher in the capital structure are the LCDs or loan-only CDS, which refer to contracts where the underlying is syndicated secured leveraged loans. Then, there are MCDs which are CDS that have the reference entity as a municipality and the reference obligation is a municipal bond. MCDs are mainly done in the US markets. Then, there are CDS on structured securities called ABCDS or asset backed CDS, which have the reference obligation typically, as asset backed securities. There are also preferred CDS which refer to CDS on preference shares and other preferred securities, where the trigger event is deferral of payment of dividends on preferred stocks and the deliverable obligations are preferred stocks.

CDS contracts are quite detailed in terms of features and specifications. We used the parallelism drawn earlier between a car insurance contract and a CDS to understand its various features.

- In the case of car insurance, the premium which is paid by the buyer of protection to the seller of protection is only a one-time payment made at the time of the contract initiation. But in the case of CDS, the premium is not a one-time payment, but a periodic payment that is typically a quarterly payment, paid at the end of each quarter. For instance, if the CDS contract provides cover for the entity for 12 months, the quarterly premium payments would be made at the end of each quarter of the 12 months in question, *i.e.*, third, sixth, ninth and twelfth months. These payments will be made only if the entity has not defaulted. In case of default, the protection seller will cover for the loss and the contract would be terminated. Before 2009, CDS contracts were only traded over-the-counter and to a large extent, they still are traded in the highly customizable OTC market. Since these CDS were privately negotiated contracts, the frequency of the payment could be different if that was what both the parties to the contract wanted. However, since 2009, CDS contracts have become pretty standardized. Therefore, the frequency of payments is almost always quarterly.
- The asset for which the credit protection is being negotiated is called the reference asset. The car would be the reference asset for a car insurance contract. For a CDS, this would typically be a single asset such as bank loan, a corporate bond, a trade receivable, an

emerging market bond issued by a sovereign, or a municipal debt contract. Though the reference asset is typically a single asset in a CDS contract, the reference asset could be a portfolio of assets such as a portfolio of asset-backed securities.

- As in the case of insurance, if the car gets damaged, then the car insurance contract is settled through a payment of damages from the insurance provider to the insurance purchaser. In the case of default by the reference entity, the contract would be terminated with the protection seller paying back the protection buyer, the loss it incurred due to the default of the reference entity. Termination of contract would also mean that the buyer of protection would no longer be paying the premium to the seller.
- The event in case of which the loss will be paid back is predefined, it is called as the "Credit Event." In a car insurance contract, coverage extends to car breaking down, getting damaged in a natural calamity, etc., but may not include drunken driving, or damage due to vandals painting graffiti on the car. Similarly, in a CDS contract, the credit event includes the reference entity filing for bankruptcy, undertaking a restructuring, becoming delinquent or insolvent, or defaulting on a payment obligation. Credit events could also include the price of the asset declining, the asset or the entity undergoing a credit rating downgrade, the lender to the reference entity decid-

Exhibit 1.3: *As with Insurance, Scope of CDS is Defined a Priori.*



ing to accelerate repayment, or a repudiation of or a moratorium placed on the asset.

However, there are a few factors which differentiate an insurance contract from a CDS contract.

- In a car insurance contract, the insurance is never physically settled. In other words, the insurance company does not ask the buyer of insurance to physically deliver the impaired car and it does not pay the par value of an undamaged car in return. In contrast, a CDS contract could be settled using a financial asset, such as a loan or bond. When a credit event occurs, if the seller of protection is not satisfied with the pricing or valuation of the asset, then he has the right to ask for physical settlement, *i.e.*, the seller of protection asks the buyer of protection to physically deliver the impaired asset that the contract referenced to and pays the buyer of protection the par value of the instrument. For example, if the defaulted bonds are trading at 40 cents to a dollar, the protection buyer can deliver the defaulted bonds and receive the par value of the bonds, *i.e.*, 100% of the notional. The list of eligible market makers and users is shown in Exhibits 1.4 and 1.5.
- In case of a car insurance, the protection buyer has to own the underlying asset, which in this case is his car. A customer cannot buy car insurance on a car that he does not own or cannot speculatively buy insurance on somebody else's car. For instance, you cannot place a bet with the insurance company that your boss will meet with an accident and buy insurance on his car to benefit from the contract if your boss indeed bumps his car. However, such speculation is possible using credit derivatives. You can buy CDS contract on a reference asset that you do not own and benefit if the reference

Exhibit 1.4: Eligible Market Makers in the Indian CDS Market.

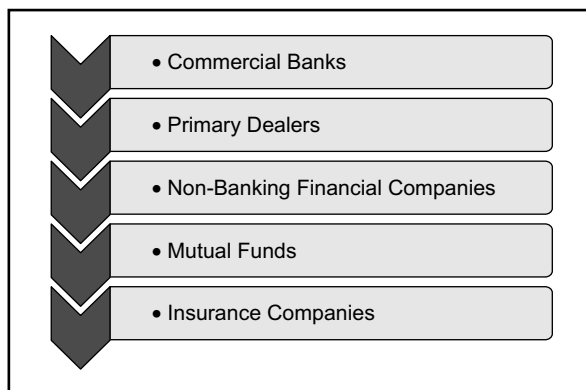
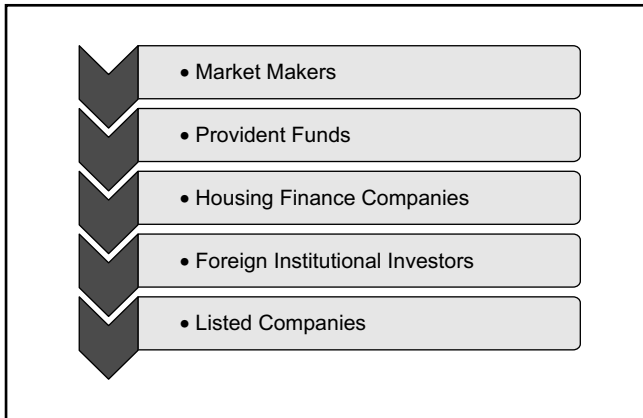


Exhibit 1.5: Eligible Users in the Indian CDS Market.

entity defaults. As we will see later in the book, such speculation is, however, not allowed under the regulatory framework in many countries, including India and China.

- You pay the insurance premium at the beginning of the insurance period. Even when the insurance payments are periodic, the payments are made before the start of the period. In contrast, with a CDS contract, you pay the fee at the end of the periodic interval.
- An insurance contract cannot be unwound in the middle of the contract period. You cannot ask for a refund if you terminate your contract midway into the insurance period. However, you can unwind a CDS contract midway into the trade and settle it based on the then prevailing market value of the contract, called the mark-to-market value.
- You cannot buy insurance on a car and profit if the chances of the car meeting an accident increases for whatever reasons. However, you can buy protection in a CDS contract hoping that the credit risk of the reference entity will deteriorate in quality and make money if it actually happens.
- Car insurance contracts usually last for a period of a year. In contrast, CDS contracts can be done for any maturity, as mutually agreed between the protection buyer and seller. It can be for as short a maturity as less than a month or for as long-dated tenors as in excess of 10 years.

1.5 NEED FOR CREDIT DERIVATIVES

Until recently, a manager of a loan portfolio could manage credit risk by diversifying the portfolio and limiting the risk exposure to a particular

credit below a threshold level. Similarly, corporates managed the credit risk stemming from their accounts receivables by diversifying their customer base and limiting exposure to each customer below a threshold level. However, these strategies are not optimal because they are not able to segregate the management of credit risk from the management of other risks that underlie the asset.

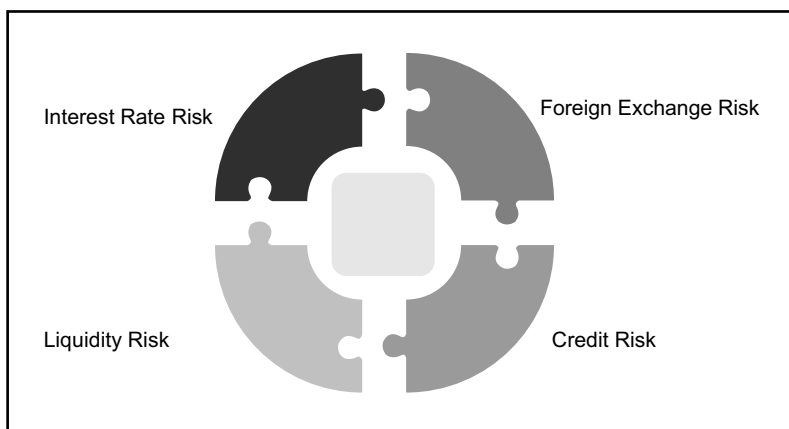
The development of credit derivatives market has played an important role, for better or for worse, in allocating the credit risks across the financial landscape. We now examine the benefits of credit derivatives: the macro-benefits from enhanced completion of markets as well as the micro-benefits accruing to each of the market participants. We will focus on the downside effects of credit derivatives on the financial markets in the latter part of the book.

Market Completion Role of Credit Derivatives

Essentially, credit derivatives play the role of isolating credit risk from the other risks of the instrument and transferring the risk from a party that is unwilling to bear the risk to a party willing and capable to assume that risk. In doing so, the credit derivatives segregate not just the management but also the ownership of credit risk from other qualitative and quantitative characteristics of the financial assets as shown in Exhibits 1.6 and 1.7. Thus, the credit derivatives possess a key ingredient that has made derivative instruments popular, *i.e.*, the ability to attain efficiency gains by allowing financial markets to be more complete.

To understand how credit derivatives achieve this process of market completion, consider a corporate bond issued by a Japanese Corporate.

Exhibit 1.6: Credit Derivatives Perform a Vital Market Completion Role.

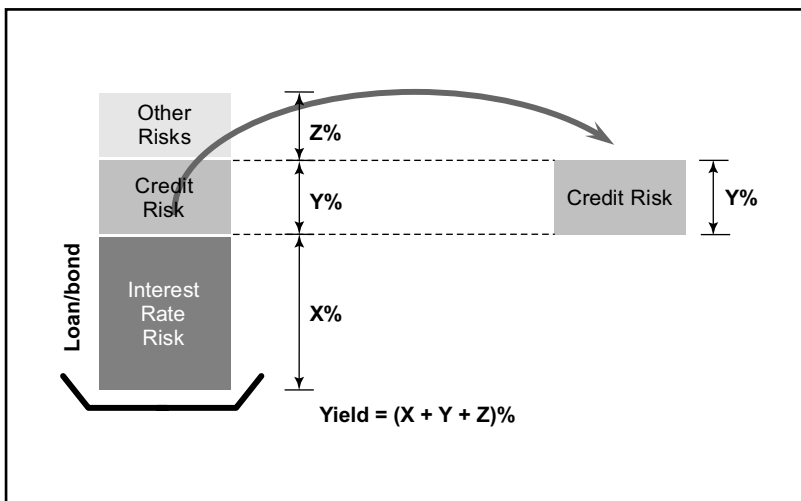


This asset bundles together foreign exchange risk, interest rate risk and liquidity risk of the bond along with credit risk. If the only way to manage the credit risk of this Japanese entity is to buy or sell that bond, which affects the positions in each of interest rate, foreign exchange and liquidity risks simultaneously, such a strategy is inefficient.

Unbundling these disparate sources of risk can generate efficiency gains. To illustrate these efficiency gains arising from disaggregating risk, consider an auction wherein each of the items are sold individually by the auctioneer to the highest bidder, as opposed to selling a package of the same items to the highest bidder. The process can certainly be more efficient if the buyer can buy items individually rather than have the constraint of buying things as a package. From the seller's perspective, this would probably fetch a higher price thus making it more efficient for both the buyer and the seller. By segregating credit risk from other underlying risks, credit derivatives make it possible for market participants to efficiently transfer specific credit exposures. This efficient transfer is accomplished by transferring the credit risk from market participants, who have the risk but do not want or cannot manage, to those who want to and can manage the risk but do not have it. The credit derivatives enable this efficient transfer from the 'have-lots' to the 'have-nots.'

Given the efficiency gains, a credit portfolio manager can supervise and administer credit risk separately and independently from other risks. In fact, a credit portfolio manager can control advanced credit risks such as recovery, uncertainty and volatility in credit spreads using credit derivative instruments.

Exhibit 1.7: Credit Derivatives Isolate and Transfer Credit Risk.



1.6 BENEFITS TO MARKET PARTICIPANTS

The evolution of credit derivatives as an asset class represents a significant development in the sourcing and management of credit risk. In an economy with a variety of participants, it is essential for many of them, such as, financial companies, pension funds, government agencies, mutual fund managers, *etc.*, that they own, manage or lessen their credit risk. Each category of market participants may have different regulatory or economic purposes for increasing or reducing their credit exposures. In the following example shown in Exhibit 1.8, we illustrate how market participants can employ credit derivatives to manage the credit risk arising in a corporate acquisition using Tata Steel's acquisition of UK steel maker, Corus Group PLC, as an example.

Exhibit 1.8: *Caselet: Hedging Credit Risk of Tata Steel UK.*

In 2006, Tata Steel sought to become one of the top five steelmakers globally through its US\$8 billion leveraged buy-out of Corus, formerly known as British Steel PLC. It was the second biggest deal in the steel industry globally, behind Mittal Steel Co.'s US\$38.3 billion acquisition of the France based and Luxembourg incorporated Arcelor SA.

For bond investors, the credit derivatives market proved to be a good hedge for the financing risk involved in the acquisition of Corus Group Plc by Tata Steel Ltd. To fund the takeover, Tata Steel borrowed as much as US\$6.17 billion, through a Corus subsidiary which had a non-investment-grade rating. Corus' debt had investment grade rating. However, because of these newly financed, high-risky loans, it got downgraded by rating agencies. Non-investment grade, also referred to as high-yield debt, are typically those if rated by the credit rating agencies, Standard & Poor's and Fitch carry a rating of BB+ or lower or a rating of Ba1 or lower by Moody's. The rating downgrade happened because the new financing for the acquisition were to be paid solely from the revenues of Corus and the parent firm Tata Steel was not guaranteeing the payments. The acquisition financed through debt and with no parent guarantees from Tata Sons, prompted rating agencies to downgrade Corus' senior unsecured credit rating by four levels below investment grade, to B+.

Many hedgers who had exposure to Corus, got worried about the financing of the deal and the increase in credit risk of the company,

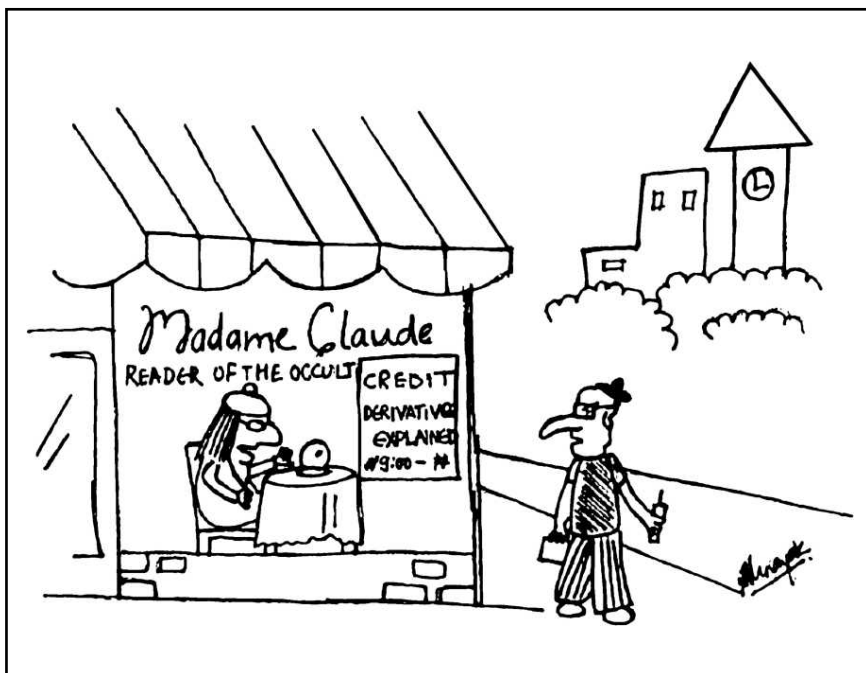
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and hence bought Credit Default Swaps (CDSs) to hedge against the deterioration in credit risk. After the financing decision was made public, CDS spreads on Corus climbed up 21%. Credit-default swaps for 5-years based on the senior unsecured debt of Corus were quoted at 1.62%, up from 1.338%, a 21% change, before the financing decision was announced. The increase was indicative of the enhanced credit risk of Corus.

In the case of Tata Steel's acquisition of Corus, the credit risk of the new entity could not have been known with certainty before the event, as such acquisitions can be financed in various ways. Instead of relying on Corus' revenue for payment of newly issued bonds, Tata Steel could have guaranteed the obligation, in which case the debt would have been rated at an investment grade level similar to that of Tata Steel. This uncertainty could be hedged with the help of CDSs. This is one of the many applications of credit derivatives. Whenever an event that can change the credit risk of a company is about to happen, financial market participants can make use of credit derivatives to hedge themselves.

Credit derivatives provide the structuring and customizing flexibility with their enhanced application scope, which other credit instruments, such as loans, bonds, are incapable of. Consider, for instance, an International Banking Arm of a Domestic Bank, *Inbank* wanting to take credit exposure on an American corporate, *UncleSamCorp* in JPY. Before the advent of credit derivatives, if *UncleSamCorp* has not issued any JPY-denominated bonds, *Inbank* may not be able to take the desired exposure. However, now *Inbank* would be able to synthetically create a JPY-denominated bond using the credit derivatives market through an instrument called Credit Linked Notes, which we will discuss later in the book. In addition, *Inbank* can sell protection on *UncleSamCorp* through a CDS denominated in JPY. Similarly, if *Inbank* wanted credit exposure for three years on *UncleSamCorp* in US dollars and the only available US dollar bonds are of a maturity of five years or longer, then again *Inbank* would not be able to take the desired exposure in the bond market. In this example, *Inbank* may be having a bullish view on the credit risk of *UncleSamCorp* only for three years. Since a five-year bond price would reflect the credit outlook of *UncleSamCorp* for not only the initial three years but also the entire five years, buying a bond now and selling after three years would not insulate the investor from the credit risk of year four and five. However, using credit derivatives, *Inbank*

Exhibit 1.9: Credit Derivatives aren't as Esoteric as they Seem.



can piece together a synthetic financial instrument on *UncleSamCorp* for precisely the maturity it wants.

Another fundamental feature of credit derivatives is that they decouple funding risk from credit risk. Funded instruments are those for which you have to pay cash up front. Credit exposure can be acquired with or without funding, *i.e.*, both in funded and in unfunded forms. Cash instruments, like bonds, are funded instruments because you have to pay the price of the bond upfront to acquire the asset and then you get periodic coupons on the bond.

Through credit derivatives, one can acquire credit exposure without any upfront payment. In the case of a CDS, you receive a periodic fee and there is no cash payout at the inception of the contract. Incidentally, the purchase of a bond and the writing of protection must not be treated as perfectly fungible from a Profit & Loss perspective. Both the yield on the cash bond and the level of the CDS are independently determined in their respective markets and can deviate, due to reasons of liquidity or other, away from perfect alignment with each other. The differential (which in theory should be arbitrated, but is not) is called the cash-CDS basis. So, the manager is still exposed to the variation of the cash-CDS basis in the short term. The bond portfolio managers can proactively change the credit

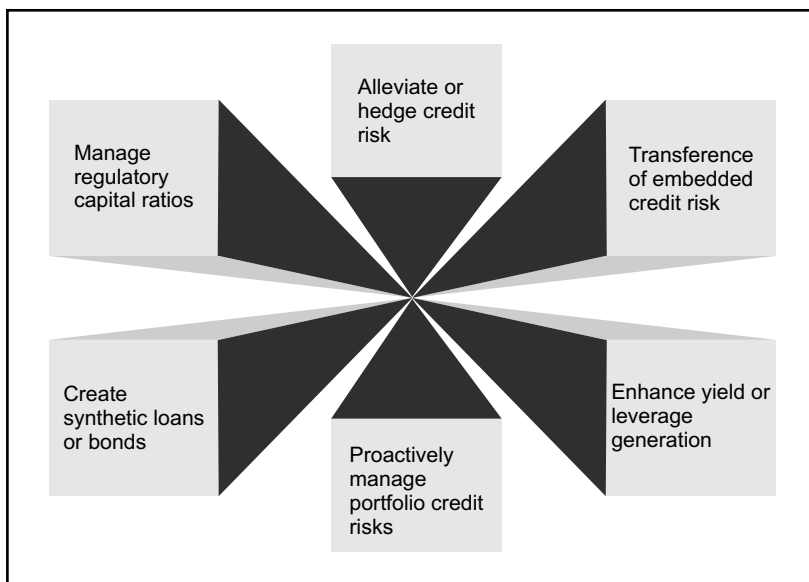
risk exposures in the portfolio without actually going long or short bonds or loan instruments in either the primary or the secondary markets.

As an illustration, let us say, there is a Fixed Income Hedge Fund Manager called *Mr. Bond* and he is saddled with some illiquid bonds that he bought some time back for which there exists a liquid CDS market. Assume in the meantime, his credit outlook on these illiquid bonds has become bearish. Now, to hedge the credit risk, he can simply buy protection in the CDS market without having to do a desperate sale of the illiquid bonds and having to put up with a large illiquidity price tag. Suppose, *Mr. Bond* is plausibly looking to enhance return for his investors, then he can sell protection on some entities for which his outlook is bullish and thus generate added return for his portfolio. Further, assume that *Mr. Bond* is restricted by the mandate given to him by his investors that he cannot invest in equity instruments because his fund is, for all intents and purposes, a fixed-income fund. He can overcome this constraint through the credit derivatives market. Presume that he has an extremely bearish view on the stock price of a company, *i.e.*, he thinks that the stock will sell for pennies within six months' time. If he were allowed to dabble in equities and their derivatives, he would simply buy a Put Option on the stock for six months and wait for the price to go down significantly.

However, according to his mandate, *Mr. Bond* cannot touch the equity asset class even with a barge pole and hence cannot buy the Put Option as he manages a fixed-income fund. With this constraint, he would not be able to make a profit if his view on this stock is right. He can overcome this constraint by going long a CDS, meaning buying protection on a CDS. In a way, it replicates the payoff of an equity put option. This is how it would normally work. In case the stock price hits the floor, it would happen because something really awful has happened to the company like say, a potentially damaging litigation, an accounting fraud, a corporate governance scandal or some such situation. In such an eventuality, the company would most likely default on its obligation as well. By buying protection on the CDS even though *Mr. Bond* has no exposure to the company, he can profit from his view if that indeed came true. Similar to a premium payout in the case of a Put Option, he will have to pay a CDS fee. Similar to the Put Option paying off handsomely, if there is a default, he will receive a substantial amount equal to the loss-given-default on the bond value.

Thus, credit derivatives as illustrated in Exhibit 1.10 give the participants the ability to:

- categorically disintegrate nested risks contained in financial instruments
- alleviate or hedge credit risk

Exhibit 1.10: Motivations for Use of Credit Derivatives

- transference of embedded credit risk
- enhance yield or create leverage
- proactively manage portfolio credit risks
- be able to create synthetic financial instruments for entities that have so far not issued debt in their capital structure or to choose custom maturities
- provide a substitute for equity derivatives. For instance, deep out-of-the-money Put Options and long CDS position both benefit from bankruptcy of the reference entity. They also help in taking positions related to volatility views
- manage regulatory capital ratios.

1.7 CONTEMPORARY SIGNIFICANCE

The contemporary significance of the credit derivatives can be appreciated by their potential to impact risk management along three dimensions.

First, currently credit risk is not actively managed. In fact, even in leading banks globally, credit risk management so far has been a case of allocating and adhering to a set of notional exposures. These exposures are set on the basis of industry and geographical limits. They do help in limiting concentration risk but may not have the optimal diversification benefits. High competition among banks in the lending business combined with a

tendency, especially in universal banks, to treat lending as the cost incurred in developing customer relationships has made credit risk warehousing a far less profitable exercise than before. It is as if a financial Wal-Mart has to sell staple stuff like loans at lower prices in order to attract customers who will also buy more sophisticated higher-margin financial products like credit derivatives. In earlier times, there were two constraints that did not allow active management of credit risk how much ever the financial institution might have wanted. Firstly, a secondary loan market was almost non-existent. Secondly, the accounting guidelines largely were cost-based rather than mark-to-market based. So, lack of active credit risk management did not affect short-term performance metrics like quarterly earnings. Consequently, the vast majority of bank loans resided until maturity. With the expansion of and advancements in credit derivatives, active management of credit risk is undergoing a change, albeit gradually.

Second, as a natural consequence of the introduction of credit derivatives, discrepancies in credit markets have gradually disappeared, thus enhancing the efficiency of the credit markets. To use, literally, a crude analogy, before the advent of a liquid market for crude oil, different derived products of crude oil were priced arbitrarily, based on the usual approach of pricing illiquid products—price it at whatever the customer is willing to pay. Once there was a standard available price for the underlying product, there was more standardization in the pricing of the derived products such as petrol, diesel, jet fuel, *etc.* Similarly, since there is a market prevailing price for credit risk, the pricing of loans too has become more standardized because the bank having credit risk can now hedge it at that market price making it a more efficient process for both the borrower and the lender.

Third, credit derivatives are unfunded and off-balance sheet instruments, *i.e.*, there is no requirement of upfront cash outlay. As such, they provide considerable scope for leverage. In effect, market participants can customize the degree of leverage to credit risk depending on their risk appetite. Though institutions differ in their taste for off-balance sheet vis-à-vis on-balance sheet exposures, off-balance-sheet financing methods become more attractive in comparison with the on-balance sheet alternatives as the balance sheet becomes more costly. To illustrate, bank loans traditionally did not appeal as a lucrative financial asset to pension funds and other financial institutions except banks, for a couple of reasons. First, assigning and servicing loans created an administrative burden. Second, absent a repo market, these institutions could not finance their investments on a secured basis in bank loans. Given the lack of such financing, the return on investment on bank loans became unattractive. However,

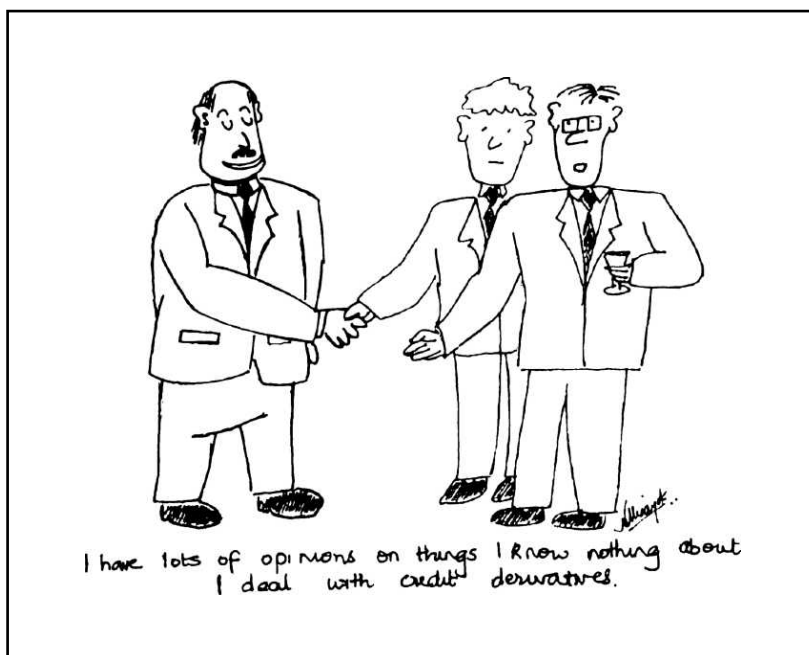
by assuming exposure through credit derivatives, pension funds are now able to synthetically finance their position and avoid the administrative costs of these assets. Thus, credit derivatives have opened new lines for distribution of credit risk and credit instruments into the institutional capital markets.

1.8 LOOKING INTO THE GLASS PRISM

Predicting the future of any financial product is difficult and it is more so, in the case of credit derivatives because they are still evolving quite rapidly. History is strewn with infamously bad predictions. One of my favorites is the statement by the former chairman of IBM, Thomas Watson, "I think there is a world market for maybe five computers." In spite of such egregiously wrong gaffes, I will venture to make a few predictions. In case I am as wrong as Thomas Watson was, I hope that I will at least adapt as well as IBM did.

The present gives us a guide for the future. Credit derivatives have already fundamentally altered the credit markets. Despite the bad publicity in the financial press regarding credit derivatives in the recent past, two conservative economies of the world, China and India, have taken initia-

Exhibit 1.11: The Future of Credit Derivatives.



tives to introduce this asset class in their domestic markets. Though it was politically incorrect for Central Banks to launch them amid the surrounding brouhaha, they still choose to do it because of the compelling value-add the product provides to market participants in managing credit risk. It also points to the fact that the asset class has a bright future despite the sometimes unjustified criticism it has been subjected to. There is a growing consensus that inappropriate regulations surrounding credit derivatives rather than credit derivative products per se, are to be blamed for aggravating the financial crisis after the subprime debacle.

The most important aspect that will decide this asset class' future is going to be value creation, *i.e.*, how much of a value-addition it does to risk managers and investors. Continued development will require two-way flow. Risk managers should be able to hedge risk that they have, but don't want. Similarly, investors should be able to get exposure to risk they want, but don't have, at an appropriate price. If the credit derivative market's micro-structure can fulfill this role, it would be value enhancing.

Credit derivatives business will likely expand further when a larger proportion of banks look to actively manage their credit risk. Currently, except the top-tier global banks, a large proportion of lending corporations manage credit risk passively. There isn't much of a managerial incentive for banks to deal with credit risk proactively. Similarly, interest rate markets grew when banks started to proactively manage the interest rate risk of the assets and liabilities; credit derivatives too would grow if there is a shift in the credit risk management attitude. The lending business may start to become standardized with uniformity in pricing. It would be similar to Super Stores keeping prices of basic stuff consistently low. With credit spreads being known from the secondary market, it would be difficult for the financial Wal-Marts to charge a very high premium on loans. The loss in margins in the loans business would, to a certain extent, get compensated by market making in the credit products. Simple credit derivative products like CDS will be more popular with the large section of market participants. In terms of the more complex credit derivative instruments, it is likely that dealers will run sizeable books rather than focus on bespoke³ deals. To use a simile from the textile world, the market would

³The term 'bespoke' is pretty commonly used in the credit derivatives world. 'Bespoke' has its origins in the word bespeak, which means to order something. The word is supposed to have its origins in Savile Row, a street in London, famous worldwide as the home of men's bespoke tailoring. Here, if a customer chooses a cloth for his suit, then until the entire suit has been cut out and assembled, that bolt of cloth is not made available for anyone else. This is because, until the customer is fully satisfied with the stitching, he may ask the tailor to re-stitch it and the tailor would not want to possibly run out of cloth. Such is the extraordinary level of customized service. A bespoke credit derivative transaction is one which has been customized for a specific client.

shift to mass production from tailoring individual transactions. To extend the analogy of textiles, both natural products and synthetic products will have their place, with their pros and cons. Similarly, loans and credit derivatives will, most probably, have a symbiotic relation. An efficient credit derivatives market can help achieve the financial equivalence of a win-win strategy. All told, it seems like it would be an interesting new world for credit derivatives after the subprime era.

CHAPTER 2

CREDIT DEFAULT SWAPS

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2.1 SYNOPSIS

In this chapter, we will introduce the credit default swap (CDS) mechanics including the specifications that have come into effect since April 2009. We will discuss the rationale for fixed coupons and the different conventions for the various geographies. We will also look at the quoting conventions for CDS spreads, the International Money Market (IMM) dates for coupon payments, the start date, effective date, day count convention and payment frequency of standard CDS contracts. We will conclude by detailing the standard conventions for North America, Europe, Asia ex-Japan and Japan.

2.2 INTRODUCTION TO CDS

A CDS, which is the simplest credit derivative, is an agreement between two counterparties that allows one counterparty to transfer the losses to another counterparty in the case of occurrence of a credit event to the underlying entity, called as reference entity. In trading parlance, we say that one counterparty is a 'long' reference entity credit risk, while the other counterparty is a 'short' reference entity credit risk. In the parlance of insurance, we can think of the 'long' credit risk counterparty as the insurance seller and the 'short' counterparty as the insurance buyer.

As stated earlier, it is pretty similar to a car owner like you buying insurance. In a car insurance, the reference asset is the vehicle, *i.e.*, not just any car, but your car. It is a car of a particular make, year of manufacture and such other details. The period for which the insurance is valid is also specified, which typically is 1 year. The period of car insurance need not be the same as the possible life of the car. Similarly, the CDS contract has a

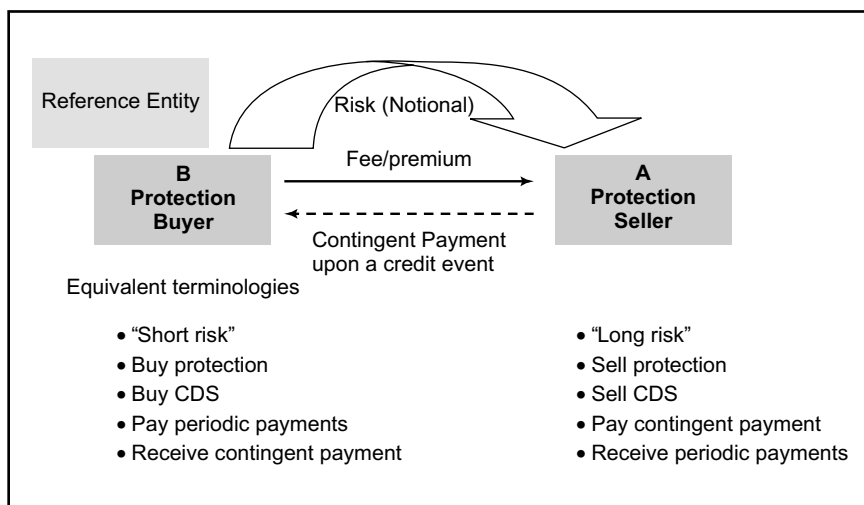
life shorter than or equal to the maturity of the reference asset. However, unlike insurance products which are mostly for a year, over-the-counter credit derivatives are more customizable and the period of insurance (CDS maturity) need not necessarily be 1 year. It can potentially be any period that the two parties mutually agree.

Evidently, there are some dissimilarities between the car insurance and the CDS example. In the case of car insurance, you actually have to have a car to be able to buy the car insurance. You cannot speculate on the event that your neighbor would bump his car and get compensated for his loss, if he actually manages to do it during the period for which you have bought the insurance. In the case of a CDS, a buyer of credit derivative protection need not own the defaulted asset to receive compensation or profit from the credit event. By corollary, buyer of protection need not suffer an actual loss to receive compensation. In the credit derivatives world, in fact, you can speculate that XYZ Company would become bankrupt over the next 5 years and actually make money if such an event indeed happens. This facility of speculating over a possible default of an asset which one does not necessarily own, in other words can be put as, one need not actually have a credit exposure to enter into a CDS contract.

2.3 CDS MECHANICS

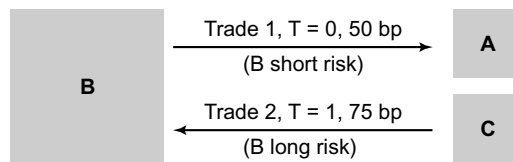
As shown in Exhibit 2.1, the protection buyer (party B) pays a periodic fee to the protection seller (party A). The fee calculation is done by monetary

Exhibit 2.1: Single-Name Credit Default Swap.



amount for which the credit protection is bought by the contract spread of the CDS. The periodic payment to be made is denoted as the CDS spread in basis points (bps), which would depend on the credit perception of the asset in question. In case a credit event occurs, the settlement of compensation for the losses by the protection seller to the protection buyer can be either cash or physical. The net amount that needs to be paid by the party which provided protection to the party which bought the protection is transferred in the case of cash settlement; whereas, physical settlement involves handing of bonds or loans with face value same as the notional amount of the CDS contract. In the car insurance analogy, if your car goes kaput, you deliver your damaged car to the insurance company and it pays you the monetary amount for which the car was insured. As mentioned before, in the case of credit derivatives, you do not have to actually own the car. So, you can deliver a car of similar specifications to the insurance firm and it will pay you the insured amount. Such physical settlement of the car insurance contract is rare. Usually, the insurance company just sends you a payment for an amount equivalent to the damages incurred. The CDS contract too provides this alternative. Because, the credit derivatives in general are over-the-counter contracts, both parties can choose to unwind the contract and settle the mark-to-market price as exemplified in Exhibit 2.2. If a credit event has happened, both parties can agree to unwind the trade depending on the current market price of the

Exhibit 2.2: Unwinding CDS: Capture Gains and Losses before Contract Matures.



Note that party B may directly unwind Trade 1 with party A, or instead with another party C, presumably for a better price. If B chooses to do the unwind trade with party C, then B tells party C that it is assigning the original trade with A to C. Party A and C then have offsetting trades with each other. In either case the profit is the same. B would receive the present value of $(75 - 50 = 25 \text{ bp}) \times (\text{risky duration of contract}) \times (\text{notional amount of the swap})$. Thus, B finishes with cash equal to the profit on the trade and no outstanding position.

reference asset, say, \$40 per \$100. Such cash settlements are the norm these days in the CDS market. Note that the recovery rate, which is \$40 in this example, is not known *a priori* but can be ascertained only after the occurrence of the credit event. As no one can decide in advance what the value of the damaged car would be before the damage, likewise, the recovery rate on the bond can be known only after the default.

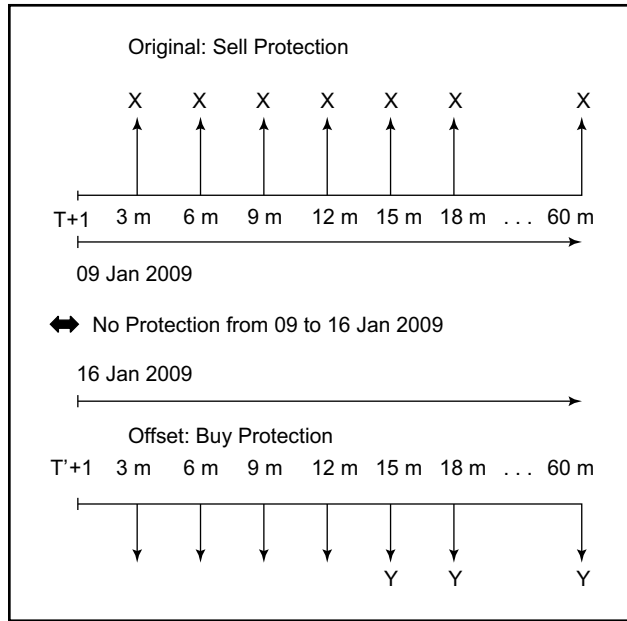
However, there does not have to be a credit event for the CDS buyers or sellers to capture gains or losses. CDS spreads, like bond spreads, widen if there is a perceived deterioration in credit risk. Similarly, credit spreads tend to tighten when the market perceives that the credit has improved. Let us say, one party went long CDS for 5 years at 50 bps per year and subsequently after 1 year, the CDS spread widens to 75 bps. If spreads were to widen thus by 25 bps, party B can choose to unwind the trade and collect profits. Present value of 75 bps minus 50 bps, equaling 25 bps for the remaining 4 years on the contract multiplied by the notional amount of the swap would be received by Party B.

2.4 NEW CDS SPECIFICATIONS

The Situation Earlier (Before 8 April 2009)

According to the earlier terms of the CDS contract, the protection buyer would be offered protection on the reference assets one business day after the day the trade takes place. Two opposite trades made on two different days, even if they cover the same reference entity and for the same notional amount, would not be offsetting each other completely as shown in Exhibit 2.3. For example, consider a trade, selling protection today and another trade, say, a week later, buying protection for the reference entity. These two trades would not offset each other completely, as there is a one week window between the two trades, in which the offset would not be complete, as an occurrence of a credit event during these 7 days would mean the investor had to pay out on the protection sold, and in turn did not receive any contingent payment as he didn't yet have the buy protection leg in effect. This issue regarding non-offsetting trades was addressed by creation of a standard date for the existence of protection irrespective of the date on which the trade was executed.

For a better illustration, consider a trade, on which you sold protection on 08 January 2009, which entitles you with the responsibility of covering for the losses due to any credit events which occur subsequent to 09 January 2009. To offset this, you buy protection a week later, which would

Exhibit 2.3: Earlier Contracts: Offsetting did not Truly Offset.

cover for your losses starting from 16 January 2009. Effectively, you still possess some risk during the one-week window, *i.e.*, from 09 January 2009 to 16 January 2009, when you don't have a bought position, during which a credit event would mean you paying out the loss cover and you would not receive any contingent payment. This residual stub risk can be taken care of by standardization of effective date, which was done in April 2009.

The Situation Now (After 8 April 2009)

Since 8 April 2009, the effective dates for accrual and coupon payments are disjointed from the effective date of protection and the trades for current contracts are executed with a daily rolling effective date. Daily rolling effective date means that a trade would have an effective date of Today minus 60 calendar days while for succession events it is considered as Today minus 90 calendar days. Similarly, for trades executed the following day, the effective date would be Following Day minus 60 calendar days, while for trades later by a week, it would be, Following Week minus 60 calendar days.

With the implementation of standardized effective dates, the actual date on which the trade takes place has more or less become irrelevant. The phrase 'Statute of Limitations' is often used to describe the fact that

all the existing positions have the same effective dates for credit and succession events.

As a result of the implementation of standard effective dates, the two trades done within a week's gap also have the same effective date. And this same effective date helps for the offsetting of trades even though the actual dates of trades are different, which was not possible earlier.

Fixed Coupon

The current CDS contracts trade with a fixed coupon and upfront payment, with the coupon being 100 bps for investment grades entities. Expectedly, for the high-yield entities, the payment is higher at 500 bps coupon. Earlier, the coupons the protection buyer paid were equal to the par spread.

With the coupons being taken as 100 and 500 bps, it does make one think the logic behind the selection of such amounts and why not say, 200 and 600. Even before April 2009, high-yield names were traded with 500 bps coupon payment only, so it has continued to be the same later on as well. Going by investor preference to trade with an upfront payment, it was deemed worthwhile to have a fixed coupon strike. One hundred bps coupon was appropriate for investment-grade entities. Re-couponing of legacy trades executed before April 2009 was set to these two fixed coupons. This process of re-couponing too consolidated the idea of having the coupons at 100 and 500 bps.

Trading with a Full Coupon

While full coupons were used in trading before April 2009, the date of the trade actually decided the date of payment of the coupon. The payment date could either be the first coupon date or the IMM date. IMM dates were twentieth day of the months of March, June, September and December, which were also the dates picked for termination of the CDS contract. Earlier, one-month mark from the first coupon date was considered as the demarcation between the two dates of payment. If the trade was executed more than 30 days earlier to the first coupon date, the premium was paid on the first coupon date for the effective number of days the protection was provided, with this being termed as Short Stub Period. Correspondingly, there was also Long Stub Period, which referred to the premium being paid on the next coupon date when the date of trade was within 30 days of the first coupon date. The premium consisted of portion of pre-

mium to be paid for the first period and the total premium for the second period. This difference in the amounts and dates of payments made this process a whole lot cumbersome and putting operations departments under added stress. So, things were changed so that it is not operationally complex. Presently, the complete premium is paid on the IMM date, with any extra payment to be made by the buyer of protection being paid by the protection seller at the time of the trade. This makes CDS now look more comparable to bonds than earlier, as payments of a particular period are done within that period itself.

Quoting Convention

The quoting convention for CDS is based on dealer runs. The Dealer runs are messages that run on Reuters or Bloomberg terminals and consist of bid and offer spreads on the reference entities on which the price is being made. These are indicative prices only for standard notional amounts ranging from \$10 million to \$50 million for standard reference entities. The Dealer Runs look something like this:

–Technology–			–Technology–		
ARW	210-220	+12	CSCO	140-150	+15
AVT	285-295	+20	ORCL	145-155	+15
CSC	135-145	+10	DELL	225-235	+20

The above is an illustration of par spread being quoted in the dealer run. The par spread is that coupon that would make the present value of protection leg and the contingent leg equal at the beginning of the trade. The recovery rate is not provided because it is not really relevant for the quotation. As we describe later in the book that recovery rate does not make much of a difference to the valuation of the CDS. For DELL, the market maker as buyer of protection is willing to pay 225 basis points annual premium and as protection seller he is happy to receive 235 basis points annual premium.

The Dealer Run has the bid offer spreads and the ticker of the reference entity. Sometimes, the change in spreads from the previous business day is included. The quotation is for full first coupon and almost always the quote is for the 5-year tenor, which is the most liquid tenor. In the DELL

example, the protection buyer has to pay 225 bps or $(225 \text{ bps} \times 10 \text{ mm notional}) = \$225,000$ annually to hedge against the risk of default on a \$10 million face value of bonds for Dell Computers (DELL).

As mentioned earlier, the date of trade is not relevant anymore, and the premium payment is done in whole on the first coupon date. And the seller of protection adjusts for the overpayment done by the buyer of protection because of the accrued amount. All CDS trades settle with an upfront payment, while the dealer pricing runs are quoted in 'conventional spreads.'

Name	5 Years	Daily change (bps)	Weekly change (bps)	Monthly change (bps)	Annual change (bps)
Islamic Republic of Pakistan	957	37	1	8	160
Republic of Turkey	224	8	17	4	78
Hyogo-ken	69	2	0	2	5
Federation of Russian States	189	5	12	5	63
Republic of Argentina	903	22	81	87	318

2.5 CDS SPECIFICATIONS

Reference Obligation and the Reference Entity

Reference obligor or reference entity is the entity whose default risk is being hedged by the protection buyer in a CDS contract. The CDS contract specifies explicitly the assets or obligation for which the credit protection is being bought or sold. Normally, a class of bonds of a particular seniority set is selected, the most common seniority being senior unsecured. A reference obligation is the loan or bond that is being referenced (similar to the car in the car insurance example). The reference obligation need not be the same as the asset that can be delivered in case of a physical settlement of a CDS as shown in Exhibits 2.4 and 2.5. It, however, would designate the lowest seniority of bonds that can be used for physical settlement in case the reference entity defaults. Markit Reference Entity Database (RED) has now become the standard in the credit derivatives market for confirming the legal relationship

Exhibit 2.4: Quotes of CDS Spreads in India.

Ticker	STATEB	SBIIN-BkIn	BHARPET	RURAELE	NABARD
Name	SBBJ	SBI	BPCL	RECL	NABARD
Tier	SNRFOR	SNRFOR	SECDOM	SNRFOR	SNRFOR
Ccy	INR	INR	INR	INR	INR
Running Spread	100	100	100	100	100
Recovery	0.4	0.4	0.4	0.4	0.4
Industry	BANKS	BANKS	PSU & FIs	PSU & FIs	PSU & FIs
Rating	AAA	AAA	AAA	AAA	AAA
Upfront1Y	0.027954428	-0.001300112	0.040285939	0.029117765	0.033183
Upfront2Y	0.14923898	0.069610144	0.190013804	0.144572923	0.133216
Upfront5Y	0.579140546	0.429972879	0.790693216	0.632781591	0.56774
Upfront10Y	1.476021692	1.309639542	1.729195386	1.744403028	1.729152
ConvSpread1Y	104.5375372	99.78901928	106.539859	104.7264155	105.3864
ConvSpread2Y	109.8350514	104.5842052	112.5266436	109.5271624	108.7779
ConvSpread5Y	115.4631263	111.4638956	121.1546674	116.9040689	115.1571
ConvSpread10Y	123.9297679	121.1932184	128.1133423	128.3653964	128.1126

(Contd.)

Exhibit 2.4: (Contd.)

Ticker	POWEGRI	IRFCI	LICHEN	HDFCL	RELIND
Name	PGCL	IFCL	LHFL	HDFC	RIL
Tier	SECDOM	SECDOM	SECDOM	SECDOM	SECDOM
Ccy	INR	INR	INR	INR	INR
Running Spread	100	100	100	100	100
Recovery	0.4	0.4	0.4	0.4	0.4
Industry	PSU & FIs	PSU & FIs	NBFCs	NBFCs	CORPORATES
Rating	AAA	AAA	AAA	AAA	AAA
Upfront1Y	0.012202926	0.018354847	0.133675327	0.102970315	0.047803108
Upfront2Y	0.133214527	0.133024264	0.393607741	0.306988956	0.242716645
Upfront5Y	0.595779192	0.688404739	1.215297804	1.067839169	0.836966055
Upfront10Y	1.684470532	1.548529194	2.741218295	2.306109834	1.668094245
ConvSpread1Y	101.9805039	102.9791	121.7174861	116.7246632	107.7606599
ConvSpread2Y	108.7777857	108.7652343	125.9949832	120.2590039	116.0084718
ConvSpread5Y	115.9099257	118.399831	132.6486895	128.6462441	122.4026796
ConvSpread10Y	127.372562	125.1255028	145.076866	137.7358999	127.1015061

(Contd.)

Exhibit 2.4: (Contd.)

Ticker	TATA	MRFLIM	THGRE	EXIM
Name	TSL	MRF	GESC	EXIM
Tier	SNRFOR	SECDOM	SNRFOR	SNRFOR
Ccy	INR	INR	INR	INR
Running Spread	100	100	100	100
Recovery	0.4	0.4	0.4	0.4
Industry	CORPORATES	CORPORATES	CORPORATES	PSU & FIs
Rating	AAA	AAA	AAA	AAA
Upfront1Y	0	0.176656212	0	-0.018257801
Upfront2Y	0.385924342	0.454151228	0	0.020253894
Upfront5Y	1.067507575	1.325411678	0	0.205029727
Upfront10Y	2.149731171	2.803400188	0	0.748446887
ConvSpread1Y	0	128.7108076	0	97.03756847
ConvSpread2Y	125.4858277	130.0094275	0	101.3332529
ConvSpread5Y	128.6372566	135.6450027	0	105.4547203
ConvSpread10Y	135.1152207	146.131938	0	112.0371183

Exhibit 2.5: Reference Obligations Restrictions for Indian CDS Markets.

- Must satisfy all of the following at all times:
 - The Bond must be denominated in Indian Rupees
 - It should be a direct obligation of the Reference Entity (no guarantees)
 - It should be in dematerialised format
 - It should be freely transferrable which means that there can be no contractual, statutory or regulatory restriction (including SEBI lock-in requirements)
- The Reference Obligation has to have any one of the following characteristics:
 - It should be listed
 - It should be rated by at least one of the Rating Agencies
 - The Reference Entity is an affiliate of an Infrastructure Company and is an SPV

between the reference entities and their corresponding reference obligations, often referred to as 'pairs.' There exists a 6-digit alphanumeric code for reference entity and a corresponding 9-digit code that identifies the 'pair.' The RED codes are now widely used by the CDS buyers and sellers to match and confirm CDS transactions electronically.

Default Definition

The description of credit event that is to be insured is probably the most critical aspect of the contract specification and usually expressed as one or more of the following events:

- Bankruptcy
- Obligation Default or Acceleration
- Failure to Pay
- Restructuring
- Repudiation or Moratorium

The most common of the default events is Bankruptcy. So, let us discuss a little bit more on it along with a historical perspective on how it has evolved. *Bankruptcy* is defined as impairment of ability or complete inability to pay creditors. It has to be a legally declared state, be it for individuals or for corporations. There are various protection measures available in different countries. Historically, if you look at how bankruptcy was treated, it does not seem very pleasant. Since corporation as a legal entity

did not exist, bankruptcy was limited to individuals. In ancient Greece, bankruptcy did not exist. That was the good thing about it. The bad thing was that if the head of the family, who typically used to be the elder most member of the family, defaulted then the entire family including their servants would become 'debt slaves.' They would be forced to be slaves to their creditors till such time that the creditors are able to recoup the losses through some means, which most commonly used to be physical labor. So, the creditors did recover their money and there was no such thing as impairment of ability or total inability to pay. In the Middle East, bankruptcy was treated slightly differently. The first time and even the second time an individual went bankrupt, he was pardoned. However, if he became bankrupt a third time, he was decapitated!

Currently, bankruptcy procedures are lot more benign as depicted in Exhibit 2.6. They vary across countries, with the current standard being the Bankruptcy Code of the United States. The Bankruptcy Code of the United States contains several chapters, each of which provides different alternative to entities seeking relief under the Code, depending on their circumstances. One of the most common forms of bankruptcy is Liqui-

Exhibit 2.6: Caselet: The Largest Bankruptcy Filing.

On 15 September 2008, Lehman Brothers went bankrupt. It filed for protection under Chapter 11 of the bankruptcy code. With \$600 billion in assets, it was then the largest bankruptcy filing in U.S. history.

In 2008, Lehman faced extensive losses due to its substantial asset holding of lower-rated mortgage tranches including large positions in subprime assets. In August 2008, there were speculations that Lehman Brothers may be bought by Korea Development Bank. KDB had difficulty getting the approval from the South Korean regulators and had found it hard to attract partners to the deal. On 9 September 2008, it informed Lehman that it had put talks of a buy-out on hold. Lehman had also in the meantime been talking to Barclays and Bank of America for a possible sale. On 14 September 2008 the Bank of England and the UK's Financial Services Authority vetoed Barclays bid to purchase Lehman. Bank of America too ended its bid as its request for Federal Reserves' assistance in the purchase of Lehman was rejected by the Fed authorities.

A bankruptcy plan was put before the bankruptcy court on 20 September 2008 according to which Barclays and Nomura Holdings acquired Lehman's business in America, Europe and Asia Pacific.

dation, which forms Chapter 7 of the Code. It involves appointment of trustees who collect the non-exempt property of the debtor and sell it, *i.e.*, they convert the illiquid assets into liquid cash. The proceeds from the sale are distributed to the creditors. The other common form of bankruptcy is Reorganization, which forms Chapter 11 of the Code. In Chapter 11, the business is reorganized instead of it being liquidated. Here, the business is controlled by the creditors and is subject to the jurisdiction and oversight of the court and works according to a bankruptcy plan. Debtors may emerge from Chapter 11 bankruptcy.

Debts are usually organized into the following categories on the basis of the sequential manner in which they would be paid out in case of default/liquidation.

- Senior or Unsubordinated Debt
- Junior or Subordinated Debt

In case of default or liquidation under chapter 7 bankruptcy, the creditors holding senior debt would have top priority and would be paid out first in full before the holders of junior debt securities are paid. Junior debt securities are usually high-risk securities with high rates of return but lower probability of recovery in case of default.

Effective Date for Credit Event and Succession Event

Before April 2009, protection bought against a credit event was effective from the following business day of the trade date. This resulted in an inherent inefficiency and systemic basis risk as there was no absolute offsetting of opposite trades, with respect to the same reference entity and of the same notional amount, executed on different dates. Consider the following scenario: An investor gets into a CDS trade by selling protection against credit risk on Thursday, 1 July 2010. Now to completely offset the transaction, *i.e.*, to hedge the risk, the investor buys protection on Friday, 11 July 2010. Since the protection is effective from the following business day, the investor faces a basis risk during the 10-day window.

A standard effective date reduced the stub risk during the window period. This is because the contracts now have a daily rolling effective date instead of the $T + 1$ effective date. Protection bought or sold today will have an effective date of 60 days before the trade date for credit events. This means that protection bought on date T has an effective date of $T - 60$ calendar days and for trade date $T + 1$, effective date would be $(T + 1) - 60$ calendar days. Similarly, for succession events, the effective date is $T - 90$

calendar days. This is what implied by the 'Statute of Limitations' by the credit derivatives market. Effective date for protection against credit events is the same for all existing positions; same is the case for succession events.

2.6 GLOBAL CONVENTION CHANGES

In April 2009, the International Swap and Derivatives Association (ISDA) issued changes in the CDS transactions convention in Australia, New Zealand, Japan, Asia ex-Japan and the Emerging Markets. The rationale behind these changes is:

- assistance and development of central clearing houses,
- improve efficiency in operations, and
- reduce outstanding gross notional amount.

2.7 QUOTING CONVENTION CHANGES

Quoting Conventions and Coupons

Australia, New Zealand, Asia ex-Japan and Emerging Markets have adopted fixed strike rates of 100 and 500 bps. The standard recovery rate assumption, for single-name CDS, is 40% for senior or unsubordinated transactions and 20% for junior or subordinated transactions for Australia, New Zealand and Asia ex-Japan. Whereas the standard recovery rate assumption is 25%, for both senior and subordinated transactions, for Emerging Markets. Japan, on the other hand, has a standard recovery rate assumption of 35% for senior and 15% for junior transactions. It has also introduced a fixed coupon of 25 bps along with the standard 100 and 500 bps fixed strike. The 25 bps strike rate would prove effective in cases which involve particularly tight credits. For Europe, the fixed coupons include 25, 100, 500 and 1000 bps, while the standard recovery rate assumption is the same as that for Asia ex-JAN (Japan, Australia and New Zealand), 40% for unsubordinated transactions and 20% for subordinated transactions.

Dates

Payment

There has been no change in payment dates for Australia, New Zealand, Japan, Asia ex-Japan. The CDS coupons still pay quarterly. However, payments for Emerging Markets have changed from semi-annually to quarterly.

Roll/Maturity

Again, there have been no changes for Australia, New Zealand, Japan, Asia ex-Japan for maturity dates. The roll dates for Emerging Markets, on the other hand, have been changed from monthly traded tenors to standard quarterly International Monetary Market dates, *viz.*, 20 March, 20 June, 20 September and 20 December.

Reduction in Restructuring Clauses

Under the ISDA 2003 Definitions, restructuring has been defined as a credit event. Usually, for North American credits, Modified Restructuring or Mod R is employed, mainly, because it qualifies as a useful alternative for hedging bank portfolios. But since bank portfolio hedgers have been decreasing over the past couple of years and the CDS market continues to grow, the industry dropped the restructuring clause altogether for North America. Also, note that trades with restructuring possibility typically stipulate a higher premium as compared to trades without the clause. This is due to the higher risk that needs to be compensated for as the possibility of a credit event increases with more clauses.

Restructuring

Currently, there has been no change for Australia, New Zealand, Japan, Asia ex-Japan and Emerging Markets. The restructuring conventions are the same as before. Restructuring (old R) for Japan, Asia ex-Japan and Emerging Markets; Modified Restructuring (mod R) for Australia and New Zealand; and Modified Modified Restructuring (mod mod R), which is largely applicable on European loans. We will discuss the restructuring conventions later in the book. Restructuring in India includes the following:

- The Board for Industrial and Financial Reconstruction (BIFR) decision
- Reference Entity is of granted statutory protection from its creditors or is declared a Relief Undertaking
- Is referred to Corporate Debt Restructuring (CDR)

Full First Coupons

A full coupon bond is a debt security or bond which has a coupon rate equal to or slightly greater than the market interest rate. A full coupon bond usually sells around its par value.

While trading with a full coupon bond, before the CDS Big Bang, the first payment depended on the trade date. It was either the first coupon date or the IMM dates. Depending on the number of days of effective protection, the accrual was due on the first coupon date. This was called a 'Short Stub' period and the trade occurred 30 days before the first coupon date. And, similarly, if the trade occurred within the 30-day period of the first coupon date, it was called a 'long stub' period. In case of the long stub, no payment would be made on the standard first IMM date. But a payment in the following period would include the portion of the protection premium owed for the first period and full premium of the second period.

Australia, New Zealand, Japan, Asia ex-Japan and Emerging Markets now have the same convention as Standard North American Contract (SNAC). Under this, full accrual of premium would be paid by the buyer to the seller irrespective the trade date.

Transformation of Old Contracts to New Contracts

Though there are no new global contract changes for Australia, New Zealand, Japan, Asia ex-Japan, and Emerging Markets and convention changes do not demand reorganizing documentation for transactions, migrating from old to new contract structure would definitely help in reducing operational and systemic risks. Also, the legacy trades (trades done at a spread different from the current market spread) have become highly illiquid and consequently it may become difficult to get a price for them.

Since pre-existing trades or legacy trades were usually conducted at a spread different from the fixed coupon strikes as per the new conventions, re-couponing has proved to be effective in circumventing the illiquidity risk. However, after re-couponing, new trades do not alter the original risk profile of the preceding trades.

2.8 NORTH AMERICAN CDS CONVENTION CHANGES

The North American CDS Convention changes are not formal changes in documentation or contracts but changes in the way of the conventions in which trading happens in this region.

Fixed Coupon

Under the new trading convention, North American trades are typically quoted at fixed strikes of 100 and 500 bps. One hundred bps, expected to be employed for investment-grade securities, are quoted as a conventional spread and 500 bps, suited for high-yield securities, are quoted in dealer runs as points upfront. Typically, before the changes, the quotes were usually made at par spread for CDS and only high-yield single-name CDS used a fixed coupon along with points upfront.

Though nothing sacrosanct about the two numbers 100 and 500, they proved to be of extreme practical convenience in the markets. Coupon of 500 bps already existed as a strike for many high-yield entities and 100 bps provided a parallel channel for investment-grade securities and thus completed the quest for standardizing coupon rates.

Standardization of Accruals

While trading with a full coupon bond, before April 2009, the first payment depended on the trade date. It was either the first coupon date or the IMM dates (20 March, 20 June, 20 September and 20 December). Depending on the number of days of effective protection, the accrual was due on the first coupon date. This was called a 'short stub' period and the trade occurred 30 days before the first coupon date. And, similarly, if the trade occurred within the 30-day period of the first coupon date, it was called a 'long stub' period. In case of the long stub, no payment would be made on the standard first IMM date. But a payment in the following period would include the portion of the protection premium owed for the first period and full premium of the second period.

However, under the new convention changes, the protection buyer has to pay the full quarterly coupon of the first coupon date, *i.e.*, the next IMM date. The protection seller will then rebate the accrued up to the protection buyer.

CDS Notional Amount

The size of standard trades varies and is a function of the reference entity. The notional amount varies from \$1 million up to several hundred millions, with smaller sizes for lower credit quality. For trades in currencies other than USD and EUR, the notional amount is usually smaller. Typical trades for CDS are in the equivalent range of \$10 million to \$100 million in various currencies.

Start Date

The start date of the CDS, *i.e.*, start of the protection for the buyer, is typically $T + 1$. Sometimes, the start date of the contract is further out in time, and is then referred to as a forward-starting CDS. However, forward-starting CDS has become much less common with the standardization of the CDS trade terms and conditions.

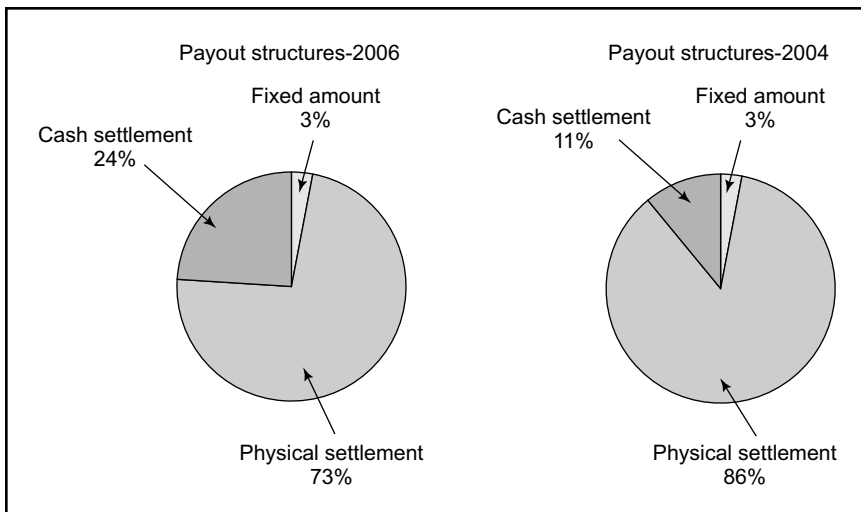
Frequency and Day Count Convention

The frequency and day count convention for the spread payments are typically, quarterly, with the same day count convention as that of the money market of that currency. The fees are paid in arrears, *i.e.*, at the end of period, and hence the first fee is paid in 3 months after the deal is struck.

Payment and Settlement

There are two alternatives possible—physical settlement and cash settlement. Earlier, the physical settlement used to be more popular than the cash settlement due to the complications involved in estimating the loss given default. However, the physical settlements too have had their share of issues in the sense that sourcing bonds after default is a major logistic issue for protection buyers, especially for unhedged position holders. In recent years, therefore, the cash settlement is more popular than the

Exhibit 2.7: Settlement Type: Physical versus Cash.



physical settlement as demonstrated in Exhibit 2.7. Payments in default normally settle quickly within 4 to 6 weeks on an average.

CDS Spread

The term 'CDS Spread' is often misleading as it is not a spread over anything. It refers to the fee that the buyer of protection pays to the seller of protection. Market participants refer to the CDS spread as a rate or price. It is generally quoted as a bid and offer.

- A *bid* of xx bps on a CDS means that the market maker is willing to enter a CDS as a protection buyer at a spread of xx bps.
- An *offer* of yy bps on a CDS means that the market maker is willing to enter a CDS as a protection seller at a spread of yy bps.

The bid quote will always be lower than the offer quote, as is usual in other markets. Market participants also employ the jargon 'to go long defaults' which means assuming a long position on credit risk or selling credit protection. Simply put, if you are a CDS buyer, you are buying credit protection or assuming a short position on credit risk, and hoping credit risk increases and/or CDS spreads rise. If you are a CDS seller, you are

Exhibit 2.8: Summary Terms of CDS.

General Terms	Fixed Payments
<ul style="list-style-type: none"> ■ Effective date: 20 December 2012 ■ Scheduled termination date: 20 December 2017 ■ Floating rate payer: X (the "Seller") ■ Fixed rate payer: Y (the "Buyer") ■ Business day: London, & New York ■ Business day convention: Modified following ■ Reference entity: ABC ■ Reference obligation(s): The obligation(s) identified as follows: <ul style="list-style-type: none"> ■ Primary obligor: ABC Corp. ■ Maturity: 15 September 2023 ■ Coupon: 6.5% ■ CUSIP/ISIN: USXXX ■ Original issue amount: USD 1,000,000,000 	<ul style="list-style-type: none"> ■ Fixed rate payer notional: USD 25,000,000 ■ Fixed rate payer payment dates: The 20th of March, June, September and December, commencing on March 20, 2013 ■ Fixed rate: 1% per annum ■ Fixed rate day count fraction: Actual/360
	Floating Payment
	<ul style="list-style-type: none"> ■ Floating rate payer notional: USD 25,000,000 ■ Conditions to payment: <ol style="list-style-type: none"> 1. Credit event notice <ul style="list-style-type: none"> ■ Notifying party: Buyer or seller 2. Notice of publicly available information applicable <ul style="list-style-type: none"> ■ Public sources: Standard public sources ■ Specified number: Two 3. Notice of physical settlement

Exhibit 2.9: Summary of Credit Events and Settlement Terms.

Credit Events	Settlement Terms
<ul style="list-style-type: none"> ■ Credit Events: The following credit event(s) shall apply to this transaction: <ul style="list-style-type: none"> ■ Bankruptcy ■ Failure to pay ■ Restructuring ■ Grace period extension: Not applicable ■ Payment requirement: USD 1,000,000 or its equivalent in the relevant obligation currency ■ Default requirement: USD 10,000,000 or its equivalent in the relevant obligation currency ■ Obligations: <ul style="list-style-type: none"> ■ Obligation category: Borrowed money ■ Obligation characteristics: None 	<ul style="list-style-type: none"> ■ Settlement method: Physical settlement ■ Physical settlement period: Section 8.5 of the ISDA Credit Derivatives Definitions, subject to a maximum of 30 business days ■ Portfolio: Exclude accrued interest ■ Deliverable obligation category: Bond or loan ■ Deliverable obligation characteristics: <ul style="list-style-type: none"> ■ Pari passu ranking ■ Specified currencies: Standard specified currencies ■ Assignable loan ■ Consent required loan ■ Transferable ■ Not contingent ■ Maximum maturity: 30 years ■ Not bearer ■ Restructuring maturity limitation applicable

selling credit protection or assuming a long position on credit risk, and hoping that credit risk decreases and/or CDS spreads drop. When compared to bond markets, assuming a long position on a bond is equivalent to taking a short position on the CDS, in credit terms. Similarly, being long the CDS is equivalent to having a short position in the bond. The summary terms and conditions of CDS is shown in Exhibits 2.8 and 2.9.

2.9 STANDARD CDS CONTRACTS

Standard North American Corporate Contract

On 8 April 2009, the SNAC became the standard CDS contract traded in North America. Big bang Protocol also happened to be implemented around the same time. There were widespread regulatory concerns in the market and these two developments provided some answers to these issues. Centralized clearing of CDS could be done which reduced settlement risk and improved liquidity.

They had fixed coupon payments of 100 bps or 500 bps and a 40% fixed recovery rate assumption for unsubordinated debt and 20% for subordi-

Exhibit 2.10: CDS Market Deals in India.

Seller	Bank A	Bank C	Bank E
Buyer	Bank B	Bank D	Bank F
Trade Date	25 July 2012	02 July 2012	07 December 2011
Effective Date	26 July 2012	03 July 2012	08 December 2011
Scheduled Termination Date	20 September 2013	20 September 2013	20 December 2012
Accrual Start Date	20 June 2012	20 June 2012	20 September 2011
Notional Amt.	Rs. 5,00,00,000	Rs. 5,00,00,000	Rs. 5,00,00,000
Fixed Rate (bps)	100	100	100
Spread (bps)	100	100	90
Upfront Amount (Pay)/Receive	0	0	0
Upfront Payment Amount	0	0	0

(Contd.)

Exhibit 2.10: (Contd)

Upfront Payment Date	0	0	0
Reference Entity Name	RECL	IRFC	IRFC
Nature of the Underlying	0	LB	LB
Credit Rating	AAA	AAA	AAA
Credit Agency	CRISIL	CRISIL	CRISIL
Credit Event	STD	STD	STD
Settlement Method	PHYSICAL	PHYSICAL	PHYSICAL
Day Count Fraction	ACT / 365(FIXED)	ACT / 365(FIXED)	ACT / 365
Rebate Payment Amount	Rs. 49,315	Rs. 17,808	Rs. 0
Rebate Payment Date	Rs. 41,116	Rs. 41,093	Rs. 0
Rebate Payment Payer	Bank A	Bank C	0
Rebate Payment Receiver	Bank B	Bank D	0

Note: RECL: Rural Electrification Corporation Limited; IRFC: Indian Railway Finance Corporation Limited; IRFC: Indian Railway Finance Corporation Limited.

nated debt. Full first coupon payments are done for all contracts and these contracts trade without restructuring (No R).

Fixed coupon payments meant that par spread would no longer be quoted. Spreads in dealer runs would now be quoted spreads, which represent the translation of the fixed coupon plus upfront payment into a single flat spread, enabling full comparison across dealers. The convention now being, low-spread names quoted as spread and high-spread as price.

Standard European Contract

With effect from 22 June 2009, the European contract changes were in line with the changes in North America but with a few exceptions. These differences were mostly due to the significance of hedging restructuring risk that is prevalent in Europe. Corporate, financial and Western European sovereign CDS contracts were the ones that were most affected by the change in convention.

The Standard European Contract (SEC) also had standard fixed coupons of 25 bps, 100 bps, 500 bps and 1000 bps and similar recovery rate assumptions just like the SNAC, with 40% and 20% for unsubordinated and subordinated debts, respectively. Fixed coupons other than the ones mentioned earlier, like 300 bps and 750 bps, were also available for re-couponing of existing trades. First full coupon payable for all contracts is done just like SNAC but SECs trade with modified-modified restructuring (Mod-Mod-R) clause.

Asia ex-Japan

The standardized terms came into effect in Asia ex-Japan on 21 December 2009. In line with the other standard CDS discussed above, Asia ex-Japan also have fixed coupons of 100 bps or 500 bps, also the same recovery rate assumptions of 40% and 20% for unsubordinated and subordinated debts, respectively and full first coupon payment for all contracts is applicable here as well. These contracts have a scheduled termination date specified unlike the others. The date can be any one of 20 March, 20 June, 20 September and 20 December. Similarly, payment date also has to be any of the above dates. A snapshot of the CDS market deals is shown in Exhibit 2.10.

Japan

The standardized terms for this variety of standard CDS came into effect in Japan on 21 December 2009. The details include fixed coupons of

25 bps, 100 bps or 500 bps. There is a slight deviation from other types of standard CDS in the recovery rates, with the figures here being 35% for unsubordinated debt and 15% for subordinated debt. Termination and payment dates must be any of the following dates: 20 March, 20 June, 20 September or 20 December. Just like other standard CDS contracts, full first coupon is payable for all contracts.

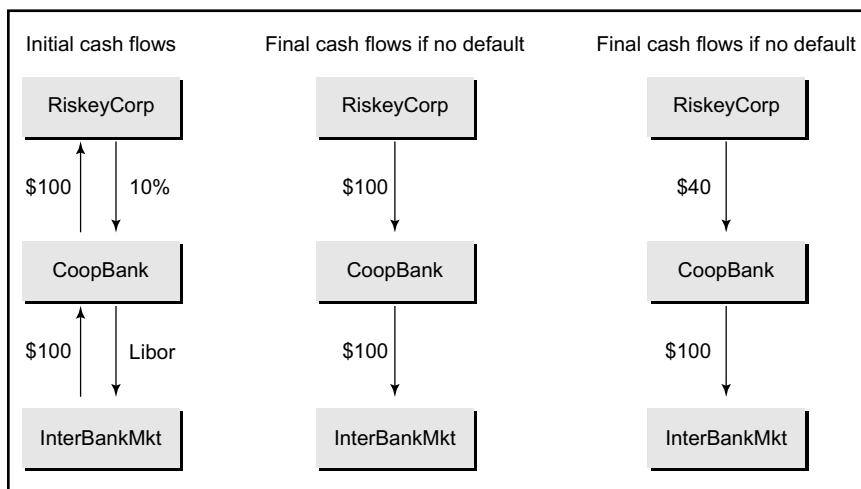
2.10 ECONOMICS OF A CDS: OLD WINE IN NEW BOTTLES

A CDS was not exactly a new instrument when it was first introduced. An instrument called asset swap was used to perform the economics of a CDS long before this basic product of credit derivatives was formally launched. A CDS serves the purpose of being able to get credit risk exposure to a bond or a loan in an unfunded way. It is unfunded because, unlike a bond where you have to invest your money to buy the bond and then have exposure to credit, in a CDS there is no initial cash outlay.

To illustrate, let us use the example of a hypothetical *RiskeyCorp* bond currently trading at par, *i.e.*, 100% of its face value. Let us say that the face value of each bond is \$100 and it pays a coupon of 10%. The maturity period of the bond is 5 years. Since the bond is trading at par, the yield of the bond is also 10%. As an aside, if the bond was trading below par, the yield would have been higher than 10%, *i.e.*, by investing only \$99, if one gets a coupon of 10%, the return on the investment is higher than 10%. Similarly, if the bond were trading above par, the yield would be lower than the coupon rate. For simplicity, we assume that the bond is currently trading at par and hence the yield on the bond is equal to its coupon. Suppose the 5-year Libor equivalent rate is 5% (Libor---London Interbank Offered Rate, technically, is the interest rate at which one bank borrows funds from another banks in the interbank market. Additionally, it is also used as a reference rate for short-term interest rates by many countries including the United States.). The 10% bond yield can then be broken down into the 5% bank funding rate and 500 bps credit risk of *RiskeyCorp*. If an entity, say *CoopBank*, wants to take exposure to *RiskeyCorp* in an unfunded way, it can do the following. Please refer to Exhibit 2.11 for a pictorial depiction of the strategy described below.

RiskeyCorp borrows \$100 from *InterBankMkt* for 5 years. Let us say that like most other banks, its funding cost is pretty close to the reference rate Libor. Depending on demand-supply constraints, it could be a few bps above or below Libor. We ignore the spread above or below Libor and

Exhibit 2.11: Replicating CDS in an Unfunded Form.



assume that it borrows at Libor flat. At inception, it borrows \$100 at Libor for 5 years and buys the bond. At maturity, the *RiskyCorp* bond will redeem at its face value of \$100 and the bank uses this amount to repay the \$100 that it has raised in the money market for buying the bond. Thus, buying the bond is done without any capital outlay from the bank.

Economically, using the principles of pricing an interest rate swap, we know that the present value of the floating rate payments of Libor is equal to the present value of the fixed swap rate cash flows. Say, the 5-year swap rate is 5%. So effectively, by funding itself at Libor and buying the bond with the proceeds, it has replicated a CDS wherein it is a short protection and is getting paid 500 bps = 10% coupon on the bond less 5% it has to pay on the borrowing.

Please note that the CDS spread is equivalent to bond yield minus interbank reference rate and not equivalent to bond yield minus risk-free rate. This is because the CDS market is an over-the-counter market and the market makers are mainly composed of banks. If a firm buys protection from a bank, the firm is hedging the credit risk of the reference entity for which it is buying protection but it takes credit risk of the bank. Since, globally banks, typically, have a rating of A, the CDS is benchmarked against the interbank reference rate which incorporates the credit risk of banking industry broadly. The difference between the rate at which the government and the banking industry borrow is the compensation of the credit risk of banks in general. A good reference for the credit spread for the banking world is the swap spread, which is calculated as the excess yield on an interest rate swap over the government bond for the same

maturity. Since a CDS carries the risk of the banking world, in general it is benchmarked against the interbank rate and not against the government yield. Hypothetically, if the firm could buy protection from the government, the CDS spread would then have been bond yield minus the risk-free rate for a given currency because government as an entity is as risk free as it gets for borrowings denominated in the local currency.

If the above structure were in USD, the corresponding interbank reference rate would be USD Libor and the risk-free rate would be the US Treasury yield. If the structure were in say Japanese Yen, the corresponding interbank reference rate would be Yen Libor and the risk-free rate would be the Japanese Government Bond (JGB) yield. The replication strategy described is similar to that of an asset swap. If we try to replicate through an asset swap, there are a few other details that we need to take care of and the exact format would be as follows:

- Go long a bond with a yield of Y_C for par. If the 5-year *Risquey-Corp* bond coupon is 10% and the bond is trading at par then $Y_C = 10\%$.
- Enter into a pay fixed interest rate swap at the market rate of Y_S with maturity equal to that of the bond and receive Libor (L). If the 5-year swap interest rate is 6%, then $Y_S = 6\%$.
- Finance the bond purchase through the repo market. [4] Normally, there is a small basis between the repo rate and Libor, *i.e.*, the repo rate is quoted as $(L - x)$.
- Pledge bond as collateral. The haircut by the repo counterparty is assumed to be zero.

A CDS trade is typically an unfunded transaction as mentioned before. The bond purchase, therefore, needs to be financed. A possible means for procuring the bonds for the trade is by employing a bond repo. In a repo, there is a simultaneous exchange of collateral and cash between the 'seller' and the 'buyer.' The 'seller' in this case is lending collateral to borrow cash. This is called a repo. The buyer, on the other hand, is borrowing the collateral and lending cash. This is a reverse repo. The bid/offer on a repurchase agreement represents the interest rate at which the collateral may possibly be pledged to borrow cash and *vice versa*. The price of buying cash or selling collateral is represented by the bid, which, in this case, will be higher than the offer. The trades involving a repo have two important features:

- **Haircut:** For a repo trade, the assets used as collateral are devalued in proportion to the perceived risk to which the holder of these assets is exposed. This devalued percentage called haircut represents the market risk anticipated by the asset holders.

- **Repo rate:** The price to finance the collateral is called repo rate. Typically, liquid credits have repo rates that are below Libor. The repo rate is usually not fixed and depends on the demand to borrow (or lend) the security in consideration. The repo rate is given by $(L - x)$, where x is the implied repo premium.

The capital in this transaction is given by the haircut. The party with the minimum cost of capital will, in effect, gain exposure to the underlying credit at the minimum net cost. Suppose, for simplicity, the haircut is zero. Then, the net spread is given by

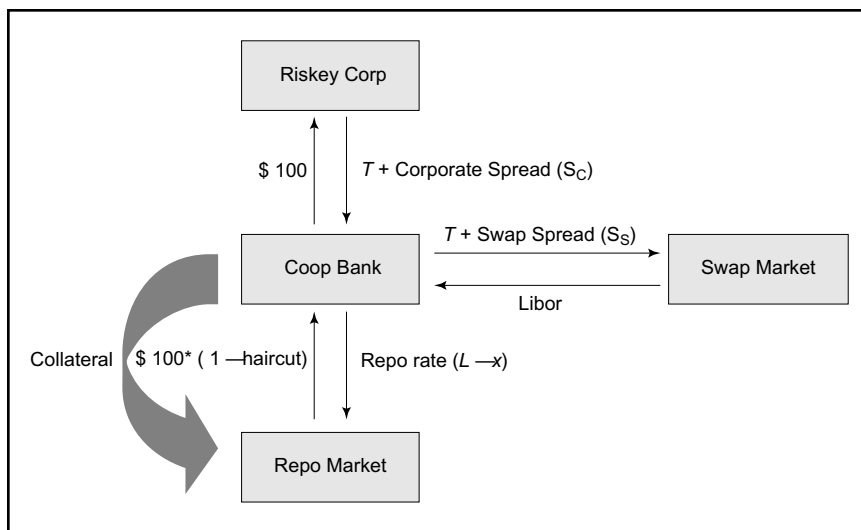
$$(S_C - S_S) + x$$

Where, S_C is the corporate spread and S_S is the swap spread.

If the implied repo premium was zero ($x = 0$), the net spread would simply be $(S_C - S_S)$. This is the same as the asset swap spread if borrowed at Libor flat. This cash flow is the same as that received by the seller of protection from the protection buyer as part of the CDS contract as shown in Exhibit 2.12. It is a fixed periodic payment till the contract expires. If there is a credit event in the bond, the repo would get terminated and *CoopBank* incurs this loss due to credit risk. This loss that is covered by the protection seller is calculated as the difference between the face value of the bond and the value that can be recovered from these bonds.

As the credit derivatives markets have got efficient, arbitrage relationships have made CDS spreads and asset swap spreads very close. There are not many large pricing differences between the markets, however if present and noticed, they are exploited by market participants. Consider

Exhibit 2.12: Replicating CDS Exposure.



an instance where the CDS spread is more than the asset swap spread. In such a scenario, there would be a considerable number of protection sellers who would hedge themselves with an asset swap. This would increase the CDS spread and would push it close to the asset swap spread. Similarly, if the CDS spread becomes lower than the asset swap spreads, then the protection buyers become active, which drives the CDS spreads higher. That said, small difference between asset swap levels and CDS spreads at times do exist and there are some fundamental justifications to it. This is because there are a few differences in the structures of CDS and asset swap.

2.11 DIFFERENCES FROM ASSET SWAPS— POINTS UPFRONT CDS

Capital at Risk

Although, as already discussed, a CDS does not entail any funding risk, it has a risk of, what can be termed as, a higher capital at risk than an asset swap. This also helps us understand the ‘points-upfront’ convention of the CDS market for some of the names that trade at extremely wide spreads. This risk is introduced in a CDS when the underlying bond price is significantly different from par. If you went long credit risk by purchasing a bond and doing the asset swap, the maximum capital that you can lose is the price that you paid for the bond. If you paid \$70 for buying a bond and post default, the bond is not worth the paper in which it is printed, *i.e.*, absolutely zilch recovery, you could lose \$70 of your capital. However, if you went long credit risk through the CDS market, and the bond recovery rate is zero, you may end up losing the par value, *i.e.*, \$100.

Points Upfront

Certain credits are considered to be of very high risk. These have a different trading convention in the default swap market and deals on these credits usually have ‘points upfront’ clause in them. According to this, dealers consider the default spread to be composed of two parts and the spread is usually quoted as:

- an upfront amount paid or received on the bond, and
- a quarterly premium that is paid thereafter.

The points paid upfront and the following quarterly premiums, together, are equivalent to the conventional default premium. The points paid

upfront by the fixed leg party are equivalent to a discount on a comparable bond. After the initial upfront payment is done in a lump-sum manner, the trade reduces to a conventional CDS trade and the swap default position is economically equivalent to that in a basic CDS, albeit with an off-market spread. The floating leg party or the protection sellers receive a major portion of the CDS spread upfront and a smaller quarterly premium thereafter *vis-à-vis* a conventional quarterly running premium.

A significant advantage, or disadvantage for certain dealers, of the points-upfront convention, is diminished volatility in earnings with respect to spread movements. If the spread widens, the mark-to-market loss will be less when compared to a conventional CDS trade with a running premium. By the same analogy, the mark-to-market gain will also be less if the spread contracts.

2.12 CDS DRIVEN BY WIN-WIN STRATEGY

The most obvious benefit of a CDS is that it transfers risk to the have-nots who want it, from the have-lots who want to do away with of it. Apart from that, the risk transfer and benefits are similar to that of swaps from the fixed-income world. We now try to understand how a CDS can create a mutually beneficial condition like that of swaps. For the benefit of those who may not know the origins of comparative advantage of swaps, here is a quick jog along derivatives history.

The first publicly known swap was done in August 1981. Two counterparties, IBM and World Bank, entered into an unprecedented bilateral contract. The reason for entering into the contract was that the World Bank wanted to borrow money in Swiss Francs (SFr). On the other hand, IBM was looking to borrow money in USD. Because of its rarity value, IBM was in a position where it could issue SFr bonds at pretty much the same rate as the Swiss Treasury, which is the best possible rate for SFr. In contrast, in the United States, IBM would have had to pay 45 bps over the US government bonds. The World Bank too was in a similar situation. Its corresponding borrowing rates in USD were equal to the US Treasury plus 40 bps, while its borrowing rates in SFr was equal to Swiss Treasury plus 20 bps. It was obvious that IBM could borrow SFr cheaper and that is what the World Bank needed. Likewise, and the World Bank could borrow USD cheaper which was what IBM wanted. The situation was ideal for a swap. IBM could borrow the currency that the World Bank wanted at a cheaper rate and *vice versa*. Consequently, the World Bank borrowed USD and lent them to IBM at the US Treasury plus 40 bps. This resulted in no loss for the World Bank while at the same time ensuring IBM a more favorable rate.

Similarly, IBM borrowed SFr and lent them to the World Bank at Swiss Treasury plus 10 bps. Through this swap, both IBM and the World Bank made 10 bps each and hence were profitable to both IBM and World Bank. This transaction caught the imagination of the fixed-income world and a market developed in swaps driven by these comparative advantages.

A similar comparative advantage exists in the credit derivatives world as well where both parties could benefit by swapping credit risk. An example of this is provided in the chapter on regulation of credit derivatives, after we have discussed the regulatory mechanism.

CHAPTER 3

VALUATION OF CREDIT DEFAULT SWAPS

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3.1 SYNOPSIS

Valuation of CDS at first glance seems like an easy problem to solve. However, as in most derivative instruments, the devil lies in the detail. In this chapter, we will highlight some of the important issues in the valuation of credit derivatives in general. Then we will describe the procedure for valuation of CDS. We will explain all the necessary specifications of the contract that need to be considered for arriving at the mark-to-market (MTM) or valuation of an existing CDS contract or for unwinding an off-market CDS trade. We will also illustrate the sensitivities of some of the important parameters that go into the pricing of a CDS.

3.2 CHALLENGES IN VALUATION OF CREDIT DERIVATIVES

Before we move on to the actual valuation of a credit derivative instrument, *i.e.*, a CDS, it may be worthwhile to understand the challenges in pricing any credit derivative. The challenges are discussed with the perspective of the entire credit derivatives product suite instead of just the CDS for which the International Swaps and Derivatives Association (ISDA) provides a standard model which is used by all market participants.

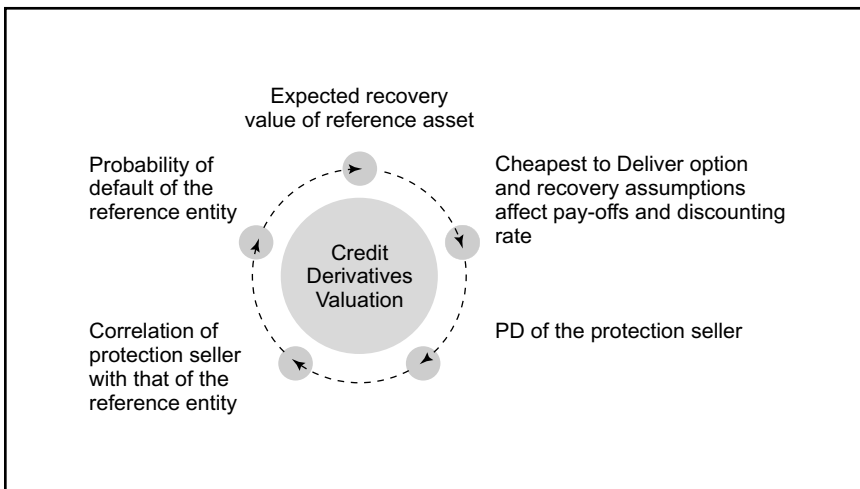
As with many complex derivative instruments, pricing between different banks and other market participants can be different. Even accounting for the margins that need to be made, the pricing between two banks could be materially dissimilar. It is not because there do not exist models for pricing credit derivatives. The problem is that there is no one single standardized way of pricing credit derivatives.

To find out what may be the expected value of a credit derivative, consider an organization that is expected to receive a cash flow of \$100 from an institution which has credit risk in a year's time. To hedge against the possibility of the fact that the credit risk institution could default on its obligated cash flow, the organization seeks to buy protection from a bank. Now, the market maker who is the protection seller assesses that the probability of the credit risk institution defaulting in the next one year is 5%, which means that there is a 5% chance that the market maker would have to make a payment to the protection buyer. The market maker would have to pay an amount equal to par minus recovery in the event of a default. If the recovery rate is estimated to be 80%, then the market maker may have to pay the protection buyer \$20 with a probability of 5%. Therefore, the protection seller should charge a credit swap premium of \$1 or 1% of notional for selling protection on the credit risk institution. This seems easy, but in trying to arrive at the fair market price of a credit derivative, we have made quite a few assumptions as shown in Exhibit 3.1 that need not be necessarily true. These are as follows:

- Our estimation of probability of default is correct and is accurately known
- The extent of loss in the event of a default is also known or can be estimated accurately *a priori*
- The default would happen at the end of the period

There are quite a few issues with each of the factors mentioned here which are now discussed.

Exhibit 3.1: Key Inputs to Pricing Credit Derivatives.



Default Probability

There are multiple ways in which chance of a default of a reference entity can be estimated.

Default probabilities from rating agencies

The biggest constraint for estimating probability of defaults from rating agencies outlook is that they can be estimated only for those entities that are rated. Even with those entities that are rated, the problem with calculation of default probabilities by rating agencies is that they are subjective estimates of defaults based on the outlook of their rating analysts. These tend to be accurate retrospectively, and as they say, all vision is 20/20 with hindsight. In the past, the rating agencies in general had a habit of reacting to events rather than proactively predict credit events. Their ratings outlook tends to trail at the back of the current default situation of the reference entity and they have been often caught napping by changing ratings outlook often after they should have. The rating agencies outlook of the possibility of default do not change dynamically and therefore they are poor proxies of market variables. Moreover, the rating agencies tend to give ratings on default of bonds, which may be significantly different from default on loans and borrowed money, which is what CDS provides protection for.

Credit spreads

In this methodology, we observe the spread between the yield on an entity's bonds and the yield on a risk-free instrument with similar maturity. The problem here is that after 2009, even the government entities cannot be considered to be risk-free. The experience of default threats by governments of Portugal, Italy, Greece and Spain, collectively known by the acronym—PIGS, has brought the attention of market participants to the fact that the so-called risk-free government debts themselves are prone to credit risk and that there is embedded return on credit risk on those government securities. Even if we assume that the difference between the bond yield and the yield on government security is a proxy return for assuming the default risk of the bond, it does assume that there is no illiquidity premium or any other return built into that spread. One can theoretically assume that the company has a certain chance of a default and that the government has none. Under this assumption, the excess return is some kind of an option premium on the company's option to default on its bond obligations. Assuming a certain loss given default, it then becomes possible to estimate the chance of the option being exercised, *i.e.*,

the company actually defaulting. Even under this restrictive theoretical assumption, the method is available only for bonds traded whose yields are readily available. As observed before, the credit spread is a function of other risks such as liquidity and term premium and it is quite problematic to assume that the spread is compensation only for the risk of default. So, this method has its fair share of problems to be used universally by market participants.

Expected default frequency

The expected default frequency (EDF) is based on the concept that a company defaults when the value of the asset falls below the value of liabilities. Therefore, the stock price can be thought of an indication of how far the company is away from bankruptcy because when the entity is bankrupt, the stock price should ideally be zero. The good thing about using stock price as an estimate for default probability is that both variables tend to get affected by all factors that influence the fortunes of the company. However, the big constraint is the assumption that the movement in stock price is entirely due to changes in the default probability of the company because share prices are affected by a myriad of factors and it would be difficult to extract out the probability of default from this.

Arbitrage pricing models using benchmark instruments in the market

This is the current method of choice for the market participants. The method is similar to the way options are priced in the financial markets. The market participants back out an implied probability of the underlying variable from the option prices. Similarly, in the case of CDS, the most basic credit derivative instrument, the probability of default is backed out from the credit spreads of the CDS trading in the market. The industry body, ISDA, has specified standard estimates of loss given default (LGD) to back out the probability of default. We will later discuss in this book that the choice of LGD assumption does not affect the CDS spread. So, an industry body like the ISDA specifying an LGD assumption only makes the estimation of probability of default standardized across market without affecting the CDS spreads.

Recovery rate

The recovery rates are presumed to be known before-hand and are easily estimable. A recovery rate on any entity's debt is dependent on the senior-

ity of the obligation and can vary from 20% for debt that is subordinated to 80% for debt that is unsubordinated. The ISDA recommends a standard recovery rate assumption for single-name corporate and sovereign CDS of typically 40% for unsubordinated and 20% for subordinated. The recovery rate assumption for the emerging markets transactions is 25% for both unsubordinated and subordinated trades.

Cheapest-to-deliver risk

Cheapest-to-deliver (CTD) risk can be understood well from the analogy of car insurance. In case you bought a contract from an insurance company that your boss would meet with an accident. In case he does, and you now want to 'physically settle,' you have the choice of buying the cheapest available car of similar specifications as that of the damaged car and give it to the insurance company and the insurance company would have to pay you par, *i.e.*, the price of the car.

In case of a credit event, the protection buyer has the option of delivering the cheapest defaulted asset which satisfies the criteria of an obligation that is deliverable in the credit derivative contract. The value of this option is quite difficult to quantify as it depends on the nature of obligations the reference entity has and cannot be generalized. For instance, if a reference entity has bonds in Indian Rupee, USD, Euro, Japanese Yen, and Singapore Dollar, it is possible that the bonds in these various currencies after default may be trading at different levels based on a range of factors including the currency risk premium, if any. Another entity having bonds all denominated in Indian Rupee or USD may not have as much variation in prices of the various bonds, assuming all the other factors being same. In the first case, the CTD option is quite valuable and may result in an advantageous position for the protection buyer *vis-à-vis* the protection seller.

3.3 PRICE IS WHERE IT CAN BE HEDGED

Even though there are various approaches to pricing of the credit derivatives, bankers do not care too much for theoretical rigor. Since banking is a business at the end of the day, the price of any product is the cost of risk managing it. Therefore, the philosophy followed by the market participants is that the price of any product is the cost of engineering it, which is called financial engineering. Let's consider how this concept of 'price is where it can be hedged' came about. The concept came about in 1970s with the standardization of option pricing through the Black-Scholes option pricing framework. Before the Black-Scholes formula was conceptu-

alized, option prices were based on subjective estimates of the possible payoff on the option. There was no one single standard way of determining option price and therefore price quotes of two traders were not even remotely close. Then came the Black-Scholes model that standardized the option markets. The reason why this made option pricing objective was because in this framework, the price of the option was equal to the cost of risk managing it through delta-hedging. Black-Scholes formulation postulated that the option payoff of a long option position can be effectively hedged by going short on the underlying stock. The amount of the short position was calculated by the first-order sensitivity of the option price to the underlying, called as the delta.

Overnight, the option pricing became standardized because each trader knew how to precisely hedge an option and therefore, how to engineer an option. So long as the traders agreed on the uncertainty of the underlying, the option price had to be the same. The market therefore started quoting the volatility, now called the implied volatility, rather than the price. Similarly, in the credit derivatives market, with the help of CDS, implied probability of default can be estimated.

Like in the options market, a similar standardization has happened in the credit derivatives market. If a bank sells a First-to-Default note, which is later discussed in the book, financial engineering similar to the Black-Scholes formula guides the trader on how to hedge it. So, the price of any product in the credit derivatives space, from simple digital default swaps to collateralized debt obligations has eventually become effectively the cost of risk managing it.

3.4 VALUATION OF CDS

We now try to understand the most common valuation methodology the market follows for one of the most basic and benchmark instruments in credit derivatives, *i.e.*, a CDS. It is now a standard model prescribed by the ISDA and accepted by all the market makers. We first discuss what the cash flows in the CDS would be and then describe how to compute the present value of the cash flows by considering expected value of the risky cash flows and discounting them. We exposit this methodology because a model which takes such aspects like the correlation between reference entity and protection seller, or incorporates uncertainty around recovery rates would be quite involved. In the below methodology, we work with the assumption of a given recovery rate.

A CDS can be decomposed in two monetary components. One would be the periodic payments, usually quarterly, the buyer of protection makes

to the seller of protection against a credit event. This payment continues either till the credit event or till maturity of the contract, whichever comes first. This is called the 'fixed leg.' Correspondingly, the other component is the contingent payment made by the protection seller to the protection buyer. This payment is contingent on the occurrence of the credit event and equals par minus the recovery value of the deliverable obligation. This is called the 'floating leg.' At the inception of the CDS trade, the Risky PV of the fixed leg and the floating leg should be equal, which is the same as saying that the on-market default swap should have a net present value of zero and is depicted in Exhibit 3.2.

Let us take an example of a CDS with an annual spread of 500 bps or 5% payable quarterly on an actual/360 bps. Let us suppose that it is a 1-year contract and we assume the recovery rate to be 40% of the notional. The notional is \$100 million. Let us say that the contract becomes effective on 20 December of the current year and matures on 20 December of the subsequent year.

We first value the fixed leg or the premium leg. The fixed leg value is the Present Value (PV) of four quarterly fee payments that would be made during the course of the year on 20 March, 20 June, 20 September and 20 December. The first fee payment made on 20 March would be computed as follows:

$$\$100\,000\,000 \times 5\% \times (90/360) = \$1\,25\,00\,000$$

The fee payment made on 20 June would be

$$\$100\,000\,000 \times 5\% \times (92/360) = \$1\,27\,77\,778$$

The fee payment made on 20 September would be

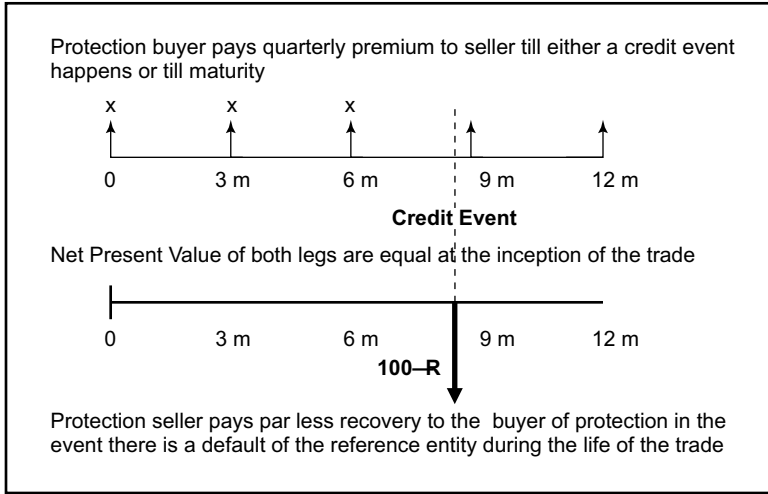
$$\$100\,000\,000 \times 5\% \times (92/360) = \$1\,27\,77\,778$$

The fee payment made on 20 December would be

$$\$100\,000\,000 \times 5\% \times (91/360) = \$1\,26\,38\,889$$

The number of days for which the fee accrues for the first period is 90 days assuming a non-leap year (31 days in December, 31 days in January, 28 days in February). If 20 March is not a good business day and happens to be a Sunday, the fee payment for the first period would still be computed from 20 December to 20 March and for the second period from 21 March to 20 June. Even if the maturity date of the contract is not a good business day, *i.e.*, a Saturday, Sunday or holiday, the contract terminates on that day.

However, these cash flows are not certain. If there is a credit event in between, say 8 months into the trade, no more fee payments would be made, *i.e.*, the scheduled fee payable on 20 September and 20 December

Exhibit 3.2: Contractual CDS Cash Flows for Buyer and Seller.

would not happen. We therefore need to find out the expected value of the fee payments. We do this by multiplying the cash flows by their survival probabilities. We then compute their PV by discounting at the applicable interest rate for the time at which the cash flows are slated to happen.

Quantitatively, it can be represented as follows:

$$\text{Risky PV}_{\text{Fixed}} = \sum_{i=1}^N S \times SP_i \times \alpha_i \times DF_i$$

Where,

N is the number of coupon periods

S is the per annum CDS spread

SP_i is the survival probability from time t_0 to t_i of the reference entity

α_i is the accrual factor from t_{i-1} to t_i

DF_i is the riskless discount factor from time t_0 to t_i

Similarly, the protection seller has an expected payment of $(100 - R)$, R being the recovery rate of the delivered obligation, of the notional amount in the event of a default. Again, the cash flows are not necessarily certain. They may happen in a probabilistic sense with a probability equal to the chance of default between time t_{i-1} and t_i . For example, if the chance of survival for the reference entity on 20 June is 96% and the chance of survival of the entity on 20 September is 94%, the chance that the reference entity will default between 20 June and 20 September is 2%, i.e., 96% minus 94%. In general, the cash flow of par minus recovery is multiplied by the default probability given by $(SP_{i-1} - SP_i)$ and discounted with the appropriate discount factor depending on the point at which the cash flow

of \$60 million (payment by protection seller in the event of default) is expected to happen.

Quantitatively, it is expressed as

$$\text{Risky PV}_{\text{Floating}} = \sum_{i=1}^N (1-R) \times (SP_{i-1} - SP_i) \times DF_i$$

Where, the above-mentioned notations are as follows:

R is the recovery rate on the delivered obligation

SP_{i-1} is the survival probability of the reference entity from time t_0 to t_{i-1}

SP_i is the survival probability from time t_0 to t_i of the reference entity

DF_i is the riskless discount factor from time t_0 to t_i

When a credit event occurs, the protection seller has to make a payment of $100 - R$ to the protection buyer, R being the recovery rate of the delivered obligation. Higher the recovery rate, lower the payment, but exposure to the CTD risk tends to reduce it. In a 'soft restructuring,' the delivered obligation may trade at a lower rate than the restructured obligation. The effect of the CTD option is ignored in the CDS pricing mechanism. The MTM for a protection buyer is

$$\text{MTM}_{\text{Protection Buyer}} = \sum_{i=1}^N (1-R) \times DF_i \times (SP_{i-1} - SP_i) - \sum_{i=1}^N S \times DF_i \times SP_i \times \alpha_i$$

and the MTM for the protection seller is

$$\text{MTM}_{\text{Protection Seller}} = \sum_{i=1}^N S \times DF_i \times SP_i \times \alpha_i - \sum_{i=1}^N (1-R) \times DF_i \times (SP_{i-1} - SP_i)$$

Determination of the probability of survival using CDS spreads and recovery rate assumptions is a quantitative process, which is explained below in detail. As we have already seen, survival probability is a key parameter in determining the MTM value on a CDS unwinding.

3.5 MODELLING DEFAULT PROBABILITIES

A straightforward approach is using market data, *i.e.*, the on-market CDS spread curve and an assumed recovery rate for delivered obligations.

One-Period Contract

Consider a credit-sensitive asset with notional value as \$1. If p is the probability of default and R is the recovery rate, for a 3-month horizon, the probability weighted payoff is given by

$$\text{Payoff} = \text{notional value} \times [p \times R + (1 - p)]$$

In the case of a default, the payoff on this risky asset is R , and in the case of no default, the payoff is par, *i.e.*, \$1. Therefore, the expected payoff is $(p \times R + (1 - p) \times 1)$. For a 40% recovery rate and a probability of default of 20% for the next 3-month period, according to the previous expression, the payoff can be calculated as

$$\text{Payoff} = \$1 \times 20\% \times 40\% + \$1 \times 80\% = \$0.88$$

So, \$0.88 is the highest price that can be expected from an investor for this asset. This is the breakeven point for the investor on a probability-weighted average. At this point, the investor breaks even on a probability-weighted average. Exhibit 3.3 illustrates the payoff of this simplified credit-sensitive asset while Exhibit 3.4 informally presents the idea.

Considering a slight modification to the problem; say, the investor would like to cover the asset by buying protection as it is a credit-sensitive asset, how much would this cost the investor. If default doesn't occur, there is nothing that the seller of protection has to pay. In case of a default, he has to pay \$0.60 to the investor. Since \$0.40 is the recovery, net of it, the payment is only 60 cents.

For a better understanding, let us say that the investor would like to perform two tasks simultaneously. The first one being to earn 12 cents by selling protection and the other being to lend \$1 which would be repaid back at the end of 3 months. For simplicity, we are assuming that we are operating in a zero interest rate environment. Since he is getting back \$0.12, the net cash outflow is $\$1.00 - \$0.12 = \$0.88$. In the 3 months that both trades last for, if default doesn't occur, the total outflow remains \$1.00. If default occurs, \$0.60 needs to be paid to the buyer of protection or a net amount of

Exhibit 3.3: Simple Credit Sensitive Asset.

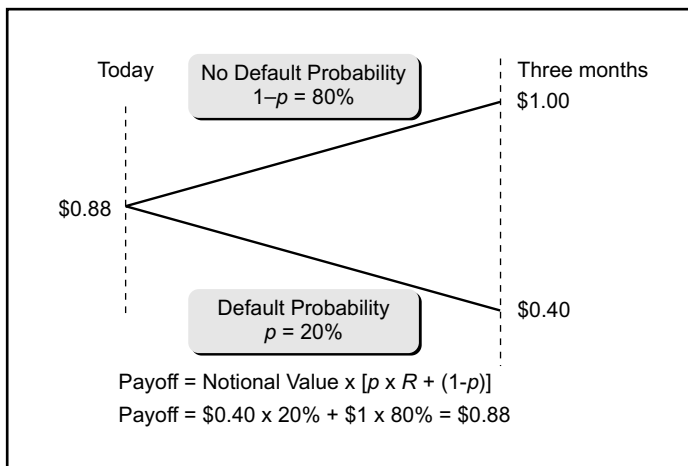
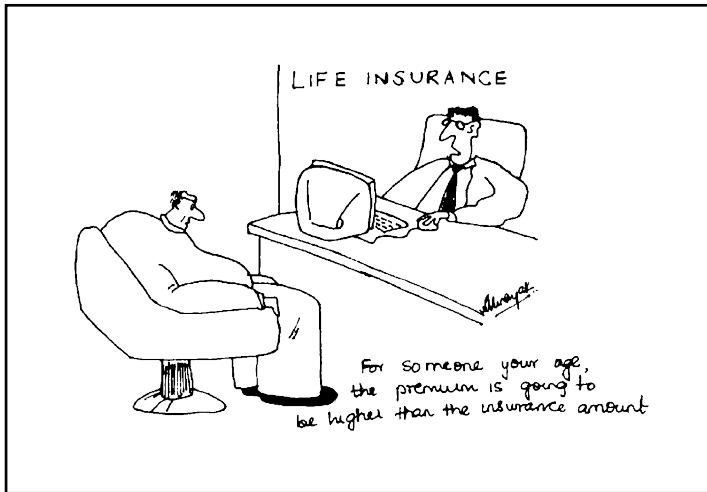


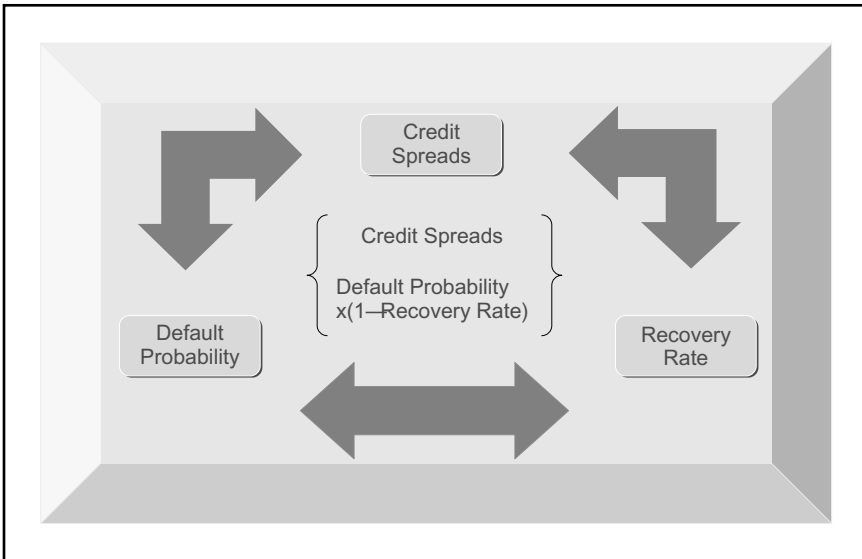
Exhibit 3.4: Pricing an Insurance Contract.



\$0.40 is to be paid. This is same as the case of original credit-sensitive asset contract, where he would get paid back \$1 if default doesn't occur and \$0.40 if default occurs on his \$0.88 that he invested initially.

Now, there are two investments the investors is making, and it is necessary for him not to be biased towards either of the two investments. The investor who has an unbiased nature towards the credit-sensitive asset (the original contract) and the risk-free asset (under the assumption that insurer and borrower do not default) is financially termed as 'Risk-Neutral.' Risk-Neutral credit spread is the 12% that was calculated earlier; it can be approximated as the product of probability of default and loss due to default.

If the cost of insurance was 11 cents and not 12 cents, the net cash outflow for the investor when he sells insurance and buys the risky asset, would be \$0.89. In either of the two cases of default or no default, the investor will earn an arbitrage profit of 1 cent since he will get back his \$1. This easy profit makes everyone follow the same trading strategy and this eventually will drive up the price of insurance to 12 cents. In a similar way, if insurance can be provided for 13 cents, he will again realize a profit of 1 cent since he can sell both the contracts for \$1.01 while he gets back the \$1 at the end of the contract. This definite profit will again lead to many taking part in this type of trade and eventually dragging back the price of insurance to its equilibrium value of 12 cents. Expected loss is \$0.12, which can be arrived at by, $0 \times 80\% + \$0.60 \times 20\%$. The expression for expected loss is, $p \times (1 - R) + (1 - p) \times 0 = p \times (1 - R)$. The same expression also yields risk-neutral spread as described earlier.

Exhibit 3.5: *The Credit Spread Tripod.*

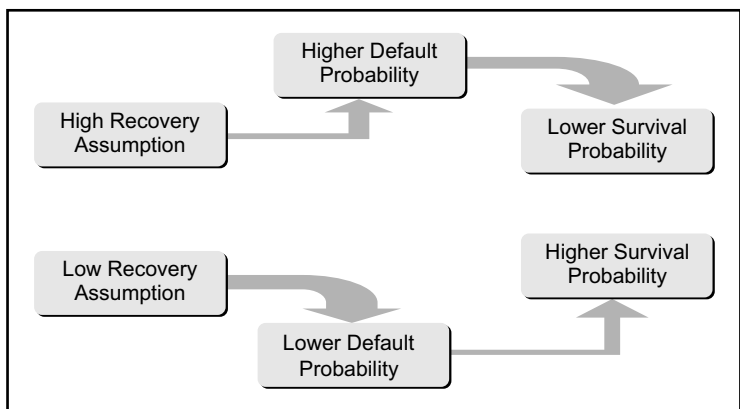
Incidentally, the recovery assumption does not make too much of a difference to the valuation of a CDS. The intuition behind this, depicted in Exhibit 3.5, is that, given the current market CDS spread, it captures the chance of a default and the intensity of default as given by the approximation: $\text{CDS spread} = \text{PD} \times \text{LGD}$, where PD is the probability of default and LGD is the loss given default. Under the assumption that the loss due to default is low, the probability of default becomes high. For instance, if the current CDS spread is 200 bps and the recovery is assumed to be 80%, *i.e.*, LGD of 20%, the chance of a default is 10%. However, if the recovery is assumed to be 20%, *i.e.*, LGD of 80%, the implicit chance of default is 2.5%.

Exhibit 3.6 shows the probabilities of default for various assumptions of recovery rates. It can be said that higher the recovery rate assumed, higher is the probability of default for a given credit spread and *vice versa*.

As pointed out earlier, a CDS contract has two legs of monetary payments---a fixed fee leg and a floating leg. Floating leg being paid only on the occurrence of a credit event. The fee leg does not have much to do with recovery, you have to pay the fee irrespective of the recovery. The recovery assumption affects the survival probabilities. The fixed leg valuation gets affected to the extent that the fee is payable only till the point there is a default. The fixed leg cash flows are, therefore, weighed by survival probabilities to compute their expected value.

In the positive relationships between recovery rate assumptions and probability of default described earlier, it is observed that the nature of

Exhibit 3.6: Recovery Assumption Impact on Implied Survival Probability.



these relationships is not the same for lower and higher recovery rate assumptions. The relationship is linear for low rate assumptions while it is observed to be more convex in nature for high recovery rate assumptions.

It is the floating leg which seems to have a significant link to recovery because the quantum of payment depends on how much is the LGD. If the LGD is less, the protection seller has to pay less. Conversely, if the recovery rate is assumed to be low, the intensity of default is apparently high. However, the floating leg has to pay only when there is a credit event. The expected value of the payment on the floating leg is LGD times probability of default. So, the value of the floating leg is a function of the inten-

Exhibit 3.7: Survival Probability with Time for Varying Recovery Rates.

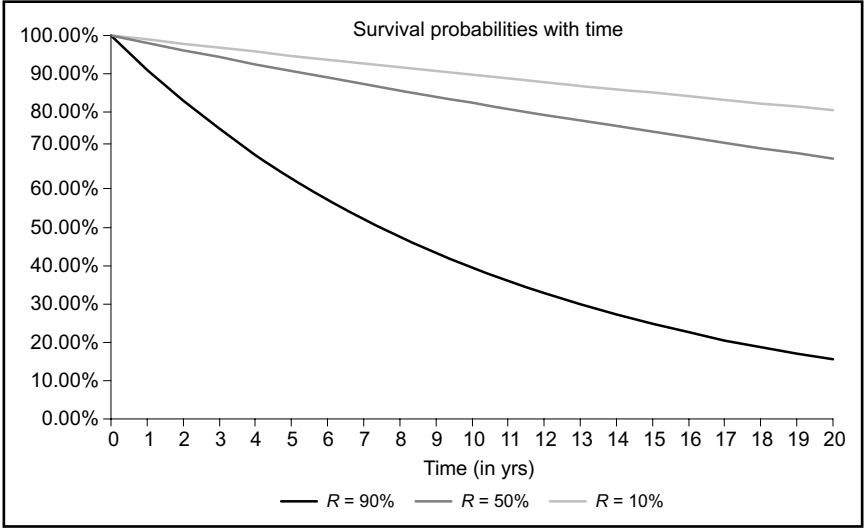
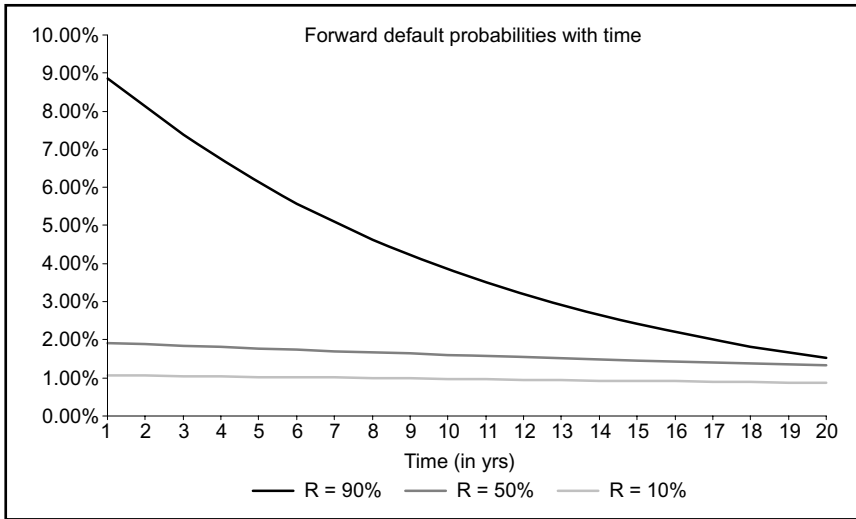


Exhibit 3.8: Forward Default Probability for Varying Recovery Rates.

sity of default and the chance of a default. As we have already discussed, given a CDS spread, if we assume a greater intensity of default, the implicit chance of default reduces and *vice versa*. So, on an expectation basis, the floating leg does not change drastically with the recovery assumption made and, therefore, the CDS MTM remains relatively stable with varying assumptions of the recovery. That's why the ISDA specifies a recovery rate assumption and it is acceptable to the market participants because the recovery assumption does not affect the valuation in a big way.

Exhibit 3.17 shows the relationship between recovery rate assumptions and survival probability while Exhibit 3.8 depicts the relationship between recovery rate assumptions and forward default probabilities. As mentioned earlier, the relationships can be seen to be linear in case of low CDS spread assumptions and exponential for higher CDS spread assumptions.

Multi-period Contract

Cumulative and conditional default probabilities

We can now widen our analysis to that of contracts over multiple periods. If the cumulative default probability for a 3-month period is 8% and that for a 6-month period is 20%, then the conditional probability of default during the 3-month to 6-month period given no default in the first 3 months can be calculated from the equation as follows:

$$20\% = 8\% + (100\% - 8\%) \times p$$

Or $p = 13\%$. The probability of default ' p ' in this case between 3 months and 6 months, given that it has not defaulted till 3 months, is known as the marginal or conditional default probability. If we are given a cumulative set of default probabilities, we can extract the conditional or marginal default probability for any specific period of time. The methodology used is similar to derive the forward interest rates given an interest rate term structure. The forward interest rate and the conditional default probability have similar connotations and are derived using the same process of bootstrapping. We can also extract the forward credit spreads like we derive the forward interest rates.

Therefore, given a term structure of CDS spread, and assuming a recovery rate and by taking into account specifications of the CDS contract as in Exhibit 3.9, the annualized probability of default can be computed.

Calculating the probability of default involves taking into account the various conventions like fee interval, payment of accrual fee on default, day count conventions, bad day adjustments, accrual frequency, stubs, *etc.*, like that in the interest rate markets. There are also certain credit derivatives specific conventions like, does the accrued interest get paid on default, or in a forward-starting CDS, does the contract expire if a default happens between trade date and settlement date. All these aspects are of importance while valuing a CDS and need to be taken into account for an accurate value of the CDS. Exhibit 3.10 and Exhibit 3.11 illustrate the different market conventions for the more actively traded currencies in the credit derivatives market.

3.6 ANOTHER WAY OF CONCEPTUALIZING CDS MARK-TO-MARKET

The MTM value of a CDS is equal to the cost of entering into a trade which offsets the original CDS contract completely. An offsetting trade, for the original trade of selling protection on a reference entity, is to buy protection on the same reference entity and for the same time period.

Consider, for example, an investor who sells at 500 bps for 5 years. Now, if the default swap premium of the reference entity tightens, to say 100 bps, the MTM value would be positive. This would be because the investor's current trade is providing him with a fixed 500 bps cash flow stream, whereas the current market level for protection on the same entity would provide a cash flow of only 100 bps (ignoring bid/offer). On the contrary, if the spread widens to 600 bps, it would result in a negative MTM value for the investor. If the default swap premium widens as com-

Exhibit 3.9: Specifications in Credit Markets Similar to Interest Rate Markets.

Reference Details				Credit Reference Parameters						
Currency	USD			Fee	Pay	Index	Payment	Payment	Recovery	
Trade Date	20-Jun-13			Interval	Accrued		Bad Day	Day Count	Rate	
Days to Spot	1						Convention	Convention	(%)	
Settlement Date	20-Jun-18			Quarterly	FALSE	Quarterly	Following	Act/360	50.00%	

Credit Spreads										
Tenors	1D	1M	2M	3M	4M	5M	6M	9M	1Y	18M 2Y
Bid Spread							98.50	108.50	118.50	128.50 138.50
Mid Spread							100.0	110.0	120.0	130.0 140.0
Ask Spread							101.50	111.50	121.50	131.50 141.50
Clean Spreads	2.005%	2.005%	2.005%	2.005%	2.005%	2.005%	2.005%	2.210%	2.417%	2.624% 2.836%

Exhibit 3.10: Credit Instruments follow Money Market Conventions for a Given Currency.

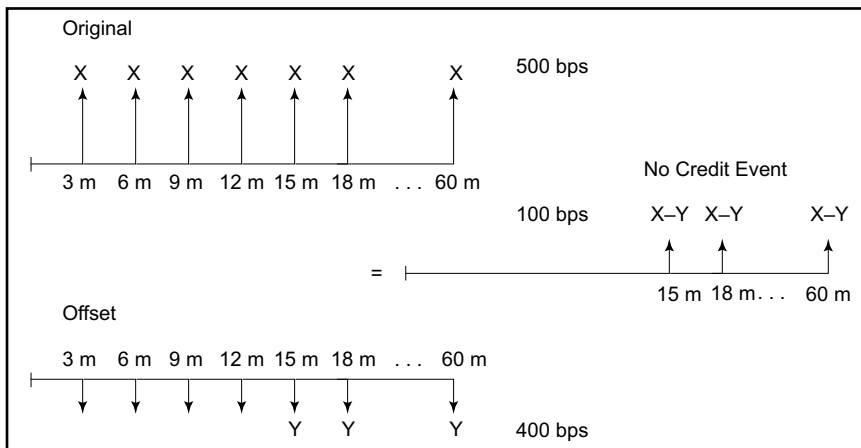
Market Conventions										
CCY	AUD	CAD	CHF	EUR	GBP	HKD	JPY	SGD	USD	
Days2Spot	1	1	1	1	1	1	1	1	1	
Float Cnv	Act/365F	Act/365F	Act/360	Act/360	Act/365F	Act/365F	Act/360	Act/365F	Act/365	
Fixed Cnv	Act/365F	Act/365F	30/360	30/360	Act/365F	Act/365F	Act/365F	Act/365F	Act/365	
MM Basis	365	365	360	360	365	365	360	365	360	
MM Freq	2	4	2	2	2	4	2	2	4	
Swap CPA	2	2	1	1	2	4	2	2	2	
Swap Days	A	A	B	B	A	A	A	A	B	
Swap Basis	365	365	360	360	365	365	365	365	360	
Swap Bad Day Convention	M	M	M	M	M	M	M	M	M	
Holiday	AUD	CAD	CHF	EUR	GBP	HKD	JPY	SGD	USD	

Exhibit 3.11: Trade Specifications.

CDS References		CDS Structure	
CDS Fee	100.00 bp	Pay Accrued Fee on Default	FALSE
Trade Recovery Rate	50.00%	Floating Leg Payment at Maturity	FALSE
Coupon Interval	Quarterly	CDS Fee payment till maturity	FALSE
First Fixing Date	20-Jun-2013		
Next Regular Fixing Date	20-Jun-2013		
Forward Start Date	20-Jun-2013		
Maturity	5 years		
Fee Day Count	ACT/365		
Accrual Bad Day	Modified Following		
Payment Bad Day	Modified Following		

pared to the initial contract premium of 500 bps, the investor is not being compensated enough.

To formalize the MTM values described earlier, we require the resultant cash flows from two offsetting transactions. Consider the previous-mentioned example, where an investor sold 5-year protection at 500 bps. The investor, in the following year, wishes to MTM his position. The important point to notice here is that the fee received in the first year is not taken into account for calculating the MTM value of the new contract, which would effectively be a 4-year contract. For simplicity, assume that the payment dates for both the trades, the original trade and the offsetting trade, coin-

Exhibit 3.12: CDS Cash Flows Due from Buyer and Seller of Protection.

cide as shown in Exhibit 3.12. The investor is long or short the fixed periodic payments to be made until the contract expiry. Discounting of these payments will yield MTM. Suppose the prevailing market premium level for protection on the same reference entity is 400 bps. Then, the investor can be thought to be long a 100-bps annuity for 4 years. This is the annuity, which, after discounting, would give the MTM value of the original default swap.

3.7 VALUING RISKY CASH FLOWS

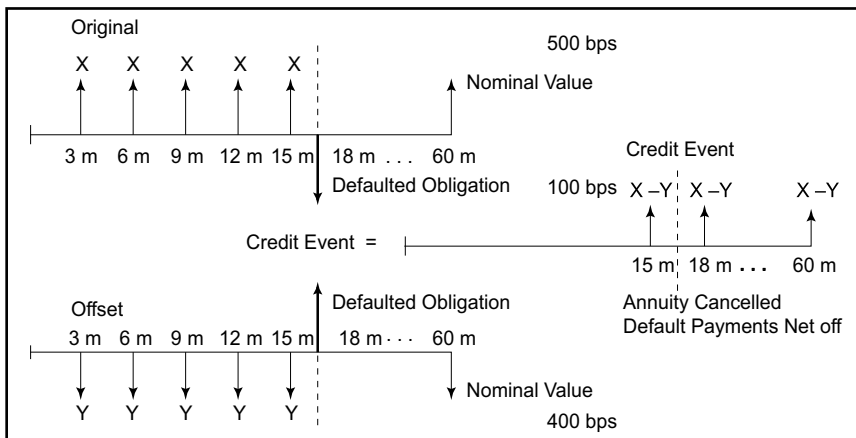
The problem with the previous computational exercise is that it does not take into account the riskiness of the annuity stream. The risk of the annuity stream is not considered, which inherently is not risk-free and it would differ in cases of a default and no default. In the case of a default, the annuity would discontinue, which would leave the investor flat as the short and long positions would cancel each other out. The carry expected and actually earned by the investor would differ. Exhibit 3.13 shows the case where a credit event terminates the annuity before its maturity.

Survival Probabilities as Weighting Factors

To account for the default risk or the risk of a credit event occurring, annuity cash flow streams need to be 'probabilistically' weighted, with survival probabilities acting as the weights. Survival probability is the opposite of a credit event happening. Algebraically,

$$\text{Survival Probability} = 1 - \text{Probability of Credit Event}$$

Exhibit 3.13: Credit Event Terminates Annuity of Fee Leg.



Using these survival probabilities as weights, the MTM on the existing default swap position can now be defined as

$$\text{MTM} = \sum_{i=1}^N (\text{Current CDS} - \text{Contract CDS}) \times SP_i \times DF_i$$

Where,

N is the number of coupon periods

Current CDS is the CDS spread currently prevailing in the market

Contract CDS is the CDS spread at which the trade was entered

DF_i is the riskless discount factor from time t_0 to t_i

SP_i is the survival probability of the reference entity from time t_0 to t_i

Introducing survival probabilities (between 0% and 100%) reduces the volatility in the MTM value, *i.e.*, the absolute value of MTM falls. This implies a decrease in the range of extreme values due to the presence of a smaller gain from the unwinding of a profitable CDS position and a smaller loss because of an unprofitable position. Reason behind this being the choice of factors for discounting. Discounting is done by a factor represented by, survival probability \times risk-free discount factor.

3.8 DETERMINING RECOVERY RATES

The CDS market provides only one input, *i.e.*, the current market spread, and investors have to deal with two unknowns: default probability (p) and recovery rate (R). The typical way to do an MTM is by assuming a recovery rate. We now try to understand this unknown and how it differs for a CDS from the cash market.

For bonds, the recovery rate, in addition to the percentage of par claim recovered, is a function of the time taken for the recovery to be settled as well as the seniority of the obligation. Secured bank loans and senior secured loans typically have much higher recovery rates in comparison to other debt securities. The recovery at the date of default depends upon the actual recovery after default discounted by the time taken for the recovery to be realized. The delay in recovery could be due to a number of reasons including legal constraints and valuation complications. Rating agencies usually formulate recovery rate assumptions on the basis of the trading price of the defaulted entity. This assumption is valid only if the investors can liquidate their positions immediately.

In the case of default swaps, however, recovery rate is the prevailing market price (after credit event) of the deliverable mentioned in the CDS contract. For CDS markets, rating agencies might provide good proxies for recovery rates, but there are reasons as to why the recovery rates may

not be identical. Though 'Default' and 'Credit Event' are employed synonymously, rating agencies' use of 'default' may sometimes contain stricter rules and hence serve as a more severe test than certain credit events. Rating agencies classify defaults into three categories for operational ease:

- Failure in payment of interest or principal on the specified date
- Bankruptcy or receivership
- An exchange with a sole purpose of escaping default or one that leaves investors with a lessened financial obligation

In addition, 'soft' credit events like restructuring and obligation acceleration are also sometimes considered for rating purposes. Expected recovery following such 'soft' restructuring credit events may be significantly higher when compared to recovery for an event such as liquidation. Protection sellers anyway have the risk of CTD to take care of in the case of a default.

So, when a recovery assumption is made for valuing a CDS, all of these need to be considered. Looking at it from another perspective, the recovery rate assumption captures all the information mentioned previously and hence may be significantly different from what has been historically observed for bonds. This is one of those cases where history may not be a good proxy for the future.

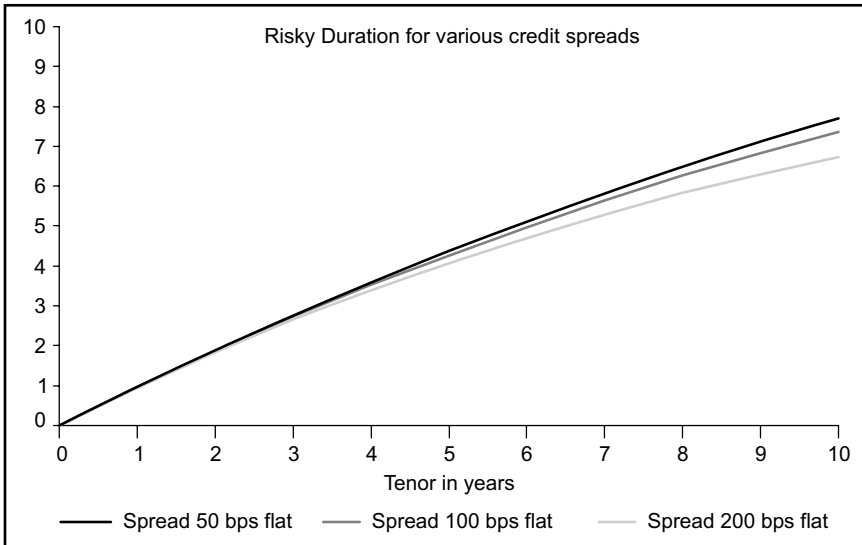
3.9 RISKY DURATION APPROACH TO MARK-TO-MARKET

The risky duration is the change in the MTM value of a CDS for 1 bp change in spread. For example, consider a protection seller who enters into a 5-year contract at a spread of 100 bps for a notional of \$100 million. If spread changes to 101 bps the next moment after the trade is consummated, the MTM gain for the protection seller would be

$$\begin{aligned} & \text{Risky Duration} \times \text{Spread Change} \times \text{Notional} \\ & = 4.0663 \times 0.01\% \times \$100 \text{ million} = \$406630 \end{aligned}$$

Intuitively, the protection seller is paying 1 bp less for effectively 5 years. Because this 1 bp gain is risky, on a risk-adjusted and discounted basis, the protection seller is gaining 1 bp for 4.06 years. The MTM gain is 4.0663 bps on a notional of \$100 million which comes to an amount of \$40663.

Exhibit 3.14 illustrates the sensitivity of the MTM values as measured by the metric of duration. It is evaluated for various tenors of CDS on the basis of varying recovery rates.

Exhibit 3.14: Risky Duration for Different Credit Spreads.

3.10 EXAMPLE: UNWINDING CDS

A Caselet

Bank XYZ has an existing CDS position and it wants to unwind the trade. Below are the options that can be taken to unwind an existing position:

- The broker can be asked to terminate the contract in which case the bank would receive/pay the MTM value.
- A new party can be roped into the contract, on the consent of all the three parties involved, to do the necessary transaction, pay/receive the MTM value.
- The bank itself can enter into another trade which would offset the original trade.

The bank is no more a party in the contract in the first two options. In the third, the bank is a party in two contracts, the original and the offsetting contract. The MTM value that needs to be paid or received accordingly is same for all the cases assuming no difference in quoted CDS levels (Exhibit 3.15).

Assume Bank A chooses option 1. The trade mechanics are as follows:

If the CDS spread widens by 30 bps and the bank chooses to go with the first option, the MTM value would be the equivalent of the Bank XYZ selling protection for a duration of 4 years on ABC Corp at 30 bps on a notional amount of \$100 million to Broker LMN. This is the same as taking a

Exhibit 3.15: Caselet: Unwinding CDS.

Existing Trade Details	
Investor	Bank XYZ
Counterparty	Dealer LMN
Trade Initiation Date	2013
Trade Type	Bank XYZ buys 5-year default protection
Reference Entity	ABC Corp
Reference Obligation	ABCO 6% June-2023, rated Baa2/BBB (Senior Debt)
Trade Currency	USD
Notional	\$100 million
Premium	1.00% Bank XYZ pays broker/dealer
Payment Frequency & Day Count	Quarterly in arrears, Act/360
Unwind Details	
Trade Unwind Date	2014
MTM Value	Positive

long position on a 30 bps risky annuity stream until maturity. The 4-year trade in this case has a risky duration of 3.52, *i.e.*, a PV01 of \$3 52 000.

A 30 bps risky annuity stream has an MTM value of \$1 05 60 000 ($30 \times \$3\,52\,000$).

3.11 MARK-TO-MARKET DIFFERENCES BETWEEN BONDS AND CDS

We saw how a representative unwinding MTM would be computed. It is pertinent to remember that in case a CDS trade is entered as a hedge for a bond exposure, the resultant MTM will characteristically be dissimilar from that of an equivalent bond unwinding in the cash market. With a change in spread, the loss or gain on the CDS will not be same as that on the asset swap. Overall, this difference in MTM valuation is due to the fact that the CDS has a lower risky duration. To understand this better, let us consider an example. Consider an asset swap trade worth an amount \$X of an n -year bond which swaps to LIBOR with a spread of plus 100 bps. The same investor also sells protection worth the same amount \$X for a

CDS spread of 100 bps. Now, say, the spread widens by 30 bps, the loss on the CDS trade would be lower than the loss on the asset swap trade. The converse is also true, *i.e.*, in the event that the spread tightens by 30 bps instead of widening, the MTM value on the bond would be higher than that of the CDS. As stated earlier, the risky duration of the CDS is lower than that of the asset swap and hence the difference in the MTM valuation.

CHAPTER 4

CDS INVESTOR STRATEGIES

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4.1 SYNOPSIS

Business in credit markets is no more limited to long or short trading strategies, but has expanded into a wide range of strategies that are based on CDS deployed in asset classes such as equities and convertible bonds, among others. They are being used in an extensive variety of trades where one needs to hedge the embedded credit risk. It is the diversity that CDS offers in transferring risk that has made it one of the most used financial instruments in recent times. We will discuss some of the more common investor strategies in this chapter.

4.2 INVESTOR STRATEGIES

In the previous chapters, we looked at the credit derivatives market more from a protection buyer's perspective. Protection sellers are usually investors looking for enhanced yield and are equally important for the market to thrive and develop. We now discuss some of the investor strategies that make use of CDS. The most simple investment product using a CDS is a credit-linked note (CLN) which, by and large, is used by corporates, insurers and pension funds. We will later look at how some of the advanced users in the market like the hedge funds use CDS for relative-value trades to hedge unwanted risks. Generally, hedge funds use CDS for a wide variety of relative-value trades. Some of the more common ones are described later in the chapter so as to get a sense of the extensive range of applications. A word of caution: the latter half of this chapter is a little involved and readers may skip it if they wish so, without affecting the continuity in understanding the subsequent chapters.

4.3 CREDIT-LINKED NOTES

Structure

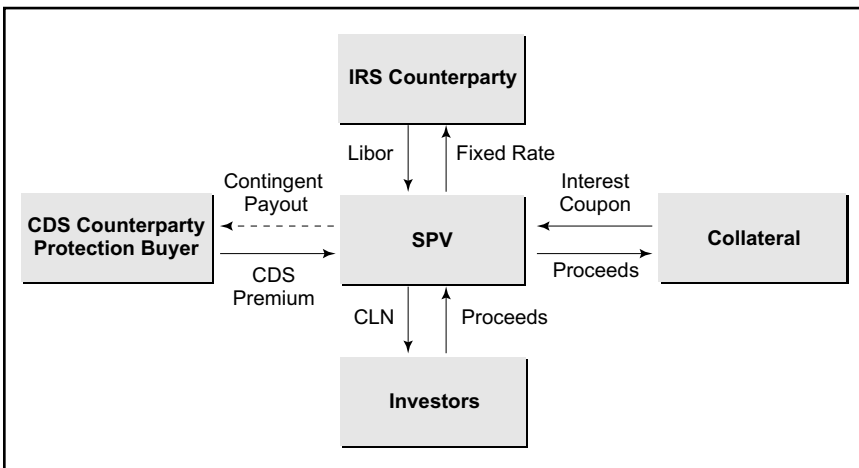
The CLNs are instruments structured such that their payoff depends upon the performance of the underlying reference entity. In a CLN, a CDS is embedded with a debt security. The holders are typically provided a higher yield through synthetic credit exposures. The CLNs are fully funded instruments and usually appear on balance sheets as compared to other derivatives which are almost always off-balance sheet exposures. These instruments can be issued directly by the financial institutions or through a Special Purpose Vehicle (SPV). An SPV is a subsidiary entity, corporation or trust formed by the institution to actively participate in derivatives trades and act as counterparty to default swaps and other credit instruments. These SPVs are collateralized and usually backed by AAA-rated securities.

Structured by packaging CDS in a funded form by issuing them from an SPV, CLNs engineer synthetic exposure to credits for the investors as shown in Exhibit 4.1. The SPV uses the issuance proceeds from the note to finance the purchase of the pre-determined collateral security. At the same time, the SPV also enters into a CDS by selling protection. The counterparty, usually a dealer or an institution, is typically a highly rated entity.

As shown earlier, a CLN can be decomposed into three parts:

- SPV
- Collateral
- CDS

Exhibit 4.1: Structure of a Typical CLN.



If required, the SPV might do a swap to minimize exposure to interest rate changes by hedging with a swap on interest rates. The SPV can also minimize the currency risk by doing a cross-currency swap. This will also modify the cash flows and can be customized as per the SPV's requirements. If we take an example, we would see that a swap constituent might be required in case the collateral cash flows have a fixed coupon payment because CLN cash flows are usually uncertain because they pay a floating interest rate such as Libor plus a spread. At the inception of the trade, the interest rate swap is structured such that it has a net present value of zero. However, if markets move, the interest rate or cross-currency swap could go in or out of money.

Enhanced Coupon

As mentioned earlier, the MTM of CLN is highly correlated to the credit risk of the reference entity. The coupon linked to the CLN could either be a pre-determined fixed-rate coupon or a floating rate coupon and has two components—default premium earned from the CDS trade with the swap counterparty, and the funding element from the collateral. This coupon payment continues till the end of the trade or till a credit event happens in the underlying reference entity during the life of the trade.

Credit Event

When a credit event occurs before the CDS agreement attains maturity then, provided there was a physical settlement clause, the delivery is done to the SPV by the protection buyer of the required qualifying obligation with notional amount equal to that of the CLN. In response, the obligation is transferred by the SPV to make up for any coupon payments that may happen in future, apart from the payment of principal, if any. The collateral is then liquidated and the proceeds constitute the par redemption made to the swap counterparty by the SPV as dictated by the rules and regulations of the contract. The issuer can redeem the CLN at 0% and the accrued CLN coupon is generated by the interest that has got accrued on the collateral, or if there is a swap premium. This coupon that has got accrued on the CLN is received by the investor. Similarly, if the collateral security is valued above par, *i.e.*, it exceeds its par value during the credit event, then the investor will receive this excess market value as well. And if the collateral's market value is below par, or less than 100%, when the credit event happened, then the amount of defaulted deliverable obligations is reduced by the default swap counterparty by

the same amount as the value reduced. There might be situations where the market value of the collateral experiences a considerable shortfall. In these cases, it may happen that the withheld obligations exceed deliverable obligations. The investor would then receive nothing and a loss is experienced by the default swap counterparty. The important thing to note is that the maximum loss possible to the investor is the notional of the CLN.

Credit Exposure of the Investor

In CLN transactions, the collateral, usually, is highly rated and so is the swap counterparty. This considerably reduces the credit risk linked to the collateral as well as the counterparty risk linked to the protection buyer. The investor is still, however, exposed to the credit risk of the reference entity and the interest rate/currency risk as well, if applicable.

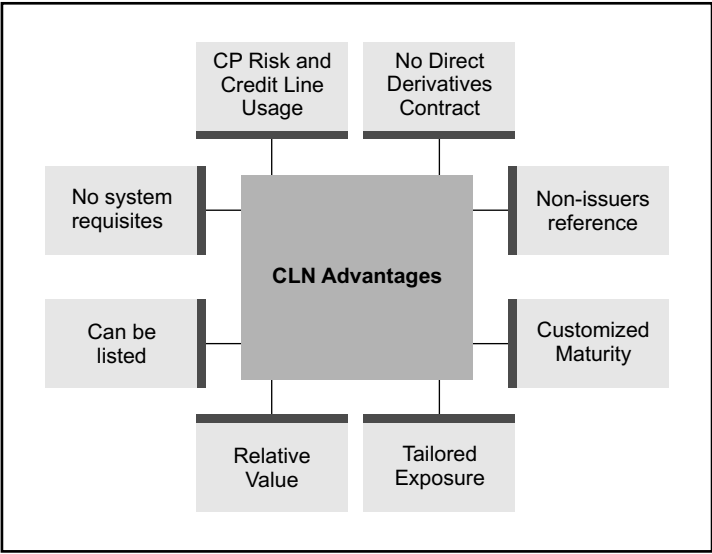
Advantages of CLN

The CLNs offer considerable advantages to the investors seeking personalized trades. The CLNs are a very effective method in gaining compartmentalized exposure to credits and greater leverage to credit risk. Maturities and coupon structures can be customized according to the client needs. For example, a maturity can be synthetically structured which is different from existing debt issues. There are some investors who are allowed to take credit exposure for longer maturities than the bond issues that are available and therefore, such investors can take exposure through CLNs to extend the tenor of the credit exposure.

These instruments also give investors potential arbitrage opportunities as there might be pricing anomalies between cash and credit markets. In addition, CLNs can be helpful in constructing a diversified portfolio by using credits that have not been issued in the bond market. Another distinctive feature of CLNs is that the counterparty credit limits related to the sale of protection is not restricted. It is applicable to investors having a lower rating as well as investors highly correlated to the reference entity.

Besides these, CLNs are listed and transferable just like other bond issues. The CLNs also reduce the direct risk exposure as the interest rate swaps and credit default swaps (CDSs) are embedded in their structure and thus, the investor need not enter into these contracts as a direct counterparty. The CLNs are funded instruments and hence, selling protection through these does not require the infrastructure and pricing systems required for default swap trading (Exhibit 4.2).

Exhibit 4.2: Advantages of CLN.

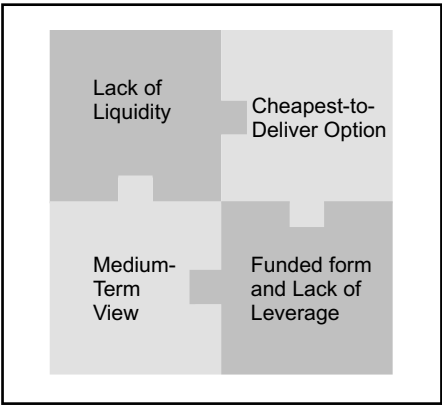


Disadvantages of CLN

The problem of the CTD option is prevalent in CLN issues as well. If the contract has a physical settlement and a credit event occurs to the underlying reference credit, physical settlement of the defaulted swap contract will most likely include the cheapest bond ranking *pari-passu* with the deliverable obligation (Exhibit 4.3).

In comparison to corporate bond issues, the CLN issues are quite small and do not include plain vanilla structures. Thus, although they can be

Exhibit 4.3: Disadvantages of CLN.



freely transferred, they are less liquid than corporate bond issues. In addition, fixed costs like legal costs involved in forming an SPV and other administrative aspects of a CLN make them a viable option for investors with a medium-term outlook. These costs are independent of the notional size of the note and hence are reflected in the pricing of the issue. This makes the short-term horizon for CLNs less practical. Also, since a CLN is issued in a funded form, there is an initial capital requirement. Moreover, there is no leverage available unlike in a first-to-default note (discussed in the next chapter).

Selection of Collateral for CLN

The collateral has two-fold purpose:

- It provides a return, which acts as some kind of a floor to the CLN investor.
- It accomplishes the task of a collateral and provides security for the swap counterparty in the event of a default.

Understandably, the pre-agreed collateral should be accepted by both the parties to the transaction. The collateral options might include obligations that have been issued by the counterparty that is providing the interest rate swap transaction. It may also include an ABS paper which is highly rated such as AAA. The ABS paper generally provides yield over Libor, *i.e.*, the yield at which the trade is normally higher than Libor. However, the government debt instruments, be it AAA rated or AA+ rated, typically have a yield that is less than Libor. Therefore, normally the collateral that is used is asset-backed security (ABS) paper instead of government debt. The collateral security needs to be determined so that the joint probability of the reference entity default and the collateral security is minimum.

Special Purpose Vehicles

An SPV is a company in most jurisdictions including in India (or a trust, as in the United States). The principal motivation behind creating an SPV is to facilitate certain transactions so as to issue debt that is customizable to a specific payoff profile which suits investors. Every SPV issue is collateralized separately and is assigned as a recourse only to a defined pool of assets. Thus, while the same vehicle can issue multiple notes and hence enter into multiple trades, no two issues affect each other. To ensure that the interests and requirements of all parties to the SPV are respected, an independent trustee is appointed to oversee these deliberations. The SPV

could be located in many jurisdictions that provide tax benefits, and the issued CLN could be given a rating and/or listed, as required.

4.4 SOPHISTICATED CDS STRATEGIES

We now focus on the more advanced strategies involving CDS.

Protected Bond Packages

The protected bond packages, as the name suggests, are issues in which an investor invests in a security and protection at the same time. Typically, an investor buys a bond and at the same time buys credit protection on the same bond till maturity. Exhibit 4.4 lists the CDS Bond basis in the Indian CDS market. The investors usually prefer two particular types of protected bond packages:

- negative basis
- small positive basis

Before investing in these protected packages, a number of factors are considered to determine the relative attractiveness of these packages as detailed further.

Carry

The most attractive protected bond packages are those with a negative basis trade because a positive carry is generated by them. In negative basis trade, a long position is taken in the bond market and a short position in the protection market simultaneously. This means that the investor buys the bond as well as goes long on protection through CDS on the bond on the same reference credit but at a narrower spread than that provided

Exhibit 4.4: *CDS Bond Basis in the Indian CDS Market.*

Date	Sector	1-Year	2-Year	5-Year	10-Year
31 July 2012	BANKS	-26.9448	-16.1921	7.3648	27.0506
31 July 2012	PSU & FIs	-34.9998	-16.7153	19.4967	36.8544
31 July 2012	NBFCs	-49.8870	-63.8730	-27.3525	-17.5938
31 July 2012	CORPORATES	-36.8723	-7.1654	14.8950	30.1162
31 July 2012	TOTAL	-36.4506	-21.6860	9.3608	25.4145

by the underlying bond's asset swap, and therefore creating a negative CDS basis. These packages are funded transactions for the entire life of the trade, provided the investors can fund at Libor. However, the carry in itself is not broad enough to attract investors, as the cost of funding is generally more than Libor, apart from taking care of the related administrative costs related to middle and back office.

Volatility

These trades have a USP that they offer 'free' (or very cheap) access to volatility in the credit markets while limiting the downside from credit. The bond market and the protection markets are run by constantly changing flows created by buying and selling. This makes the basis a highly volatile variable. This inherent volatility may reflect in the technically driven market attitude by hinting at market movements like convertible bond issuance or fundamental credit transactions like banks going long protection to hedge against risks on loan transactions.

A negative basis trade gives investors the opportunity to grab the benefit of this volatility and profit by unwinding both the legs of the trade if the basis changes significantly from a negative value to a high positive value. The opportunities are readily prevalent when high-quality bonds are involved, as they trade at a tighter spread in the credit market. And as the spread widens, the basis becomes positive.

Besides this, packages with a small positive basis trade that have shown high volatility in the past are also attractive investments for those who believe that historical basis volatility is a good indicator of the possible future range of trade.

Moderately Bearish

Protected bond packages yield the highest profit during bearish situations. The basis ascends towards becoming strongly positive as the spread widens. When the credits deteriorate by a significant amount, there may be market makers willing to buy the bond but liquidity in market makers offering to sell protection can decrease substantively. Consequently, selling protection or being long protection can prove to be a majorly profit-making stance.

The definition of credit events is much broader than the events of default. This leads to a positive bias for the protection buyer who is also the beneficiary of the CTD option in case of physical settlement of the defaulted swap.

Bond Documentation

The CTD option is of considerable importance in a physical settlement though it is not too valuable in the case of an auction with the hardwiring of the auction process after the CDS big bang and therefore a credit event would not entail a CTD. Price performance of credits, following a credit deterioration or corporate restructuring, could be divergent and depends on the different covenant languages between individual bond issues. As a result, a long stance with robust covenants along with credit protection could be beneficial.

Documented protection might be in the form of rating-triggered coupon step-up language. In a rating-triggered coupon step-up language, a credit rating decline will improve the carry in the trade. This strategy could be particularly attractive for negative basis trades. Analogously, many bond issues also have a corresponding step-down language following a credit upgrade, which turns around the previous-mentioned impact. These languages are most beneficial on credits with a negative trend.

Price of Bond

Trades with a negative basis are particularly favorable in cases where the bonds are purchased at low prices. Default swap contracts provide protection on credit for the par value claim of the credit and hence the exposure to potential loss will remain capped at the bonds' purchase price. Conversely, when the bond is trading above par, or at a premium, there is a certain amount of exposure on the principal.

Unwind Profits or Losses

The change in profit and loss for a given spread change in the default swap may not necessarily be equal to that of the cash bond swapped. Suppose the spread widens equally for two transactions---a long 5-year asset swap and an equivalent long 5-year credit protection position. Then, the change in asset swap position would be greater than the change in the CDS position. More specifically, the loss on the MTM of the asset swap would be higher than the gain on MTM on the CDS. This happens because going long protection is a positive gamma position which reflects in the annuity stream of the fee paying leg surviving, where the long protection position has been taken at a tighter spread and the short protection has been sold at a wider spread. And though the investor has a positive annuity of the fee leg for the outstanding life of the contract, the chance of a credit event and

hence the termination of the annuity of fee leg is higher at wider spreads than at tighter spreads.

Additionally, unwinding a protection contract also assumes a below-par recovery rate. Typically, a 40% recovery is assumed as per the ISDA recommendations for senior obligations which are unsecured. For recovery assumptions higher than 40%, the range of profit and loss would be lower and for assumptions of recovery higher than 40%, the profitability and loss on the CDS when unwound would be greater. Hence, it is not feasible to calculate the net present value of a negative basis trade by just discounting the positive carry for the lifetime of the transaction.

4.5 INVERTED CURVE TRADES

Curve Inversion

Expected recovery values are an important factor in determining the outlook for prospective bond trades. On deterioration of issuer's credit quality, the bond trading takes place on price-basis instead of spread-basis. This leads to an inverted spread curve of the issuers. An inverted spread curve means that the yield on bonds with shorter maturity is higher than the yield on bonds that take a longer time to mature. When hedgers and bears buy protection in an aggressive manner through the shorter-dated contracts, then inversion of default swap curve takes place. The probability of this is directly proportional to the market's perceived probability of a credit event occurring in the near future. There are cases when the default swap curve gets inverted to a larger extent than the cash market curve. This happens because investors who go long protection do not own the security trading at a discount.

The inversion of the default swap curve provides investors the opportunity to shorten the maturity period and improve yield. The investor can also benefit if the spread between default swap markets and cash market tightens at that portion of the curve which is shorter-dated. Shorter-dated default swap premiums also tend to exhibit more volatility.

Investor Opportunities from Curve Inversion

Investors who have a bearish outlook on a particular credit but do not expect default during the early period of the contract may find curve inversion very beneficial by giving them the option to purchase forward

protection at reduced levels. To achieve forward protection, longer-dated protection should be bought and shorter-dated protection should be sold simultaneously. Thus, when shorter-dated protection is sold at wider spread, the overall cost of protection is reduced. In case of such an event, the investor's CDS positions during the shorter term are offset and the investor receives a positive carry.

The example that follows illustrates this with regard to a conjectural credit: an investor goes long protection for 5 years at 300 bps and goes short protection for 1 year at 500 bps, thereby having a positive carry of 200 bps in year 1. This is the same as going long 4-year protection 1-year forward for 241 bps. The outcomes that are possible for this strategy are as follows:

- Credit event in year 1: The investor gets positive carry on being hedged until the credit event occurs.
- Credit event between year 1 and year 5: This outcome is desirable for an investor since he gets positive carry in the first year and receives long protection thereafter. The best result for the investor is occurrence of the credit event after year 1, *i.e.*, when the investor gets full positive carry in the first year without making any payment.
- There is no credit event in the entire 5 years: This event is possibly the worst outcome. However, the cost of protection is subsidized in this event by the carry in year 1.

4.6 SUB-VERSUS-SENIOR CDS STRATEGIES

Protection Levels and Recovery Expectations

Subordinated debts usually trade wider than unsubordinated debts across all the debts instruments. The differentials in their yields vary considerably and these spread variations reflect different valuation methods of default risk or the expected recovery after default.

In default swap markets, the valuation methods are different from those in the cash markets. The probability of default of unsubordinated and subordinated contracts is identical. This is because the same obligatory definition is applicable to all the contracts unless mentioned otherwise. The conventional market way is identification of obligation wherein credit event takes place as 'borrowed money.' This convention does not distinguish on the basis of seniority of claim. Thus, the differential between unsubordinated and subordinated trades in CDS contracts is driven primarily by expect-

ed recovery values following default of the reference entity. Numerically, when the unsubordinated spreads are half of the subordinated spreads, the expected unsubordinated loss after default is calculated as half of the subordinated loss. More specifically, an 80% unsubordinated recovery or 30% unsubordinated loss implies a 60% subordinated recovery or 60% subordinated loss, respectively. Default protection spreads change as expected default changes. Any alteration in the sub-to-senior default premium ratio will change the expected recovery value assumptions. Consider, for example, a drop in the sub-to-senior default premium from 2.0x to 1.5x will imply that expected relative recovery value of subordinated debt has improved. An 80% unsubordinated recovery expectation, or 20% unsubordinated loss, now implies a subordinated recovery rate of 70%, or 30% loss, expectation, respectively. Subordinated recovery will remain strictly positive as long as unsubordinated recovery expectations are above 33%.

Banks and Insurance Companies

An active credit derivatives market exists for major global and European banks on unsubordinated as well as subordinated levels. The default swap spread levels for the banking sector remain largely volatile. This, however, does not affect the average sub-to-senior ratio, which remains relatively steady for the sector as a whole. The relative recovery value assumptions made by the market also remain largely unchanged. In the past, insurance company credits were not particularly active in the default swap market, while banks were trading at higher multiples than insurance sector, especially in the case of subordinated trades. Through these trade levels, the market typically supported less difference between unsubordinated and subordinated recovery rate assumptions for insurance companies than in banking institutions.

Cash Flow Neutral Trading Strategies

A good method to bring about change in sub-to-senior ratios is by taking flat-carry offsetting positions in both protections, unsubordinated and subordinated. For example, when sub-to-senior ratio is higher than peers or historical averages, a possible tactic is selling the subordinated protection and then buying the unsubordinated protection such that it is proportionate to the sub-to-senior ratio. This strategy offers a chance to profit when the sub-to-senior ratio 'normalizes' to historical averages or peer group levels. In occurrence of such an event, the payoffs will reflect the actual relative recoveries in subordinated and unsubordinated debts.

When the sub-to-senior ratio is lesser than the expectations, based on previously collected data or peer group comparisons, a likely tactic would be buying subordinated protection and selling a greater notional amount of unsubordinated protection in an amount which is multiple of the sub-to-senior ratio.

4.7 CONVERTIBLE BOND HEDGING WITH CDS

We now try to understand one of the more exotic applications commonly used by hedge funds. Exhibit 4.5 to Exhibit 4.8 in this section provide

Exhibit 4.5: Convertible Bonds Background and Description.

Sell shares at a premium	A convertible bond is usually priced at a premium to prevailing market price
Low-cost financing	Coupon/yield of a convertible bond is usually below cost of straight debt
Broaden investor base	Convertible bond investors are a unique pool of investors different from conventional equity investors
Difficult market conditions	When equity markets are volatile and new issue environment is unfavorable, convertible bond investors may still be available
Send a bullish signal	A convertible bond offering conveys management's bullish view on the stock; better market making and enhanced investor awareness can drive share price appreciation
Structural flexibility	Convertible bonds can be structured to meet specific objectives
Foreign currency risk	Exposure to devaluation of local currency on the coupon payment and redemption amount if bonds are not converted
Currency market regulations	It can often be uneconomical and/or unviable to hedge foreign currency risk due to currency market regulations and/or availability of hedging instruments
Cash flow commitment	Annual cash coupon typically exceeds ordinary share dividend
Potential dilution	A convertible bond offering can result in a cheaper equity if share price performs strongly in future

Exhibit 4.6: *Convertible Bond Sensitivity.*

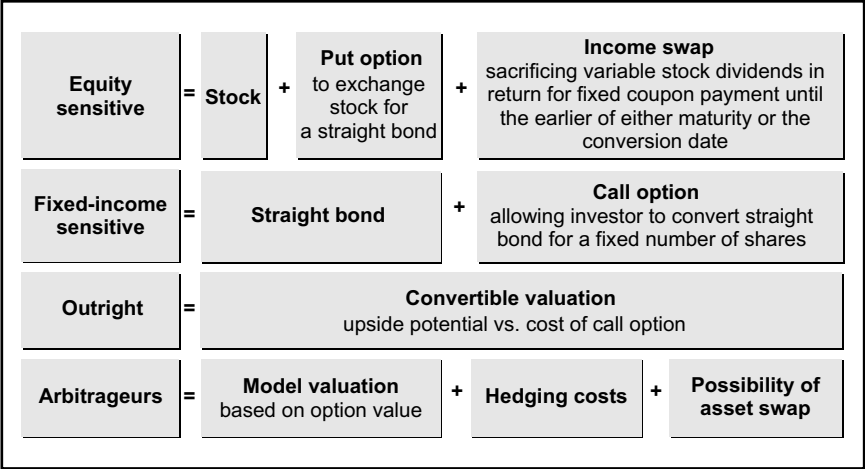
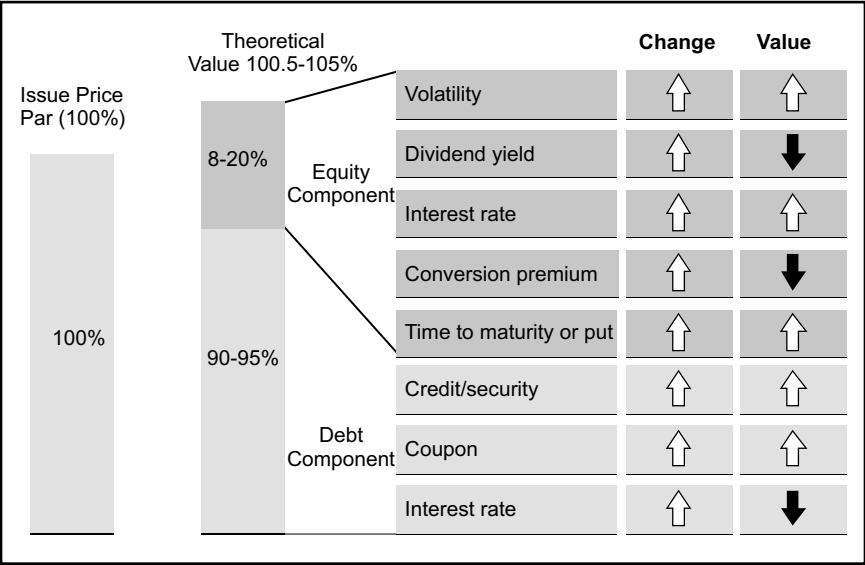
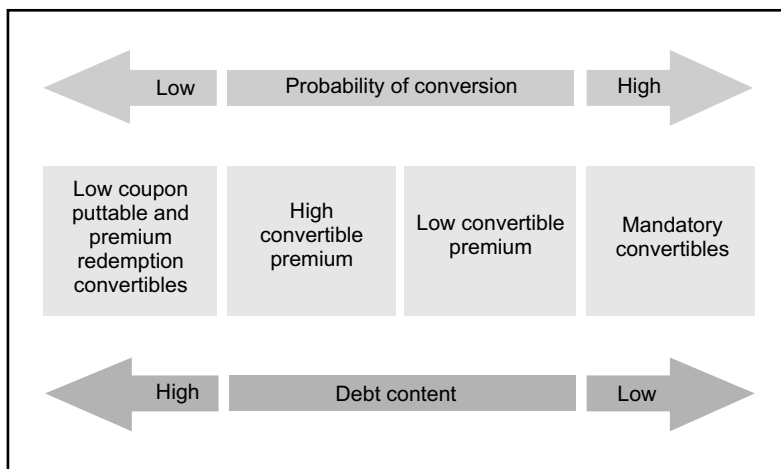


Exhibit 4.7: *Impact of Key Variables on Convertible Bond Pricing.*



description of convertible bonds so that the strategy can be easily understood.

Convertible bonds come bundled with various risks including interest rate risk, issuer credit risk, equity risk and currency risk. Consequently, efficient convertible bond hedging can prove to be an effective way to segregate wanted risks from the unwanted ones. Proficient and skilful hedging can lead to great profits. Additionally, the presence of hedgers affects all

Exhibit 4.8: Convertible Bond Structure, Pricing and Probability of Conversion.

convertible security instruments' valuations and market dynamics, which has an impact on all the investors in the market.

Return Profile

Before exploring the reasons for a convertible hedger utilizing the CDS market, let us first understand expected convertible bond price behavior and the concept behind delta hedging, the most elementary form of convertible hedging. We now understand convertible bond behavior, of vanilla convertible that redeems in the form of cash at the time of maturity, *i.e.*, not mandatory or of an exotic nature. When the price of the share and the parity of the instrument decline, fixed-income properties cloud the equity market valuations. Typically, then, the price of the instrument is shouldered by the 'bond floor' or the investment value of the bond. This means that the price of the instrument is equal to what it would have been without the equity option. If the share price continues to plummet and approaches zero, the bond floor will most likely fall apart. Contrary to this, if the share price surges, the issue become more equity-sensitive.

Delta Hedging

Delta hedging is one of the easiest approaches to convertible bond hedging. The objective behind the delta hedging approach is to minimize equity market risk. The delta hedging method provides hedged investors with the opportunity to increase valuations without any exposure to fluc-

tuating stock prices. And though commonly misunderstood, hedgers are concerned with the movement of the hedge; the direction of movement is immaterial.

In delta hedging, the hedger partakes in borrowing shares and shorting equity against the long convertible position. Number of shares to be sold short = (Conversion Ratio) \times (Number of Bonds held) \times (Parity Delta); where parity delta is equal to change in number of points of the theoretical value for a one unit change in parity. When expressed as a percentage, the conversion ratio is defined as the number of shares into which conversion of each bond is acceptable.

As an example, consider a convertible bond with a conversion ratio of 100 shares and a parity delta of 0.20 or 20%. Then, for each bond held on a natural hedge, the hedge will simultaneously borrow and short sell 20 shares. Sometimes, the hedger has a definitive idea of how the underlying shares will perform in the future or the hedger believes that the actual parity delta is different from the one generated by the model. The hedger can then take advantage of this insight and decide to sell more shares (heavy hedge) or less shares (light hedge) depending on the view held.

The position then taken by the hedger is managed according to the movements in the parity delta *vis-à-vis* the insight held on light or heavy hedges. Increase in parity delta or taking view for heavy hedge will result in the hedger borrowing more shares with the aim to sell short. On the other hand, when parity delta decreases or a view for a light hedge is taken, the hedger will buy back the shares.

Credit Hedging Using CDS

If an opportunity presents itself, the convertible bond hedger will try to hedge the credit risk cost-effectively. Convertible trading far in the money, *i.e.*, the equity price is far above the conversion price, may not require this. Contrary to this, if the convertible bond is trading close to the investment value, hedging the credit risk might become imperative. The outlook for convertible markets depends on the equity markets. If the equity markets decline, sensitivity of the convertible markets with respect to equity markets declines. This usually makes the convertible bond hedgers very credit risk oriented.

Establishing the Credit Hedge

Consider, for example, the convertible hedger has a position in a convertible bond with the following terms as given in Exhibit 4.9.

Exhibit 4.9: Convertible Bond Hedge Example.

Characteristic	Example
Nominal Size	1000
Price	105%
Coupon	2% pa
Maturity	Three years with cash redemption at 100%
Conversion Ratio	25 shares per bond
Parity Delta	30%
Credit Sensitivity	-0.25 points for 10 bps move in the credit spread
Position Size	\$100 million nominal or 10,000 bonds

There is more than one method available to hedgers to determine the extent of credit protection required. The example provided above is just one possible alternative of calculating the results. The hedger here decides to be short protection against the notional value of the underlying security. We assume the price of the CDS to be 120 bps. In terms of the contract, the hedger will either settle for the same tenor of protection (say, 3 years) or get the exact maturity date matched.

Typically, there will be a convertible model on which the hedger will operate, which will calculate parity delta and the credit sensitivity on the basis of certain input variables. In this case, the model may be calculating that for a 10 bps increase in the spread, the theoretical value of the convertible should decline by 0.25 points. The hedgers will have to find out how much they should pay for an additional 10 bps protection over the tenor of the hedge. This can be worked out by estimating the present value of 10 bps per year for 3 years, which let us say, works out to 27.75 bps.

For a 10 bps increase in the credit spread based on the notional value of the convertible bond position, the hedger will expect a loss of 0.25 points. The hedger would also calculate the present value of an increase in 10 basis points in protection. So, to protect the \$100 million nominal position by neutral credit hedge, the value of CDS protection that needs to be bought is approximately \$90 million ($\$100 \text{ million} \times 0.0025 / 0.002775 = \$90,090,090$).

The following factors also need to be considered:

- Assuming a natural hedge, the hedger will simultaneously buy credit protection and borrow 75,000 shares based on 10,000 bonds

that have a conversion ratio of 25 shares/bond on a delta having 30% parity.

- The maturity date of the protection contract will typically be the put date, if applicable.
- The default protection market for convertibles is limited to convertible bonds. This is typically the case where it is not mandatory for the convertible bond to be redeemed in cash or the one where during the time of maturity, the issues can deliver a share equivalent.
- Analogous to 'Heavy' and 'Light' hedging view for the short sale of equity, a view on the credit risk or direction might be developed by the hedger and thus he might opt to buy some credit protection.

4.8 WINGS TRADES

Wings Trades Defined

Technically, buying shares and default protection at the same time constitutes a 'wings trade.' The wings trade dealing combination is specifically designed to take in large profits when extreme changes in the underlying entity occur. These extreme changes may take place in the form of share price surges or default of the enterprise value of the company during the contract duration. The funding of the default protection is derived from the projected dividend earnings from the stock. This makes wings trade a profitable alternative for issuers who trade at yields having a high dividend in comparison to the default swap premium. Technically wings ratio is defined as

$$\text{Wings Ratio} = \frac{\text{Notional Amount of Default Protection}}{\text{Notional Amount of Stock Purchased}}$$

However, since wings trade is generally designed to have a 'zero carry,' wings ratio is calculated as

$$\text{Wings Ratio} = \frac{\text{Dividend Yield}}{\text{CDS Premium}}$$

Wings trades can be especially attractive in certain situations as depicted in Exhibit 4.10. Like mentioned before, a wings trade is designed for generating profits in adverse situations, *e.g.*, when investors who have experienced heavy losses on distressed securities balance the likelihood of recovery (a bullish scenario) with the possibility of recurring future losses (a bearish scenario). And when the equity volatility that is being implied is high, a strategy like that of option straddle in the equity market might be

inconceivable and expensive. Thus, wings trades could be very lucrative on those entities which have volatile assets and are subjected to extreme valuations. These trades are constructed as simultaneous long position in a high-dividend paying stock and a CDS. Usually, it is structured as a self-financing strategy, *i.e.*, the dividend received on the stock is enough to pay the premium on the CDS. Since dividends are not known *a priori* and can be volatile, wings trades are better suited on those entities whose dividends are 'sticky,' as dividends normally are. 'Sticky' dividends mean that they do not change much year on year.

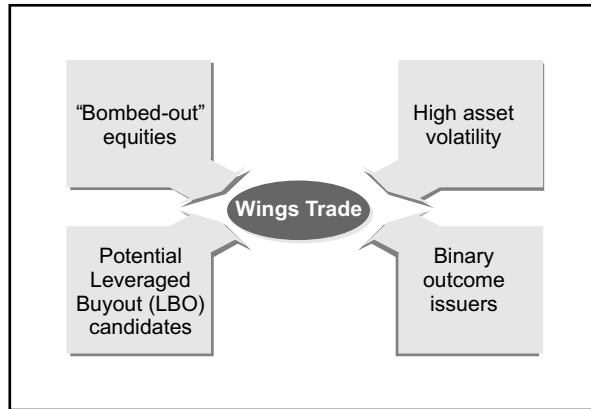
Identifying Prospects

To find out the possible entities on which wings trade can be structured, normally one looks at the following criteria:

- The ratio of dividend yield to the premium of CDS, called the Wings ratio, ought to be high
- The dividend stream should be secure
- Mostly have a 'Buy' recommendation by analysts on the underlying stock, which in any case, analysts normally have

An investor can do better than 'hope' that the dividends would not change. He can actually lock in the expected dividends in the equity derivatives market. This he can do by going long the futures contract instead of the stock. The price of the futures contract incorporates the expected dividend payout. If the expected dividend payout is high, then the price of the stock, when it goes ex-dividend, is expected to decrease. This would be reflected in the price of the futures contract. If the actual dividend is lower than that previously expected, then the price of the futures contract would appreciate to that extent because the futures contract's pricing is based on, among other things, the expectations of the dividend payout in the market over the duration of the contract. Assuming that the investor goes long the contract today, a decrease in dividend is made up for by a matching increase in the futures contract rate. Hence, the dividend yield rate implied by the market is at all times incorporated in the price of stock futures contracts. When the contract is purchased, the dividend yield rate is captured, or locked in effectively. To affect a wings trade, the investor can purchase a futures contract instead of the stock, and a CDS. In case futures contract does not exist, the investor can replicate it in the options market by going long an at-the-money (ATM) call and simultaneously shorting an ATM put, though the transaction cost here would be high.

Typically, investors put in wing trades on those stocks which have pretty high asset volatility. In addition, possible candidates for leveraged buy-

Exhibit 4.10: Wing Trade Characteristics.

out are lucrative wing trade names since the possibility of a large swing in the stock price exists.

One of the indicators of asset volatility can be the implied equity volatility on the options of the stock. Binary outcome issuers are those companies which have a high probability of either succeeding beyond expectations or facing downside risks such as severe product liabilities or litigation risk. Such companies generally have differing capital structure recommendations---possible underweight recommendation on the bonds and an overweight recommendation on equity. Companies which are likely candidate of leveraged buyouts are possibly the best wing trade contenders because they provide prospects of profits on both equity leg and the CDS. The potential takeover premium would make the equity trade profitable, while an increase in leverage of the balance sheet of the entity would make the CDS spreads widen and hence a long CDS trade would have a positive MTM. On the other hand, companies with a deteriorating credit profile may do a rights issue for recapitalization and this may be loss making on both the equity and the CDS leg. Decrease in leverage due to recapitalization would make the CDS spreads tighter, while dilution of equity would make the stock price go south.

Outputs and Scenario Analysis

Normally, the wings trade has a longer maturity than the time horizon on which you expect your views to materialize. Generally, the underlying CDS has a term of 5 years, the P&L of a wings trade is generally calculated for a 1-year or 6-month duration. A company develops the P&L of a wings trade for typically three types of scenarios:

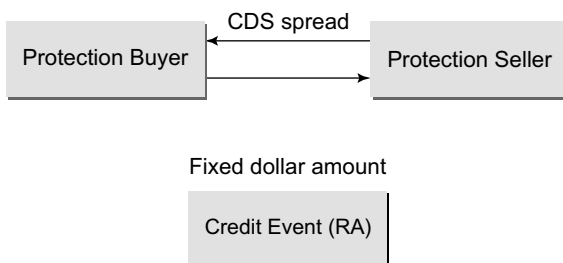
- a significant surge in share price
- occurrence of a default
- a sharp decrease in share price without an equivalent degradation in credit fundamentals

Positive returns are generated by the first two scenarios, but the final scenario yields negative returns. A general sensitivity analysis that is normally carried out is by assuming that the share price of the company is either the highest of 52 weeks or the lowest of 52 weeks unless, it is at either extreme right now, or during the 1-year investment horizon of the wings trade. Until it is assumed that the company's credit risk is expected to change during the investment horizon, it would be acceptable to assume that CDS price would react accordingly, taking into consideration the interrelation between the equity markets and the credit markets. It is realistically assumed that a significant decline in equity value would coincide with a credit event. But as usual, possibilities of a credit event could arise although shares haven't collapsed. Since the investor is long equity and long protection, the wings trade, as it literally means, makes money in the event of extreme events. Implicitly, it is also a play on correlation between equity and credit markets.

4.9 TYPES OF CDS

Binary CDS

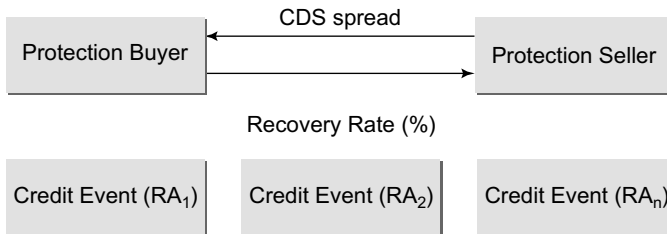
In binary CDS, the protection seller pays to the protection buyer a fixed dollar amount in place of a post-credit event valuation. In return, the buyer pays him periodic spread. (RA represents Reference Asset)



Basket CDS

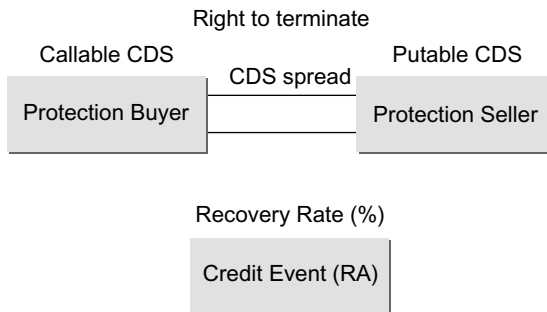
The standard payoff from seller to buyer can be initiated by credit event occurring to any particular or group of reference assets in the portfolio as

opposed to the single credit event occurrence. The correlation between various assets within the portfolio is an important determinant of the spread.



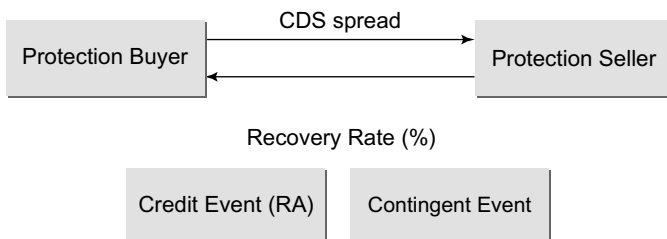
Callable or Putable CDS

A callable CDS gives the protection buyer a right to terminate the contract before any credit event. Similarly, a putable CDS gives a similar right to the protection seller.



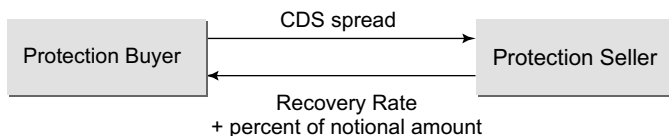
Contingent CDS

A contingent CDS warrants the payoff from protection seller to buyer in occurrence of a credit event to reference asset along with a pre-specified contingent event.



Leveraged CDS

A leveraged CDS adds a per cent of notional amount along with the standard post-default valuation in order to create a leveraged position. Such kinds of CDS are used primarily for hedging purposes.



There are other non-standard credit derivatives: CDS indices, swaptions, tranches, fixed recovery CDS and recovery locks.

4.10 EVOLUTION OF CDS TRADING STRATEGIES

In conclusion, we can consider many more advance ways in which CDS is used for trading. However, that would be beyond the scope of this book. Suffices to say that there are ever more new ways of using the CDS market in conjunction with other asset classes like interest rate, foreign exchange and commodity, as markets are getting progressively more interconnected. In future, we may see more innovative ways of using CDS for hedging and trading purposes.

CHAPTER 5

INDICES AND BASKET PRODUCTS

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5.1 SYNOPSIS

Linear baskets were among the earliest of the investor products in the credit derivatives space. As the credit derivatives market has advanced, it has become increasingly standardized and one of the manifestations has been the evolution of a set of indices which are structured as linear baskets. In this chapter, we will also discuss one of the earliest basket structures, a First-To-Default Basket (FTDB), which is a leveraged position in a basket of CDS. An investor is exposed to the risk of default on the entire basket rather than on a single name. Because the basket has a higher probability of default than an individual credit, the seller of protection receives a spread greater than the widest individual spread in the basket. Typically, the FTDB pays a good proportion of the sum of the spreads in the basket, while a linear basket pays a weighted average of the spreads of entities comprising the basket.

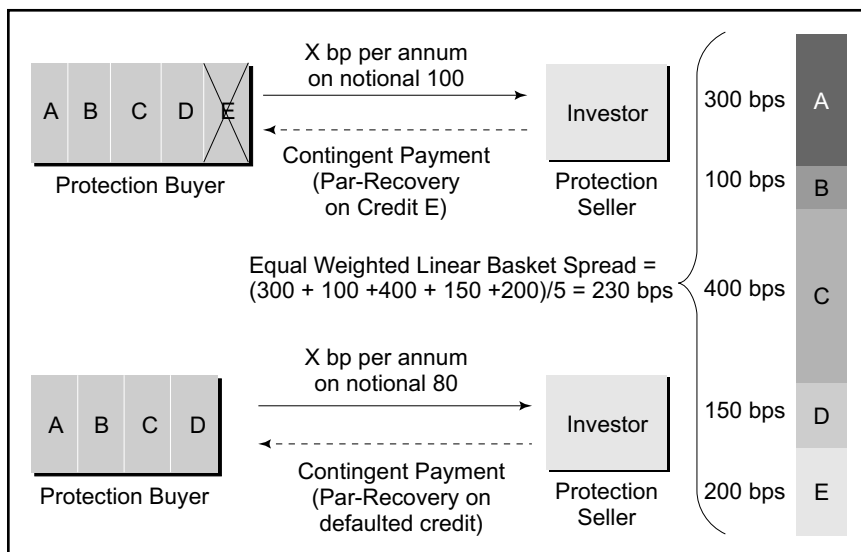
5.2 LINEAR BASKET

In a linear basket, the protection seller takes on exposure to each credit equal to $1/N$ of the notional of the basket, where N equals the number of credits in the basket (assuming equal weighting). An illustration of a linear basket is in Exhibit 5.1. When the first credit event happens:

- termination of the swap of the defaulted credit takes place,
- notional of the defaulted credit reduces the notional of the trade and
- exposure to the non-defaulted credits is borne by the investor.

Yield on these structures is proportionately additive, as one credit does not rely on the other. One of the significant advantages is that it requires

Exhibit 5.1: Linear Basket Illustration.



less documentation if exposure to many credits in one single trade is taken.

The most popular linear basket is the CDS index, which is a pretty effective way of taking a position on a basket of credit entities. The benefit is that the swap index is a completely standardized credit security and is more liquid, and trades at a smaller bid-offer spread than an individual CDS.

5.3 TOWARDS GREATER STANDARDIZATION: CDS INDICES

The CDS market has evolved considerably, as discussed in the previous chapters, and is increasingly getting standardized. One of the important drivers in the development process, apart from enhanced clarity in legal and regulatory aspects, has been the evolution of indices, which is now discussed.

A single, liquid vehicle is provided to the investors by the CDS indices through which they can take diversified long or short exposure to a particular credit market or a segment of the market. The advantages of a CDS index is shown in Exhibit 5.2 while the benefits are listed in Exhibit 5.3. If we take the example of S&P 500 and various other benchmarks in the market, the credit default indices reflect the performance of a basket of credits, namely, a basket of single-name CDS, *i.e.*, CDS on individual credits.

The CDS indices exist for US investment-grade and high-yield markets, the European investment-grade and high-yield markets, the Asian markets and the global emerging markets. Typically, hedging a portfolio of CDS or bonds with a CDS is cheaper than to buy many CDSs to achieve a similar effect, as the bid-offer spread in some of the indices is less than 1 bp. As of now, there are mainly two families of indices in the CDS marketplace---CDX and iTraxx. The former, *i.e.*, CDX, is the index that is composed of companies in North America and the emerging markets. The administration of the CDX index is done by the CDS Index Company (CDS IndexCo). The marketing of this index is done by the Markit Group Limited (Markit). Companies other than that in North American and the emerging markets, *i.e.*, mainly in Europe, are managed by the International Index Company Limited (IIC). This company which is now owned by the Markit, administers iTraxx Europe and iTraxx Asia. On 14 November 2007, Markit acquired IIC and CDS IndexCo. So, all the credit derivative indices are now managed by the Markit Group.

Every six months, a new series of CDS indices is issued. After the announcement of each series, the investment banks form a group and poll to decide the credit entities that would constitute the new issue. This process is adopted so that the index doesn't clutter with instruments that don't exist anymore or those which trade in an illiquid manner. On the issuing date, based on the credit spread of the entities in the index, a fixed coupon is decided for the whole index. After it is decided, the index constituents are made public and the fixed coupon is set and the indices start trading actively.

As opposed to a perpetual index like the S&P 500, the CDS indices comprise of a fixed composition and fixed maturities. New indices which have a basket of underlying credits are launched twice in a year. New indices

Exhibit 5.2: Advantages of CDS Indices.

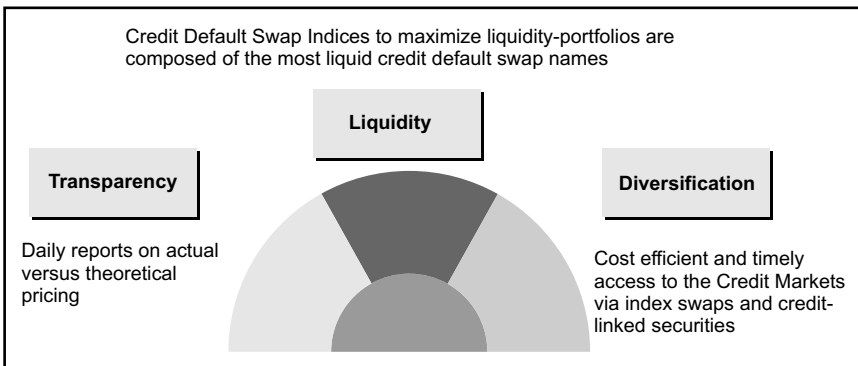
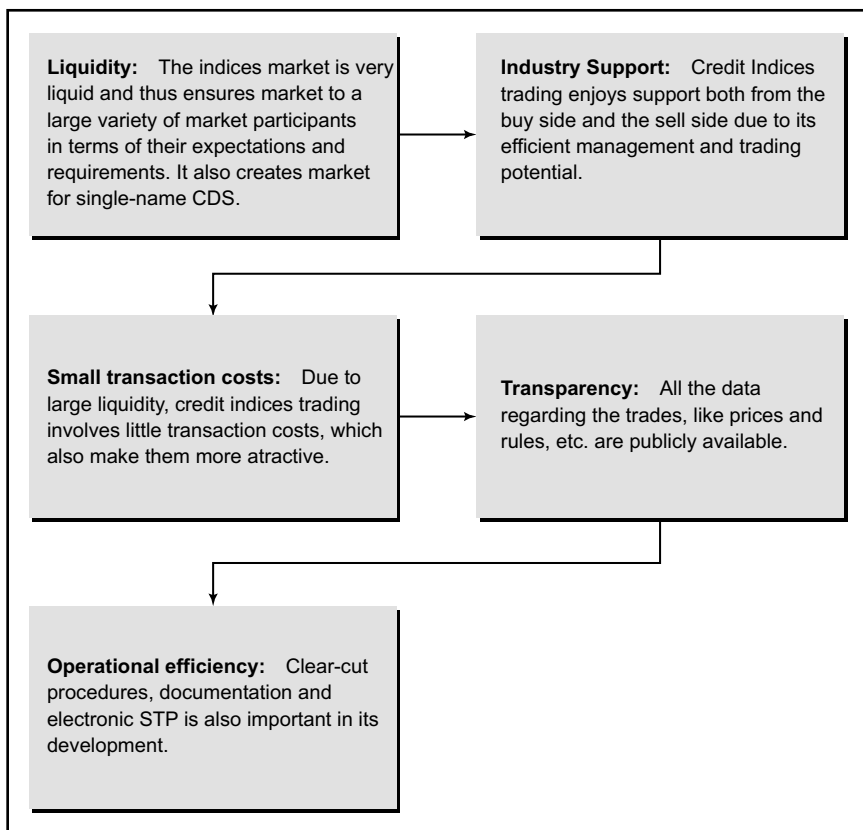


Exhibit 5.3: Benefits of CDS Indices.

are launched so that the changes in the credit market are reflected and the index is given more consistent duration and liquidity. After a new index is launched, it is termed 'on-the-run index,' and the current indices continue to trade as 'off-the-run,' and their trading continues until they mature. Like in other asset classes, on-the-run indices tend to be more liquid than off-the-run indices.

5.4 MECHANICS OF THE INDICES

Dealers and Dow Jones Company worked together to create a global family of highly liquid, standardized CDS indices. The results of this effort are two collective ventures within the global credit derivatives dealer community---the Dow Jones CDX indices for North America and the emerging markets, and the Dow Jones iTraxx indices for Europe, Japan and Asia. A rule-based portfolio selection process is used for creating the indices.

Prominent credits in the market and liquid single-name CDS are given preference for inclusion. Some of the indices have sub-indices based on ratings, industry groups or geographic region.

Fixed Coupons

Most of the single-name CDSs trade on a par-spread basis, with the spread being calculated by equating the value of the contract as zero for both the buyer and the seller of protection. In certain cases, when the spread crosses a particular threshold value, the buyer needs to pay immediate upfront fees and then continue with the regular periodic spreads. The fixed coupons that were previously employed in trading of the CDS indices have been extended to investment-grade CDS contracts in North America by the Big Bang and Small Bang modifications and the standard coupon amount is 100 and 500 bps. Under the new trading convention, the regular investment-grade CDS trade at 100 bps (low-stressed and high-grade names) and high-yield CDS trade at 500 bps. It is possible to have extra strikes of 50, 100, 500 and 1000 bps; with a view to have trades initiated close to par so that the change in the trading strategies is gradual with the new convention. Additional strikes, however, reduce the standardization of contracts.

Benefits

The fixed coupons have helped reduce the amount of outstanding CDS and the associated positions worth millions of dollars. This has been accomplished additionally through the central clearinghouses like Markit, which have the ability to net down the outstanding notional amounts. The system of upfront payments and spreads has motivated the participants to cancel out their existing position rather than take new off-setting positions. The system of paying both the fixed coupon and upfront spread has also led to more effective netting between the index and single-name contracts; thus, making the trading of CDS contracts more consistent with the bond markets. Additionally, dealers are protected against steep rise/decline in the CDS prices after a financial event of large magnitude. These changes in convention have not only strengthened and enforced the regulations, but have also made the CDS market more transparent and liquid.

The new conventions have been embraced both by the buy-side and by the sell-side market participants. The trades are being executed frequently and massively under both the 100 and 500 bps regimes. Recent CDS market trading patterns have signified the success and convenience of the

new conventions. A snapshot of the CDX index is shown in Exhibit 5.4. Exhibit 5.5 provides a brief description of iTraxx indices. Exhibit 5.6 lists the differences between Markit CDX and Markit iTraxx while Exhibit 5.7 details the coupon payment dates.

A fixed coupon is paid by the indices, which is decided by the consortium during the time of launch such that the market spread of the index is close to the coupon. During the trading of the index, the index changes its market spread but the coupon does not. For example, assume that an index has a coupon of 100 bps (annual rate) that is paid quarterly. Assuming the index's market spread is different from the coupon's, which is generally the case, an upfront exchange of money would be done to account for the difference. For example, if the market spread of the index is 110 bps, the seller of protection (long risk, the investor who receives the coupon) will receive an upfront payment of $(110 \text{ bps} - 100 \text{ bps}) \times \text{risky duration} \times \text{notional}$. The upfront payment plus the 100 bps coupon is equivalent to receiving a 110 bps coupon. Risky duration is used to calculate the present value of the future spread payments, adjusted for default risk and time value.

All the CDSs in the index have equal weightage and therefore if there is one single credit event, then the notional value of the investor's exposure comes down by $1/N$, if there are ' N ' credits in the index. If there are 100 names in the credit event, then if there is a credit event in one name, we will have 99 credit names in the index. Consider an Investor B who goes long protection, *i.e.*, short risk for \$100 on an index with a coupon of 100 bps. Let us suppose that there is a credit event in one name and the recovery rate on that name is 40%, *i.e.*, it falls in value to \$0.40 per \$1 face value. Investor B will deliver one bond, purchased for \$0.40 in the marketplace, with a \$1 face value (notional $\times 1/100$) and receive \$1 in cash. Investor B will continue paying 100 bps annually, but on the new notional value of \$99.

The market spread of an index may change if there is a credit event in an underlying credit. Continuing our example, assume that before the credit event, 99 of the credits underlying the index have a spread of 100 and one credit has a spread of 1100. Also, assume that the index is trading at its theoretical value. The market spread of the index will be 110 bps. If the credit is with a spread of 1100 defaults, the credit will be removed from the index and the market spread of the index will now be 100 bps, the average of the remaining 99 credits. An investor who is long protection (short risk) will, therefore, lose money when the index spread rallies, but receive money on the credit event (\$0.60 in our example). If the credit event was widely anticipated, these two factors will likely offset one another for no significant net impact on profit-and-loss statement.

Exhibit 5.4: Snapshot of CDX.

Index	Coupon (%)	Price (%)	Spread	High (%)	Low (%)
CDX.NA.HY	2.750	100.370	266	100.813	99.090
CDX.NA.IG	0.350	99.974	36	100.077	99.805
CDX.NA.IG.HVOL	0.750	99.425	88	99.848	99.001
CDX.NA.XO	1.400	99.485	152	100.030	98.909
CDX.EM	1.250	101.127	98	101.150	100.068
CDX.EM.DIVERSIFIED	0.800	100.581	66	100.718	100.017
CDX.NA.HY.BB	1.750	99.712	182	100.279	98.870
CDX.NA.HY.B	2.500	99.894	253	100.344	98.892

Exhibit 5.5: Brief Description of iTraxx Indices.

Type	Index Name	No. of Entities	Description
Benchmark Indices	iTraxx Europe	125	Most actively traded names in the 6 months prior to the index roll
	iTraxx Europe HiVol	30	Highest spread (riskiest) names from iTraxx Europe index
	iTraxx Europe Crossover	45	Sub-investment-grade names
Sector Indices	iTraxx Non-Financials	100	Non-financial names
	iTraxx Financials Senior	25	Senior subordination financial names
	iTraxx Financials Sub	25	Junior subordination financial names
	iTraxx TMT	20	Telecom, Media and Technology
	iTraxx Industrials	20	Industrial names
	iTraxx Energy	20	Energy industry names
	iTraxx Europe	125	Most actively traded names in the 6 months prior to the index roll
	iTraxx Europe HiVol	30	Highest spread (riskiest) names from iTraxx Europe index

Exhibit 5.6: Differences between Markit CDX and Markit iTraxx.

	Markit CDX	Markit iTraxx
Region	America and EMEs	Europe and Asia
Currency	USD, EUR	EUR, JPY, USD (Asia ex-Japan) and Australian Dollar
Determination of Reference Entities	Dealer poll	Liquidity poll
Modified Restructuring	Not a credit event	Credit event
Business Days	USD- New York, London EUR- London and TARGET settlement date	London and TARGET settlement date

Exhibit 5.7: Dates for Coupon Payments.

Index	Payment Frequency	Dates	Calculation basis
For CDX.EM	Semi-Annually	20 June, 20 December	Actual/360
All others	Quarterly	20 March, 20 June, 20 September, 20 December	Actual/360

5.5 INDICES ADMINISTERED BY MARKIT

We take here, as examples, the Markit CDX.NA.IG index and the Markit iTraxx Europe to examine their features and provide an overall picture of Markit indices.

The CDX indices are multi-sector indices with semi-annual roll dates in March and September. The Markit CDX North American Investment Grade Index has a total of 125 names. The roll dates for the CDX.NA.IG index are 20 March and 20 September. Exhibit 5.9 shows the index roll timeline for the Markit CDX.NA.IG index. The maturity dates for this index are typically 1, 2, 3, 5, 7 and 10 years and the underlying names are all investment grade, *i.e.*, have a rating of above BBB-. There are also 30 names in investment grade with high volatility and these are called HiVol. The tranches available for CDX.NA.IG are 0--3, 3--7, 7--10, 10--15,

Exhibit 5.8: Constituents of CDX.EM Diversified Emerging Market Index.

Short Name	Reference Obligation	Avg. Rating	Sector	Weight (%)
Arab Rep Egypt	EGYPT 8.75 11Jul17 (3)	BB	Government	2.500
Argentine Rep	ARGENT 8.25 31Dec33 Sink	B	Government	2.500
Bqe Cen de Tunisie	BTUN-CentBank 8.25 19Sep27	BBB	Government	2.500
Rep Venezuela	VENZ 9.25 15Sep27	BB	Government	2.500
Companhia Vale do Rio Doce	CVRD-ValOvseas 8.25 17Jan34	BBB	Materials	2.500
Federative Rep Brazil	BRAZIL 12.25 06Mar30	BB	Government	2.500
Hutchison Whampoa Ltd	HUWHY-INT0313 6.5 13Feb13		Consumer Cyclical	2.500
JSC Gazprom			Energy	2.500
ICICI Bk Ltd	ICICIB (2) 6.375 30Apr22 BondCall	BB	Financial	2.500
JSC VTB Bank			Financials	2.500
Kazkommertsbank JSC	KKB 7.875 07Apr14	BB	Financial	2.500

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Exhibit 5.8: (Contd.)

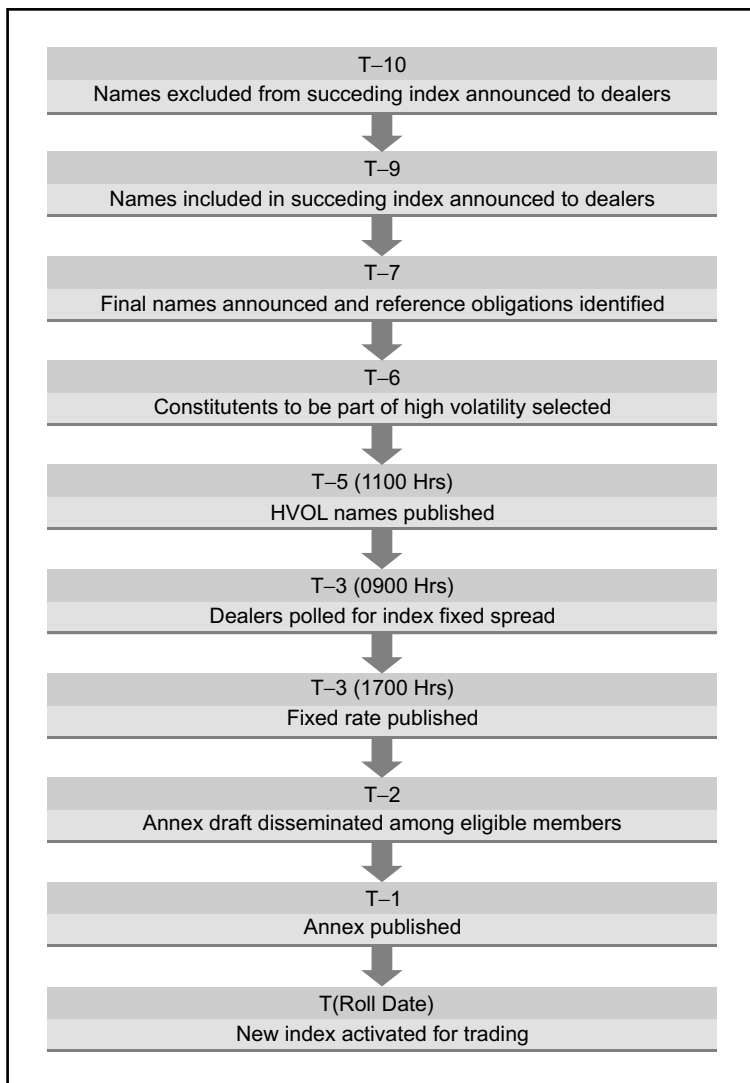
Short Name	Reference Obligation	Avg. Rating	Sector	Weight (%)
Kdom Thailand	THAI 7.07 30Sep13	BBB	Government	2.500
Lebanese Rep	LEBAN 11.625 11May16 (2)	B	Government	2.500
Malaysia	MALAYS 7.5 15Jul15	A	Government	2.500
Oriental Rep Uruguay	URUGAY 9.25 17May17	B	Government	2.500
Petroleo Brasileiro S / A Petrobras			Energy	2.500
Peoples Rep China	CHINA 4.75 29Oct13	A	Government	2.500
Petroleos Mexicanos SA	PEMEX-PrFunMTst 9.5 15Sep27	BBB	Energy	2.500
Rep Bulgaria	BGARIA 8.25 15Jan15 (3)	BBB	Government	2.500
Rep Colombia	COLOM 8.125 21May24	BB	Government	2.500
Rep Croatia	CROATI 5 15Apr14	BBB	Government	2.500
Rep El Salvador	ELSALV 8.25 10Apr32 (2)	BB	Government	2.500
Rep Hungary	REPHUN 4.75 03Feb15	BBB	Government	2.500
Rep Indonesia	INDON 6.75 10Mar14	BB	Government	2.500
Rep Korea	KOREA 4.25 01Jun18	A	Government	2.500

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Exhibit 5.8: (Contd.)

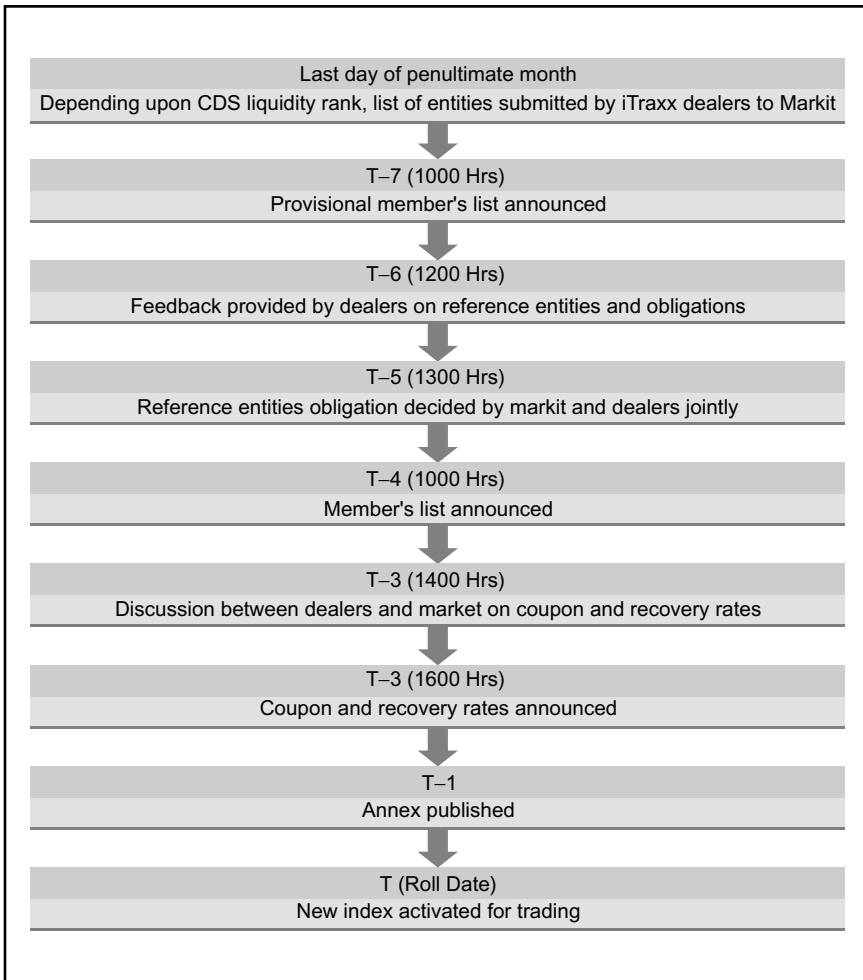
Short Name	Reference Obligation	Avg. Rating	Sector	Weight (%)
Rep Panama	PANAMA 8.875 30Sep27	BB	Government	2.500
Rep Peru	PERU 8.75 21Nov33	BB	Government	2.500
Rep Poland	POLAND 5.25 15Jan14	A	Government	2.500
Rep South Africa	SOAF 6.5 02Jun14	BBB	Government	2.500
Rep Philippines	PHILIP 10.625 16Mar25	BB	Government	2.500
Rep Turkey	TURKEY 11.875 15Jan30	BB	Government	2.500
Romania	ROMANI 8.5 08May17	BBB	Government	2.500
Russian Fedn	RUSSIA 2.25 31Mar30 Struc	BBB	Government	2.500
Socialist Rep Vietnam	VIETNM (3) 6.875 15Jan16	BB	Government	2.500
St Bk India	SBIIN-StateBkInFrn 15Feb16 Float	BBB	Financial	2.500
St Israel	ISRAEL 5.125 01Mar14	A	Government	2.500
St Qatar	QATAR 9.75 15Jun30	AA	Government	2.500
TenagaNasional BHD	TENAGA 7.5 01Nov25	BBB	Utilities	2.500
Ukraine	UKRAIN 7.65 11Jun16	BB	Government	2.500
Utd Mexican Sts	MEX 7.5 08Apr33	BBB	Government	2.500

Exhibit 5.9: Index Roll Timeline for the Markit CDX.NA.IG.



15--30 and 30--100. The index roll timeline for the Markit CDX.NA.IG is presented here.

The Markit iTraxx Europe index is a benchmark index and consists of the top 125 single-name traded CDS by volume. The design of the iTraxx indices ensures that the outcome results of the selection procedure are easily replicable and are the most liquid indices with high trading volumes. The roll dates for the iTraxx Europe are the same as the CDX.NA.IG, *viz.*, 20 March and 20 September. However, the iTraxx Europe has maturity

Exhibit 5.10: Index Roll Timeline for iTraxx Europe.

dates of only 3, 5, 7 and 10 years. The tranches available for the iTraxx Europe are 0--10, 10--15, 15--25, 25--35 and 35--100. The iTraxx Europe roll timelines are presented in Exhibit 5.10.

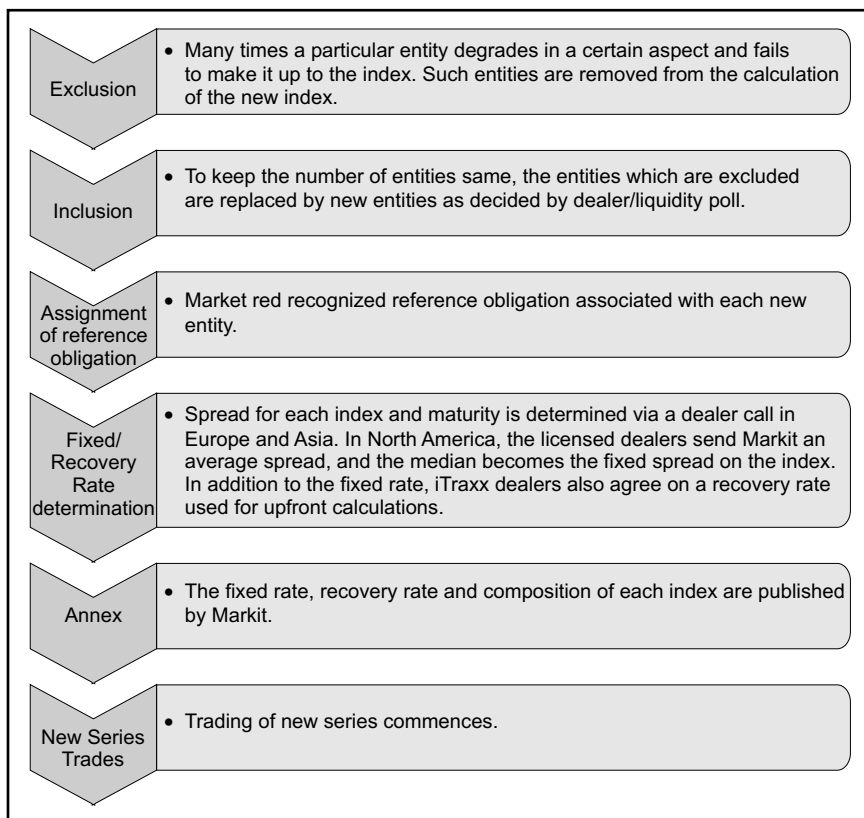
To determine the members of iTraxx Europe, a liquidity poll is conducted among all the market makers and each market maker then responds to Markit with a list of entities with the highest trading volumes over the past 6 months. The names have to be incorporated in European Free Trade Association member countries. The trading volumes used for calculation of the entities should be based on subordinated transactions and should not include internal transactions. In case of multiple entities under the same ticker, the most liquid entity is eligible for index membership.

In addition to the poll, there are certain rules which are followed during the process of member selection. For instance, all the entities have to be labeled as investment grade by standard rating agencies like Moody's and S&P. For these agencies, entities with ratings given as under or below are excluded:

- Fitch: BBB–
- Moody's: Baa3
- S&P: BBB–

All the entities are sorted and ranked according to their respective sectors, as defined by iTraxx. The ranking is ordinal with the most liquid entity of a particular sector being assigned a rank of 1. A method of objective elimination and addition based on pre-defined criteria is followed to determine the members and is shown in Exhibit 5.11. Starting with the previous series, all downgraded and defaulted entities are deemed ineligible and hence excluded. Entities that changed sectors or were

Exhibit 5.11: For Every New Series of Index Rolled Out, the Following are Carried Out.



merged are also excluded. All entities above the median are included and below 125% of the top-most excluded. The excluded entities are substituted by those with the next highest liquidity ranking. Finally, a master list is compiled with all the entities from all the sectors. All the entities below top 150 are excluded and substituted by the next entity, of that sector, with the highest liquidity. The iTraxx Europe then contains 125 entities selected by the procedure as described earlier. These entities are from five different sectors and the composition is described as follows:

- Autos and Industrials: 30 entities
- Consumers: 30 entities
- Energy: 20 entities
- Financials: 25 entities
- Telecom, Media & Technology (TMT): 20 entities

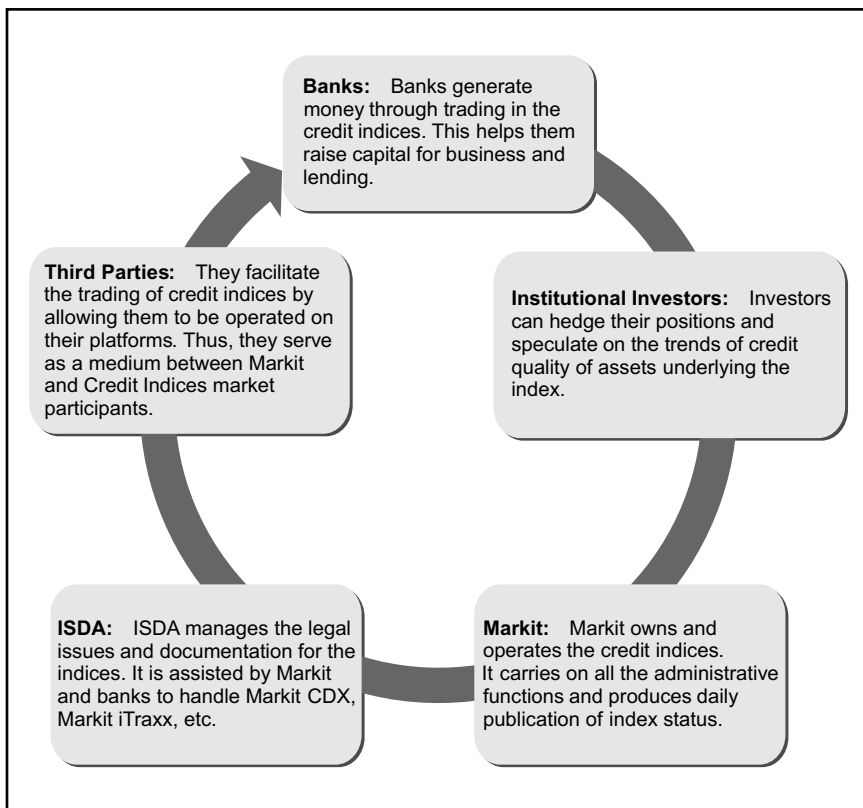
5.6 CALCULATING THE INDEX

A CDS index spread is not directly derived on the value of the underlying CDS, but is controlled by supply-demand of the market. This is similar to the way closed-end mutual funds are priced, where the traded price is based on the buying and selling of the index, not directly on the net asset value of the underlying securities. Exhibit 5.12 describes the participants in the CDS Index markets.

To compute the theoretical value of the index, the following calculations are performed:

- Observe the current market levels of the single-name CDS that have the same maturity date as the index.
- Convert the spreads into prices. Do this by assuming that each single-name CDS has a coupon equal to the index coupon and is being valued against its own CDS curve. For example, if the index has a coupon of 75 bps and the actual market CDS fee of the first credit in the index was 100 bps, one would calculate its approximate price as $\text{par} - (\text{spread difference}) \times \text{duration}$. If we assume that the risky duration is 4, the result is $1.00 - (0.0100 - 0.0075) \times 4 = \0.99 .
- Mark-to-market: Once the prices for all of the underlying credits are calculated, take a simple average. The average would be the theoretical value of the index in price terms. Then, convert this price to a spread using the index duration.
- The basis to theoretical is the difference between the market-quoted index spread and the theoretically calculated spread.

If the spread that is quoted of the index is greater than the value that is derived theoretically, then basis to theoretical is positive. If reverse is the

Exhibit 5.12: Participants of CDS Index Markets.

case, then basis to theoretical is negative. The terminology is different for those indices that trade on the basis of price terms instead of in terms of spread. An example of such an index is HY CDX. When this index trades at a higher price than the theoretical price that is implied by the underlying credits, we say the index is trading with a positive basis to theoretical value. For individual credits, investors attempt to arbitrage this relationship by going long the cheap security and shorting the expensive security. One can do this with indices as well, but the transaction costs involved with trading the entire basket of single-name CDS in comparison to the index have to be factored in.

In a quickly changing market, the movement of the index is much quicker than the underlying credits. This is because in buying and selling the index, investors can express different views about the credit market in a single trade. This can generate greater liquidity in the indices compared to the individual credits. As a result, the basis to theoretical value for the indices tends to increase in magnitude in volatile markets.

5.7 COMPARING THE CDS INDEX

The theoretical value of an index based on the underlying instruments can be calculated in two ways:

- Using risky duration for each underlying credit
- Hazard rate model for each underlying credit. This gives better results when fixed and current coupons are widely spaced.

Both the intrinsic value theoretically calculated and the value at which it is actually traded are quoted daily. The market perception which results in supply and demand dynamics ultimately decides what position will be profitable.

5.8 TRADING BASICS

Credit Indices are over-the-counter instruments that can be traded through authorized dealers. The trade can be operated through both spread-based and price-based strategies. However, the convention for the index will be same as that of the underlying cash instrument.

Spread	CDX (IG, XO, HVOL), iTraxx (Europe, Japan, Asia ex-Japan, Australia), MCDX
Price	CDX (HY, EM, EM.Div), LCDX, LevX

The index buyer purchases the exposure to credit event with respect to reference entities incorporated in the index in return for profit. The profit is in terms of quarterly fixed coupon payments from the protection buyer, *i.e.*, short index position. Both the long and short positions make upfront payoff and the trade is settled at maturity in terms of difference in the change in price of the index. The quoted price is always the clean price which is the cash price less the accrued interest.

5.9 COMPARISON OF CDS INDEX WITH CASH BONDS

Comparison of the CDS indices to cash bonds is a two-step process. First, comparing the index to the levels of the individual CDS that make up the index, and second, comparing the single-name CDS levels to bonds. The second step is an average of the basis between a representative bond for each credit and the CDS curve for that credit. To do this calculation perfectly, one would need a liquid bond for each credit with the exact

maturity date of each index. As such bonds do not exist, investors often choose the most liquid bond for each credit that is nearest to the maturity date of the index. If no such bond exists, credits are often excluded from the basis calculation. The result is therefore an approximation of the relative expensiveness or cheapness of the index to the cash bond market for a similar list of credits.

Note that this calculation incorporates the comparison of the index to the underlying CDS. This is because, if the basis between each bond and its CDS curve is averaged to zero but the index was trading 5 bps expensive to the CDS market (*i.e.*, expensive to theoretical value), then the index would also be trading 5 bps expensive to the cash bond. Some other important aspects of the index are as follows:

- The most liquid CDS maturity is the 5-year tenor, followed by the 10-year tenor.
- Standard trade sizes are \$10 million to \$50 million, or its equivalent, for the main US and European indices, and \$10 million to \$25 million for sub-indices.

5.10 CREDIT EVENTS

In case of a credit event, the defaulted entity is withdrawn from the index and the notional amount is re-evaluated containing the rest of the entities. This new version of the index trades only when the recovery rates are set.

Physical or cash settlements are available when a credit event occurs:

- Physical settlement entails the protection buyer delivering the bond or the loan and receiving par on the portion of the index made up of the defaulted reference entity and the defaulted asset is handed over to the protection seller. However, there are certain issues. When the notional exposure in many trades for an actual credit is small for an index, the mechanics of cash settlement's operational efficiency is more than physical settlements, which involves an actual loan/bond trade.
- In a cash settlement, an auction decides the recovery price, and this is paid to the protection buyer. Auctions are used in both unsecured market and senior secured markets. The whole market uses the recovery price to settle the trades and ensures that all the contracts have the same price of settlement.

When bankruptcy is declared, the major participants are coordinated by the ISDA and an event determination date is agreed upon. Coupons stop accruing on the defaulted entity on this date. The date of auction in all probability would be announced approximately between 3 and 4

weeks after occurrence of a credit event. Markit administers the auction and publishes the results of each step of the process on its Web site.

5.11 NOTES VERSUS SWAPS

The US high-yield indices have funded securities in addition to the swap indices. The funded index is similar to the swap index in that it tracks the returns of the same basket of single-name CDS. It differs in that it is priced and traded like a bond, with transfers of cash at the time of purchase in addition to coupon payments like the CLNs. If an underlying credit defaults, in terms of percentage, the coupon level remains constant. However, in terms of money, it is lessened because the face value of the note is reduced by 1/100, assuming there are 100 credits in the index.

CDS Index Variations

Single-name standard CDS contracts follow the post-credit event settlement process as mentioned earlier. Apart from the normal governing documents that explain about standard single-name CDS transactions (the 2003 ISDA Credit Derivatives Definitions and the 2009 ISDA Credit Derivatives Determinations Committees, Auction Settlement and Restructuring Supplement), each Confirmation cites a Standard Terms Supplement. Different supplements come for untranching indices, tranching indices and swaptions; they are also obtainable for the following families of indices: CDX IG/HY/XO, CDX EM and iTraxx Europe, SovX, Asia ex-Japan, Japan and Australia.

In terms of application of guarantees, kinds of credit event captured, obligation and deliverable obligation characteristics, these indices pretty much match that for single-name CDS contracts. However, where these indices are nonidentical from their underlying single-name CDS contracts, their effective date as for an index effective date is the index roll date.

CDS Indices Change for Credit Events

If a hard credit event happens on any one or more of reference entities and such is decided by the relevant Determination Committee (DC), then the settlement is done by the normal auction process. Thus, in presence of ' n ' different entities, the settlement is on $1/n^{\text{th}}$ of the notional amount for the index. After the auction, the constituents of the index are modified. If the original index was the iTraxx Crossover S14 V1, for example, the new index would be iTraxx Crossover S14 V2. The version will upgrade and the

constituents will be formed after exclusion of the defaulted asset: The upgraded index has a notional factor of $(n - 1)/n$. This value is the reduced value of the notional amount as fraction of original notional amount.

In case a restructuring credit event happens on one of the reference assets in an index, the index is divided into two. Thus, in the previous example, the iTraxx Crossover S14 V1 would be divided into $(n - 1)/n$ of iTraxx Crossover S14 V2 and $1/n$ of the standard CDS contract. The relevant counterparties can then decide to have a single-name CDS contract settlement within the exercise date. If the contract is triggered, it is settled through the normal auction procedure for restructuring credit events; if neither does, the single-name trade lasts as it is. The reasoning for such a system is that there is a single standard type of index traded at all times.

5.12 FIRST-TO-DEFAULT BASKET

Linear baskets like index products only allow proportional credit exposure. However, protection sellers typically look for enhanced yields by taking more exposure. To pursue the target, options available are limited. Strategies formulated generally include lowering the credit curve to upper yielding names, not rejecting lower liquid bonds or investing in new structured credit forms. The validity and profitability of these responses depend on the market conditions, investing environment and investment objectives.

The credit market volatility can provide entrepreneurial trading accounts tremendous, and often scalable, opportunities. This fluctuation in earnings, however, is not best suited for all the investors. Portfolios are often designed to provide stable returns and hence, disregard credit trading at distribution tails. These investment objectives are fulfilled by dealing with credit derivatives and other structured products that increase the yield on exposures on core credit. They help investors sidestep exposures to high-risk/return credits.

This is the principle behind the FTDBs. The FTDBs provide alternative ways to improve returns. They focus on exposure to credit and generate a degree of high leverage with a small basket of credits. These credits are well examined and are carefully scrutinized with regard to the investment objectives.

5.13 STRUCTURE OF FTDB

In principle, an FTDB and a CDS are the same---protection is provided against credit events on the reference entity. Technically, however, they

are structured differently. In an FTDB, the protection seller provides protection until a credit event to one of the reference entities or maturity. Effectively, the protection seller faces the 'FTDB' risk on a multiple number of credit entities.

Consider an example of an FTDB. Suppose we have a basket of credits. Each of these credits has a notional amount of \$100 million. The default swap contract or, in this case, a basket default swap contract is valid till one of the underlying reference entities experiences a credit event. If any of the reference entities experiences a credit event, the basket default swap will terminate and the buyer of protection will get \$100 million. This \$100 million payment is usually contingent on a credit event on an obligation that is deliverable in the case of a physical settlement.

The FTDBs are particularly attractive to the investors because of the leverage they provide. The FTDBs help investors in gaining simultaneous exposure to multiple credits. The FTDB trade mentioned earlier exposes the protection seller to the credit risk of five reference entities. This amounts to a notional of \$500 million, sum of the individual notional amounts. To compensate for the increased risk exposure, the basket default swap premium is much larger than the individual CDS premiums. However, the loss is limited on the downside. In case of default or any other credit event, the seller has to pay the notional amount of just one reference entity, *i.e.*, \$100 million. In effect, the investor is long protection on five different default swaps but has to make the contingent payment for only one.

The FTDBs are attractive to protection buyers as well. A basket swap is a great way to hedge multiple credits at the smallest possible cost. However, an FTDB is an imperfect hedge for the protection buyer. Generally, the notional amount of only one credit is exposed to the protection seller, *i.e.*, the first credit to default is exposed. The residual risk of multiple defaults is then retained by the buyer. This residual risk is generally an inadequate hedge for the buyer. The cost of hedging can decide the price the buyer is ready to shell out for the basket. FTDBs are illustrated in Exhibit 5.13 while the mechanics are explained in Exhibit 5.14.

Exhibit 5.13: First-to-Default Baskets---an Illustration.

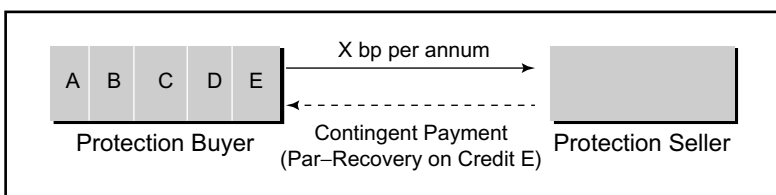
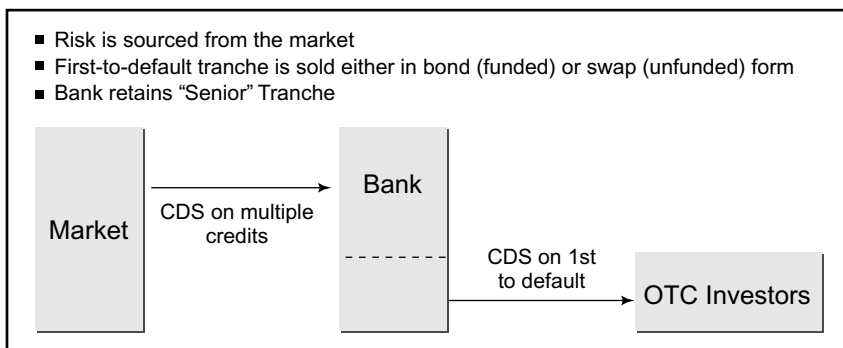


Exhibit 5.14: Mechanics of FTDB.

Investors are also offered FTDBs in the form of CLNs. As discussed earlier, CDSs in funded form of new issues from that of an SPV are used to create CLNs. An FTDB swap is embedded within an FTDB CLN and an investor is able to indirectly sell protection during his investment in a cash instrument.

5.14 BASKET PRICING

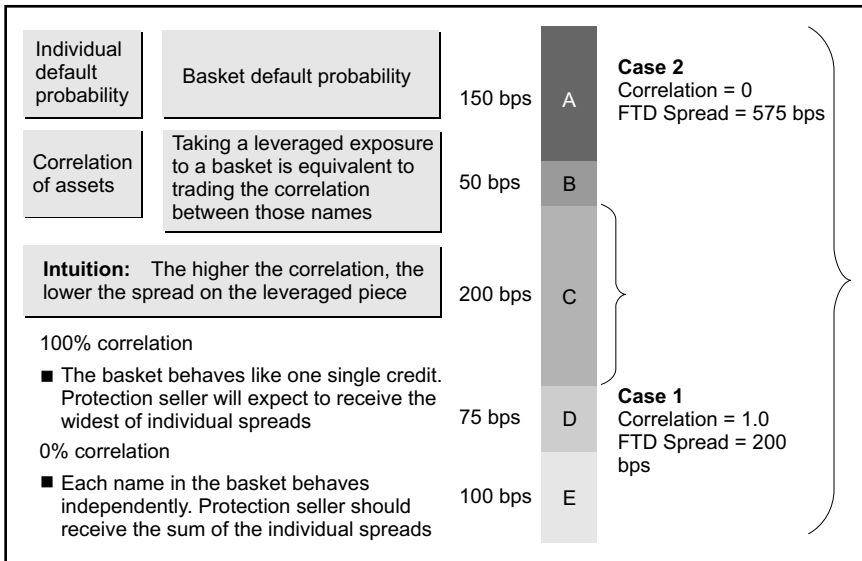
Valuation Inputs

Basket pricing methods are more involved and complex as compared to single-name CDS pricing methods. The valuation models of basket swaps would have to take into account the following key factors:

- the total number of basket reference entities
- chance of default of reference entities along with that of the protection seller
- correlation of default among the reference entities
- the kind of correlations that exist between the joint default of the reference entities and that of the protection seller
- tenor of swap
- expected LGD of each of the reference entities

After leaving apart the chances of all the credits in the basket defaulting, the basket premium depends on the correlation of default among these entities. Exhibit 5.15 explains the effect of correlation on FTDB spread. Essentially, the premium offered on selling protection is for a single default but it also shows as to how the chances of occurrence of default increase. The credit risk of the basket is a function of the default correlation of the underlying reference credits. Typically, the credits are not perfectly

Exhibit 5.15: Effect of Correlation on First-to-Default (FTD) Spread.



correlated and hence the credit risk is greater than a single-name CDS for any of the reference credits. Therefore, being long protection needs to be incentivized for the higher risk with a larger yield on the basket than the individual single-name CDSs. And as the correlation becomes weaker, more compensation needs to be provided to take on the additional risk. In other words, the premium is inversely proportional to the correlation.

$$\text{Basket Default Premium} \propto \frac{1}{\text{Default Correlation between Credits}}$$

There are two boundary conditions that apply to the basket premium. They have been explained using the example of Exhibit 5.15 as follows:

- The weakest credit given above is 'C'. The basket premium should be greater than the individual default premium of 'C', the weakest credit in the basket, *i.e.*, basket default premium more than 200 bps. This represents the fact that the seller needs to be compensated for the higher chance of default relative to that of any one reference entity.
- The sum of individual premiums of all the basket constituents is 575 bps. The sum total of the CDS premiums obtainable for each of the single-name CDSs in the basket should be more than the basket premium, *i.e.*, basket default premium less than 575 bps. The basket premium is given this upper cap because the buyer is just buying protection on the first one to default.

The FTDBs cannot be replicated or reconstructed in the cash market like the single-name CDSs. Hence, they cannot be priced from the no-arbitrage interactions between the cash bond market and the derivative markets. This makes the pricing methodology of the instrument extremely difficult and complicated. Practically, the dynamic hedging behavior of the dealers who go long protection on FTDBs create the approach to price an FTDB.

Dynamic Hedging of FTDB

Dynamic hedging is a slightly complicated process but provides useful insight into the basket pricing process. One of the indicators of the basket premium is the hedging behavior of a dealer. This transaction would normally be hedged by a dealer who buys protection on a basket from an investor who would normally hedge this position by selling default protection in an individual's name in the basket. The delta or the hedge ratio is basically the quantity of protection sold in each reference entity by the dealer. This hedge ratio is determined by the pricing parameters and their interdependence. It is a function of the default CDS of the entities making up the basket. Given similar recovery rates, if single-name CDS all trade at the same spread, all the reference entities would have similar deltas.

The reason the hedge is labeled as dynamic is because it needs to be balanced continually. The hedge ratio changes as the underlying default premiums frequently shifts from their previous value. This necessitates the need for dynamic adjustment of the hedges. For small changes to the hedge ratio, the trader would not want to dynamically change his risk position and may choose to go long or short bonds to hedge, thus creating a basis risk for him.

If a credit event happens, and assuming a non-zero hedge ratio, the dealer is required to unwind the hedges on the non-defaulted credits. The spread movement of the remaining credits will be an indicator of the cost to be borne to unwind the hedge. And since the spread movements hinge on the correlation between the reference entity that has defaulted and the other reference entities that have not defaulted, they indirectly affect the unwinding cost.

Now, the spread widening or the 'expected' spread widening for a non-defaulted single-name CDS is directly proportional to the correlation between the defaulted and the non-defaulted credits. Greater the correlation, greater the spread widening and *vice versa*. Additionally, a greater correlation will also indicate a higher cost of unwinding the hedge. Since the dealer has bought protection on the FTDB, he sells protection on the hedge. Consider again the example in Exhibit 5.15. Suppose the dealer sells protection on 'A' at 150 bps and credit 'D' defaults. If the correla-

tion between the two is high, the spread of 'E' widens to, say, 200 bps. The dealer then incurs a loss in unwinding this delta hedge. The loss is equivalent to the present value of 50 bps. To minimize the loss from the hedge unwinding, the dealer would try to retain a lower delta, *i.e.*, sell less amount of protection. However, this would also imply a lower basket default premium for protection.

If the correlation is low, it implies a lower expected spread change in a non-defaulted credit in lieu of a credit event and which in turn lowers the cost of hedge unwinding. The trader can thus retain a larger delta to sustain the hedge, *i.e.*, larger amount of protection can be sold. This can provide a larger premium to pay for the protection on the basket.

Positive Gamma Trade and Negative Carry

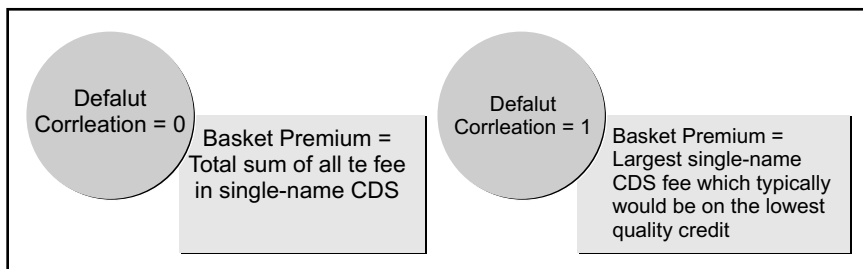
Suppose we have a basket with three credits and all the credits have a 5-year maturity. The single-name CDSs trade at 100 bps. If correlation is assumed at 50%, the model-implied breakeven basket premium comes to 236 bps. The hedge ratio for each single-name CDS is 68.4%. The total sum of the CDS fee obtained on sale of each CDS in the basket, also called hedge carry, can then be calculated as follows

$$\text{Hedge Carry} = 68.4\% \times 100 \times 3 = 205 \text{ bps}$$

The hedge carry being lower than the breakeven basket coupon results in the dealer having negative carry (31 bps). This is true for most of the baskets. The breakeven premium of the basket is larger than the carry on the hedge because of the positive net expected gain that occurs after a credit event. Boundary conditions for basket premium is shown in Exhibit 5.16.

Long positions in single-name CDSs are not able to completely replicate basket swaps. To lock in a perfect hedge, the course of spread movement of each of the credits and the actual default of a credit, which are both uncertain in nature, have to be hedged together. Typically, only the spread process is hedged leading to an imperfect hedge. Hence, in exchange for a net expected profit in the event of a default, the dealers are required to pay a negative carry. In other words, the dealer owns a long gamma position.

As mentioned earlier, the amount of protection that is sold in each name is equal to the delta, which is the first-order sensitivity of the price to the credit spreads. The rate of change of this delta is called gamma. Upon widening of spread of an underlying CDS, the dealer has to rebalance the position on the hedge. This changes the hedge ratio or the delta of the underlying name and hence the gamma is positive. This position of the dealer is called a long gamma trade. Dynamic hedging then proves to be

Exhibit 5.16: Boundary Conditions for Basket Premium.

advantageous to the dealer. This is because the reference credit will either widen or tighten. Widening of the reference credit will give rise to an escalation in the delta. The dealer will then sell more protection and increase the carry on the trade. On the other hand, tightening of the reference credit means that the delta will decrease and the dealer can buy more protection. The dealer will increase the gains and reduce the risk. If considered from an arbitrage perspective, it is automatically clear that the hedge would have a negative carry on the dealer hedging just the spread process of the underlying reference credits.

Default Correlation

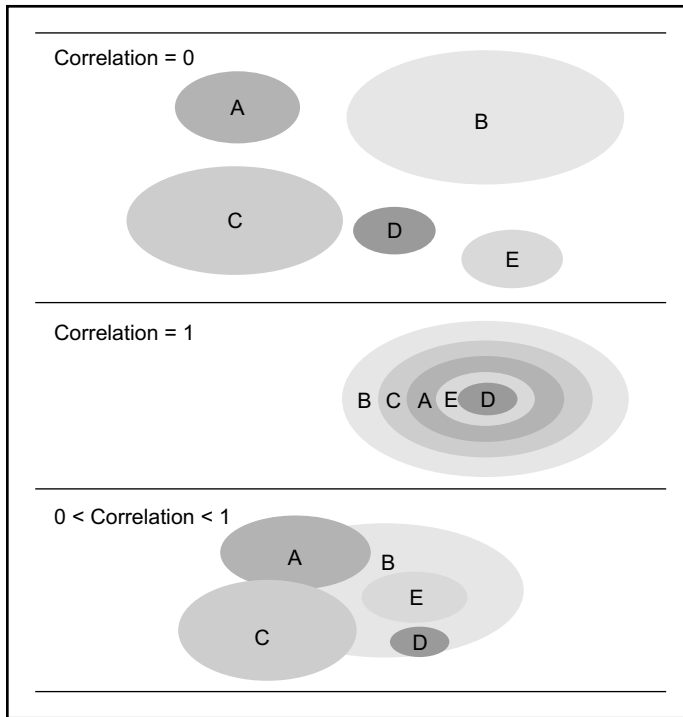
The basket premium a dealer is willing to pay for a particular basket depends on the hedge ratios which are determined by the default correlations of the basket constituents. Consider the illustration in Exhibit 5.17 of the higher and lower end of the premiums on the FTDB as a function of the correlation of default:

Increase in default correlation should, therefore, lead to a decrease in the basket default premium. The biggest relative premium increase than the average single-name CDS fee is produced by a basket of uncorrelated credits.

5.15 SENSITIVITY OF BASKET TRADES

Creating a Suitable Basket

Like every other investment instrument, a basket needs to be high yielding. The basket of credits is required to be tailored in such a manner so as to provide the protection seller with accurate and preferred level of exposure and leverage. The basket credits chosen to minimize the likeli-

Exhibit 5.17: Risk Illustrated—Different Cases of Correlation.

hood of multiple defaults provide the highest leverage to the seller and an operative hedge to the buyer.

Investment-grade credits prove to be a better ingredient for baskets than high-yielding credits. Though high-yield credits can be picked such that the default correlation is low, the individual probabilities of default are generally higher and this could lead to simultaneous default. Non-defaulted high-yield credits might decline ominously in some cases of single default. Consequently, this might lead to a sharp increase in the future protection price of these credits. The likelihood of this happening with investment-grade credits is quite low as they are generally not expected to experience such credit deterioration. If a credit of an investment-grade quality basket defaults, there is a possibility of re-hedging the other credits at levels that are cost-effective.

Analysis of Basket Samples

The FTDB premiums depend on several aspects such as default correlations, amount of credits present in basket and quality of the credits. Let us

look at the level of sensitivity of FTDB premium with regard to the previously mentioned factors.

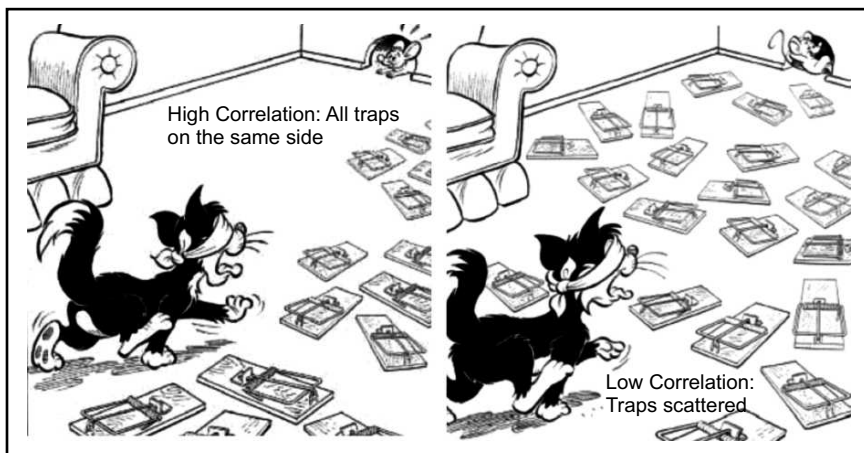
Correlation

Correlation is the driving factor behind the trade-off between risk and reward in a basket structure. So, depending on this, greater correlation will lead to greater probability of multiple defaults, and thus will lower buyer's protection value. Exhibit 5.18 demonstrates the relationship through a Tom and Jerry example, between the chance of a default (Tom steps on a trap) and correlation (traps laid). In the case when correlation is high, *i.e.*, all the traps (reference entities) are laid on one side of the room, the chance that Tom will get trapped is low. However, when the correlation is low, *i.e.*, traps are scattered all over the place, the chance of his getting trapped is higher because he just needs to step on one trap to get, well ... trapped.

Number of reference entities

Typically, increasing underlying credits of a basket will lead to an increase in the basket default premium, if the correlation is constant. On addition of more credits, *i.e.*, more traps are laid, the probability of first-to-default event goes on increasing. This increase in risk of default requires a greater level of compensation. However, this relation is slightly concave and the increase in the number of reference entities reduces the rate of increase in the basket premium. Typically, dealers find that balanced baskets with

Exhibit 5.18: *Intuitive Understanding Large and Small Correlation—the Tom and Jerry Way.*



three to seven reference credits can be hedged most effectively. As the number of names increases, the deltas will decrease. A low delta means a low-hedge notional, which will eventually lead to setting up of hedges in lower market liquidity.

Default premium

The risk of the first default of the FTDB upsurges as the spreads of the single-name CDS increase by the same amount underlying credit entities. Assuming there is no correlation between the basket entities, the basket price would be the individual basket premiums added together.

Basket structures provide better opportunity to dealers when the underlying credits trade at spreads which are identical or alike ratings of the credit are shared by them. The presence of an extremely low-quality credit could influence the price of the basket rendering protection on the other credits inappropriately valued.

5.16 BASKET SWAP STRATEGIES

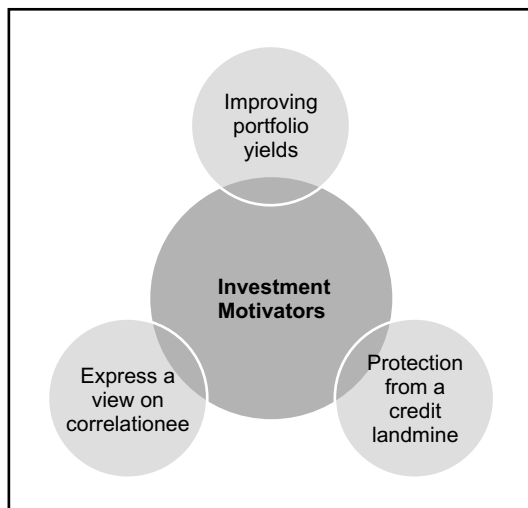
Investment Motivators

Replication of basket swaps is not possible in the cash market and special advantages are given to the investors in terms of leverage and relative value. Unleveraged investments in single-name CDS become less profitable and do not overcome portfolio yield hurdles, as the credit spread tightens. To enhance yields and generate profit, investors expand their investment ranges and look for opportunities in assets which yield more and have a higher rating. The investors also go short protection on an FTDB of approved credits, which crosses the hurdle on yield keeping in mind the fact that default swaps on the reference entities which have a single name might not cross the hurdle by themselves. Motivations for credit investments are shown in Exhibit 5.19.

Sometimes, dealers have opinions on the correlation that is different from market-implied correlation. Suppose an investor believes that a bunch of single-name credits has a larger correlation than is implied by an FTDB on the same basket of reference credits. The investor's opinion can be expressed by indulging in going short protection on the FTDB.

Various factors like accounting and related uncertainties may raise the issue of unanticipated deterioration of a particular credit. Assuming that the right sector allocations might be made by the investor, an unexpected credit degradation might drastically decline the portfolio returns. By buy-

Exhibit 5.19: Motivations for Credit Investments.

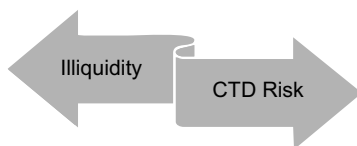


ing protection on a basket swap, the losses of the investors could be reduced. Although it might lessen the overall portfolio return for the investor, protection under uncertain financial environment is critical because losses can be huge.

Disadvantages

Being customized, investor-specific instruments with specific maturity dates, basket swaps are generally not very liquid. The basket protection in tenors correlating to the liquid single-name CDS is generally sold by the investors in 5 years.

Similar to the case with single-name CDSs, upon the occurrence of credit event, the protection seller has exposure to the CTD risk. If an underlying reference credit undergoes a credit event, the settlement by physical delivery of bonds in the FTDB is likely to entail the CTD risk. The bond that is physically delivered would be the one that is priced the lowest and is ranked *pari-passu* to the reference obligation of that particular reference entity that has undergone a credit event.



Investment Strategies

The prospective advantages of basket investments imply succinct trading methods for expressing particular views. Some of the strategies are as follows:

- **Making leveraged scenarios:** Upon tightening of credit spreads, the inaugural default protection on an FTDB of ratified names is sold by the investors so that the portfolio yield is increased, rather than going down the curve of the credit and making investments in credits that have a lower rating. Although the basket may have approved credits, the imperfect correlation among the basket of reference entities increases the chance of a default as compared to each of the individual reference entities.
- **Creating a synthetic senior position:** Taking a bought protection position in basket of reference entities that is small and then buying FTDB protection by the investor creates a synthetic senior position. Here, the net carry is lesser than the individual credits, even though there is lesser risk involved with the trade. A loss will be incurred only in cases of multiple defaults. The risk taken by the investors is that the actual correlation would be more than the expected correlation, resulting in an increase in the probability of multiple defaults.
- **Credit convexity trade:** An FTDB protection is bought by investors who partake in hedging through sale of single-name CDS on underlying credits. Such investors are long gamma and possess a possibly large upside if the underlying credit spreads are volatile. The downside becomes limited as a result of the hedge, excluding cases where actual correlation tends to be more than the expected correlation. Some characteristics of this trade are negative carry, non-directional and no requirement of price convergence and no effect during price divergence unlike other long/short strategies. There is a risk involved that FTDBs would be illiquid, and so dynamic hedging until maturity is a good strategy. Active management and access to liquidity in the CDS market would be necessary for this.
- **Creating a cost-effective short senior position:** Investor could be selling FTDB protection and also buying protection on the individual credit. This is like being short the senior tranche in the portfolio of underlying credits. The investor would have a small negative carry, in case the previously mentioned position is established at a low rate. This is just like buying low-priced deep out-of-the-money put options on the portfolio that would have big payoff in situations where in the whole market tanks and there are simultaneously numerous defaults.

CHAPTER 6

CDS BIG BANG AND SMALL BANG

.....

6.1 SYNOPSIS

Since April 2009, the ISDA implemented hardwiring of CDS contracts which in simple terms means incorporation of auction settlement terms into standard CDS documentation. This has eliminated the requirement of credit event protocols in order to cash-settle CDS transactions. Since the new ISDA definitions came into force, one frequent issue of concern is the settlement of CDS after occurrence of a credit event under the new definitions. This chapter will summarize the changes that have happened and detail the process of settlement.

6.2 MAJOR CHANGES IN CREDIT EVENT PROTOCOLS SINCE 2009

There were two major changes—the Big Bang that was introduced in April 2009 and the Small Bang that was brought into effect in July 2009. These revisions published by the ISDA introduced the Auction Settlement and Restructuring Supplements, respectively, to the 2003 ISDA Credit Derivatives Definitions. They were accompanied by various changes in CDS trading conventions with a view to increase the operational efficiency of the markets and reduce the huge outstanding notional amount associated with the CDS contracts. The three major changes introduced were as follows:

- Hardwiring for auction process for bankruptcy, failure-to-pay event and its extension to restructuring
- Establishments of Determination Committee (DC)
- Modification of effective date for credit event protection to account for a rolling lookback duration

Hardwiring of Auction Process

All CDS settlements are now handled through a systematic auction process after the credit event valuation. However, in certain cases as described later, the contract settlement is according to the pre-determined fall-back settlement method like the physical settlement process. We will discuss the physical settlement process in the next chapter. We will discuss the conditions under which an auction is held later in this chapter.

Determinations Committees (DCs)

The determinations made by the DC on issues such as occurrence of credit event, applicability of an auction and deliverability of particular obligation would be binding in nature. The final composition of the Credit Derivatives Determinations Committees was announced by the ISDA on 3 April 2009 to include five regional Determinations Committees—the Americas, Asia ex-Japan, Australia/New Zealand, EMEA and Japan. All the five DCs work under the Credit Derivatives DCs' rules. Each one has 15 voting members (8 global dealers, 2 regional dealers and 5 buy-side members), 3 non-voting members (2 dealers and 1 buy-side member) and a non-voting secretary from the ISDA. Membership of the DCs is reviewed annually (Exhibit 6.1).

In India, the following is the representation for the DC as decided by the ISDA and the Fixed Income Money Market and Derivatives Association of India (Exhibit 6.2):

Exhibit 6.1: Determination Committee.

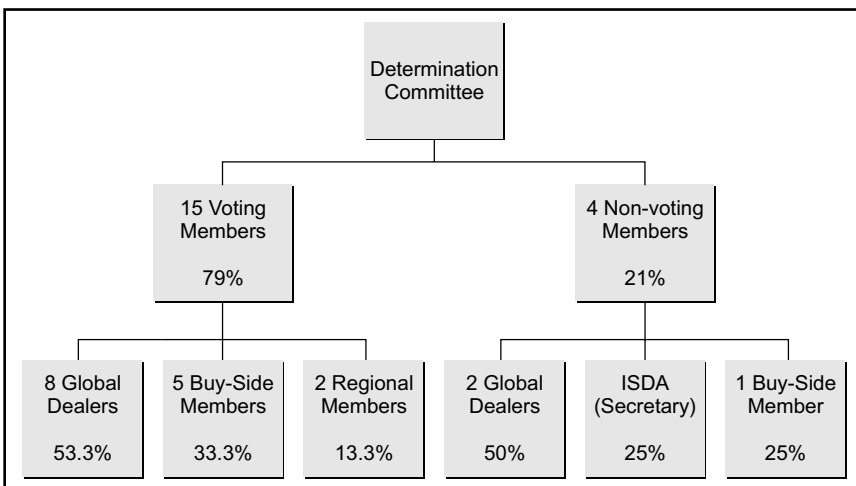
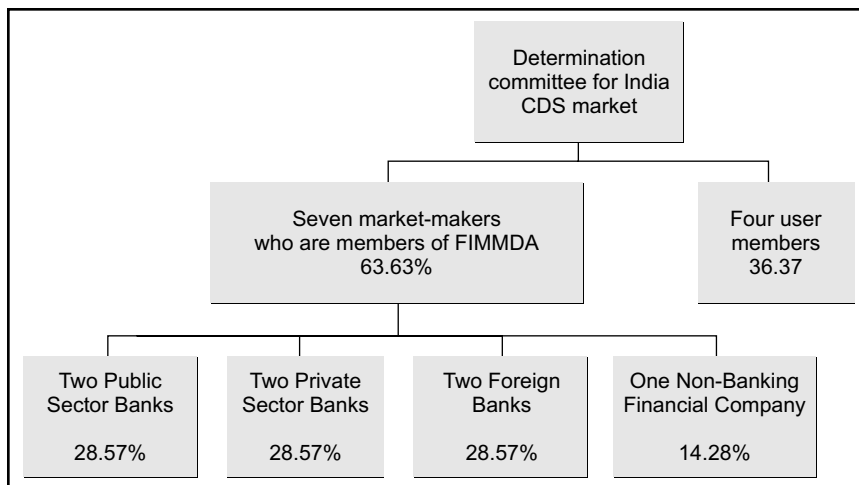


Exhibit 6.2: Determination Committee for Indian CDS Market.

To be eligible to be a DC member, all dealer institutions must have been the participants in the bidding process in previous auctions, and must have followed the 'Big Bang' criteria and Depository Trust and Clearing Corporation (DTCC) trade volume criteria. Dealers are selected according to their rank in trading volumes. Buy-side members must have at least \$1 billion in both managed assets and notional single-name CDS exposure. Moreover, agreement of one-third out of the total of the then-current buy-side members is required for any new buy-side member inclusion.

External review committee

The external review committee takes over the task if the DC fails to reach an 80% supermajority consensus. If the consensus is less than 80% but more than 60%, the external committee must wholly pass their decision in consensus if they want to reject the decision of the DC. In case the consensus is less than 60%, two-third majority of the external committee can also reject the DC's decision. The DC will get their hearing before the external committee and the results will be published by the ISDA as a binding rule for all future decisions.

Rolling Lookback Period

According to the Small Bang and Big Bang, a credit event would be known to occur only if the relevant DC finds that it happened within 60 calendar

days period before the request of intervention was made. This request can be made by the market participants. The respective duration is 90 days for a succession event. Such lookback periods are defined as 'statute of limitations.' Also, there is no business day adjustment to this date. Such statutes of limitations make transactions and fungibility more suitable for each other in a way that all the existing trades will have identical effective credit event and succession event date. This removes basis risk between offsetting trades.

Determining whether a credit event has occurred

Once the DC accepts the request from an eligible market participant, it will decide whether an event has occurred, based on the required documents about Credit Event Resolution Request Date and Credit Event Backstop Date, and may seek external expertise, if necessary. It may also decide not to accept the request. If it is decided that the credit event has occurred, then the event determination date is decided according to the date for calculating accrued interest. It is defined as follows:

- The Credit Event Resolution Request Date in case DC announces Credit Event or,
- The first date on which one counterparty delivers credit event notice and notice of publicly available information to the other party. This happens only in the absence of DC ruling.

6.3 TYPES OF CREDIT EVENTS

The credit events include one or more events of bankruptcy, failure-to-pay event, obligation acceleration, obligation default, repudiation/moratorium or restructuring, as defined in the ISDA definitions. As per the Confirmation, the CDS contracts recognize the following credit events for standard North American and European corporates and financials:

- Bankruptcy: Bankruptcy can occur if the reference entity is dissolved or becomes insolvent
- Failure to Pay
- Restructuring (except for standard North American CDS)

The CDS settlement is triggered automatically in case of hard credit events. Bankruptcy, inability to deliver commitments, repudiation/moratorium, obligation acceleration and obligation default are all hard credit events. On the other hand, restructuring is a soft credit event and will initiate settlement only if any one of the parties pursues it.

Bankruptcy

The following are the situations which are classified as bankruptcy or an event leading to it:

- Legal entity dissolved: A part or full of its assets are liquidated to pay for the outstanding liabilities. The legal entity is dissolved other than because of a merger or a consolidation.
- Fails to settle its debt
- Makes a general assignment, arrangement or composition with or in favor of its creditors
- Warrants bankruptcy proceedings
- Is given overseer, liquidator, conservator, receiver, representative, guardian or similar for all/majority of its assets to manage
- Faces an event which is analogous to above situations and applicable laws of any jurisdiction

Failure to Pay

Failure to make payment larger than the requirements on one or more of its obligations is considered a credit event for the reference entity.

Repudiation/Moratorium

‘Repudiation/Moratorium’ is not considered a credit event in standard CDS contracts in North America and Europe. However, it is an event that is most commonly applied to sovereign CDS contracts and at times to the emerging market corporates. Repudiation/Moratorium is said to have happened when the following events occur:

- Potential Repudiation/Moratorium: a sanctioned officer of a reference entity or a governmental authority disaffirms, renounces, repudiates or rejects or contests the legitimacy of its obligations in a total sum of not fewer than the default specification or declares or imposes a moratorium, cessation or rollover, whether de facto or de jure, related to one or more obligations in sum not less than the default specification and unable to settle without default or restructuring with respect to any such obligation on or before the repudiation/moratorium evaluation date.
- A failure to payment or a restructuring event happens on or before the evaluation date of repudiation/moratorium.

Note that if a potential repudiation/moratorium takes place during the period under the CDS contract, it turns into a complete repudiation/

moratorium and will be payable under the contract even if the failure to payment or restructuring event as a consequence of repudiation/moratorium gets known after the scheduled termination date.

Restructuring

Restructuring credit event considered to have occurred in case of the following events:

- Change in either the principal or stipulated interest amount or time
- Change in priority of payment contract making it less prior
- Change in pre-specified currency specification. Any change in the interest or principal payments to a not permitted currency is considered a restructuring event.

Event should not be covered under the conditions of the obligation in Backstop Date and the obligation issue date. Also, the event must:

- result from credit quality degradation of financial entity or reference asset;
- comply with multiple holder obligation that specifies that the restructuring credit event must be held by the consent of more than three holders to the event requiring two-third majority or/and
- occur not due for tax adjustment or any other accounting formalities.

The CDS confirmation specifies the default requirement. In general, it is taken as equivalent of \$10 million unless specified otherwise. Currencies permitted are of the G-7 countries which are OECD members and with AAA rating of Moody, Fitch or S&P.

The changes mentioned earlier must occur as binding to all holders and restructuring should be done by announcement or decree by the reference entity or government authority, with sufficient number of intermediate holders.

Voluntary restructuring is said to be valid if one or more obligations are liable for restructuring or if one or more bonds are under the Collective Action Clause. For restructuring to initiate, more than a certain pre-specified number of holders should agree to it. In other cases, voluntary restructuring will not trigger the CDS contract.

Alternative approach that sovereigns, specifically, improve their debt profile is through debt exchange. In this way, the relevant events will initiate the CDS settlement, although this exchange will not trigger the settlement directly.

The other credit events are as follows:

- **Obligation Acceleration:** This is said to take place if full or partial agreement over obligations become due or payable or any of the

stipulated payment becomes payable before the expected date of their failure because of any credit event other than payment settlement.

- **Obligation Default:** In case, due to any credit event other than payment settlement, full or partial agreement over obligations or any stipulated payment is declared due or payable.

6.4 THE DIFFERENT RESTRUCTURING CONVENTIONS

The CDS contracts can trade with the following restructuring conventions:

- **No R:** Restructuring is not a credit event.
- **Old R:** Restructuring is considered equal to default/failure-to-pay credit event.
- **Mod-R:** The restructuring maturity limitation and fully transferable obligation provisions are applicable.
 - Obligations should be transferable, or assignable, without agreement on supply
 - Restructuring maturity limitation date details about obligations
- **Mod-Mod-R:** The restructuring maturity limitation and fully transferable obligation provision is applicable.
 - Obligations should be transferable or assignable without agreement on supply except for a condition where no such permission may be required for the transfer.
 - Modified restructuring maturity limitation date details about obligations for buyer-triggered contract. If it is triggered by the seller, no limitation date is applicable.

No maturity limitation on deliverable obligations (beyond the usual 30 years) and no transferable obligation limitation for the sovereign trading. These conventions help in reducing the value of CTD option in a buyer-triggered credit event. They also limit the deliverable obligation maturity in restructuring event.

Before April 2009, the North American CDS contracts typically traded Mod-R for investment-grade names and No-R for indices and high-yield single names. Chapter 11 automatically triggers a default event and thus inclusion of restructuring, as credit event is not required.

However, restructuring is important for Europe for the following reasons:

- There is no Chapter 11 or equivalent which discusses about restructuring as credit event.

- The CDS hedging is unviable because Basel rules do not recognize restructuring as a valid credit event.

Thus, for Europe:

SEC	:	Mod-Mod-R
European single names and iTraxx indices	:	Mod-Mod-R
Subordinated European Insurance Contracts	:	Old R

Different Restructuring Conventions

The restructuring conventions are different in different regions and types of contracts as mentioned earlier. Conventions for standard CDS contract are given in Exhibit 6.3.

Exhibit 6.3: Restructuring Conventions for Various Events.

Region	Convention	Multiple Holder Obligation
North American Corporate	No R	Applicable
European Corporate	Mod-Mod-R	Applicable
Subordinated European Insurance Corporate	Old R	Applicable
Emerging European Corporate	Old R	Applicable to loans, not bonds
Latin America Corporate	Old R	Not Applicable
Australia Corporate	Mod-R	
New Zealand Corporate	Mod-R	
Japan Corporate	Old R	Not Applicable
Asia Corporate	Old R	
Western European Sovereign	Old R	
Latin America Sovereign	Old R	Not Applicable
Emerging European & Middle Eastern Sovereign	Old R	Not Applicable
Australia Sovereign	Mod-R	
New Zealand Sovereign	Mod-R	
Japan Sovereign	Old R	Not Applicable
Asia Sovereign	Old R	

6.5 FROM CREDIT EVENT TO AUCTION

On the decision of the DC that the credit event has occurred, a particular schedule of events is followed up to the auction process. For hard credit events, this principally just consists of the description of the deliverable obligations and the date of the auction. For restructuring credit events, it is more intricate because the event is voluntary and the maturity restraint on deliverables for buyer-triggered contracts needs the specification of auction maturity buckets. The timetable can be altered by the DC with 80% majority at all times.

The following section illustrates the procedure for defining the list of deliverable obligations for the auction process. This is common to both hard and soft credit events and permits the market participants to both include and exclude obligations from the list. The DC decides the obligations on the list with half majority if unchallenged, 80% majority or external evaluation, if challenged.

Determining the List of Deliverable Obligations

- The DC declares that credit event has happened and one or more auctions will be held (+3 calendar days*)
- At 5 p.m.: Initial list of deliverable obligations printed (+2 calendar days*)
- At 5 p.m.: Deadline for suggesting added deliverable obligations
- At 7 p.m.: Supplemental list printed (+3 calendar days*)
- At 5 p.m.: Deadline for objecting on obligations on the list (+2 calendar days*)
- The final list is printed and the maturity buckets are stated (for restructuring credit events)

Please note that (*) indicates the first business day falling on or after this day.

If the investors demand to physically settle their contract through bonds or loans in the auction, they will be required to guarantee that the bond or loan they are delivering is on the list of deliverable obligations and fall in the designated time period.

For a non-restructuring credit event, the auction takes place on the third business day immediately before the 30th calendar day after the credit event resolution request date after the list has been printed.

Restructuring Credit Event Process

The restructuring credit events, unlike other credit events, are optional and provides a choice to the buyer and seller whether to settle the CDS contract or not (and that too, partially or wholly) under some time period deadlines and maturity limitations under the Mod-R and Mod-Mod-R.

Due to these restrictions, it is generally not possible to settle with the same set of deliverables into every CDS contract, which makes the auction process more complicated. The following list gives additional timeline for a restructuring credit event, and the list of deliverable obligations and the maturity buckets for the auctions.

- The DC announces that credit event has occurred and one or more auctions will be held (+3 calendar days*)
- At 5 p.m.: Initial list of deliverable obligations published (+2 calendar days*)
- At 5 p.m.: Deadline for proposing additional deliverable obligations
- At 7 p.m.: Supplemental list published (+3 calendar days*)
- At 5 p.m.: Deadline for challenging obligations on the list (+2 calendar days*)
- The final list is published and the maturity buckets are specified (for restructuring credit events)

Please note that (*) indicates the first business day falling on or after this day.

6.6 RATIONALE FOR SPLITTING THE AUCTION INTO MATURITY BUCKETS

Before the restructuring supplement of the Small Bang Protocol, the maturity restrictions on deliverables for the buyer-triggered contracts were as follows:

Mod-R:

The restructuring maturity limitation date is the later of

- the CDS maturity date
- the earlier of
 - 2.5 years following the restructuring date
 - the latest final maturity date of any restructured bond or loan

Mod-Mod-R:

The modified restructuring maturity limitation date was the later of

- the CDS maturity date

- 5 years after the restructuring date for any restructured bond or loan
- 2.5 years following the restructuring date for any non-restructured bond or loan

There is no restriction after the usual 30 years deadline on deliverables for the seller-initiated contracts.

Since the set of deliverables can vary for every CDS maturity, the Small Bang Protocol outlines a set of auction maturity buckets. The deliverable obligations and CDS contracts are assigned into these maturity buckets and a practicable number of auctions are then organized---up to one auction per maturity bucket, per seniority.

The auction buckets are applicable for those contracts that trade Mod-R and Mod-Mod-R unlike a single auction for those trading Old-R and with classical credit events like bankruptcy and default. Under the fall-back to physical settlement (outside the auction), the original maturity limitations are applicable.

Calculating the Auction Maturity Buckets

There can be up to eight maturity buckets, based around the IMM dates. Note that the IMM dates refer to the 20 March, 20 June, 20 September and 20 December, differing from the true IMM dates which fall on the third Wednesday of these months in case of the CDS contracts. The eight maturity buckets are as follows:

- 2.5 year (Mod-Mod-R, 5 year)
- 5 year
- 7.5 year
- 10 year
- 12.5 year
- 15 year
- 20 year

In addition, there may be a pre--2.5-year bucket for Mod-R only. The obligations are deliverable into bucket and which CDS contracts fall into which bucket is decided by a set of guidelines. To summarize, the whole process is as follows:

1. **Calculate the IMM date--based bucket maturities to allocate the deliverables:** Beginning with the restructuring date (as determined by the DC), move to the next IMM date (20 March, 20 June, 20 September, 20 December) and add X years to get the maturity of the auction bucket X. Thus, if the restructuring date is 23 October 2012, the next IMM date is 20 December 2012 and so the 2.5-year bucket

Exhibit 6.4: Relevant Bucket Dates for Allocation of Deliverables.

Restructuring date: 23 November 2012		
Bucket	Start date	End date
2.5 year	23 November 2012	20 June 2015
5 year	21 June 2015	20 December 2017
7.5 year	21 December 2017	20 June 2020

goes from 23 October 2012 to 20 June 2015, the 5-year bucket goes from 21 June 2015 to 20 December 2018, and so on. The first three are shown in Exhibit 6.4:

2. Allocate the deliverables into the buckets: If the final maturity of the obligation listed in the final list of deliverables by the DC falls on or before the bucket maturity date, it goes in the maturity bucket. However, under Mod-Mod-R, the restructured obligations would fall into the 2.5-year bucket rather than in the 5-year bucket.

Consider, by way of example, the list of deliverables in Exhibit 6.5. They are a subset of the final list of deliverable obligations for an actual credit event triggered on 23 November 2012. They have been taken so that the final bucket dates are identical as if the entire set of actual deliverables were used.

There are only three possible buckets because there are no deliverables maturing after 20 June 2020. The first four deliverables mature on or before 20 June 2015, the 2.5-year bucket maturity date shown in Exhibit 6.5. They, therefore, fall in Bucket 1. The next three deliverables mature on or before 20 December 2017 and therefore, fall in Bucket 2. The final three deliverables mature after 20 December 2017 but on or before 20 June 2020 and therefore, fall in Bucket 3.

3. **Define the bucket maturity dates for CDS contracts so that no contract falls in a bucket that only contains obligations with maturity longer than the CDS maturity:** After the deliverables are assigned into the maturity buckets, the allocation of the CDS contracts has to be done so that there is a minimum of one deliverable in the bucket that matures before the CDS contract. Any CDS contract that falls in a bucket with only longer-maturity deliverables rounds down to the next previous bucket known as the rounding down convention. The exclusions are the CDS contracts in the front bucket maturing before the shortest deliverable obligation as they cannot be rounded down any further and they stay in the 2.5-year

Exhibit 6.5: Deliverable Allocation by Bucket.

Restructuring date: 23 November 2012				
Bucket	Description	ISIN	Maturity date	Seniority
B1	Deliverable 1	XS0273602622	02 November 2013	Senior
B1	Deliverable 2	XS0283695228	25 January 2014	Senior
B1	Deliverable 3	XS0307691559	28 June 2014	Senior
B1	Deliverable 4	XS0308096709	20 June 2015	Senior
B2	Deliverable 5	XS0302133607	25 November 2015	Senior
B2	Deliverable 6	XS0194937503	25 June 2016	Subordinate
B2	Deliverable 7	XS0234075314	10 November 2017	Senior
B3	Deliverable 8	XS0257752013	21 June 2018	Subordinate
B3	Deliverable 9	XS0405791509	15 September 2019	Senior
B3	Deliverable 10	XS0346016073	23 April 2020	Senior

bucket. The deliverables that are relevant for them are those that fall directly into a maturity bucket, rather than those that are also deliverable into it due to falling into a shorter bucket.

For Mod-R only, if the longest-maturity restructured bond or loan has its maturity before the 2.5-year bucket maturity, there is an extra pre--2.5-year maturity bucket having all CDS maturing on or before this restructured bond or loan. Considering the situation in Exhibit 6.6, the shortest deliverable falling in Bucket 2, that is not in Bucket 1, is Deliverable 5, which matures on 25 November 2015. All the CDS contracts maturing before that date must therefore fall in Bucket 1, and so the maturity date of the first bucket for the purposes of allocating CDS contracts is 24 November 2015. So is the case for both sub and senior CDS contracts as they have the same front bucket, and in fact there are no subordinated deliverables in the front bucket for sub CDS.

The condition is different for the second and third buckets and it is not the same as that in subordinated and senior CDS contracts because the shortest-maturity bond falling in Bucket 3 is subordinated.

Exhibit 6.6: Buyer-triggered Auction Maturity Buckets for the Deliverables.

Restructuring date: 23 November 2012				
	Senior		Subordinated	
Bucket	Start date	End date	Start date	End date
2.5 year	23 November 2012	24 November 2015	23 November 2012	24 November 2015
5 year	25 November 2015	14 September 2019	25 November 2015	20 June 2018
7.5 year	15 September 2019	N/A	21 June 2018	N/A

The maturity of the second bucket is therefore 14 September 2019 for senior (the day before the shortest senior deliverable in Bucket 3) and 20 June 2018 for subordinated (the day before the shortest sub deliverable in Bucket 3), with longer contracts going in Bucket 3. The final bucket maturity dates are summarized in Exhibit 6.6.

6.7 TRIGGERING OF THE CDS CONTRACT

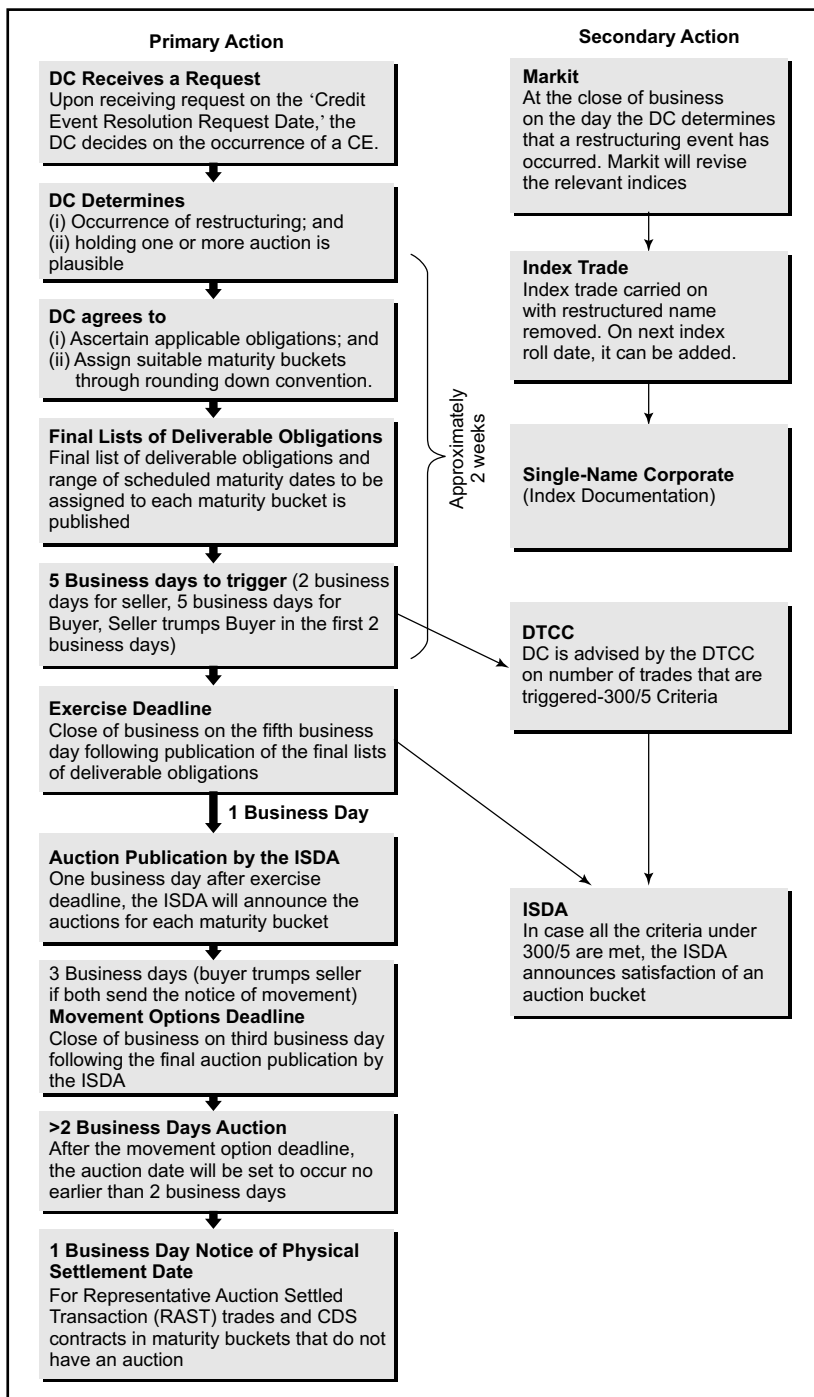
The triggering of the CDS contract can be done by both the protection buyer and the protection seller. The buyer-triggered CDS contract goes into the auction bucket on the basis of its maturity date and the seller-triggered CDS contract goes into the longest auction bucket whatever is applicable according to the data. If the contract is triggered by both, the rule followed will be same as in the case of seller-triggered settlement. Because buyer- and seller-triggered CDS contracts can be allocated in different buckets even if they are of same maturity, it is possible that the recovery risk will be faced in flat position. This risk can be crucial. However, it can generally be managed by calculated triggering.

The triggering window is usually 5 days after the printing of the final list of deliverable obligations. The protection seller can only trigger the contract during the initial 2 days; however, the buyer can do so during the entire duration of 5 days. Triggering is normally done through the DTCC.

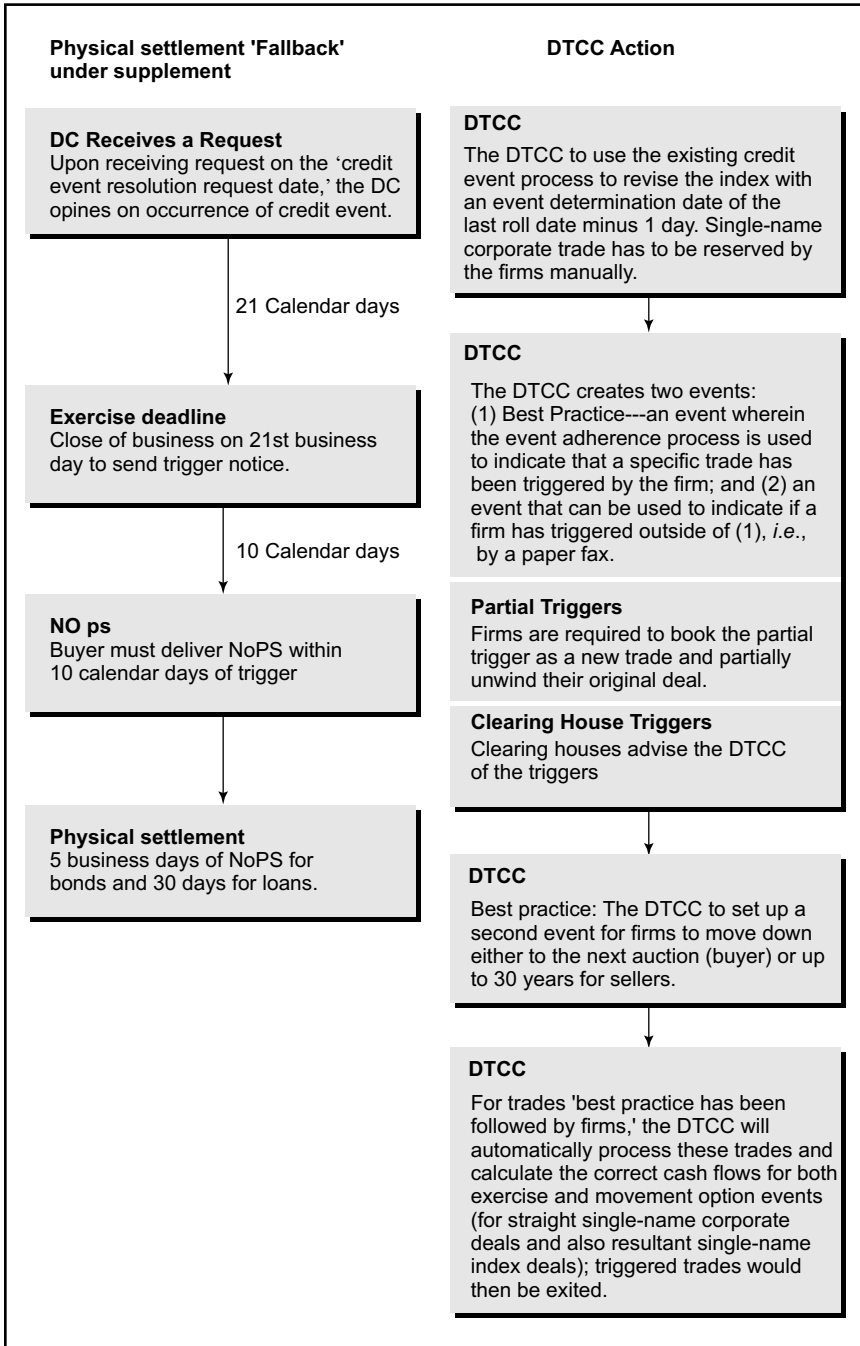
The 300/5 Rule

The auctions for various maturity buckets take place after the triggering window is declared closed by the DC. Any bucket that has a minimum of

**Exhibit 6.7: Summary of CDS Auction Settlement Timeline—
Primary and Secondary Actions.**



**Exhibit 6.8: Summary of CDS Auction Settlement Timeline—
'Fallback' and DTCC Action.**



300 triggered transactions and a minimum of 5 dealer counterparties may have an auction (the 300/5 rule). However, this rule is not compulsory. All the other buckets that will have auctions are also decided by the DC.

The Movement Option

If the DC refuses to hold an auction for a particular maturity bucket, the movement option will come into effect, *i.e.*, both the counterparties have an option to move the contract to a bucket that is exercising an auction. The duration for exercising the movement option is three business days.

If the protection buyer takes the step, the CDS contract drops down to the next earliest auction holding maturity bucket and to the auction holding longest bucket if the step is taken by the protection seller. If both decided to take this step, the rule followed will be identical to the buyer-initiated move. If neither of them takes the step, then the fallback settlement method applies which is pre-specified in the CDS confirmation. This generally takes place in the form of a physical settlement.

The timeline of the CDS auction settlement is charted for ready reference in Exhibits 6.7 and 6.8.

CHAPTER 7

CDS CREDIT EVENT AUCTION

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7.1 SYNOPSIS

The means of settling the CDS contracts are becoming more and more standardized along with the evolution of such contracts for single-name, indices and tranches. Earlier, in case of a default or any other credit event, there used to be an exchange of defaulted asset against par value. This arrangement has become more and more difficult with the evolution of the CDS market and hence there is a need for a standard auction process to determine the recovery value. We will now review the auction process that is carried out by the Determination Committee (DC) in detail. We will explain the concept through a stylized example and then with an actual example in this chapter.

7.2 THE ROLE OF THE AUCTION

The role of auction can be understood in the context of the following, where the auction process is more efficient vis-à-vis the physical settlement process:

- There may be cases when the protection buyer may not actually own the reference asset. The obligation to deliver it, particularly for very large quantities due to excess notional amount of the CDS contracts in comparison to the actual availability of the underlying, would thus lead to delivery inflation due to supply constraints.
- For facilities like indices and tranches, many market participants do not want to have ownership of the physical asset. This makes protection selling less profitable.

- In the absence of single common market-wide price, deliverable obligations recover at different rates depending on the capability of the delivering party.

The constraints concerning physical delivery led to the evolution of an auction process to permit cash settlement of contracts and a common market-wide price. The auctions evolved to the present process, which have now become well-established. From 2005 to 2010, there have been 78 auctions.

Until 2009, every auction demanded a distinct auction protocol to be signed by all counterparties. This was administratively cumbersome, and thus with higher standardization and transparency in the CDS markets, the procedure was hardwired for all credit events through application of the Big and Small Bang Protocols in 2009. The present setup enables CDS positions to be settled proficiently following a credit event, contributing meaningfully to efficient operation of the CDS markets.

7.3 GLOBAL CDS CONTRACT CHANGES

Event Determination Committee

As discussed earlier, the ISDA 2003 Definition implemented the provisions for one DC in each region. The markets were divided into five regions for this purpose: America, Asia ex-Japan, Australia and New Zealand, Japan and EMEA (Europe, Middle East and Africa). The primary responsibility of each DC was to determine the occurrence of a credit event or a succession event and the date and type of the event, in case of occurrence. The DC then determines the terms and conditions of the auction procedure, also known as 'Hardwiring of Auctions.' The committee makes binding conclusions on the deliverable obligations and the cash settlement price.

All the DCs across all regions are consistent in their organization, *i.e.*, their structure and composition. Each DC consists of eight global dealers, two regional dealers, five buy-side members, two non-voting dealers, one non-voting buy-side member and the ISDA as a non-voting secretary.

To ascertain whether a credit event has occurred, the concerned ISDA member must raise the issue with the sponsorship of a DC member. The period for consideration is given by the 'lookback period'. For a credit event, the 'lookback period' is 60 days and for a succession event, 90 days. The issue has to be raised within this period. Moreover, only the date of

issue is relevant for the deliberation procedure to be initiated. The time taken by the committee in determining the legitimacy of the notice does not deprive the protection buyer of the rights of settlement. Upon investigating, if the procedures confirm a credit event, deliverable obligations and settlements are indicated and auction terms and procedures, if required, specified. An 80% supermajority is required to positively conclude a decision, and when this condition is not satisfied, the issue is transferred to an external panel.

Hardwiring the Auctions

Hardwiring the auction mechanism has improved over the old contract, which only facilitated physical settlement of trades, by providing an effective, efficient and clear procedure to determine the cash settlement price. Though the auction process itself was implemented in 2005 and has performed well, the procedure was too complex and cumbersome. The credit event auction mechanism overcomes this drawback to a large extent by facilitating a structured and standardized settlement procedure, whether through physical or through cash settlement. The auction terms need to be tailored to best fit each credit and are determined by the ISDA. The auction terms include the following:

- Auction date
- Initial and subsequent bidding information publication time
- Inside market quotation amount
- Maximum inside market bid-offer spread
- Minimum number of valid inside market submissions

CDS Auction Mechanism

The auction mechanisms were developed by the auction administrator—Markit. The auction mechanism consists of two parts. For the first part, a two-way market quote of the defaulted assets and the physical settlement requests are required as inputs. The defaulted assets usually have a predefined maximum market spread and a predefined quotation size, which depend on the liquidity on the assets and hence might be auction specific. With the two-way market quotes supplied by the dealers, an inside market midpoint, IMM (not to be confused with International Money Market, which is also abbreviated as IMM), is formulated by a process of elimination of crossing markets. Then, the best half—highest bids and lowest offers of the remaining bids and offers are considered and the

average is calculated. Then, the open interest is calculated, *viz.*, difference between the sum of total buy-side physical settlement requests and the sum of total sell-side physical settlement requests. In the process, a monetary penalty called the 'Adjustment Amount' is charged to dealers with off-market submissions. The off-Market submissions are usually wide of the mark as compared to the IMM and on the wrong side of it. Adjustment amount equals quotation amount, multiplied by the price difference compared to IMM.

This is followed by comparing the par—principal balance outstanding and the highest offer from the inside markets submitted by a dealer. The higher value between these is set as the 'limit offer cap.' The 'limit offer cap' is then utilized during the second stage of the process of auction and is applicable only for loan credit default swaps (CDSs) auctions. After the first stage is over, the following information is made public:

- The inside market point
- The size and direction of open interest
- The limit offer cap
- Adjustment amounts, if any

Once this information is disseminated, the dealers and investors have a stipulated time to comprehend and analyze the overall market picture and submit the limit orders, if they desire, for the next part. The limit orders are then taken to the second part of the auction process and are used in a kind of matching process with the open interest. Since the open interest is already known before the limit orders are made, only the 'relevant' limit orders are carried forward to the second stage. If the open interest is meant for the purpose of selling, the highest limit order is taken and matched to the open interest amount equivalent to the size associated with the limit order. In case the open interest is the other way around, *i.e.*, to buy, the lowest limit order is considered and the same procedure is repeated. The same process is repeated with the second highest limit order (assuming open interest is to sell) and so on. The final price is then determined, which for an open interest position to sell is always zero but for an open interest portion to buy is concluded when the last limit order is matched to the open interest.

Auction Mechanism: Part 1

Consider a hypothetical example where eight dealers have submitted their respective bid/offer spreads on pre-specified reference obligations (Exhibit 7.1). The market spread is assumed to be 2% and the quotation size \$10 million.

Exhibit 7.1: Dealers Bid/Offer Spreads.

Dealer	Bid	Offer
JPMorgan	50	52
IDBI Bank	48.50	51.75
ICICI Bank	51.25	53
Deutsche Bank	48	51.25
Standard Chartered Bank	49.50	52.25
HSBC	47	49.75
Barclays Bank	48.75	50
Citibank	50.75	52.75

Exhibit 7.2: Sorting the Bids in Descending Order and the Offers in Ascending Order.

Dealer	Bid	Dealer	Offer
ICICI Bank	51.25	HSBC	49.75
Citibank	50.75	Barclays Bank	50
JPMorgan	50	Deutsche Bank	51.25
Standard Chartered Bank	49.50	IDBI Bank	51.75
Barclays Bank	48.75	JPMorgan	52
IDBI Bank	48.50	Standard Chartered Bank	52.25
Deutsche Bank	48	Citibank	52.75
HSBC	47	ICICI Bank	53

Now, for the dealers ICICI Bank and Citibank, the bids are higher than the offers from HSBC and Barclays Bank and hence these deals cross with each other. These are excluded from the calculation of the inside market point. The best half of the remaining bids includes JPMorgan, Standard Chartered Bank and Barclays Bank. The best half of the remaining offers includes Deutsche Bank, IDBI Bank and JPMorgan (Exhibit 7.2). The inside market point is then the average of these six numbers. Inside market point is 50.50 (rounded off to the nearest one-fourth).

Physical settlement requests

Exhibit 7.3: Physical Settlements Request.

Dealer	Buy/Sell	Size (\$ mn)
JPMorgan	Buy	7
IDBI Bank	Buy	8
ICICI Bank	Sell	2
Deutsche Bank	Sell	6
Standard Chartered Bank	Sell	4
HSBC	Buy	6
Barclays Bank	Sell	5
Citibank	Buy	9

Tallying the difference, we get an open interest position of \$13 million to buy (Exhibit 7.3).

Adjustment amount

Since the open interest position is to buy and for dealers HSBC and Barclays Bank, the offers were less than the IMM, they both will pay an adjustment amount.

$$\text{Adjustment Amount} = (\text{IMM} - \text{Offer}) \times \text{Notional } (\$10 \text{ million})$$

For HSBC, the adjustment amount comes out to be \$75 000 and for Barclays Bank it amounts to \$50 000.

Auction Mechanism: Part 2

In the second part, the limit orders are matched to the open interest position and the final price is calculated.

Limit offer

The limit offer includes the carried-forward offers, including the crossed offers from part 1 and the offers directly submitted in the second part. The crossed trades from part 1 are carried forward at the IMM.

Offers from Part 1, including the cross-market offers, are carried forward at inside-market-midpoint level (Exhibit 7.4). The offers by HSBC and Barclays Bank are carried forward at the inside-market-midpoint

Exhibit 7.4: Crossed Trades Carried Forward at the Inside Market Midpoint.

Offer Price	Offer Size	
52.5	2	}
51.5	4	
50.75	3	
50.5	5	}
50.5	5	
51.25	4	
51.75	2	}
52	5	
52.25	7	
52.75	1	}
53	4	

level of 50.50. Sorting the offers in ascending order as shown in Exhibit 7.5, we get the open-interest position is of \$13 million and the direction is to 'sell.' The top three offers match the open-interest criteria and hence are sufficient to find the final price. Since 50.75 is the last limit offer matched to the open interest, the final price comes out to be 50.75.

Exhibit 7.5: Sorting the Offers in Ascending Order.

Offer Price	Offer Size
50.50	5
50.50	5
50.75	3
51.25	4
51.50	4
51.75	2
52.00	5
52.25	7
52.50	2
52.75	1
53.00	4

7.4 AUCTION MECHANICS

The settlement conditions are published by the DC after they take decision regarding the auction process. The auctions are then managed by Markit. The auction terms summarize the guidelines regarding the auction process and are typically standard among different events. The event-specific details are in Schedule 1 of the terms and conditions and contain the following information:

- The relevant reference entity
- The relevant dates (event resolution date, auction date and timing of different parts of the auction) and publication times
- The relevant auction buckets
- Deliverable obligation features
- Various auction-related sizes and spreads

The auction is divided into two portions. The first stage creates the net physical settlement necessities and a suggestive market for the final price. The second stage is a Dutch auction: limit orders decide the final price as the one which settles the net physical position recognized in the first stage. All the transactions occur at the final price, and this recovery level is used in the cash settlement of contracts.

Both Settlements: Cash and Physical

In usual cases, the settlement of CDS contract is through cash settlement. However, the counterparties can pre-decide whether they would like to opt for physical settlement. Exhibit 7.6 lists the auctions held since 2005.

- Protection buyers will get $[\text{notional} \times (1 - \text{final price}) - \text{accrued}]$
- Protection sellers will pay $[\text{notional} \times (1 - \text{final price}) - \text{accrued}]$

Exhibit 7.6: Auctions Held Since 2005.

Year	Number of auctions
2005	5
2006	4
2007	1
2008	10
2009	45
2010	13

The accrued takes care of the time gap between event determination date and previous coupon payment. The flow of money is reverse if the coupon is paid after event determination date. The physical settlement is done by a Customer Physical Settlement Request Letter that is to be sent by 5 p.m. on the business day before the auction. This is a firm contract to buy or sell deliverable obligations at the final price. After the auction, protection buyers settling their contracts physically stipulate the obligations to be delivered in a Notice of Physical Settlement (NOPS). The NOPS is due by 4 p.m. on the business day after the auction and the related terms and conditions can be changed hereafter.

The process can be outlined as follows:

Protection buyer:

- Deliverable obligation sold
- Cash value (par – final price) obtained
 - ⇒ Deliverable sold and (final price + par – final price) obtained
 - ⇒ Deliverable sold and par obtained

Protection seller:

- Deliverable obligation obtained, final price given
- Cash value (par – final price) given
 - ⇒ Deliverable received and (final price + par – final price) given
 - ⇒ Deliverable received and par given

Investors can only make physical settlement requests to the maximum of their CDS position in the contract. If they have bought net \$1 million of protection, they can submit to sell less than \$1 million of bonds/loans in the auction. It is so because the CDS protection is bought to hedge a particular underlying and the assets can be settled at par. An appeal that is in the reverse direction to the net CDS position is not valid, *i.e.*, sellers cannot appeal requests for physical settlement to sell in the auction and *vice versa*.

7.5 EXAMPLE OF ANGLO IRISH AUCTION

We now discuss the auction of Anglo Irish Bank to illustrate the procedure discussed earlier through an example.

1. **Calculating the IMM:** This is used to determine the final recovery rate. Involved counterparties enter in a two-way market for the deliverable obligations. They are asked to do so in a pre-specified quotation size and bid-offer spread. These are called the initial market quotation amount and the maximum initial market bid-offer spread.

To determine the IMM, crossing and touching markets are rejected. The normal of the best half of the outstanding bids and offers is then calculated as the IMM. Rounded-up value is used, as required. The dealer markets

Exhibit 7.7: Dealer Inside Markets as Submitted: Anglo Irish Auction.

Anglo Irish Auction 2.5-year bucket			
Dealer	Bid	Offer	Dealer
Bank of America N.A.	76.5	80	Bank of America N.A.
Barclays Bank PLC	75	78.5	Barclays Bank PLC
BNP Paribas	79	82.5	BNP Paribas
Citigroup Global Markets Ltd.	75.5	79	Citigroup Global Markets Ltd.
Credit Suisse International	74.5	78	Credit Suisse International
Deutsche Bank AG	76.75	80.25	Deutsche Bank AG
Goldman Sachs International	78.5	82	Goldman Sachs International
HSBC Bank PLC	75	78.5	HSBC Bank PLC
JPMorgan Chase Bank N.A.	75.5	79	JPMorgan Chase Bank N.A.
Morgan Stanley & Co.	78	81.5	Morgan Stanley & Co.
Nomura International PLC	79	82.5	Nomura International PLC
Société Générale	75.5	79	Société Générale
Royal Bank of Scotland PLC	78	81.5	Royal Bank of Scotland PLC
UBS AG	77	80.5	UBS AG

that were submitted for the 2.5-year bucket of the Anglo Irish auction are shown in Exhibit 7.7.

To calculate the IMM, bids are sorted in descending order, and the offers are sorted in ascending order, while rejecting the crossing/touching markets. The average of the best half of those remaining bids is taken as outlined in Exhibit 7.8. The first two bid-offers cross and the third touches, so these three are rejected for the purposes of determining the IMM. As there are 11 bid-offers left, the best six are used which are the highlighted ones. The average comes out to be 78.29, which on rounding off becomes 78.25.

2. Determining the size and direction of the net open interest (NOI): This is the net notional of all the physical settlement requirements and is completed through orders in the second section of the auction.

**Exhibit 7.8: Dealer Inside Markets Ranked with Best Half
Highlighted: Anglo Irish Auction.**

Anglo Irish Auction 2.5-year bucket; IMM = 78.25			
Dealer	Bid	Offer	Dealer
BNP Paribas	79	78	Credit Suisse International
Nomura International PLC	79	78.5	Barclays Bank PLC
Goldman Sachs International	78.5	78.5	HSBC Bank PLC
Morgan Stanley & Co.	78	79	Citigroup Global Markets Ltd.
Royal Bank of Scotland PLC	78	79	JPMorgan Chase Bank N.A.
UBS AG	77	79	Société Générale
Deutsche Bank AG	76.75	75 80	Bank of America N.A.
Bank of America N.A.	76.5	80.25	Deutsche Bank AG
Citigroup Global Markets Ltd.	75.5	80.5	UBS AG
JPMorgan Chase Bank N.A.	75.5	81.5	Morgan Stanley & Co.
Société Générale	75.5	81.5	Royal Bank of Scotland PLC
Barclays Bank PLC	75	82	Goldman Sachs International
HSBC Bank PLC	75	82.5	BNP Paribas
Credit Suisse International	74.5	82.5	Nomura International PLC

Calculating the NOI

Apart from two-way market quotes making for the defaulted entity, the dealers present their physical settlement requirements. If the party is a net protection buyer, then it can bid up to the amount of its net auction CDS position, and *vice versa*, if it is a protection seller. Their CDS position size limits their position to bid or offer. Apart from this, the dealers can also present requests on behalf of customers.

Exhibit 7.9: Physical Settlement Requests: Anglo Irish Auction.

Anglo Irish Auction 2.5-year bucket		
Dealer	Bid/Offer	Size (EUR)
Bank of America N.A.	Offer	6.5
Barclays Bank PLC	Offer	10.2
BNP Paribas	Offer	31.5
Citigroup Global Markets Ltd.	Offer	0
Credit Suisse International	Offer	21.55
Deutsche Bank AG	Offer	9.8
Goldman Sachs International	Offer	12
HSBC Bank PLC	Offer	0
Morgan Stanley & Co.	Offer	9.7
Nomura International PLC	Offer	0
Société Générale	Offer	18.9
Royal Bank of Scotland PLC	Offer	0
JPMorgan Chase Bank N.A.	Bid	12
UBS AG	Bid	4.1
Total	Offer	104.05

Thus, we see from Exhibit 7.9 that summing the total requests gives an aggregate interest to sell €104.05 million. This is the NOI and it carries on to the next stage of the auction. The €16.1 million to buy is offset against the €120.15 million to sell, giving a limit order of €104.05 million as shown in Exhibit 7.10.

Exhibit 7.10: NOI Position: Anglo Irish Auction.

Anglo Irish Auction 2.5-year bucket	
Sum of Buy Physical Requests	16.1m
Sum of Sell Physical Requests	120.15m
Sum of Physical Request Trades	16.1m
Sum of Limit Order Trades	104.05m

The Adjustment Amounts

Penalty is levied on dealers who give off-market bid-offers to make sure that the IMM is coherent with the market for defaulted assets. The dealer has to give the quotation amount multiplied by the difference between his bid/offer and the IMM if the bid/offer is on opposite side of IMM. This is called the adjustment amount. Thus,

$$\text{Adjustment amount} = \text{Quotation amount} \times (\text{Bid} - \text{IMM})$$

If the NOI had been to buy, the adjustment amounts would have been taken from the dealers submitting touching/crossing offers on the opposite side of the IMM.

7.6 THE SUBSEQUENT BIDDING PERIOD IN AUCTION

The IMM, NOI and any adjustment amounts are printed within a time span of 30 minutes of the initial part of auction closing. After 2 or 3 hours, the latter part of the auction starts.

Limit Orders from the First Part of the Auction are Carried Through

The latter part of the auction process decides the clearing level for the NOI through a Dutch auction process wherein the market participants present limit orders and all the transactions happen at the final price. The market participants can submit more than one limit order in the direction of the open interest. Additionally, the suitable side of the limit orders from the first part of the auction is operated. All touching/crossing markets are operated at:

Exhibit 7.11: Adjustment Amounts.

Anglo Irish Auction 2.5-year bucket	
Dealer	Penalty (EUR)
BNP Paribas	15,000
Nomura International PLC	15,000
Goldman Sachs	5,000

- the greater of the primary market submission or the IMM (if the open interest is to buy)
- the lesser of the primary market submission or the IMM (if the open interest is to sell)

Limit Orders are Subject to a Cap Amount

The cap amount is determined in the auction settlement terms. Generally, it is 50% of the bid-offer spread. It limits the final price to make sure that it is not too distant from the IMM in the opposite direction. There must be a downward force on the recovery and so the final price is less than or equal to the sum of IMM and the cap amount, if it is a sale of open interest. The opposite is the case when the open interest is to buy. The limit orders are then sorted in order and filled until the NOI is matched. Thus, limit bids are sorted in decreasing order if the open interest is to sell and *vice versa*, if it is to buy. The highest limit bids submitted in second stage of the Anglo Irish auction is shown in Exhibit 7.12. The final level of net interest is the final price along with the following:

- Trading of all positions finalized in the second stage of the auction process.
- All cash-settled CDSs are recovered.
- Trading of all physically deliverable obligations completed.

The cumulative net interest to sell 104.05 million bonds is filled at a price of €74.5 which is determined to be the final price.

Special Cases

- Final price = IMM, if NOI = 0.
- Final price = 0, if the NOI is to sell, if limit bid-offers to satisfy it are present.
- Final price = par, if the NOI is to buy and in the absence of limit order to satisfy it.

Currency Rates

The exchange rates as fixed by reference to the WM/Reuters page at 4 p.m. London time. Mid-point rates are published the day previous to the auction date:

- one business day before the auction in America
- two business days for outside America

Exhibit 7.12: Highest Limit Bids Submitted in Second Stage of the Auction.

Anglo Irish Auction 2.5-year bucket			
Dealer	Bid	Size	Cumulative total
Credit Suisse International	80.0*	5	5
BNP Paribas**	78.25*	2	7
Goldman Sachs International**	78.25*	2	9
Nomura International PLC**	78.25*	2	11
Royal Bank of Scotland PLC**	78.0*	2	13
Morgan Stanley & Co. International PLC**	78.0*	2	15
Royal Bank of Scotland PLC	77.0*	5	20
UBS AG**	77.0*	2	22
Deutsche Bank AG**	76.75*	2	24
Bank of America N.A.**	76.5*	2	26
The Royal Bank of Scotland PLC	76.0*	5	31
JPMorgan Chase Bank N.A.	75.5*	5	36
Société Générale**	75.5*	2	38
Citigroup Global Markets Ltd.**	75.5*	2	40
JPMorgan Chase Bank N.A.**	75.5*	2	42
UBS AG	75.0*	30	72
Barclays Bank PLC**	75.0*	2	74
HSBC Bank PLC**	75.0*	2	76
BNP Paribas	74.5^	24	100
JPMorgan Chase Bank N.A.	74.5^	5	105
Credit Suisse International**	74.5^	2	107
Credit Suisse International	74.125	5	112
The Royal Bank of Scotland PLC	74	25	137
Barclays Bank PLC	74	10	147

*Bid was filled.

^Bid was partially filled

**Limit orders were brought through from the first part of the auction.

These rates are only applicable for the original NOPS. If the NOPS is changed, the applicable rate is set on the business day after the NOPS effective date. This is a modification from the situation before the Big Bang. This is to reduce the opportunity for the protection buyer to benefit from

currency fluctuation between auction and settlement dates and to amend his NOPS.

7.7 THE CTD OPTION DRIVING THE RECOVERY

The CDS contract is basically driven by two things, the first of which should be the deciding factor in usual situations:

- The value of the CTD bond
- The size and direction of the NOI as compared to the participant position

Valuation of the CTD bond has to be done before entering the CDS contract. The protection buyer is long the option and *vice versa*. The condition is same for both the physically settled and the cash-settled arrangements.

Because the protection buyers can deliver any of the obligations under the list of permissible deliverable obligations, it is most beneficial for them to deliver the CTD bond. The value of CTD will thus determine the price of recovery. The extent to which it is done depends on the size of the notional outstanding relative to the size of NOI.

In case of a restructuring event, the number of times restructuring has happened before and the valuation determines the payoff, as opposed to the common situation of standard credit events. However, both restructured and non-restructured obligations trade at different prices.

Value of CTD bond is an important parameter in physical settlement. While the buyer has the CTD option, the seller faces the risk of the value of the asset actually being delivered. However, in the case of cash settlement, the CTD will determine the IMM level. Therefore, the final price can be non-identical, depending on the proceedings of the second part of auction process. Thus, the three important parameters are as follows:

- Size of NOI in comparison to the cumulative deliverable notional outstanding, and specific to the notional outstanding of the CTD obligations. All things remaining the same, the larger the NOI compared to the notional of deliverable obligations, the more distant from the IMM the final price is likely to be decided.
- The direction of the NOI: Given the cap amount, the direction of the NOI limits, the choice of the final price gets decided relative to the IMM. If there is a huge NOI to sell and there are limited buyers, the final price that is decided can be less. The auction price will set high if there are more NOI to buy than the obtainable deliverables.
- The net CDS position of auction participants compared to the magnitude and direction of the NOI.

Note that if the reference entity was in many indices and/or in Collateralised Debt Obligations (CDOs), there will be greater CDS notional

outstanding. A large number of auction participants will sell bonds or loans into the auction if there are many contracts held with the underlying CDS, leading to a NOI to sell in absence of any obvious buyers. The lesser the NOI in comparison to the extent of the CDS notional unsettled, the larger the likelihood that one or more participants will decide where the final price sets relative to the IMM under the cap restrictions.

Example of Nortel Auction Mechanism

Now, after the auction mechanism has been described using a hypothetical example and that of Anglo Irish Bank, it is corroborated with an actual auction detail of CDS of a telecommunication giant---Nortel Networks Limited. Nortel filed for bankruptcy protection on Wednesday, 14 January 2009. Nortel's demise was one of the biggest business failures in North American history. Since the auction process has now been discussed at length, only the auction data is presented in Exhibit 7.13 to Exhibit 7.19.

7.8 CASE STUDIES

Anglo Irish

The first Anglo Irish Restructuring Credit Event occurred on 23 November 2010 caused by the change in the terms and conditions of the 2017 subordinated notes. The choice given to the bondholders was that they

Exhibit 7.13: Auction Details: Nortel Networks Limited CDS.

Reference Data		Deliverable Obligations		
RED 6:	N/A	US656569AD23	USC65614AB25	US665815AH97
Index Constituents of:	None	US656569AK65	US656569AE06	US665810AB31
		USC65614AC08	USC65614AD80	US656569AH53
		US656569AL49	USC65614AA42	US656569AB66

Auction Details			
Default Date	1/14/2009	Inside Market Quotation Amount	\$2 MM
EDD	1/14/2009	Bid-Offer Spread	2%
Auction Date	2/10/2009	Participating Bidders	11
Cash Settlement Date	2/18/2009	Adhering Parties	435
Event	Bankruptcy	Accrual Calculation Method	Normal

Exhibit 7.14: Initial Bidding Results: Nortel Networks Limited CDS.

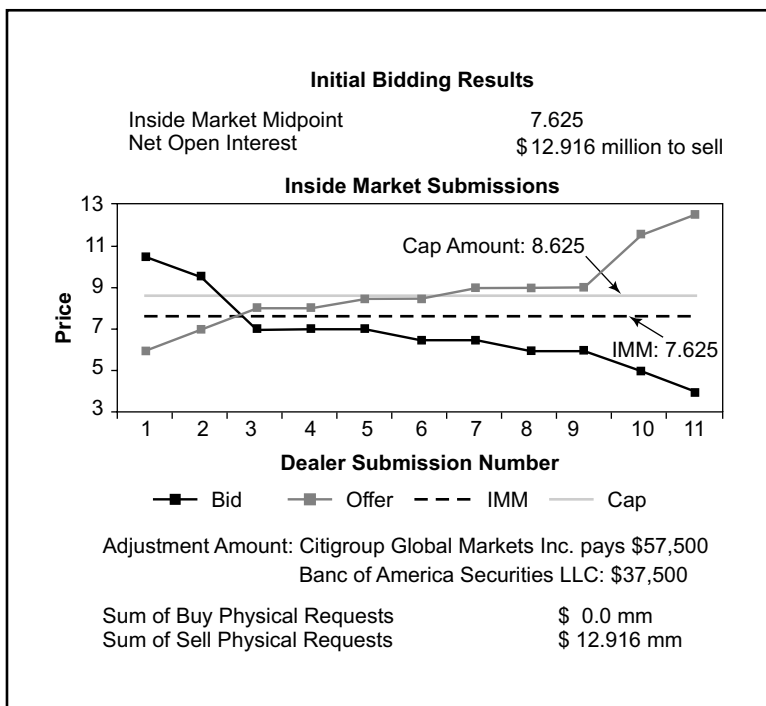


Exhibit 7.15: Final Bidding Results: Nortel Networks Limited CDS.

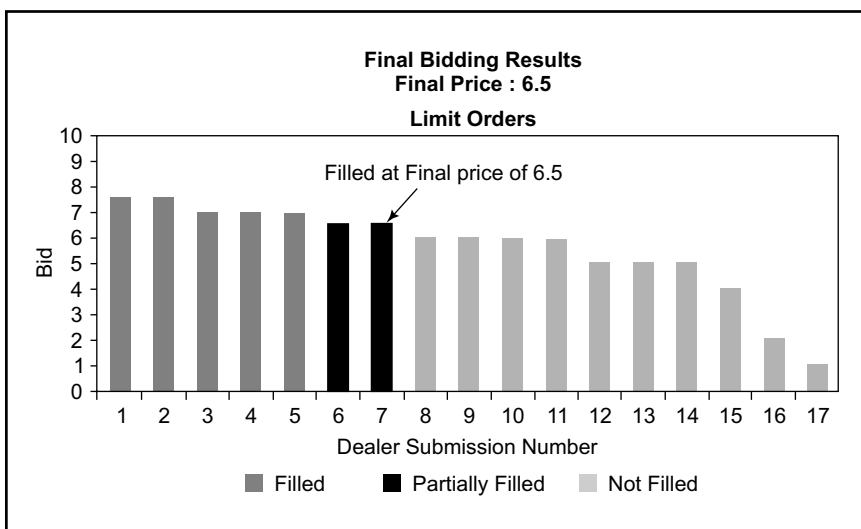


Exhibit 7.16: Bond Prices: Nortel Networks Limited CDS.

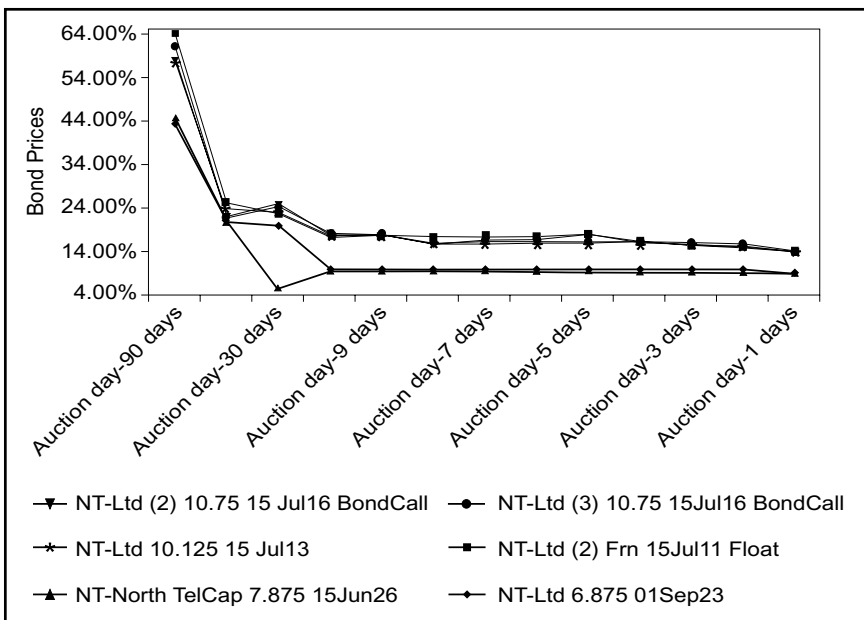


Exhibit 7.17: Initial Bidding Results: Nortel Networks Limited CDS.

Inside Market Submissions		
Dealers	Bid	Offer
Banc of America Securities LLC	9.5	11.5
Barclays Bank PLC	4	6
BNP Paribas	7	9
Citigroup Global Markets Inc.	10.5	12.5
Credit Suisse International	6.5	8.5
Deutsche Bank AG	6	8
Goldman Sachs & Co.	6	8
J.P. Morgan Securities Inc.	7	9
Morgan Stanley & Co. Incorporated	5	7
The Royal Bank of Scotland PLC	6.5	8.5
UBS Securities LLC	7	9

(Contd.)

Exhibit 7.17: (Contd.)

Physical settlement requests		
Dealers	Type	Size
BNP Paribas	O	0
Banc of America Securities LLC	O	0
Barclays Bank PLC	O	0
Citigroup Global Markets Inc.	O	4.76
Credit Suisse International	O	0
Deutsche Bank AG	O	0
Goldman Sachs & Co.	O	0
J.P. Morgan Securities Inc.	O	0
Morgan Stanley & Co. Incorporated	O	0
The Royal Bank of Scotland PLC	O	0
UBS Securities LLC	O	8.156

Exhibit 7.18: Final Bidding Results: Nortel Networks Limited CDS.

Limit Orders		
Dealers	Bid	Size
Citigroup Global Markets Inc.**	7.625*	2
Banc of America Securities LLC**	7.625*	2
J.P. Morgan Securities Inc.**	7*	2
BNP Paribas**	7*	2
UBS Securities LLC**	7*	2
Credit Suisse International**	6.5^	2
The Royal Bank of Scotland PLC**	6.5^	2
Deutsche Bank AG**	6	2
Goldman Sachs & Co.**	6	2
Banc of America Securities LLC	6	2
Goldman Sachs & Co.	6	5
Morgan Stanley & Co. Incorporated**	5	2
Morgan Stanley & Co. Incorporated	5	12.916
Banc of America Securities LLC	5	2
Barclays Bank PLC**	4	2
Deutsche Bank AG	2	12
The Royal Bank of Scotland PLC	1	12.916

**Limit Orders that were derived from inside markets.
 *Limit Orders that were filled.
 ^Limit Orders that were partially filled

Exhibit 7.19: Bond Details and Prices: Nortel Networks Limited CDS.

Bond Details					
	ISIN	CUSIP	Name	Coupon	Maturity
Bond 1	US656569AD23	656569AD2	Nortel Limited	10.75	07/15/16
Bond 2	US656569AK65	656569AK6	Nortel Limited	LIBOR + 4.25	07/15/11
Bond 3	USC65614AC08	C65614AC0	Nortel Limited	LIBOR + 4.25	07/15/11
Bond 4	US656569AL49	656569AL4	Nortel Limited	10.75	07/15/16
Bond 5	US656569AG53	656569AG5	Nortel Limited	10.125	07/15/13
Bond 6	USC65614AB25	65614AB2	Nortel Limited	10.125	07/15/13
Bond 7	US656569AE06	656569AE0	Nortel Limited	10.125	07/15/13
Bond 8	USC65614AD80	65614AD8	Nortel Limited	10.75	07/15/16
Bond 9	USC65614AA42	65614AA4	Nortel Limited	10.75	07/15/16
Bond 10	US656569AB66	656569AB6	Nortel Limited	10.75	07/15/16
Bond 11	US665815AH97	665815AH9	Nortel Limited	6.875	09/01/23
Bond 12	US665810AB31	665810AB3	Nortel Networks Capital Corporation	7.875	06/15/26

(Cont'd.)

Exhibit 7.19: (Contd.)

Bond Prices

Date		Prices			
		US656569AD23	US656569AL49	US656569AG53	US656569AK65
Auction day - 90 Days	10/03/08	58.42%	58.00%	61.30%	64.33%
Auction day - 60 Days	11/18/08	21.50%	22.17%	24.08%	25.33%
Auction day - 30 Days	12/30/08	24.50%	25.17%	23.08%	22.75%
Auction day - 10 Days	01/27/09	18.31%	18.00%	18.10%	17.38%
Auction day - 9 Days	01/28/09	18.06%	18.00%	17.95%	17.92%
Auction day - 8 Days	01/29/09	16.00%	15.63%	16.00%	17.50%
Auction day - 7 Days	01/30/09	16.31%	16.75%	16.00%	17.50%
Auction day - 6 Days	02/02/09	16.31%	16.75%	16.00%	17.50%
Auction day - 5 Days	02/03/09	16.50%	18.08%	16.00%	18.25%
Auction day - 4 Days	02/04/09	16.50%	16.58%	16.35%	16.00%
Auction day - 3 Days	02/05/09	16.19%	16.00%	16.00%	15.60%
Auction day - 2 Days	02/06/09	15.70%	16.00%	15.70%	15.13%
Auction day - 1 Day	02/09/09	14.30%	14.00%	14.00%	14.19%

(Contd.)

Exhibit 7.19: (Contd.)

Date	US665810AB31	US665815AH97
10/03/08	44.99%	43.50%
11/18/08	20.50%	21.00%
12/30/08	5.50%	20.00%
01/27/09	9.50%	10.00%
01/28/09	9.50%	10.00%
01/29/09	9.50%	10.00%
01/30/09	9.50%	10.00%
02/02/09	9.50%	10.00%
02/03/09	9.50%	10.00%
02/04/09	9.08%	10.00%
02/05/09	9.08%	10.00%
02/06/09	9.08%	10.00%
02/09/09	9.08%	9.00%

could exchange their bonds for 20% face value of a one-year government-guaranteed floating rate note, which meant a change in the terms and conditions of outstanding notes as well, giving the issuer the right to call all the outstanding notes for €0.01 for every €1000 face value. This caused a restructuring credit event, as the changes made reduced the principal and a considerable number of bondholders offered their bonds to make the changes in terms and conditions binding on all the holders.

Had there been a voluntary debt exchange, it would not have been considered a credit event, which was not the case here. Since the terms and conditions changes were binding on everyone, this triggered a credit event. Furthermore, while the restructuring was just on one of the subordinated bonds, because the obligation category is just borrowed money, this impacted both unsubordinated and subordinated CDSs.

Since the remaining 2017 bonds were called within a few days, the obligation that triggered the event no longer existed, leaving the 2014 and 2016 issues to be subjected to a similar transaction on 20 December. For auctions which took place before this date, both the bonds were to be delivered but due to the timing and outcome of the second exchange offers, the auction was observed to be very sensitive to all these factors:

- For auctions earlier to the exchange of the 2014s and 2016s, both subordinated bonds were deliverable, the former into the 5-year auction bucket, both into the 7.5-year auction bucket. The effect of this on CDS was that the short-maturity sub CDS contracts recovered as unsubordinated, while the long-maturity sub CDS contracts had a sub recovery just below 20, which was the exchange value.
- For auctions after the exchange, there were no outstanding sub bonds and so all subordinated CDS contracts recovered as unsubordinated.
- For auctions after the exchange but with one or both exchanges blocked, both the sub bonds were deliverable as in the first case earlier, with senior recovery on short-maturity sub CDS contracts. However, sub recovery CDS contracts were different because potential recovery outcomes for the sub bonds were less clear.

There were a number of possible settlement issues that came up, such as, with the auction occurring before 20 December, there was the risk of protection sellers being delivered sub bonds which might not have settled in time for the exchange to be done on 20 December. In case the auction was to occur after 20 December, the absence of any sub deliverables would have tilted the dynamics of sub CDS contracts. Exhibit 7.20 shows the timeline for Anglo Irish Credit Event. Keeping all these issues in consideration, the DC worked out a solution, which was to fast-forward the

Exhibit 7.20: Timeline for Anglo Irish Credit Event.

The timeline for the event was as follows:	
Date	Development
19 Nov 2010	Deadline for tendering 2017 notes for exchange
23 Nov 2010	2017 notes announcement changing the terms and conditions of outstanding notes
23 Nov 2010	DC asked to decide whether or not a Restructuring Credit Event had occurred
24 Nov 2010	DC rules that there has been a Restructuring Credit Event
01 Dec 2010	Final list of deliverable obligations is published
09 Dec 2010	5 auctions are held: 2.5-year, 5-year and 7.5-year unsubordinated auctions and 5-year and 7.5-year subordinated auctions

auction timeline, to ensure that the auction takes place in time for sub bonds delivered in the auction to be tendered for exchange. The event occurred on 23 November and the final list was published on 1 December, with the auction taking place on 9 December. The time frame for physical settlement of the sub bonds was also reduced.

There were some important issues regarding the unsubordinated bonds apart from the subordinated bonds. The rounding down convention followed in the auction would round a CDS contract to a shorter bucket if it had no deliverables in the bucket. Hence, the deliverable unsubordinated bonds could directly impact the final auction maturity buckets for both subordinated and unsubordinated bonds.

The main issue to be looked at was regarding the covered bonds. The covered bonds had a maturity of guarantee of 18 months after the maturity date, and the holders ultimately had claim on the guarantor. In the case of a default by the issuer, the proceeds from the issuer would be paid to the guarantor. And the issuer would be discharged from further obligations and the responsibility of paying back the bondholders with the remaining amounts would rest with the guarantor.

The guarantor not being the reference entity, there was uncertainty whether the guarantor's contributions should be considered. The covered bonds would fail the deliverable obligation characteristics if the contributions were not considered, and would be deliverable if considered. Practically, the covered bonds had to be deliverable, which was the judgment of the DC as well, but strictly going by the definitions, this interpretation was wrong.

The good part was that with the auctions arising from the restructuring of the 2017s, being successfully held, the exchange of 2014s and 2016s also successful. These circumstances meant that if a second restructuring credit event were to happen, the issue remains if any auctions will be held at all, as much of the outstanding CDS has already been triggered in the first set of auctions. According to the definitions, there would be no necessity of an auction but that would be up to the DC to decide, if a second restructuring event were to happen.

Thomson

This event was Thomson's first restructuring credit event. This was the first time when a bucketed auction process was used, as this event occurred after the implementation of the Small Bang Protocol.

Thomson was in every series of iTraxx indices at that time, and this made this event an extremely involved one, as there were numerous trades to be watched out for. Outstanding positions were reduced ahead of the auction but as the auction was successful, these things only improved its standardization and transparency.

The timeline for the Thomson Credit Event is shown in Exhibit 7.21.

Exhibit 7.21: Timelines for Thomson Credit Event.

Date	Development
15 June 2009	Thomson defers payment of a privately placed note with agreement from a 'sufficient number of holders to bind all holders'
24 July 2009	Thomson announces a debt-for-equity restructuring plan
27 July 2009	The Small Bang Protocol extends auction settlement to cover restructuring credit events
10 Aug 2009	The facts around the 15 June payment deferral become public and the question of whether a restructuring credit event has occurred is raised to the DC
12 Aug 2009	The DC rules that there has been a restructuring credit event
18 Sept 2009	The initial list of deliverables is published
6-13 Oct 2009	The triggering window is open
22 Oct 2009	Auctions are held for three maturity buckets

Unlike the Anglo Irish Event, the timeline for this event was spread over 4 months. Revolving credit facility (RCF) and some publicly undisclosed number and size of private notes were the deliverables. The information released by Thomson was very limited, which made it difficult to know about the composition of the buckets and other details during the buildup to the auction. Thomson was in the process of agreeing on a debt-for-equity restructuring plan with its bondholders. The DC took its time in assessing all these complications that were to be taken care of. Primarily, there were two issues that caused major difficulties:

- The structure of the RCF: Being a multicurrency facility, the RCF mandated indemnification of protection seller by protection buyer if delivering RCF. In fact, this requirement was avoided because Thomson entered into a deed poll undertaking to any recipients of the RCF through the auction not to request an advance under the revolver other than a rollover advance in the same currency as the maturing advance. Additionally, it turned out that the revolver had been amended three times; so it was, in fact, three separate deliverables, falling in two buckets.
- The deliverability of obligations that had adhered to the debt-for-equity restructuring plan was, in fact, not deliverable into the auction, despite theoretically being deliverable obligations.

As most of the information was not publicly available, the market participants' perception was that majority of deliverables had actually adhered to the restructuring and hence was not deliverable. This made the latter issue an important one.

The payment deferral that caused the credit event could not be concluded with certainty due to liquidity issues, as the company did have cash in the near term, and from this, it was predicted that the recoveries would be relatively high but will vary considerably with maturity.

All the factors along with the lack of much publicly available information, contributed to a cloud of uncertainty above the whole auction process. In the end, positioning and the inverted nature of the recovery curve meant that the front bucket recovered substantially higher than the others, as shown in Exhibit 7.22.

Bradford and Bingley

As a consequence of the UK Treasury's Bradford and Bingley PLC Transfer of Securities and Property (Amendment) Order, the terms and conditions of dated subordinated notes under the Banking (Special Provisions) Act 2008,

Exhibit 7.22: Auction Results of Thomson Credit Event.

Bucket	IMM	Open Interest	Final Price
2.5 Year	91.25	€80.967 million to sell	96.25
5 Year	80.375	€220.669 million to sell	65.125
7.5 Year	80	€147.568 million to sell	63.25

Bradford and Bingley (B&B) was forced into a credit event. The amendment order outlined that the interest and principal payments on dated subordinated notes were due and payable only if it was notified by B&B to its bondholders that shown in Exhibit 7.23 they were due and payable.

The timeline for the event shown in Exhibit 7.23 was as follows:

Exhibit 7.23: Timeline of Bradford and Bingley PLC Credit Event.

Date	Development
20 February 2009	The Bradford and Bingley PLC Transfer of Securities and Property (Amendment) Order 2009 came into force
26 May 2009	Bradford and Bingley PLC announced its intention not to make the 16 June 2009 coupon payment on its 16 June 2023 notes
16 June 2009	Bradford and Bingley PLC did not make its coupon payment
20 June 2009	The grace period for the coupon payment expired
09 July 2009	The DC was asked to determine whether a Failure to Pay Credit Event had occurred
30 July 2009	An auction was held

Since the law regarding the deferment of coupon payments was changed in February, B&B had an option whether to make the June payment, so it was unsure if the non-payment in June constituted a failure-to-pay credit event. Or is it that the introduction of the amendment itself constituted a restructuring credit event. These things were left to the DC to decide and they ruled that the non-payment does constitute a failure-to-pay credit event taking into consideration the change in law. An auction was therefore held a few weeks later. The ruling by the DC was such because, an event is a credit event notwithstanding that it results from a

change in the law or that there is a defense to it based on an applicable law. This was exactly the case. The only reason that the non-payment did not trigger a failure-to-pay event instantly was the change in law. The defense that B&B put up was the change in law, which did not forbid them from payment, but only offered them an option not to. It would not have been known before the 16 June payment date that the coupon was not going to be paid. Since the order only allowed the payments to be deferred and did not have a legal binding, it did not trigger a restructuring credit event.

General Motors

General Motors under Chapter 11 of the United States Bankruptcy Code, filed for bankruptcy on 1 June 2009. The decisions regarding this situation were taken at a pretty fast pace because of the concern that there might not be any deliverables remaining unless the process was finished fast.

As a result, the DC expedited the auction timetable, with the final list being published on 10 June 2009 and auction being held on 12 June 2009, well ahead of General Motors exiting Chapter 11 on 10 July 2009.

Fannie Mae and Freddie Mac

A bankruptcy credit event was triggered on 6 September 2008 as Fannie Mae and Freddie Mac were placed into conservatorship by the Federal Housing Finance Agency (FHFA). Exhibit 7.24 shows the auction results of Fannie Mae and Freddie Mac.

The consequent auction had many interesting things to consider:

- Both sub and senior recoveries were expected to be high because of the nature of the occurrence of the event. And since it meant that

Exhibit 7.24: Auction Results of Fannie Mae and Freddie Mac.

Auction Results				
	Fannie Mae		Freddie Mac	
	Unsubordinated	Subordinated	Unsubordinated	Subordinated
IMM	92.4	92.65	93.75	93.8
Net Open Interest	\$12 million to buy	\$608 million to buy	\$79 million to buy	\$540 million to buy
Final Price	91.51	99.9	94	98

the entities will be having federal backing as they were now in conservatorship, there was no issue of difference in credit qualities of sub and senior.

- The CDS contracts may not have been triggered, had the FHFA used some other alternative to the conservatorship action that it took.
- There were numerous non-standard senior obligations, making it a difficult task to determine the cheapest one among them to deliver.
- It was not long since the auction process was started to be used, so many of the participants involved were new and unfamiliar with the process.
- Before the announcement, due to the uncertainty about the future, the few subordinated bonds, having high coupons that were outstanding at that time underperformed. But later, after the decision was announced that federal backing would be there, the performance turned around, and due to the high coupons, these bonds were attractive.

CHAPTER 8

CDS STRUCTURAL ROADMAP

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8.1 SYNOPSIS

This chapter provides an overview of what happens when a CDS deal goes south, *i.e.*, there is a credit event with a physical settlement. There are certain situations in which the ISDA may not conduct an auction settlement in which case the credit event protocols will have to be followed. We will discuss in detail the instruments that can be delivered in a physical settlement and also some vital structural credit considerations. Law and structural credit analysis tend to overlap in areas such as these. Since a thorough analysis from a legal perspective is beyond the scope of this book, it is recommended that readers take legal advice from professionals on specific issues. That said, this chapter, however, hopes to highlight some key areas to take into consideration when entering into a CDS.

8.2 BASIC MECHANICS UNDER ISDA DEFINITIONS FOR PHYSICAL SETTLEMENT

Event Determination Date

Upon occurrence of a credit event, the event determination date is considered the first milestone. When the credit event notice and the notice of publicly available information are served, the settlement clock starts ticking and this is when a credit event is said to occur according to the prevalent market practices.

Credit Event Notice

A notice of a credit event, irrevocable in nature, which occurs between the effective date and the scheduled termination date of the contract, is called credit event notice (CEN). The CEN contains a detailed description of the all the facts of the situation that would be relevant to determine whether a credit event has occurred or not. It is not necessary that the credit event is continuing on the date CEN becomes effective. Provided the credit event takes place during the continuance of the contract, CEN is allowed to be served up to 14 calendar days after CDS schedule termination date. The CEN may be served by the buyer or seller. Service by seller is a standard market practice that allows for management of risks by dealers who are in offsetting positions.

Notice of Publicly Available Information

The CEN is usually required to be accompanied with a notice of publicly available information (PAI), which is irrevocable in nature. The notice should cite PAI confirming the happening of the credit event. The PAI should reasonably confirm the facts of the situation that may be relevant to the determination of the occurrence of the credit event. Acceptable sources of PAI include news media such as Bloomberg, Dow Jones, Reuters; several major financial newspapers; releases by the Reference Entity, Trustee or Bankruptcy Filings. If press reports are used, then two sources of the PAI are required to be shown.

8.3 PHYSICAL SETTLEMENT OF CDS

Notice of Physical Settlement

In cases of physical settlement, the buyer is required to serve a notice of physical settlement (NoPS) to the seller within 30 calendar days of the event determination date. This NoPS is a form of confirmation of the buyer's delivery plans in settlement of the CDS and is irrevocable in nature. It includes a detailed description of the deliverable obligations.

In spite of being irrevocable, NoPS allows the buyer to notify the seller about changes in the bonds or loans to be delivered, provided that such notification is given on or before the physical settlement date. Additionally the buyer can correct any errors and inconsistencies that have been made in the description of the deliverable obligations even after this date.

Physical Settlement Period

The physical settlement period is defined as the period within which the deliverable obligations are mandated to be delivered after the NoPS has been issued. For investment-grade contracts in Asia, Australia and Europe, the physical settlement period is 30 business days, in accordance with the acceptable market standards. The situation is different in the United States. There, the contracts are worded so as to specify the longest period for settlement in accordance with the relevant market practices, conditional to a cap of 30 business days. The physical settlement date is either the last day of the physical settlement period or the date on which all the deliverable obligations have actually been conveyed, whichever is earlier. The timeline for physical settlement of CDS following a credit event is given in Exhibit 8.1.

Buy-in of undelivered bonds

According to the ISDA definitions, if the buyer defaults on delivering the bonds detailed by the NoPS till five business days after the physical settlement date, the seller is vested with the option to close out some or all of the transactions by way of a buy-in of relevant bonds, subject to the condition that the seller serves at least two business days' notice to the buyer indicating such buy-in. The notice must specify the following:

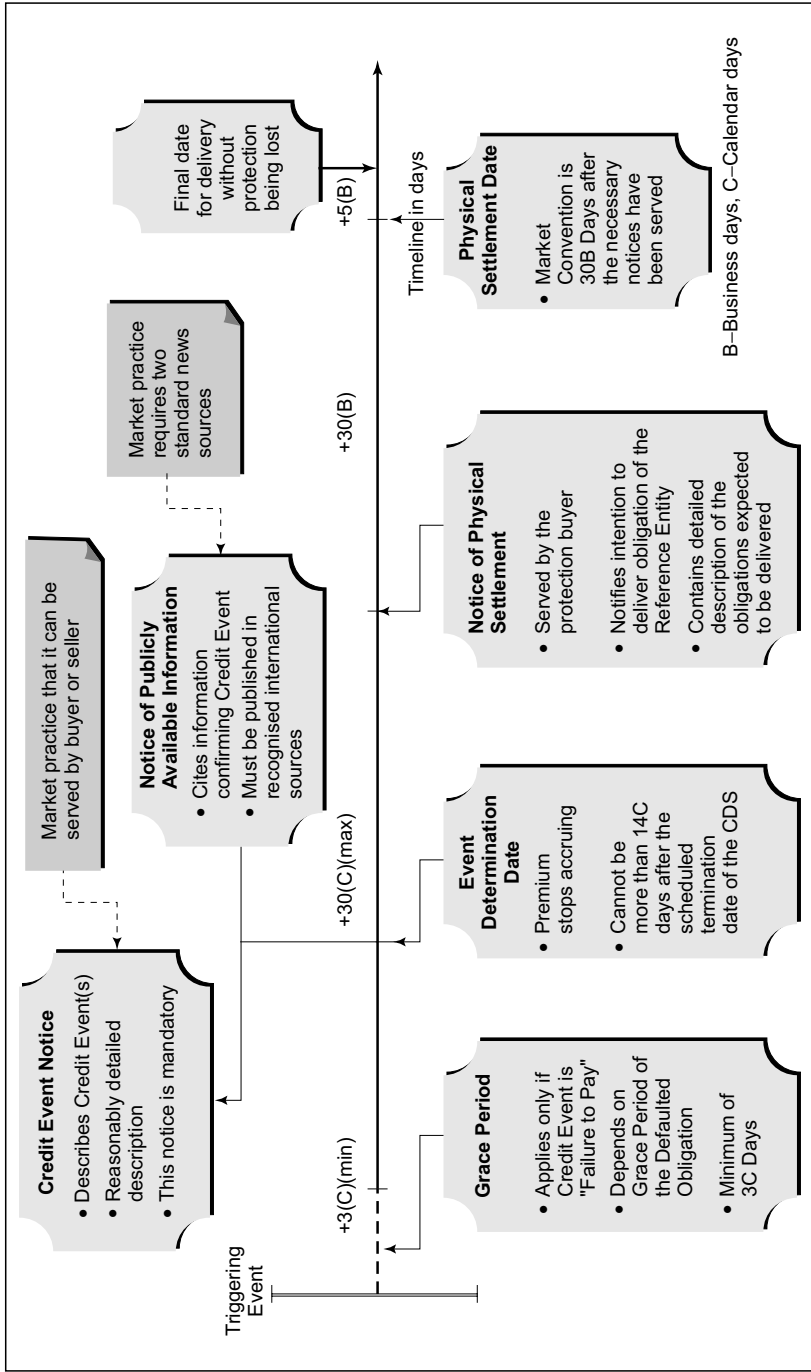
- Bonds that need to be bought-in
- Principal amount of such bonds
- Date of such buy-in

Pursuant to the notice, the seller has to get quotes from five dealers, take the lowest bid and thus execute the buy-in, all within a matter of five business days. The buyer's right to deliver the bonds is reinstated for a further five business days, if the seller fails to execute the buy-in within the stipulated time. This process keeps going on until the contract is physically settled. For contracts with North American Reference Entities for physical settlement, this system is most widely used.

Alternative settlement procedure related to loans not delivered

Alternative procedures commence in case loans specified in NoPS are not delivered within the stipulated period of five business days after the physical settlement date. Initially, when the delivery fails due to failure to obtain obligatory consents from the borrower, delivery of alternative bonds/loans is provided for.

Exhibit 8.1: Timeline for Physical Settlement of CDS following Credit Event.



If the loans have not been delivered, the deliverable obligation characteristics are complied with. On the seller's part, the seller has been vested with the right to make the buyer convey a particular bond (transferable, but not bearer) or loan, which is assignable, at any time later than 20 business days after the physical settlement Date. The seller has the option to choose the bond or the loan he wants to be delivered as long as it can recognise seller of the instrument who is willing to sell. Alternative procedures carry no time caps.

8.4 TWO SETS OF OVERLAPPING OBLIGATIONS

When buying or selling protection on a CDS, it is important to have a complete understanding of the reference entity's obligations. There are two sets of overlapping obligations as follows:

- Reference obligations which decide whether credit event has occurred
- Deliverable obligations which determine the CDS recovery

The recovery of the CDS contract through the auction will be determined by value of delivered obligations from protection buyers.

Obligations of a Reference Entity

The obligation categories for standard CDS contracts are outlined here. Generally, the only requirement for standard contracts is that they should come under Borrowed Money category. This also covers perpetual and drawn revolving credit facilities. It does not cover fully undrawn revolving credit facilities, preference shares, limited partnership interests or any other type of equity without any necessity for repayment. All the qualifying guarantees are taken into account if they come under CDS confirmation, and otherwise only qualifying affiliate guarantees apply. The obligation characteristics of single-name CDS contracts is tabulated in Exhibit 8.2.

As tabulated, the details of the deliverable obligation characteristics are as follows:

- **Not subordinated:** The obligation must hold top priority payment obligation and above any unsubordinated borrowed money obligation.
- **Specified currency:** Any of the lawful currencies of Canada, Japan, Switzerland, the UK and the USA, the Euro and any successor currencies to these currencies.
- **Not contingent:** Convertible, exchangeable or accreting obligations, which do not have their principal amount reduced through convert/exchange/purchase/redeem before the delivery date.

Exhibit 8.2: *Obligation Categories for Standard, Single-Name CDS Contracts.*

North American Corporate	Borrowed Money
European Corporate	Borrowed Money
Subordinated European Insurance Corporate	Borrowed Money
Emerging European Corporate	Bond or Loan
Latin America Corporate	Bond or Loan/Bond
Australia Corporate	Borrowed Money
New Zealand Corporate	Borrowed Money
Japan Corporate	Borrowed Money
Asia Corporate	Bond or Loan
Western European Sovereign	Borrowed Money
Latin America Sovereign	Bond
Emerging European & Middle Eastern Sovereign	Bond
Australia Sovereign	Borrowed Money
New Zealand Sovereign	Borrowed Money
Japan Sovereign	Borrowed Money
Asia Sovereign	Bond or Loan

(Contd.)

Exhibit 8.2: (Contd.)

	Not Subordinated	Specified Currency	Not Contingent	Assignable Loan
North American Corporate	X	X	X	X
European Corporate	X	X	X	X
Subordinated European Insurance Corporate	X	X	X	X
Emerging European Corporate	X	X	X	X
Latin America Corporate	X	X	X	
Australia Corporate	X	D	X	X
New Zealand Corporate	X	D	X	X
Japan Corporate	X	X	X	X
Asia Corporate	X	X	X	X
Western European Sovereign		X	X	X
Latin America Sovereign	X	X	X	
Emerging European & Middle East Sovereign	X	X	X	
Australia Sovereign	X	D	X	X
New Zealand Sovereign	X	D	X	X
Japan Sovereign		X	X	X
Asia Sovereign	X	X	X	X

Specified Currency implies Standard Specified Currencies & Domestic Currency so the domestic currency is deliverable, in addition to the usual specified currencies.

(Contd.)

Exhibit 8.2: (Contd.)

	Consent Required Loan	Transferable	Max Maturity 30 Y	Not Bearer
North American Corporate	X	X	X	X
European Corporate	X	X	X	X
Subordinated European Insurance Corporate	X	X	X	X
Emerging European Corporate	X	X		X
Latin America Corporate		X		X
Australia Corporate	X	X	X	X
New Zealand Corporate	X	X	X	X
Japan Corporate	X	X	X	X
Asia Corporate		X	X	X
Western European Sovereign	X	X	X	X
Latin America Sovereign		X		X
Emerging European & Middle East Sovereign	X	X	X	X
Australia Sovereign	X	X	X	X
New Zealand Sovereign	X	X	X	X
Japan Sovereign	X	X		X
Asia Sovereign		X		X

(Contd.)

Exhibit 8.2: (Contd.)

	Not Domestic Issuance	Not Domestic Law	Not Sovereign Lender
North American Corporate			
European Corporate			
Subordinated European Insurance Corporate			
Emerging European Corporate	X	X	
Latin America Corporate	X	X	
Australia Corporate			
New Zealand Corporate			
Japan Corporate			
Asia Corporate	X	X	X
Western European Sovereign			
Latin America Sovereign			
Emerging European & Middle East Sovereign			
Australia Sovereign	X	X	
New Zealand Sovereign	X	X	
Japan Sovereign			
Asia Sovereign			

- **Assignable loan:** A loan that can be allotted or novated with no requirement of agreement from the reference entity.
- **Consent required loan:** A loan that can be allotted or novated with requirement of agreement from the reference entity.
- **Transferable:** An obligation that is exchangeable to institutional investors with no requirement of any kind of restriction or condition.
- **Maximum maturity:** 30 years
- **Not bearer:** Any obligation that is in registered form.
- **Not domestic issuance:** Any obligation that is listed or capable for sale external to the domestic market of the Entity.
- **Not domestic law:** Any obligation that is not overseen by the rules of the Reference Entity or its dominion or Sovereign.
- **Not sovereign lender:** Any obligation not principally payable to a Sovereign or International Institution.

Some implications and important points to note regarding obligations

Since the limitations on deliverable obligations are superior to credit event obligation as defined, there can be non-deliverable obligations under a credit event also. All kinds of obligations, irrespective of seniority, can trigger CDS contracts. Thus, a credit event can be triggered by a perpetual security leading to both unsubordinated and subordinated CDS contract settlements but not deliverable in itself.

Unsubordinated bonds are deliverable into subordinated CDS contracts. All obligations senior to the reference obligation are deliverable into a CDS contract. In case of sovereigns, the deliverable obligation features before the restructuring alone determine the deliverability of an obligation. The deliverable obligation features on the delivery date decides if it is deliverable or not for the corporates. In a condition where a corporate restructures to wash their hands off any deliverable obligations on the delivery date by swapping 100% of its obligation for equity, the DCs normally enable a quicker auction to guarantee, where possible, that this result does not arise.

The Reference Obligation

The reference obligation stated in the CDS Confirmation is at all times deliverable, if:

- It is not stated as an excluded obligation in the CDS Confirmation.

- If it can be converted or exchanged, and has not been converted to equity before the delivery date.
- It fulfills any maturity restriction in a restructuring credit event.

Notably, it can be contingent and be still deliverable.

Zero-coupon bonds

Zero-coupon bonds are classically accreting obligations and the amount payable on acceleration is equivalent to the original issue value plus an extra accelerated amount. A zero-coupon bond is deliverable at its accreted value. Thus, a 5-year bond with an issue price of 100 accretes on a straight line basis, would be deliverable at 120 after 1 year, 140 after 2 years and so on.

Inflation-linked bonds

Inflation-linked bonds can be deliverable or not deliverable, conditional whether the principal at maturity can be condensed by the inflation linkage. If the principal settlement is inflation-linked, then

- If the principal resettlement is at least par, the bond is deliverable.
- If it is below par, then the bond will not satisfy the not-contingent deliverable obligation characteristic and is not deliverable.

Revolvers

A revolver is classically a facility permitting the debtor to draw down debt up to a stated maximum amount during a stated time period. The amount of debt can be settled and re-borrowed during the time period. Normally:

- Fully drawn revolvers are deliverable
- Fully undrawn revolvers are not deliverable
- Partially undrawn revolvers may or may not be deliverable depending on the drawn amount. The buyer is then obligated to provide insurance to the protection seller if there are more drawings on the undrawn part in the future.

Normally, the protection buyer must underwrite the protection seller in case of any further liability arising beyond that stated by the CDS position: undrawn parts of the revolver, exchange rate risk linked with repayment and re-borrowings under a facility with more than one currency used in settlement.

Direct Obligations

Direct obligation of a reference asset should be defined with proper clarifications unlike the interest-only or principal-only obligations. The DC will finally take its decision regarding future events regarding strips. Perpetual can or cannot be Borrowed Money, decided according to exact information available but the important issue to decide is whether there is obligation for repayment. In case, the holders' right of redemption is absent (or is theoretical rather than real), the perpetual will have difficulty satisfying Borrowed Money requirement.

8.5 ASIAN AND EUROPEAN MARKET PRACTICE

Problems for CLNs

In Asia and Europe, the CLNs are a prevalent investment means as they provide a funded indirect means to achieve the following:

- Exploiting pricing anomalies between cash and CDS markets
- Achieving investment flexibility to tailor-made features such as maturity
- Accessing names of entities who have not issued bonds

The CLNs are not a major product area, in markets where the corporate bond market is deeper, like that in the United States. Since the CLNs have a finite life, bond buy-in, which does not prescribe final date on the settlement process, poses great challenges for the structurer/buyer, as they have a hard time managing their risks.

The 60-Day Cut Off

In Asia and Europe, it is acceptable to specify a cap of 60 business days on a physical settlement to circumvent the previous challenge. Thus, the contract automatically terminates if the buy-in procedure does not result in full settlement within 60 business days. The portions of the contract that are not settled within that period expire worthless irrespective of the credit event that has occurred. The settlement cycle in North America continues indefinitely till the physical settlement is completed.

By using 'Hedge Adjustment Event' language, the issues mentioned earlier can be effectively resolved. These Hedge Event Adjustment clauses allow settlement to be deferred, in case settlement from hedges, or offsetting trading position related to counterparty obligations is not received by the structure or the counterparty under the CLN.

8.6 CERTAIN OTHER ISSUES

‘Clean’ Delivery

The buyer is obligated to deliver bonds/loans with an outstanding principal balance equal to the notional amount of the CDS during settlement. Accrued but unpaid interest is excluded as it is the acceptable market practice. A summary of CDS Settlement timeline is given in Exhibit 8.3 while the CDS Structural roadmap is given in Exhibit 8.4.

Standard Specified Currencies

Bonds or loans are allowed to be denominated in standard specified currencies when delivered in keeping with the current market practices. These are the currencies, including successor currencies of Canada, Japan, Switzerland, the United Kingdom and the United States and the Europe. This way, bonds in Japanese Yen currency could be used to settle a \$10 million CDS contract, subject to the requirement of outstanding principal balance being equivalent to \$10 million at the time of such delivery. Some believe that the buyer achieves a degree of currency optionality due to potential to alter the currency of the bond during settlement.

8.7 REFERENCE ENTITY

Transfer of Default Risk

Defining and identifying the reference entity, whose credit risk is being transferred, is one of the most vital issues underlying a CDS transaction. It is a crucial factor to avoid unexpected losses, even though it may seem like a petty task. Large corporate groups usually consist of a network of subsidiaries in which various entities have debt in one form or another. Dealers and investors involved in CDS trade need to ensure that they know the detailed particulars of the underlying reference entity. It could be possible that the credit risk associated with different corporate entities within the same group may be different and so will be the expected recovery following default. It is also possible that a group subsidiary may default while the others are solvent, which creates basis risk.

It is a good idea to ensure that underlying reference entity is likely to have some deliverable debt outstanding during the protection period for buyers of protection. Protection, in case of physical settlement, would oth-

Exhibit 8.3: Summary of CDS Settlement Timeline.

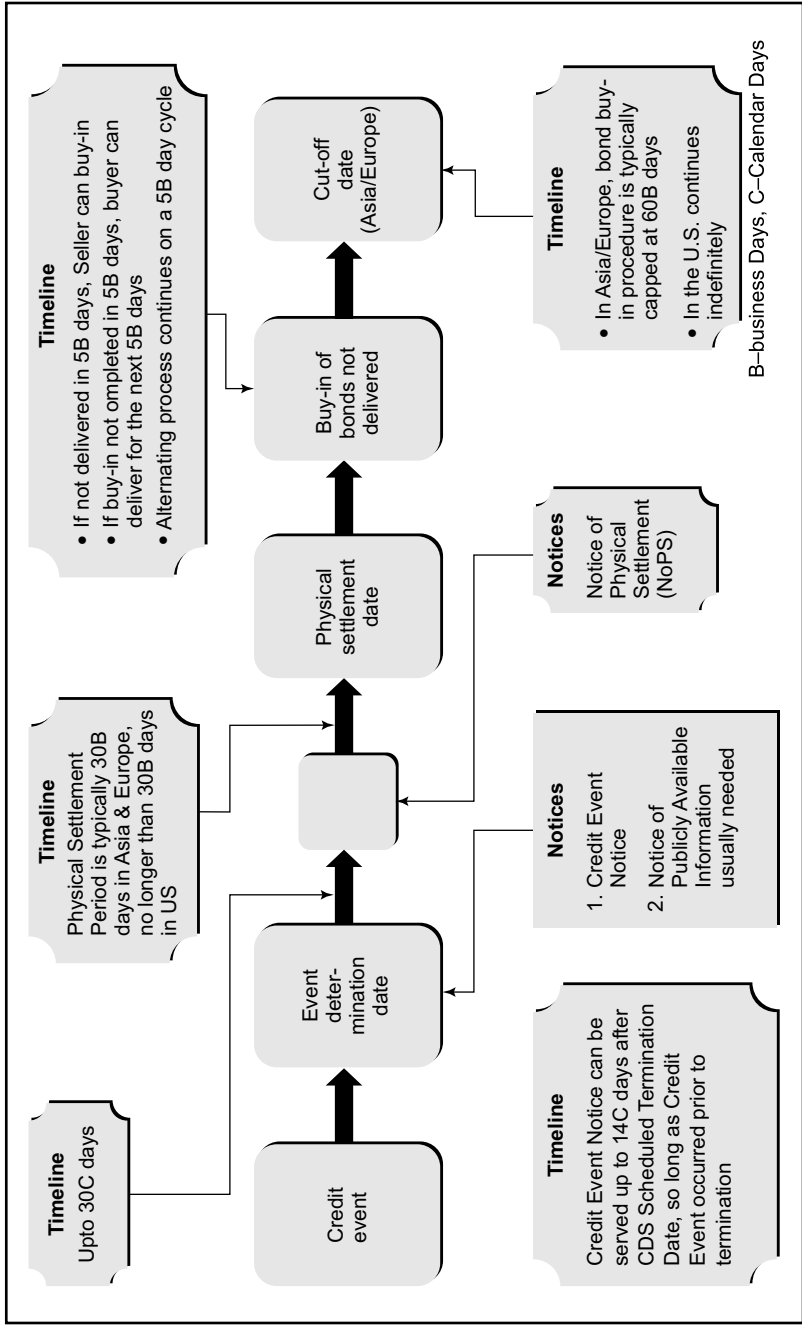


Exhibit 8.4: CDS Structural Roadmap.

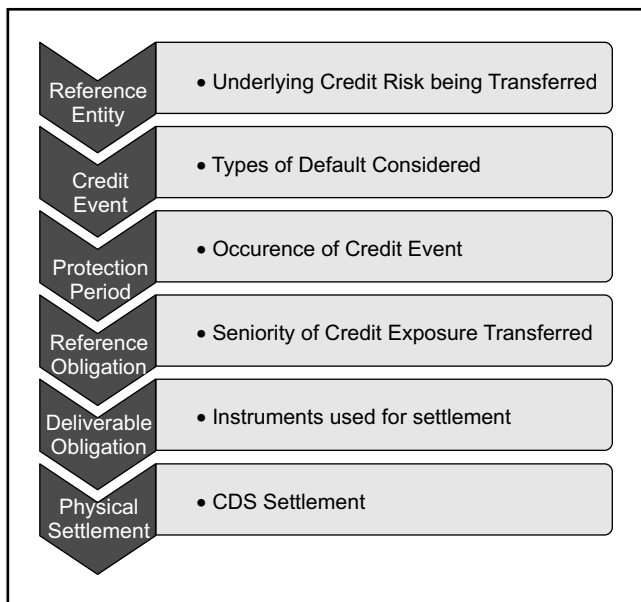


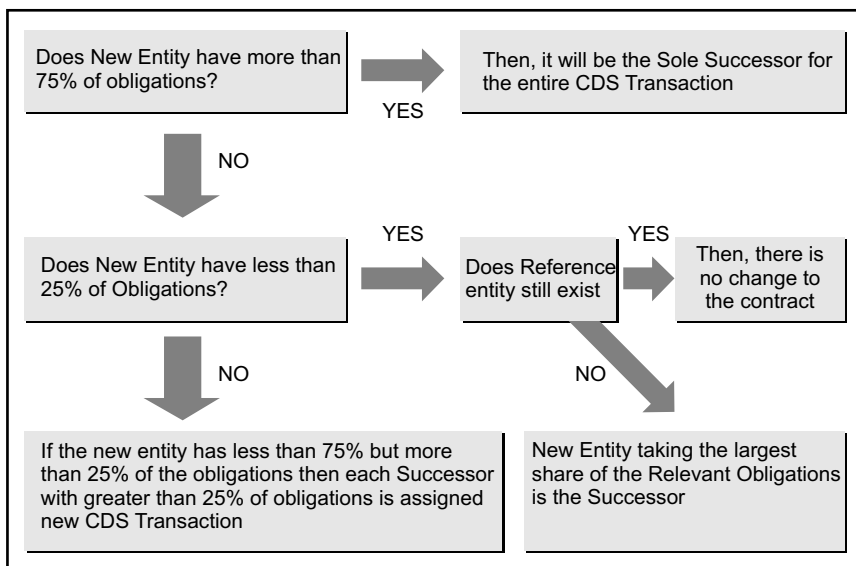
Exhibit 8.5: Caselet: Armstrong World Industries.

The US Company, Armstrong World Industries, triggered credit default swaps (CDSs) upon missing payment on its debts, even though its parent company, Armstrong Holdings did not. The parent and principal subsidiaries had been treated interchangeably and had hedged positions with offsetting contracts in the other entity. The lesson to be learnt was that there could be a possibility of substantial credit basis risk between different entities which are in the same group. Worse still, certain contracts in the market had referenced simply Armstrong without clarifying as to which specific entity the contract referred.

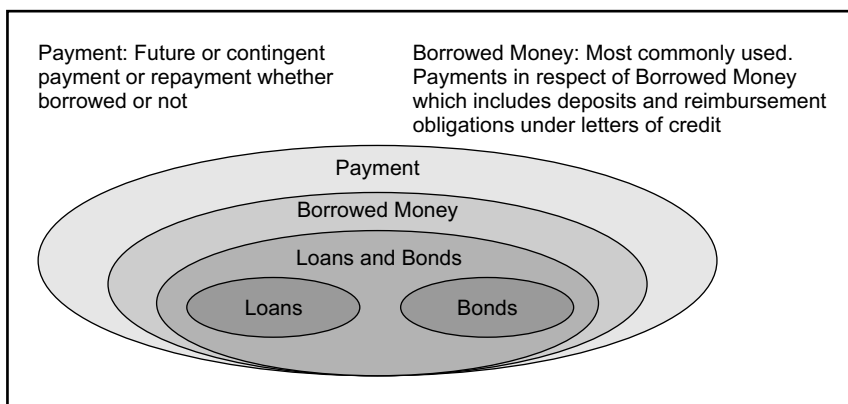
erwise be worthless upon a credit event even though the company itself may be bankrupt.

8.8 SUCCESSORS TO THE REFERENCE ENTITY

There may be a situation where the reference entity might undergo corporate restructuring, for example, a merger. The debt of a reference entity then might be transferred to other entities or *vice versa*. If this happens

Exhibit 8.6: Decision Tree for Successor of CDS.

before the maturity date of the CDS contract, a methodology has been worked out to determine whether the reference entity should be replaced by its successors. An example of problems in referencing is shown in Exhibit 8.5. The decision tree for succession is shown in Exhibit 8.6 and the obligation characteristics is represented in Exhibit 8.7. The contract details for the most liquid CDS contracts is listed in Exhibit 8.8. In the ISDA definitions, succession is tested by the succeeding company taking on 'all or substantially all' of the obligations of the reference entity through actions such as mergers, consolidations, amalgamations or transfers.

Exhibit 8.7: Obligation Characteristics.

ISDA Credit Derivatives Physical Settlement Matrix

Exhibit 8.8: Contract Details for the Most Liquid Standard CDS Contracts.

Transaction Type	Standard North American Corporate	Standard European Corporate	Standard Subordinated European Insurance Corporate	Standard Western European Sovereign
Business Days	If the Floating Rate Payer Calculation Amount is denominated in USD: London & New York EUR: London, New York & TARGET GBP: London JPY: London & Tokyo CHF: London & Zurich CAD: London, New York & Toronto	If the Floating Rate Payer Calculation Amount is denominated in EUR: London & TARGET USD: London & New York GBP: London JPY: London & Tokyo CHF: London & Zurich CAD: London & Toronto	If the Floating Rate Payer Calculation Amount is denominated in USD: London & New York EUR: London & TARGET GBP: London JPY: London & Tokyo CHF: London & Zurich CAD: London & Toronto	If the Floating Rate Payer Calculation Amount is denominated in USD: London & New York EUR: London & TARGET CAD: London & Toronto GBP: London
Calculation Agent City	New York	London	London	London

(Contd.)

Exhibit 8.8: (Contd.)

All Guarantees	Not Applicable	Applicable	Applicable	Applicable
Conditions to Settlement	Notice of Publicly Available Information Applicable	Notice of Publicly Available Information Applicable	Notice of Publicly Available Information Applicable	Notice of Publicly Available Information Applicable
Credit Events	Bankruptcy Failure to Pay Restructuring, if specified as applicable in the relevant confirmation Restructuring Maturity Limitation and Fully Transferable Obligation Applicable	Bankruptcy Failure to Pay Restructuring Modified Restructuring Maturity Limitation and Conditionally Transferable Obligation Applicable	Bankruptcy Failure to Pay Restructuring	Failure to Pay Repudiation/Moratorium Restructuring
Obligation Category	Borrowed Money	Borrowed Money	Borrowed Money	Borrowed Money
Obligation Characteristics	None	None	None	None
Settlement Method	Auction Settlement	Auction Settlement	Auction Settlement	Auction Settlement

(Contd.)

Exhibit 8.8: (Contd.)

Fall-back Settlement Method	Physical Settlement	Physical Settlement	Physical Settlement	Physical Settlement
Physical Settlement Period	As per Section 8.6 of the Definitions capped at 30 Business Days	30 Business Days	30 Business Days	30 Business Days
Deliverable Obligation Category	Bond or Loan	Bond or Loan	Bond or Loan	Bond or Loan
Deliverable Obligation Characteristics	Not Subordinated Specified Currency Not Contingent Assignable Loan Consent Required Loan Transferable Maximum Maturity: 30 years Not Bearer	Not Subordinated Specified Currency Not Contingent Assignable Loan Consent Required Loan Transferable Maximum Maturity: 30 years Not Bearer	Not Subordinated Specified Currency Not Contingent Assignable Loan Consent Required Loan Transferable Maximum Maturity: 30 years Not Bearer	Specified Currency Not Contingent Assignable Loan Consent Required Loan Transferable Maximum Maturity: 30 years Not Bearer
Escrow	Applicable	Applicable	Applicable	Applicable

(Contd.)

Exhibit 8.8: (Contd.)

60--Business Day Cap on Settlement	Not Applicable	Applicable	Applicable	Applicable
2009 ISDA Credit Derivatives Determinations Committees, Auc- tion Settlement and Restructur- ing Supplement to the 2003 ISDA Credit Derivatives Definitions	Applicable	Applicable	Applicable	Applicable
Fixed Rate Payer Payment Dates Frequency	Quarterly	Quarterly	Quarterly	Quarterly

CHAPTER 9

REGULATORY OVERVIEW

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9.1 SYNOPSIS

An overview of the capital adequacy treatment is provided in this chapter. Understandably, the norms vary from country to country for the credit derivatives. The US and UK regulations are drawn upon to explain the capital adequacy treatments for each class of instruments. The impact on regulatory capital under the Basel III guidelines will be reviewed and the approach provided by the RBI will also be discussed in this chapter.

9.2 RATIONALE FOR REGULATION

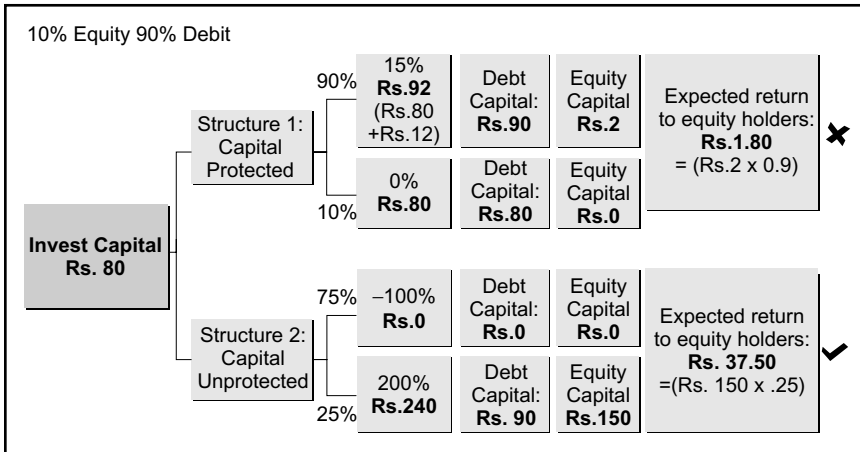
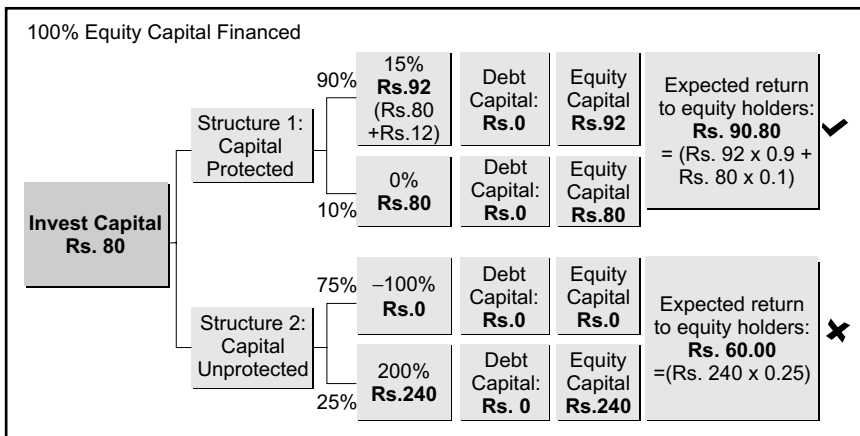
If you are a company manufacturing widgets, there is nobody except your shareholders, to whom you are answerable if you have to put on a credit derivative trade. If the trade makes money, your shareholders make money and if it takes a hammering, then the shareholders being the owners of the company take the hit. Say, your company has a capital of Rs. 100 of which equity was Rs. 10 and debt was Rs. 90. If by trading on credit derivatives you make a profit of Rs. 5, then your shareholders make a 50% return on their capital (return of Rs. 5 on equity capital of Rs. 10). Conversely, if you make a loss of Rs. 5, then all the loss is taken by your equity shareholders and their capital reduces by 50%. If, however, you actually lose more, say Rs. 15, then the bill has to be footed by both the equity capital providers (Rs. 10) and the debt capital providers (Rs. 5). The equity capital providers lose all their money but it is not sufficient to absorb all the loss. The debt holders consequently have to share the loss as well. If you were not a company manufacturing widgets but you were in the business of banking, you would be regulated to make sure that the possibility of a scenario of a loss of Rs. 15 is minimized.

Let us push the envelope a little bit to understand this better. Say, this corporate started with a capital of Rs. 100 (equity capital of Rs. 10 and debt capital of Rs. 90). On the first day of business, it incurred a loss of Rs. 20. Even if the book value of the liability side of the balance sheet is Rs. 100, the true value is only Rs. 80---Equity is worth nothing and debt has worth of Rs. 80. The next day, a banker comes to you and suggests a couple of credit derivative trades and wants you to invest all of your remaining capital of Rs. 80. The first structure is capital protected, *i.e.*, your Rs. 80 of capital invested is secure. It provides a coupon of 15% with 90% probability and no coupon with 10% probability, *i.e.*, expected default probability is 10%. The capital invested is fully protected in this structure. The second structure is the junior most tranche of a collateralized debt obligation. To make it uncomplicated, let us dichotomize the probability distribution. Let us say that there is a 75% probability that you could lose all the capital invested, *i.e.*, nothing is returned back to you. And there is a 25% probability that your capital will become three times, *i.e.*, you get your capital back and a coupon of 200%.

The expected return of the first structure is a positive 13.50% ($15\% \times 90\% + 0\% \times 10\%$). The capital in this structure is fully protected. The only risky part is the coupon and the risk too is quite low. The expected return of the second structure is a negative 25% ($-100\% \times 75\% + 200\% \times 25\%$). In this structure, three out of four times you should expect to lose all your capital.

You would expect that if the company management is sensible enough, it would choose the first structure which provides an expected positive return instead of the second structure which provides an expected negative return. But, it is not so. Most clever companies will choose to invest in the second structure instead of the first. To understand why, consider the returns for the owners of the company---the equity capital providers. In the first structure, Rs. 80 invested has two possibilities---either it becomes Rs. 92 (15% coupon on Rs. 80 + the initial capital of Rs. 80) or it remains Rs. 80 (zero coupon). If he gets back Rs. 92, the money that the equity holder gets to make is only Rs. 2 since he owes Rs. 90 to the debt holders. If he gets back zero coupon, anyway he is bankrupt, *i.e.*, does not have the ability to pay back his debt. His expected return by investing in this structure is Rs. 1.80 ($\text{Rs. } 2 \times 90\%$).

In the case of the second structure, there are two possible outcomes. Three out of four times, he would lose all his money, *i.e.*, he would have zero capital left. He gets nothing back and his debt holders get nothing back too. One out of four times, the money will get tripled. Rs. 80 will become Rs. 240. He owes only Rs. 90 to his debt holders and the rest of the

Exhibit 9.1: *Equity Owners Return.*Exhibit 9.2: *Equity Owners Return if All Equity Funded.*

Rs. 150 is his. His expected return is Rs. 37.50 (Rs. 150 × 25%). Please look at Exhibits 9.1 and 9.2 to see the rationale behind the decision-making process.

However, you cannot have 100% equity capital financed.

The underlying message is as follows. Once the capital of the firm has reduced to Rs. 80, you have no money left of your own in the firm. You are essentially punting on your debt-holders' money. In this case, you could choose a risky strategy so as to maximize your wealth. At the end of the day, you are working to maximize your wealth. You could care for the debt capital provider if you share a personal relationship with him or her. If you only share a contractual relationship with your debt capital providers, *i.e.*, they are not exactly your uncles or cousins, then you do not care

too much for their loss, particularly if you are getting to make money at their expense.

A similar dynamics works in the case of banks. Here, the debt capital provider is the public, which deposits money in the bank. Regulation is needed to ensure that the bank's management does not take too much risk and if they choose to do so, they should have sufficient capital at stake to lose. Simplistically, the money that the bank puts on its own, apart from the depositor's money, is called bank capital.

The rules about how much a bank should have its own capital at stake should be highly standardized because different banks can have very different business focuses and the rules of the game should be fair to all banking industry participants.

To understand why this is so, let us first understand the business of banking. In a world of no regulation, you can start a bank with zero equity capital. Hypothetically, assume that you take deposit from 100 depositors of Rs. 1 and make loans to 20 people of Rs. 5 each. The liability side of the bank balance sheet has Rs. 100 (deposits taken) and the asset side has Rs. 100 (loans given). Even if one loan out of 20 loans goes into default, the bank may not be able to fulfil the obligation to its depositors. Since the depositors are common folks who are not very rich, there has to be a regulation to ensure that depositor's interest is protected. To ensure that banks do not get to the stage where they are not in a position to pay back depositors money, regulators need to ensure that banks are sufficiently capitalized.

The shareholders of the bank would want to keep the bank capital as low as possible. To understand this, let us look at a simplistic possibility. Consider two banks---*HighCap* Bank and *LowCap* Bank. They both have similar asset side of the balance sheet, say, Rs. 100 of loan assets and you are receiving an average loan interest of 10% on them. However, the two banks are differently capitalized. *HighCap* bank has taken deposits to the extent of Rs. 80 and the remaining Rs. 20 is its own capital. *LowCap* bank has taken deposits to the extent of Rs. 90 and the remaining Rs. 10 is its own capital. Assume that the deposits are paid an average interest of 5% by both *HighCap* and *LowCap* banks. The return on capital for *HighCap* bank would be $(100 \times 10\% - 80 \times 5\%)/20 = 30\%$. The return on capital for *LowCap* bank would be $(100 \times 10\% - 90 \times 5\%)/10 = 55\%$. Everything else remaining the same, the shareholders of *LowCap* bank would be 'more happy' with a return on capital invested at 55% than those of *HighCap* bank with a return of 30%.

There exists a trade-off between higher bank capital and the viability of banking as a business. If you make capital requirements too high, shareholders of banks would not be able to make adequate returns and there-

fore would not want to involve themselves in the business of banking. If you make capital requirements too low, then you are increasing the risk for the depositors.

9.3 CAPITAL CALCULATION

The amount of capital is dependent on the assets that the bank has. Let us consider two banks—*LowRisk* Bank and *HighRisk* Bank and try to calculate the capital that they would need to have.

LowRisk Bank Capital

LowRisk Bank has assets of Rs. 100 with the following breakup:

Assets	Amount
Cash	Rs. 10
Government bonds	Rs. 15
Mortgage loans	Rs. 50
Other loans	Rs. 20
Other assets	Rs. 5

Typically, regulations prescribe that cash and government bonds have 0% risk weighing, residential mortgage loans have 50% risk weighing and other loans and assets have a 100% risk weighing. Risk-weighted assets based on the earlier prescription would be as follows:

Assets	Amount	Risk-weighted amount
Cash	Rs. 10	$10 \times 0\% = \text{Rs. } 0$
Government bonds	Rs. 15	$15 \times 0\% = \text{Rs. } 0$
Mortgage loans	Rs. 50	$50 \times 50\% = \text{Rs. } 25$
Other loans	Rs. 20	$20 \times 100\% = \text{Rs. } 20$
Other assets	Rs. 5	$5 \times 100\% = \text{Rs. } 5$

The risk-weighted assets are Rs. 50. If the prescribed capital adequacy ratio (capital/risk) is 8%, then the *LowRisk* Bank has to have a minimum capital of only Rs. 4.

HighRisk Bank Capital

HighRisk Bank has assets of Rs. 100 with the following breakup:

Assets	Amount
Cash	Rs. 5
Government bonds	Rs. 10
Mortgage loans	Rs. 20
Other loans	Rs. 50
Other assets	Rs. 15

Typically, regulations prescribe that cash and government bonds have 0% risk weighing, residential mortgage loans have 50% risk weighing and other loans and assets have a 100% risk weighing. Risk-weighted assets based on the earlier prescription would be as follows:

Assets	Amount	Risk-weighted amount
Cash	Rs. 5	$5 \times 0\% = \text{Rs. } 0$
Government bonds	Rs. 10	$10 \times 0\% = \text{Rs. } 0$
Mortgage loans	Rs. 20	$20 \times 50\% = \text{Rs. } 10$
Other loans	Rs. 50	$50 \times 100\% = \text{Rs. } 50$
Other assets	Rs. 15	$15 \times 100\% = \text{Rs. } 15$

The risk-weighted assets are Rs. 75. If the prescribed capital adequacy ratio (capital/risk) is 8%, then the *HighRisk* Bank has to have a minimum capital of Rs. 6, about 50% higher than the *LowRisk* bank's minimum requirement.

9.4 REGULATORY BENEFITS OF CDS BIG BANG

The phenomenal growth of the CDS market in the new millennium has attracted active participants as well as regulatory supervisors in large numbers. Along with these, this expansion has also increased the need for standardization, efficiency and infrastructural soundness of the CDS market system.

On 8 April 2009, the ISDA successfully implemented the Credit Derivatives Determinations Committees and Auctions Settlements Protocol. The CDS 'Big Bang,' as it is now called, is a step towards standardized and efficient CDS market contract and conventions. While the contract changes are applicable on the global CDS contracts, the convention changes are only for the North American CDS. The contract changes were focused on three prime objectives as follows:

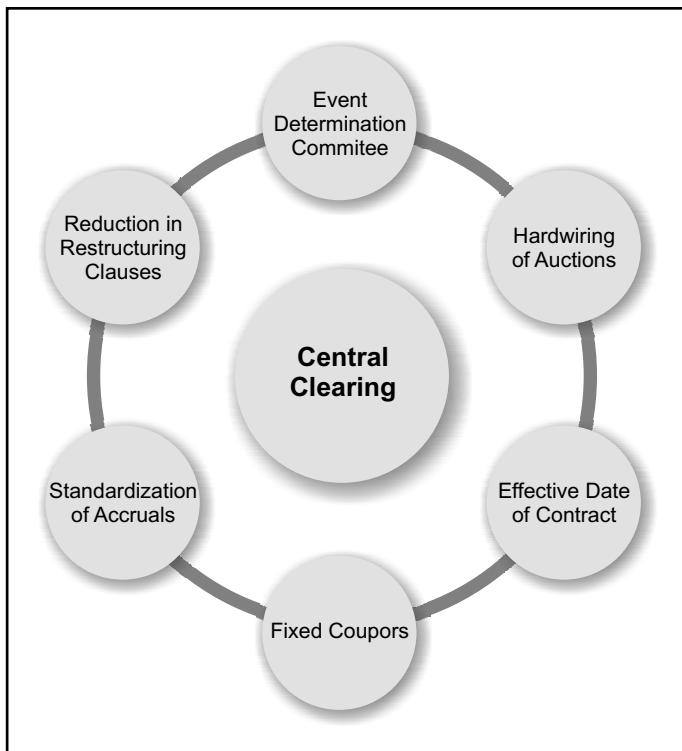
- Facilitate central clearing of trades
- Reduce outstanding gross notional amount
- Improve operational efficiency

Central Clearing of CDS Trades

Before the CDS Big Bang, the market operated largely on bilateral trades or mutual agreements between two parties. This imbedded an inherent systemic risk in the market. The Big Bang attempts to overcome these inefficiencies through the process of standardization as shown in Exhibit 9.3.

- Event Determination Committee (DC): Formulate binding conclusions on credit and succession events as well as terms of auction, if required.
- Hardwiring of Auctions: Facilitate structured and standardized cash settlement in case of credit event.
- Effective Date of Contract: Standardize rolling effective dates irrespective of location of the trade.

Exhibit 9.3: Central Clearing Advantages.



- Fixed Coupons: Standardizing payments and hence help in offsetting contracts.
- Standardization of Accruals: Ensure payments as well as their timings are ordered uniformly for all contracts.
- Reduction in Restructuring Clauses: Less restructuring clauses would make more CDS trades eligible for standardization and hence help in reducing the outstanding notional amount of CDS trades.

This first three of these apply to the global CDS contracts and the latter three to the North American Conventions.

Markit RED Code

Markit RED stores information regarding the reference parties and obligations (known as 'pairs') to order to bring in more transparency in verification of pairs dealing in the CDS market. It also contains data regarding historical events to assist the holding of position through the life of trade. It tries to bring in accuracy in the confirming trades and in reference data mapping and contains legally verified reference data for Markit CDS index constituents. They are widely used for electronic trading, matching and clearing and are compatible with platforms relevant to CDS market trade like inter-dealer broker, trade execution and processing and market data. The RED code looks like:

- Reference entities: 6-character RED code
- Reference obligations: 9-character RED code

Reduction in Outstanding Gross Notional Amount

Trade compression aims to reduce the total outstanding gross notional amount, which in 2008 was more than \$50 trillion, as well as the total number of outstanding trades. The condition, however, is to maintain the same risk profile and cash flow for all trades. By maintaining the same risk profile, it means that the profit/loss should not change after the trade change. Reducing the gross notional amount by replicating each counterparty's risk portfolio and cash flows helps in mitigating operational risks and improving functional costs.

Exhibit 9.4 shows how standardization of maturity dates and coupon rates will help in reducing the outstanding gross notional amounts in the CDS market today. With increased uniformity in payments and dates, the

Exhibit 9.4: Trade Compression.

Credit	Status (Buyer/ Seller)	Notional \$ (million)	Maturity Date	Coupon (bps)	Annual cash flow \$('1000)
TradeComp Ltd.	Seller	-15	20/12/2011	500	750
TradeComp Ltd.	Seller	-20	20/12/2011	250	500
TradeComp Ltd.	Buyer	40	20/12/2011	300	-1200
TradeComp Ltd.	Seller	-10	20/12/2011	450	450

The above trades can be compressed into a single trade with a net notional amount of \$5million as a 'net' status of a buyer with the same maturity date. The coupon would then be on a net 1000 bps positive cash flow of \$500,000.

number of trades eligible will increase, thereby, also reducing the total number of outstanding trades in the market.

Improving Operational Efficiency

There has been a great amount of work put in to clear backlogs in the CDS market, thereby improving operational process efficiency. Active industry and market participants have been trying to channelize the process and steer it through systematic gateway. Nevertheless, efforts towards standardization and achieving the T+0 or same-day trade matching target will definitely aid the current struggle to reduce market inefficiencies.

9.5 BASEL III

Basel III is the third set of accords that has been developed by the Basel Committee for Banking Supervision. The effort is to strengthen the regulatory capital regime which has been shown to be inadequate in the wake of the financial crisis starting 2008. The changes that have been effected in the third accord are quite significant in comparison to the second accord popularly known as Basel II.

A significant change that has been suggested is in the characteristic, reliability and unambiguousness of the capital that constitutes bank capital. In the Basel II accord, preference shares were treated as Tier-1 capital. Now, Tier-1 capital is restricted to only core equity capital that consists of common stock and retained earnings. In Basel II accord, there were manifold criteria for Tier-2 capital. Now, those subclasses have been removed and the criteria for Tier-2 capital have been made simpler. Under Basel-II accord, Tier-3 capital was available for covering market risk. Under Basel-III accord, Tier-3 has been done away with. This has been done to make sure that the capital allocated to market risk has the same quality of capital backing it as that for credit risk and for operational risk.

Apart from strengthening the quality of capital, the coverage of the risks that exist in banks has been made more comprehensive. The risk coverage of the Basel-III capital framework is also being strengthened. These amendments will lead to an improvement in the capital needs for the exposures related to counterparty risk which arise from derivative transactions as well as from repos and financing of securities. These regulations will also lay the path for the introduction of a central counterparty for the over-the-counter derivatives, such as, a central clearing house. It is likely that a lot of over-the-counter business may become exchange traded. It will also drive the need to find new ways of hedging counterparty credit risk that is prevalent in the market.

Furthermore, the Basel committee is making sure that there is a suitable capital allocation for leverage ratio. The intention of this leverage ratio requirement is to not allow building up of excessive leverage, leading to systemic risk for the entire banking industry. The leverage ratio also incorporates supplementary safety measures for measurement errors in counterparty credit risk as well as that of model risk by complementing the measures that are risk based with straightforward measures that are centred on gross exposures rather than net exposures.

The committee is initiating a set of procedures to encourage the accumulation of capital cushions in nice times so that the buffer can be used during times of stress and strain. This is expected to promote building of capital that is countercyclical---accumulating capital during good times so that they can be advantageous during times of economic downturns. This would reduce the pro-cyclicality as well, making capital allocation forward looking in a non-alarming way. This would help the regulators also accomplish the objective of shielding the banking industry from phases of oversufficiency of credit growth. In the Basel-III capital regime, banks are required to perform stress tests which encompass scenarios such as increase of credit spreads of counterparties in a recession. This is to encourage sturdier provisioning procedures.

To boot, the Basel Committee is launching a minimum liquidity criterion for global banks that contains a liquidity coverage ratio condition for 30 days. This is underpinned by a lengthier structural liquidity ratio called Net Stable Funding Ratio. The committee has imposed supplementary capital requirement for systemically important banks.

The Basel-III recommendations, though not specific to credit derivatives, are expected to be less-than-benign for all over-the-counter derivatives, including credit derivatives, as they increase the cost of capital for over-the-counter derivative business. However, higher cost of capital may increase the need for banks to hedge credit risk and therefore use credit derivatives. Currently, banks use credit derivatives mainly for market making. However, under the new capital regime, since the amount of risk capital may increase, this may give a fillip to banks transferring credit risk to other financial institutions. Basel-III norms allow banks to partially offset capital by using standard products like indices to hedge. This may become more prevalent under the Basel-III capital regime. So, the new set of regulatory guidelines is expected to have a mixed effect on credit derivatives, with one set of drivers increasing the cost of over-the-counter derivative business while the other acting as a catalyst to use credit derivatives as hedging instruments.

CHAPTER 10

HEDGE ACCOUNTING OF CREDIT DERIVATIVES

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10.1 SYNOPSIS

With hedge accounting, entities can supersede the usual treatment of accounting for credit derivatives either by offsetting the MTM profit or loss or by adjusting assets' carrying value. Thus, it is considered a privilege that is earned rather than a right-to-avail hedge accounting. Only upon fulfilling accounting standards requirement can an entity get the right to benefit from hedge accounting. This chapter will explain the nuances of hedge accounting for credit derivatives.

10.2 CREDIT DERIVATIVES AND ACCOUNTING

Globally, there are two benchmark accounting standards for credit derivatives—Generally Accepted Accounting Principles (GAAP) in America and the International Accounting Standard (IAS) used in Europe and Asia. Under both these accounting standards, credit derivatives are reported on the financial statements and the gains or losses from these are reported in the earnings account. Due to the change in fair value of CDS and that of the loan or bond are not mutually offsetting, there are only few credit derivatives that are able to achieve hedge accounting. When these gains or losses are recorded in income statement, it naturally leads to volatile earnings since there would be fluctuations in each quarter's earnings. For example, say there is a credit derivative that partakes in hedging for the credit risk involved in a loan. When this loan depreciates in value because of a deterioration in credit risk or an increase in interest rate, the CDS would most probably appreciate in value and this causes earnings volatility.

These losses and gains on the CDS may be counterbalanced by the amount of provisions that are allocated for expected credit losses on the bond or loan, but the gains or losses on CDS would only partially offset the loan loss provisions. The largest holders of credit risk in the form of loans are the banks and as the accounting guidelines change, the management tries to reduce the earnings volatility which may cause a lot of differences in the practices of managing risk of loans. Because of this earning volatility, banks and other corporates try to decrease the credit risk by using less credit derivatives. Accordingly, drafters of accounting standards have to make such changes to the accounting treatment such that it does not disincentivize people who manage their credit risks by making use of credit derivatives.

In cases where the credit derivative, rather than the hedged item, is marked to market, the volatility can be greatly reduced by measuring the hedged asset at fair value, which would result in change in hedged item value offsetting the change in credit derivative. How effective the hedge is, would greatly affect the earnings volatility, considering an accounting approach of full fair value.

“Fair value option” is a new option developed under IAS 39 by the International Accounting Standards Board (IASB). This option allows fair value accounting to be used for any financial instrument designated by banks or corporates (using IAS) during purchase or origination. In this way, both credit derivative and hedged item can be marked to market to record difference in fair value in the earnings statement.

Even though fair value option may seem to effortlessly address problems associated with credit derivatives, it has a number of drawbacks. The Basel Committee on Banking Supervision drafted a comment letter addressed to the IASB in which it addressed such issues as well as their recommendations. To deal with reliability and verifiability concerns, it was observed that difficulty existed in determining, verifying and auditing fair value measurements in the absence of measurable market prices and valuation approaches. Another suggestion was that reporting should be made more complete and less comparable. The Basel Committee has discussed the disincentive in accounting treatment of credit derivatives. Marking down financial liabilities to fair value and recording a gain would be done when the creditworthiness of any entity reduces. The practice of market making of the reduced credit risk could result in the insolvent entity appearing solvent in extreme cases.

Some restrictions on fair value option were recommended by the Basel Committee to deal with these issues. The Basel Committee has recommended to prohibit the fair value option for illiquid credit derivative

instruments like CDOs and to disallow marking to market of credit risk of the institution's own outstanding debt. Moreover, fair value option was advocated to be kept limited to such transactions that are susceptible to hedge risk and to such situations wherein reduction in accounting volatility was possible. Furthermore, heightened disclosures with respect to the fair value option were recommended by the Basel Committee.

10.3 INTRODUCTION TO HEDGE ACCOUNTING

Numerous companies get involved in hedging credit by taking steps so as to lessen or counterbalance credit risks arising from their actions. The process of hedge accounting reports effects of hedging credit derivatives and risks in the same periods, thus resulting in manifestation of the results of hedging activities including hedged credit derivatives. Hedge accounting gives the entities a chance to override the usual accounting practice for credit derivatives, *i.e.*, fair value through profit or loss, or adjusting carrying value of liabilities and assets. So, it should be considered a benefit that has to be earned, instead of a right. Obtaining the right to achieve hedge accounting has to be earned by entities by meeting the necessities provided in the accounting standards.

A well-known advantage of hedge accounting rules is the fact that it involves revelation of additional information about a company's hedging program for the benefit of investors. Additionally, a company is also required to give detailed picture of the risk management philosophy and strategies followed by it. This helps the investors and analysts in determining a company's capabilities of hedging financial exposures, or credit exposures, in particular. This would lead the company's sound hedging programs being rewarded by the investors and analysts, alike.

Another considerable advantage of hedge accounting is reduction caused in earning volatility. By allowing companies to record gain or loss in the hedged item and related hedges in the same time period, volatility is decreased. Irrespective of the fact whether gain or loss on the hedged item gets recognized instantly or is deferred, the matching criterion is applied. This is an important benefit because earnings volatility tends to have a negative effect on the value of a company.

For example, if a company has a receivable from a subsidiary of a group company, and if the account becomes bad, then the value of the receivable goes down. If the company also has a payable from another subsidiary of the same group company and if both subsidiaries have parent guarantees, which they usually do, then there exists a natural hedge for the receivable.

In the absence of an appropriate natural hedge, the company can enter into a credit derivative, say, a CDS to buy protection on the group entity. In this case, the credit risk of the subsidiaries and the group entity are similar because they have parent guarantees. If the account becomes bad, then the loss in the receivable is offset by a gain in the CDS. Matching gains and losses of a company proves to be a desirable outcome. This is possible if the hedge accounting criteria are met.

Though accounting standards vary across countries, hedge accounting standards are pretty much the same. One of the major reasons for this is the conscious effort of accounting standard bodies trying to arrive at a uniform accounting guideline. There is greater convergence sought among disparate accounting standards. Since hedge accounting standards were formulated in the new millennium when this sentiment was a predominant factor, the hedge accounting guidelines have been uniform across the board.

10.4 ACCOUNTING STANDARDS: A BRIEF OVERVIEW

Primarily, there are two major accounting standards boards—the Financial Accounting Standards Board (FASB) and the IASB. The FASB is a private organization running not-for-profit, which develops the GAAP within the United States in the interest of the public. Created in 1973, it was designated by the Securities and Exchange Commission (SEC) as the organization accountable for the purpose of drafting standards of accounting for US public companies. The IASB was established on 1 April 2001, to succeed the International Accounting Standards Committee (IASC). The IASB is vested with the responsibility of drafting the International Financial Reporting Standards (IFRS) which is a fresh name that has been given to the IAS after 2001. The IASB is a self-governing, non-publicly funded body that sets the accounting standards. The guidelines issued by the IASB are currently followed by more than 115 countries including the members of the European Union, the United Kingdom, Russia, Australia and Japan.

Globally, there are two kinds of accounting guidelines—principles-based accounting and rule-based accounting. Principles-based accounting such as GAAP is used as a theoretical basis for the accountants. There is an array of objectives that serves as a standard for good reporting. Additionally, cases are provided as illustrations to explain the standards better. The guidelines are meant to be used only under specific situations provided therein. The vital benefit of principles-based accounting is that since the

guidelines are not specific in nature, they can be used in various circumstances. Presence of specific requirements can cause the managers to manipulate statements to comply with the guidelines. On the other hand, the disadvantage of principles-based guidelines is the absence of proper procedures which can result in defective and unpredictable communication making it tough to liken two organizations.

Rule-based accounting is essentially a menu of detailed guidelines that must be adhered to in the preparation of financial statements. The good thing is that strict rules reduce the possibility of lawsuits by increasing the accuracy, reducing ambiguity and preventing aggressive financial reporting by management. But, complicated rules can also result in unnecessary complexity while making the financial statements.

We may be well served by acknowledging that no accounting standard is either a purely rule-based or a purely principles-based system. Every accounting standard exists somewhere along a spectrum between rules and principles. Currently, it is widely acknowledged that the US GAAP is a bit too skewed towards the rule-based side of the spectrum while the IFRS is more skewed towards the principles-based accounting. Hedge accounting under both IFRS and FAS is a principles-based guideline. Since the accounting standards in India are similar to IFRS (and in most cases is an exact copy-paste of the IFRS standard with a few tweaks here and there), we will later take up a few cases to see how the principles need to be interpreted.

10.5 HEDGED ITEMS AND HEDGING INSTRUMENTS

Hedge accounting entails that right at the beginning of the hedge, the items are identified and then designated to be hedged (Exhibit 10.1). The hedged item can be a firm commitment, a liability, an asset or a highly likely transaction that is forecasted to happen. It can be a group of any such items or even be a net investment in a foreign operation.

It is necessary that the item that is hedged exposes the entity to changes, future cash flows or in fair value, in such a manner that the income statement is affected, either in current period or in future periods. Apart from the credit risk, interest rate risk, foreign currency risk, commodity price risk and equity price risk are often hedged. General business risks like the risk to plant and machinery or risk of unexpected weather, which cannot be gauged, cannot be hedged. Similarly, acquisition of another entity in a combination of business cannot be a hedged item except for the risk of foreign exchange that may be involved.

Exhibit 10.1: Helpful Hint for Hedge Accounting of Credit Derivatives.

For a financial liability or asset, a part of the risk is labelled as hedged item. For example, a company might designate just the credit spread part of a loan or a bond and not the interest part (LIBOR). This can improve the effectiveness of the hedge since the interest rate is not being hedged. But, it is to be noted that the portion should be lesser than total cash flow. For example, an entity cannot assign a credit spread part of a liability in which the effectual interest rate is less than the credit spread as in the case of a convertible bond, leaving a negative residual portion.

These are the hedge types that are accepted---hedging fair value, hedging cash flow and hedging of net investments of corporations' foreign operations. There are not any credit derivative applications of the third type of hedge (investment in foreign operations), so we will skip discussing that aspect.

Fair Value Hedges

These are used for the purpose of hedging the deviations in fair value of the debt securities or the liabilities or assets. For example, the market value of a bond that pays a fixed rate of interest undergoes change as soon as the rates of interest or credit spreads fluctuate. Thus, if price risk of a bond is hedged with a derivative, it is said to be hedging of fair value (Exhibit 10.2).

Any deviations in derivative's fair value would be reflected in the income statement. This could be made up for by the change in the hedged item's fair value in the income statement.

Exhibit 10.2: Example of Fair Value Hedge.**Example**

Fixed rate debt issued by company before swapping debt to floating rate.

Accounting for swap

Swap is marked to market and changes in value are recognized in current earnings.

Accounting for debt

Change in value of debt related to change in market interest rates is recognized in earnings. Combination of swap change in value plus debt change in value is offset in earnings.

Cash Flow Hedges

Derivatives can also be used to hedge changes in future cash flows arising from existing assets or liabilities, or from forecasted transactions. For example, interest payments on a company's variable-rate debt expose a company to interest rate risk. Hedging this exposure using an interest rate swap (to convert the debt from floating rate to fixed interest rate) would be considered a cash flow hedge under the hedge accounting rules.

In a cash flow hedge, changes in the fair value of the interest rate swap would accumulate first in the statement of comprehensive income (Exhibit 10.3). A portion of these gains or losses would be transferred out of comprehensive income to the income statement whenever interest is paid on the hedged debt. The net result will be a fixed rate of interest expense.

Exhibit 10.3: Example of Cash Flow Hedge.

Example

Company issues floating rate debt, then swaps to fixed rate.

Accounting for swap

Swap is marked to market and changes in value are recognized first in statement of comprehensive income and then in earnings as interest payments on hedged debt are made. At maturity, swap's value reduces to zero. Swap's carrying value is adjusted each period to reflect actual swap payments or receipts.

Accounting for floating rate debt

Variable interest rate expense is recognized in earnings as incurred.

Combination of swap change in value plus debt change in value is offset in earnings.

10.6 CLASSIFICATION OF CREDIT DERIVATIVES AS ACCOUNTING GUIDELINES

The accounting standards do not prescribe rules for addition of losses and gains from credit derivatives in the income statement. However, they prescribe certain guiding principles. They require inclusions of line items in the income statement and provide that presentation of additional line items be done so that the entity's fair financial reporting is done.

Presentation in the Income Statement of Gains and Losses from Credit Derivatives

It is required that there must be consistency between presentation of losses/gains from hedging instruments in the income statement and the strategies of risk management and accounting policies of the entity. The best-practice possible strategy would be the following:

- Reporting of returns from hedges is done in the same line item as those from the hedged items. The ineffective part is reported distinctly, for example, in other operating expense/income.
- Instances of losses/gains on credit derivatives held for trading are reported in a distinct line item or in the operating income and expense. Both credit derivatives, which are not nominated as hedging instrument and not qualified for hedge accounting, are said to be not included into the entity's accounts.

10.7 DISCONTINUING HEDGE ACCOUNTING FOR CDS

Hedge accounting ceases prospectively in the following cases:

- Failure in an effectiveness test
- Sale of the hedged item
- Sale or expiry of hedging instrument
- The hedge item is revoked of its designation
- The future cash flow for a cash flow hedge is improbable.

In case of failure of a hedge relationship to clear test of effectiveness, ceasing of hedge accounting takes place from the previous date when the hedge was established to be operative. This date is generally the beginning of the period of failure of the effectiveness test by the hedge. If the event or change in circumstances, which led to the failure of the effectiveness test by the hedging relationship, can be determined by the entity or it can be effectiveness of the hedge before the event can be established, then ceasing of hedge accounting would take place from the date of change in circumstances or that event. All the variations in the hedging instrument's fair value are recognized in the income statement and the variations in its future fair value are accounted for as and when they occur. For example, future changes in fair value for an 'available-for-sale' hedged item, except currency differences and impairment on monetary items, are given recognition in equity, but for loans or receivables as hedged items, fair value

future changes other than impairment are given recognition only when the item is sold.

With an objective of ensuring matching hedged item to the gains and losses arising in that period, rules are prescribed by the accounting guidelines to provide for treatment of existing hedge accounting gains or losses which have already been documented in prior periods of reporting. In particular:

- If it is a fair value hedge, deviations in the hedged risk would have been adjusted against the carrying value of the hedged item. In the case of a debt instrument, recalculation of the effective interest rate is done to amortize over the remaining life of the instrument, the accumulated hedging adjustment. In case of equity instrument which is categorized as 'available for sale,' amortization of the hedging adjustment that has got accumulated is not done, but the extent of loss or gain on sale is affected.
- If hedging is done on cash flow, then losses or gains that arise in the effectual period of a cash flow hedge are considered to be in equity where they remain till occurrence of the related cash flows. In a forecast transaction, if the future cash flow is a mere possibility but nevertheless might occur, the losses and gains remain in equity till such time the actual gain or loss is experienced, but if the change of the future cash flow is no more there, gain/loss is usually sent to the income statement.

10.8 CASELETS IN HEDGE ACCOUNTING FOR DIFFERENT CDS

This section sets out, in a caselet format (Exhibit 10.4 to Exhibit 10.16), the implementation of the standard where companies desire to realize hedge accounting. We will cover it using the IFRS guidelines, especially IAS 39. As mentioned before, the Indian hedge accounting standard (AS) 30 is exactly similar to IAS 39.

10.9 THE NOT-SO-GOOD THINGS ABOUT HEDGE ACCOUNTING FOR CDS

The Hedge effectiveness needs to be monitored regularly after it is put in place. Those hurdles are often difficult and sometimes costly to meet, which forces many companies to sidestep hedge accounting. The substan-

Exhibit 10.4: Designating a Net Position to be a Hedged Item.**Caselet Background**

Company 'Seeking-to-hedge,' whose functional currency is USD, has a global treasury center that is responsible for collecting and assessing the group's credit risks and offsetting the net position using derivative instruments with an external party. For example, it has an accounts receivable of \$25 million from Company XYZ and an accounts payable of \$10 million to a subsidiary of Company XYZ. It has therefore entered into a CDS where it has bought protection on Company XYZ for \$15 million.

Caselet Solution

IAS 39.84 prohibits the designation of a net position as the hedged item. It is possible to achieve a similar effect by designating the hedged item as part of one of the gross positions, *i.e.*, as one or more individual assets, liabilities or forecast transactions that are equal in amount to the net position (IAS 39.AG.101). The Company can therefore designate the CDS contract as a hedge of the receivable of \$15 million.

Exhibit 10.5: Held to Maturity Investment Designated as Hedged Item for Credit Risk.**Caselet Background**

Company L invests in a fixed rate bond. It classifies the investment as held to maturity. The entity also enters into a CDS under which it buys protection in order to offset its exposure to fair value credit risk on the bond.

Caselet Solution

IAS 39.79 allows a held-to-maturity investment to be designated as a hedged item with respect to credit risk and foreign exchange risk but not interest rate risk.

Exhibit 10.6: Can Alike Items Portfolio be Designated as a Hedged Item.**Caselet Background**

Company N has a large number of individually small receivables denominated in the same currency and wants to hedge them using a single CDS.

(Contd.)

Exhibit 10.6: (Contd.)**Caselet Solution**

Yes. A group of similar items, such as a group of receivables denominated in the same currency, may be designated as the hedged item, provided that the fair value movements of each individual item that are attributable to the hedged risk are expected to be approximately proportional to the fair value movements of the group of assets that are attributable to the hedged risk (IAS 39.83). When a group of similar items is designated, the hedge is tested for effectiveness on a group basis.

Exhibit 10.7: *Can an Entity's Own Credit Spreads be Designated as a Hedged Item.***Caselet Background**

Company P has repurchased some of its own bonds (bond buyback). It plans to resell the bonds in the market in six months to finance a new capital expenditure. The entity purchases a CDS on its own entity to protect itself against the risk that the credit spreads may widen, resulting in decreased proceeds from the future sale of repurchased bonds.

Caselet Solution

No. A forecast transaction qualifies as a hedged item only if it exposes the entity to a particular risk that can affect profit or loss (IAS 39.86). A purchase, sale, issue or cancellation of an entity's own bond instruments is recorded in debt and hence does not affect profit or loss (*i.e.*, no gain or loss is reported in the income statement).

Exhibit 10.8: *Re-designation or De-designation of a Relationship that is a Cash Flow Hedge.***Caselet Background**

Company X has highly probable forecast accounts receivable from a customer who is rumored to be under distress. Company X re-assesses periodically the proportion of the exposure that should be hedged in accordance with its strategy. It decides to reduce the hedged level from 70% to 40% of the forecast accounts receivables. The hedging instruments are CDS contracts. Following this change to its strategy, Company X's management:

(Contd.)

Exhibit 10.8: (Contd.)

- a. de-designates the existing hedge relationship;
- b. enters into a new CDS with the same maturity as the original hedge, partially offsetting the original hedging instrument, so that the combination of the two CDS contracts reflects its new position (*i.e.*, a hedge of 40% of forecast accounts receivables) and
- c. re-designates a new hedge relationship in which the hedging instrument is a combination of the previous hedging instrument and the new CDS contract.

Caselet Solution

Yes. Company X's management can periodically de-designate and re-designate the cash flow hedge relationship. The mechanism of de-designation and re-designation must be properly documented and be consistent with the entity's risk management policy. The accounting treatment at the date of de-designation and re-designation is as follows:

- a. Cash flow hedge accounting may be applied to the original hedge relationship until the date of its de-designation. The change in the fair value of the original hedging instrument that was recognized in equity remains in equity as the forecast transaction is still expected to occur.
- b. Cash flow hedge accounting may be applied to the second hedge relationship starting from the date of re-designation.

Exhibit 10.9: Hedging a Net Investment in a Different Currency.**Caselet Background**

Company B has a net investment in a Hong Kong subsidiary, whose functional currency is Hong Kong dollars (HKDs). As the HKD is pegged against the US dollar, management wishes to designate a USD borrowing as a hedging instrument in a hedge of this net investment.

Caselet Solution

It depends. There is no specific prohibition on designating a borrowing in one currency as a hedge of a net investment in another. However, the hedge accounting may be used only if the hedge is expected to be highly effective and actual results are in the range of 80%--125%. This requirement will not be met for most currency pairs, in which

(Contd.)

Exhibit 10.9: (Contd.)

case hedge accounting cannot be used. Hedge effectiveness may be achieved if there is high correlation between two currencies (for example, if these are formally pegged to each other) and it is reasonable to assume that this correlation will continue. However, unless the currencies are perfectly correlated, some ineffectiveness will arise. In this case, it is likely that the hedge will be effective as long as the peg between HKD and USD is not changed.

Exhibit 10.10: *Internal Derivatives as Hedging Instruments.***Caselet Background**

Company C uses internal derivative contracts to transfer risk exposures between different legal entities within the group or between divisions within a single legal entity. For example, a subsidiary's credit risk to another group subsidiary may be transferred to the central treasury unit through an internal CDS contract.

Caselet Solution

No, only instruments external to the reporting entity can be designated as hedging instruments (IAS 39.73). Internal derivatives can be used to document the link between an external hedging instrument (held, for example, by the parent company or a treasury unit) and a hedged item in another group entity, such as an operating subsidiary, provided that all gains and losses arising on the internal derivative are eliminated on consolidation (IAS 39 IG F1.6).

Exhibit 10.11: *Can a Derivative that is Already Existing be a Hedging Instrument.***Caselet Background**

Company E has a portfolio of foreign exchange derivatives that it classifies as held for trading. The company enters into a new firm commitment that exposes it to foreign currency risk. Management wants to designate one of its existing trading derivatives as a hedge of this exposure.

Caselet Solution

Yes, provided that the hedge is expected to be highly effective. Hedge accounting for the derivative is applied from the inception of the hedge relationship.

Exhibit 10.12: Maturity of the Hedging Instrument and the Hedged Item.**Caselet Background**

Company J enters into cash flow hedges of accounts receivables in June 2015. It is not possible to determine exactly when in June the accounts receivables would be received. Company J therefore decides to hedge the first X million of accounts receivables in June 2015. The hedging instrument, however, will mature on a specified day (for example, 15 June 2015).

Caselet Solution

There is no requirement for the maturity date of the hedged item to match exactly the maturity of the hedging instrument. However, timing mismatches may give rise to ineffectiveness. In addition, if the derivative matures after the hedged item, it cannot be designated only for the time until the hedged item occurs, as a hedging relationship cannot be designated for only a portion of the time period during which a hedging instrument remains outstanding (IAS 39.75).

Exhibit 10.13: Proportions of Derivatives as Hedging Instruments.**Caselet Background**

Company K enters into a CDS contract for \$10 million to hedge forecast future USD-denominated receivables. At the time of entering into the CDS contract, only \$8 million of forecast receivables are considered to be highly probable. Company K's management wants to designate 80% of the CDS contract as a hedge of the highly probable future receivables of \$8 million.

Caselet Solution

Yes. IAS 39.75 allows an entity to designate a proportion of a derivative as the hedging instrument. Company K can therefore designate 80% of the CDS contract as the hedging instrument. However, an entity may not designate only a portion of the remaining life of a derivative as the hedging instrument (IAS 39.75).

Exhibit 10.14: Timing of Effectiveness Testing.**Caselet Background**

Company A has entered into a floating-to-fixed-rate swap to hedge the interest rate payments of a floating rate debt. It issues financial state-

(Contd.)

Exhibit 10.14: (Contd.)

ments semi-annually. IAS 39.88(e) requires the effectiveness of a hedge to be assessed on an ongoing basis.

Caselet Solution

IAS 39 requires both prospective and retrospective effectiveness tests. A prospective effectiveness test assesses whether the hedge is expected to be highly effective in future periods. A retrospective effectiveness test assesses whether the hedge actually has been effective in a past period.

The timing of the tests is as follows:

- a. At the inception of the hedge, a prospective test is required to assess whether the hedge is expected to be highly effective during the period for which the hedge is designated. If this test is not passed, hedge accounting cannot be used.
- b. As a minimum, a retrospective test is required at every reporting date (whether interim or full year) to assess whether a hedge has actually been highly effective in the period under review. If this test is not passed for a particular period, hedge accounting cannot be used for that period.
- c. A further prospective test is also required at every reporting date (whether interim or full year) to assess whether the hedge is still expected to be highly effective during the remaining period for which the hedge is designated. If this test is not passed, hedge accounting must be discontinued prospectively.

Exhibit 10.15: Failed Retrospective Test with a Successful Prospective Test.**Caselet Background**

A hedge relationship designated by Company K fails the retrospective test for a given period; the management, therefore, ceases to apply hedge accounting from the last date on which it demonstrated effectiveness (IAS 39.AG.113). The management performs a successful prospective effectiveness test with the same hedging instrument and the same hedged item at the start of the following period. The management wishes to re-designate the hedge relationship for the remaining life of the instrument.

Caselet Solution

Yes. The management can re-designate a hedge relationship following a successful prospective effectiveness test. IAS 39 does not preclude

(Contd.)

Exhibit 10.15: (Contd.)

an entity from designating the same derivative as a hedge of the same item in a subsequent period, provided that the hedge relationship meets the criteria for hedge accounting (including effectiveness) in that subsequent period. The management must de-designate the initial hedging relationship and re-designate a new hedge relationship for the subsequent periods.

Exhibit 10.16: Discontinuance of a Fair Value Hedge of a Bond.**Caselet Background**

Two years ago, Company A issued at par a Rs. 400 million, 5-year fixed-interest rate bond. At the same time, it entered into a 5-year fixed-to-floating interest rate swap that it designated as a fair value hedge of the bond. After 2 years, the hedge fails a retrospective test. At the date the hedge last passed an effectiveness test, the carrying value of the bond included a cumulative adjustment of Rs. 2 million, reflecting the change in the fair value of the hedged risk.

Caselet Solution

Company A discontinues hedge accounting prospectively (previous accounting entries are not reversed). If the reason for discontinuance is that the hedge failed an effectiveness test, hedge accounting is discontinued from the last date when the hedge was demonstrated to be effective (IAS 39.AG.113). The adjustments to the carrying amount of the hedged item to reflect the changes in fair value that are attributable to the hedged risk remain as part of the item's carrying value, but no such adjustments are further made in future periods. When the hedged item is carried at amortized cost, these previous hedging adjustments are amortized over the remaining life of the item by recalculating its effective interest rate. The adjusted carrying value of Rs. 402 million will be the basis for calculating a new effective interest rate, starting from the last date the hedge passed an effectiveness test. The hedging adjustment of Rs. 2 million is therefore recognized in profit or loss over the remaining life of the bond.

tial cost of documentation and ongoing monitoring of designated hedges is sometimes not worth applying the rule. Also, the qualifying hedges are either unavailable or are too costly or too poorly documented to be used. Additionally, the hedge accounting is avoided because it increases the

risk of restatement. The liability of documenting and monitoring hedge effectiveness is another reason why people shy away from hedging. The unspoken reason for shying away from applying hedge accounting is the risk of restatements, particularly the ones related to documenting and ongoing monitoring of the effectiveness of the hedge.

CHAPTER 11

SUBPRIME CRISIS AND CREDIT DERIVATIVES

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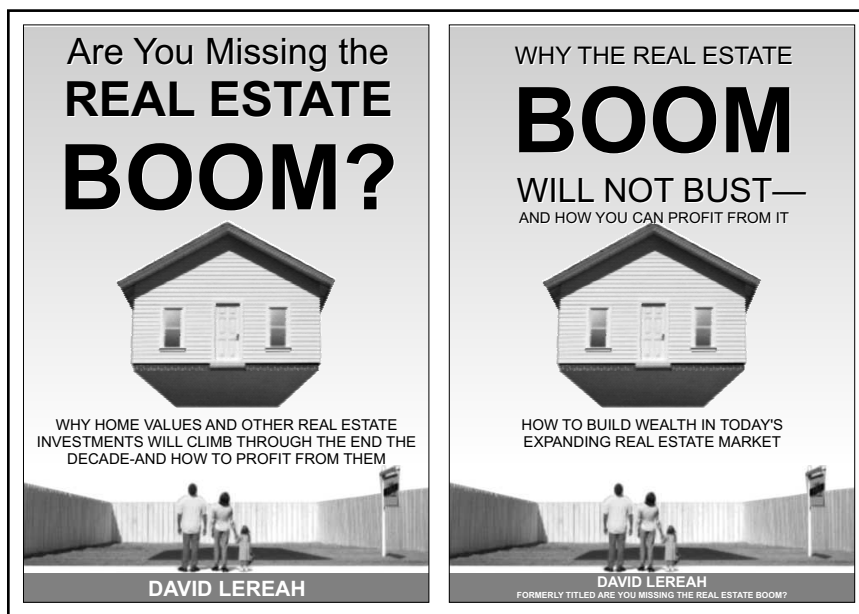
11.1 SYNOPSIS

In this chapter, we will look at the reasons for the subprime crisis. This is important because the credit derivatives have been blamed in a big way for the subprime crisis. It is vital to understand the most fundamental reasons for the crisis, which had nothing to do with credit derivatives. Since the reasons were fundamentally different from credit derivatives, the content covered here does not have much to do with credit derivatives. It deals mainly about the central origins of the subprime market and the consequent crisis.

11.2 HOUSING BUBBLE IN THE UNITED STATES

It is pretty widely known that the Americans love their homes. However, in the 1990s and the first half decade of this century, the enthusiasm to own homes was quite high and probably irrational even by the American standards. The overall home ownership in the United States showed an increase from 64% in 1994 to 69.2% by 2004. This sentiment was also reflected by the popular books like 'Are You Missing the Real Estate Boom?' This book was not so surprisingly written by the National Association of Realtor (NAR) Chief Economist, David Lereah. He changed the title of the book a year later to 'Why the Real Estate Boom will not Bust—And how you can Profit from it' (Exhibit 11.1). With hindsight, at least the picture of the book cover seemed right. Truly for many, their own homes became inaccessible because of foreclosures. As an aside, a little bit of detail on the author of the book—David Lereah, he was the spokesperson for the NAR. May be, his optimism on the real estate boom was, I guess, because

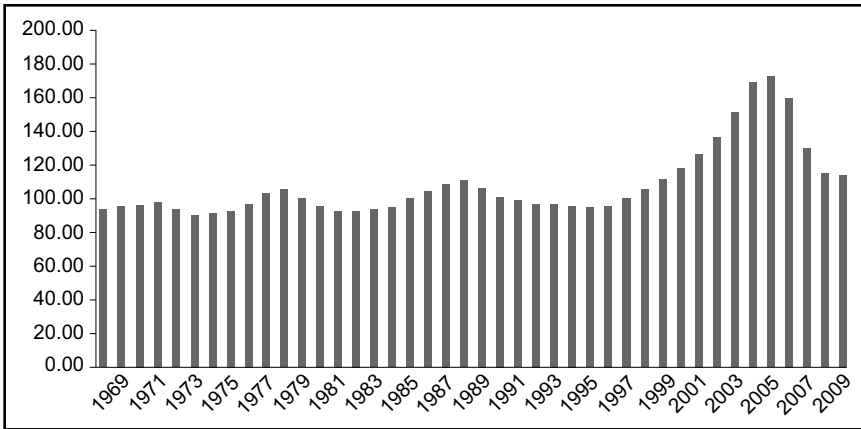
Exhibit 11.1: Books Reflecting the Housing Sector Sentiment.



he took his job a little too seriously. He incidentally, in the book flap describes himself to the US audience as “one of the nation’s most prominent housing economists.” I just checked my own biography (written by me) to make sure I was not stretching the point of credulity, except may be my photograph.

11.3 POPULAR MYTH THAT HOUSING IS A GOOD INVESTMENT ALWAYS

This was a good belief till about 2006 when the housing prices were increasing year on year on average since the 1930s. The belief that they would continue to increase forever and could never go down was what was wrong with the belief. The idea of home as a good investment was initially based on strong economic rationale. Buying a house *vis-à-vis* renting was better investment decision if you were going to live in the house for more than 5 years. The initial payment for buying the house, called the down-payment, was not a substantial amount. The initial mortgage payments mainly consisted of the interest and very little of principal amount. With the house prices going up, the owner’s equity in the house went up. To illustrate this, I use as an example with you as the home owner. Let us say, you borrow \$80 from your friend and put \$20 of your money and

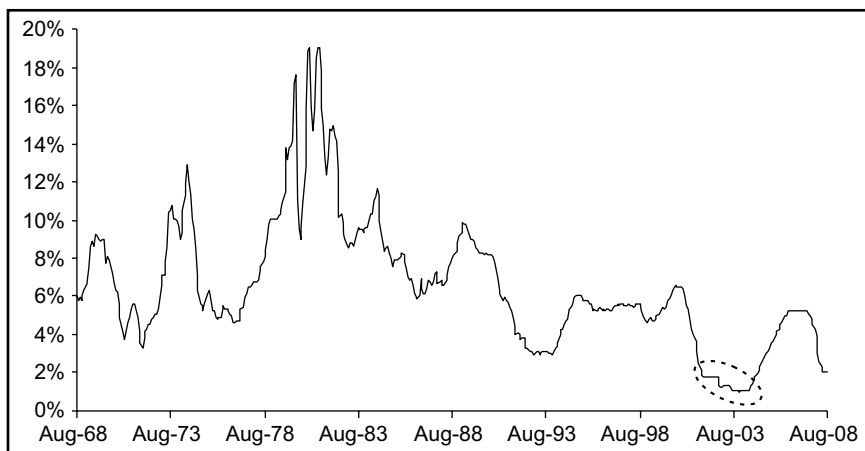
Exhibit 11.2: Inflation-Adjusted Home-Price Appreciation in the United States.

invest this \$100 in buying a home. Assume you pay 10% interest to your friend and the house prices increase year on year around 20%. Assuming you did not pay any principal amount back to your friend, your return on the \$20 capital invested would have been 60%. You earn \$20 on the investment and pay \$8 (10% of \$80) as interest to your friend. The remaining \$12 is your return on a capital investment of \$20, earning you a 60% return on investment in the house year on year. Since tax break is given to the interest part of the loan, the after-tax return on investment becomes even higher when you consider the tax benefits from taking the debt.

Investing in the house for the Americans was a good strategy when the house prices were not too high. However, once the prices had gone too ahead of themselves, renting was probably a better option than buying a home. As they say, your home may be the best place, but there is no reason why you cannot rent it. Partly because of the societal influence apart from rising home prices, renting to many Americans did not seem like a very attractive proposition (Exhibit 11.2).

The other factor which influenced the decision to buy rather than rent, was the interest rate prevailing from late 2001 till early 2006. If the rent on the borrowed money, *i.e.*, the interest rate on the mortgage was low, then buying a house was economically more a rational choice than the renting one. Also, low interest rates made owning homes more affordable because the monthly mortgage payments became less. This also increased the demand by creating more buyers.

Because interest rates were pretty low for an extended span of time, many believe that the former Federal Chairman Alan Greenspan engineered the perfect housing bubble. He reduced the short-term interest rates to unprecedented low levels in 2002 and 2003 from 6.5% to 1%

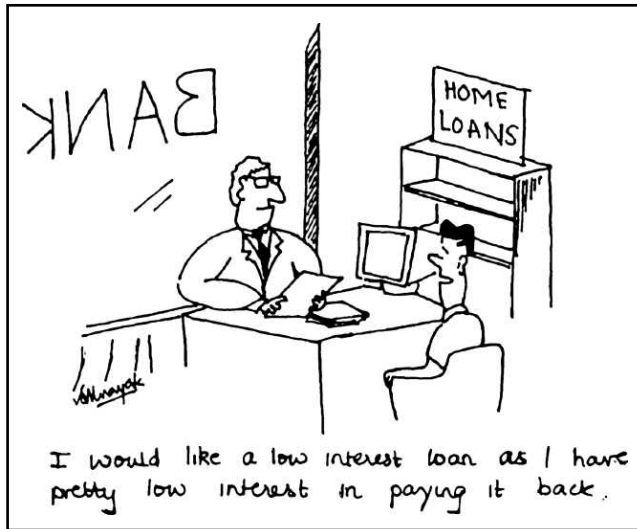
Exhibit 11.3: Federal Funds Rate

(Exhibit 11.3). This resulted in mortgage rates falling down across the board making home buying more ‘within means.’ Interest rates on 30-year mortgages fell approximately by 2.5%. The Fed through its interest rate cuts, in a way, had prompted speculation unintentionally, which also contributed to the housing bubble. It is estimated that about 1.65 million homes purchased in 2006 were for investment purposes, which is approximately 22% of all homes purchased in the United States in that year. In addition, there were about 1.04 million units purchased as vacation homes. While houses had not been traditionally used as investments, it all changed during the housing sector boom. Subsequent to the dotcom bust, households tended to regard equity markets as too volatile and unreliable. The fact that housing prices had increased steadily on average over a long period of time made the average household investor think of houses as reliable investments. The irrational exuberance that was earlier on display by the household investors in the stock market during the dotcom era was now getting channelized in the housing market (Exhibit 11.4).

11.4 THE OWNERSHIP SOCIETY

The prevalent preference added to the societal pressure of the Americans to be owners of the homes they live in was perhaps best epitomized by George Bush’s 2004 presidential campaign slogan ‘the ownership society’ when he was running for re-election. One of the leading values of this society was home ownership. One could dismiss that slogan as an old, time-tested ritual of politicians to make their policy agendas more attractive by tying thematic ribbons to political agendas. However, in a way, it

Exhibit 11.4: Borrowers Interest in Paying Mortgages Back.



implicitly conveyed a larger message to the Americans that owning homes rather than renting was, somehow, the done thing. It was a phrase coined as a slogan for a model of society that the US government was trying to promote. Describing the rationale, he stated in a fact sheet released by the White House in October 2004 that, "...if you own something, you have a vital stake in the future of our country. The more ownership there is in America, the more vitality there is in America, and the more people have a vital stake in the future of this country." The idea was that when people own assets, they would no longer identify themselves as low-esteemed bourgeois and start to think of themselves as owners. He hoped that this would make class consciousness a thing of the past. George Bush self-importantly declared in October 2004, "We're creating an ownership society in this country, where more Americans than ever will be able to open up their door where they live and say, welcome to my house, welcome to my piece of property." In fact, the rhetoric was so popular that there were books dedicated to this theme like---'Bullish on Bush: How George Bush's Ownership Society will make America stronger' detailing how this society was good for every American. Bush remarked in 2002, "Under 50% of African Americans and Hispanic Americans own a home. That's just too few." He called on the financial institutions "to unlock millions of dollars, to make it available for the purchase of a home." The subprime lenders were taking leads straight from the then head of state. More importantly, it conveyed a message to the society at large that owning a home was better than renting one, even if the economics of doing so was not right.

11.5 REAL ESTATE REALITY SHOWS

It seemed like all of the America was having a love affair with real estate. There was a collective crave for property which was reflected in about 20 odd reality shows on prime-time television on real estate. 'House Hunters' was the most popular of the lot with an average of just under a million viewers per episode. A close second came a show with a conspicuously greedy title---'Flip this house' with about 800,000 viewership. And then there were other shows like 'Location, location, location' on BBC America and a more dramatic and competitive 'Double Agents' on Discovery Home, where two realtors were pitted against each other. The reality shows made property conversations the most exciting thing at churches and cocktail parties with people bragging truthfully or otherwise about how much money they have made with houses. These reality TV shows were outlets of window-shopping for property without leaving the comfort of homes. They neither necessarily conveyed the whole truth of the market nor were they dishing out really useful advice. The main goal of these shows was understandably entertainment and not education. But they did manage to overhype the market and make it seem more surreal, glamorous and lucrative than it actually was. They became more of a fad like the other reality programs on losing weight or a bunch of disparate people being locked up in a large secluded house, like 'Big-Boss' on the Indian Television. What was actually being dished out was a combination of fact and fiction with the audience sometimes naively assuming it to be all facts.

In fact, one of the news channels, Fox News in Atlanta to be specific, found out that some of these shows were lying big-time to the audience in prime-time television. In a hugely popular show 'Flip this House,' the Fox News team found that there was a real estate investor deceiving millions of viewers by making claims of having sold every single house that had been featured on the show after making extensive renovations. The truth was that the houses had never been sold and the renovations performed were substandard. Most sophisticated investors were not surprised about those aspects of 'reality' television, but the naïve folks watching the program took these 'reality' shows on realty at face value.

In fact, such shows were lapped up by a larger community without sufficient scrutiny. It is said that, any TV production house with half an idea of a program on real estate started producing one because the economics worked out well for the TV channel. It was a match made in heaven between the TV channels and the advertisers for these shows such as furniture brands, paint manufacturers, tile makers---anybody who had any-

thing to do with real estate. Like the rest of America trying to get a pie of the growth in property prices, this was the idea of the TV channels to cash in on real estate (Exhibit 11.5).

It not only made the markets overheated but also gave the audience a false notion that everybody else was making money from property and hence must be safe and sound, which was evidently not true. It made speculation seem like a noble activity that all of the America seemed to pursue. Obviously, all these at the fundamental level had nothing to do

Exhibit 11.5: Popular Real Estate Reality TV Shows.

Flip This House	Location, Location, Location	The Adam Carolla Project	What You Get from Investing in House
Double Agent	Housing Hunters	Sell This House	What You Get for the Money
Designed to Sell	Hidden Potential	Property Ladder	The Real Wives of New York City
Date My House	Flipping Out	My First Place	The Real Housewives of Orange County
Buy Me	Flip That House	Million Dollar listing	The Bubble

with the credit derivatives, but everything to do with the subprime housing market.

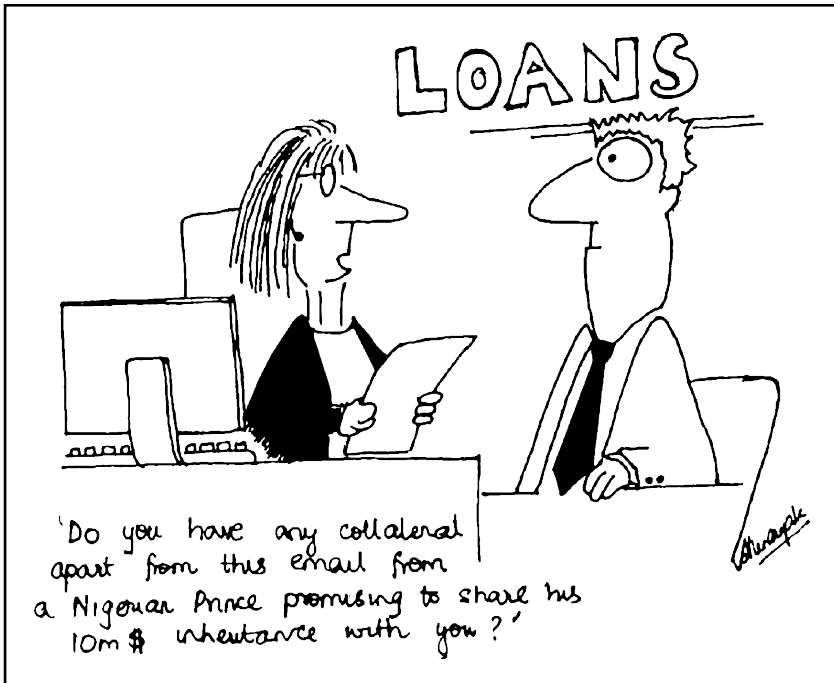
11.6 DOWN PAYMENT LOOPHOLE

Down payment in the context of a house purchase is the upfront amount that the home buyer has to pay initially in cash at the time of finalizing the transaction. In the United States for home purchases, this amount typically varies from 5% to 20% of the purchase price. In India, the amount is more like 20%. The point of a down payment is to ensure that the borrower does not walk away from the loan after taking it. And if he did, he could stand to lose about 5%--20% of the purchase price because he forfeits the down payment amount. In the eventuality that the borrower does walk away from the loan, a sizeable down payment also greatly enhances the possibility that the lender would be able to recover the loan amount by selling off the mortgaged home.

For borrowers with a not-so-good credit history, down payment was a major constraint in buying a home (Exhibit 11.6). To get a sense of how much of a constraint it might be, think of a home that costs \$200,000 which is a little less than the median home sales price in the United States in 2006. A 10% down payment would be \$20,000. Given that the average household income in the United States in 2006 was approximately \$50,000 according to the United States Census Bureau, \$20,000 was not exactly some loose change for an average US family. In fact, for families with annual income less than \$25,000 (which was about the salary of a first grade schoolteacher), 43% of them had a lifetime savings of less than \$10,000. So, even a 10% down payment was not all that easy given the high home purchase price.

One way in which this constraint could have been gotten over was if the seller and buyer of the home had a deal, to shortchange the lender. The seller could tell the buyer that I will lend you the money that you need to make the down-payment and you pay me a little more for the house. In that case, the benefits of down payment that we spoke about earlier are negated. Understandably, it was one of the main reasons why no lender allowed the seller to make a down payment on behalf of the buyer. However, there existed a loophole to get around this constraint.

Since the 1990s, the Federal Housing Authority (FHA) had allowed home buyers to accept gifts of down payment from non-profit organizations. The sellers made contribution to these non-profit organizations which make donations to the buyers, thus circumventing the earlier constraint and making home buying less prohibitive. A side effect of this was that house prices to a certain extent got inflated artificially because of the

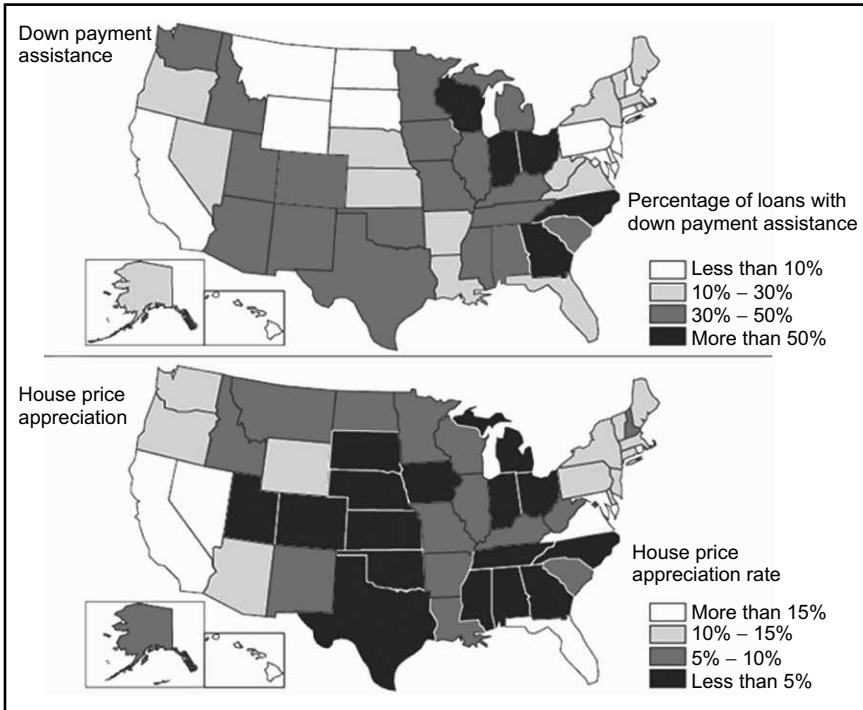
Exhibit 11.6: *The E-Mail Collateral.*

'complementary' service provided by the home seller. Exhibit 11.7 pictorially depicts the correlation between down payment assistance and house price appreciation. States which witnessed higher down payment assistance also had home prices increasing at a faster pace than states which had less assistance in down payments.

11.7 EXAMPLES OF LAX LENDING

Ben Butler, an 80-year-old Georgian, secured an IndyMac loan in 2005 for constructing a modular house. IndyMac released the mortgage based on Mr. Butler's application saying he earned Social Security income to the tune of \$3825 each month. The only hitch was that, back then, the maximum social security benefit was less than half that amount. Mr. Butler contends that he was not aware if his income was inflated by an intermediary. His attorneys say that IndyMac should have been able to figure out during the process of loan processing that his figures were inflated to at least double the amount and should have caught the mis-statement. They allege that it was either the intermediary or IndyMac itself which inflated the figures.

Exhibit 11.7: Purchases using Non-profit Down Payment Assistance and House Price Appreciation.



Most of the former employees who reviewed loan application to ensure accuracy of information and borrower's credibility were mortgage underwriters. Many say that their efforts to do their jobs were hamstrung by higher-ups. "I would reject a loan and the insanity would begin," said a former underwriter and team leader working for IndyMac, on being interviewed. "It would go to upper management and the next thing you know it's going to closing... I'm like, 'What the Sam Hill? There's nothing in there to support this loan.'"

From 2003 to 2006, during the housing boom, many lenders did not bother to document the borrowers' crucial information like income and assets that would have determined their credibility and hence, the quality of loans deteriorated to such an extent that employees joked about it. Badly documented loans started being called 'Disneyland loans,' as a play on the mortgage taken by a Disneyland cashier by claiming a yearly income of \$90,000. Claims made by a person who was earlier the president of IndyMac indicate that CEO Michael Perry and other senior management were focusing on the growing volume of loans 'at all costs' even if it meant disregarding company policies to 'push loans through.'

11.8 PREDATORY LENDING

There is an old adage in the world of banking that if the terms and conditions of a loan seems like it is too good to be true, then you should know that it very probably actually is! Predatory lending is a bit of a derogatory term that is used when lenders convince unsuspecting borrowers to take loans that cost them more than what is a fair cost to them given their credit profile, or has risks that are not fully disclosed to the borrower. Now, let us understand why predatory lending happened to subprime loan takers, and for that we need a brief background on something called as 'redlining.'

Redlining is a euphemism which literally means that a service provider marks with a red line a geographical zone or a community for not providing a service (Exhibit 11.8). In the United States, redlining is the tacitly followed practice of denying a service usually along racial lines. In the domain of mortgages, this manifested as loans being denied to families belonging to a particular race---typically Blacks and Hispanics. Many a times, a low-income White family would be given a mortgage while a similar mortgage may be denied to a middle-income Black family. And on many occasions, an entire neighborhood could be disadvantaged because of its racial profile (Exhibit 11.9).

Exhibit 11.8: Illustration of the Literal Meaning of Redlining.

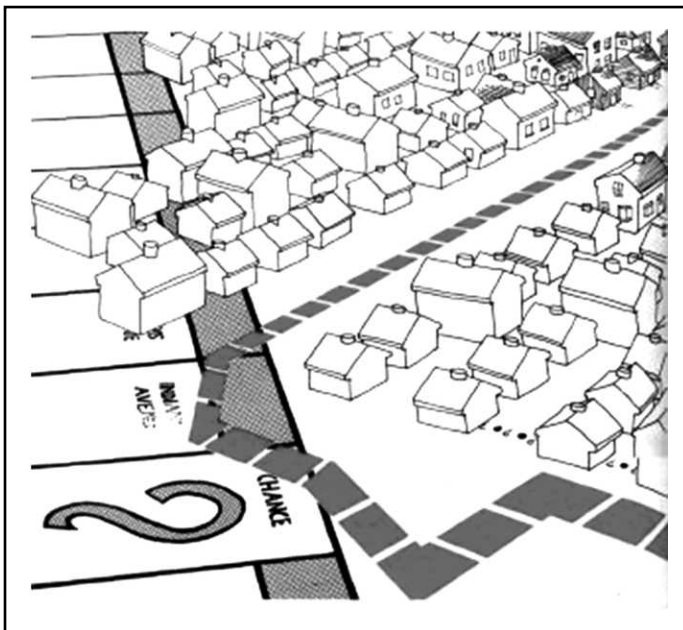
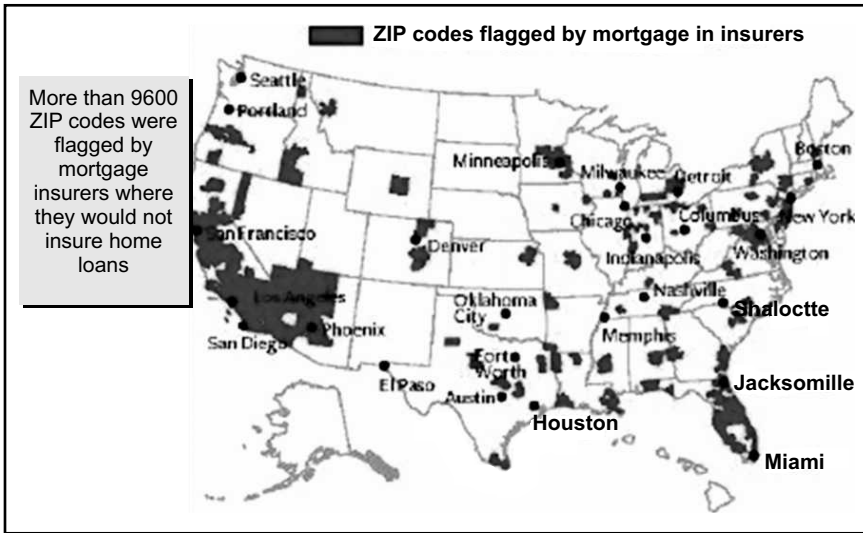


Exhibit 11.9: ZIP Codes used as Flags for Redlining.

To reduce discriminatory lending practices along racial lines, the US federal government passed a law called the Community Reinvestment Act (CRA) to boost loans given by the commercial banks families from varied communities. The act required financial institutions to meet borrowing requirements of families from all communities, irrespective of race, in the area in which they were chartered to operate. Compliance with this act was to be taken into account by the regulator in approving applications for new branch openings or any mergers and acquisitions the bank may pursue. The objective of this act was to encourage banks to be more active in underserved markets which otherwise may have been ignored.

To score brownie points with the regulator, the banks started to make more mortgages to minorities. The pendulum swung to the other extreme, where banks started to actively give mortgages to those communities which would get them credits in the CRA compliance. The banks started to give mortgage to families who should have been justifiably denied a mortgage in the first place, irrespective of the community they belong to. In a way, the CRA unintentionally contributed to banks approving risky mortgages. The other side effect was that banks gave mortgages to Blacks and Hispanics and charged them higher than what was fair because generally they were not that financially sophisticated (Exhibit 11.10). This soon turned into predatory lending---mortgages given to gullible borrowers at an exploitatively high cost. Consequently, families which would have probably not walked away from mortgages if they were priced fairly, found it more difficult to make their mortgage payments (Exhibit 11.11).

Exhibit 11.10: Mortgages Meant for Rocket Scientists.

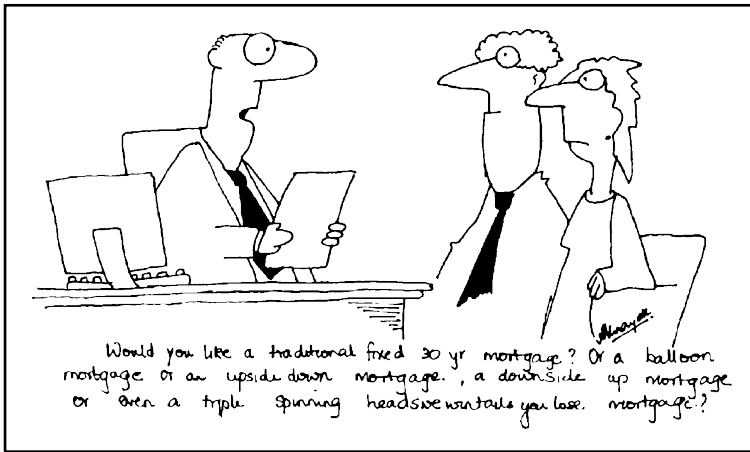
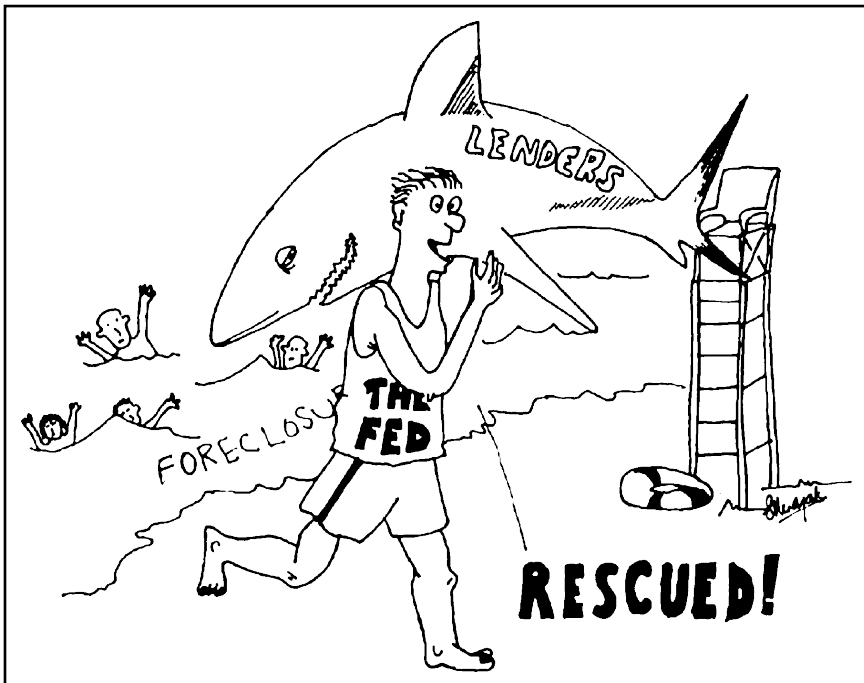


Exhibit 11.11: The Rescuer and the Rescued.



11.9 SUBPRIME MORTGAGE-BACKED SECURITIES

Having understood the more basic causes of the subprime crisis, let us now focus our attention to the securitization and eventually subprime

credit derivatives. We will first trace the origins of securitization and the role it used to play. We will then present a case study to describe how at the outermost level, the crisis manifested through the credit derivatives and that credit derivatives were not the primary cause, but perhaps a secondary or a tertiary cause. But first, the origins of securitization.

If we want to understand the origins of securitization, *i.e.*, history of mortgage loans and their growth, we need to rewind back about eight decades. In 1938, in the wake of the great depression, Franklin D. Roosevelt, the then President of the United States, initiated a sequence of programs with the intention of giving relief to his countrymen from the crisis. He called this sequence of programs---the new deal. The name of the program was derived from the game of cards in which a new deal means, the dealer collects all the cards for redistributing them again with hopefully a new combination and a different result.

There was a collapse in the housing market during that era which made the private lenders averse to making mortgage loans. The mortgage borrowers were defaulting on their loans. Roosevelt wanted to 'redistribute the cards' in the mortgage loan market by changing the structure of the mortgage market. He created Fannie Mae in 1938 to make available federal money to the local banks to fund home mortgages. A large part of funding of the association used to come from the federal government and some from foreign investors. Essentially, the development of the secondary mortgage market happened during this time. Local banks would make mortgages which Fannie Mae will buy. For the first 30 years after it began, it had a monopoly on the mortgage market. As the size of the mortgage market increased, it started consuming a large portion of the federal budget. In 1968, because of fiscal pressure produced by the Vietnam War, Lyndon Johnson, the US President after John F. Kennedy, privatized it so as to remove the strain from the federal budget. Even though it was privatized, it continued to get the benefits of tax exemption along with implicit government backing.

In 1970, so as to initiate competition for Federal National Mortgage Association and also to develop the secondary mortgage market, the federal government established Freddie Mac or the Federal Home Loan Mortgage Corporation (FHLMC).

11.10 SECURITIZING SUBPRIME MORTGAGES

We now understand the securitization technology and how they were used to securitize subprime mortgages. The Collateralized Mortgage Obligation (CMO), a financial debt was introduced when Salomon Smith

Barney, along with First Boston, created it for the FHLMC, a governmental agency. It is legally defined as a special purpose entity distinct from the creator institution, which owns a set of mortgages called as a pool. There are set rules according to which bonds are issued and payments are made to the investors. Collaterals are the mortgages, tranches are bonds, the set of rules that determine the procedure is called structure and these all are collectively called the deal. The CMO investors comprise central banks, hedge funds, banks, pension funds, insurance companies, mutual funds, sovereign funds and government agencies.

Securitization Purpose and Technology

Transforming a mortgage loan into a suitable bond can be done by the basic method to simply 'split it.' For example, a \$600,000 30-year mortgage with a 7.5% interest rate would be split to form 600 bonds of \$1000 each. The bonds will have an amortization of 30 years, and say, 7.00% interest rate with the residual 0.50% being taken by the servicing company to carry out servicing effort. There are various investor concerns associated with this format:

- Prepayment risk involved with the format would mean that the borrower would have the option of paying the mortgage, even before the expiry of the 30 years period. If the borrower does so when the rates decline, the investor would be forced to reinvest the money at smaller rate of interest, which would be undesirable. Since the money of the investor would be tucked away for a long period of 30 years, very few investors would be interested in the format. Even if the loan was refinanced every 10 years, resulting in average bond lasting only 10 years, the risk remains that the borrowers rationally would choose to not refinance during times of elevated interest rates which is recognized as extension risk. For longer bonds, when the price fluctuates with changing interest rates, it causes greater probability of penalty or bonus for investors who wish to sell their bonds before time. This phenomenon is called interest rate risk.
- Normal bonds are just like 'interest only loans,' in which a fixed amount is borrowed by the borrower who then has to pay interest only at the end of the period when he returns the principal amount. On the other hand, both interest and principal are paid monthly in a normal mortgage, which causes decrease in the interest earned. This is unwanted for investors as they have to then reinvest the principal.
- If the loans are not certified by quasi-governmental agencies, it would be undesirable for some investors who would not agree with

the trade-off between the associated risk and the accompanying reward of the interest rate received, *versus* the potentiality for principal loss in the eventuality that the borrower does not pay.

The CMO was created by Salomon Brothers and First Boston to tackle these concerns. The CMO, in order to satisfy different types of investors, creates various types of bonds from the mortgage loan. For example:

- Four different classes of bonds could be created. From this, the first group would be given preference over the second group, when it comes to prepayment, and so on. In this way, the first group would pay off sooner before the next and would have lesser rate of interest. So, a 30-year mortgage would be turned in different types of bonds to satisfy the requirements of various investors.
- Four different classes of bonds could be created. In case of a loss, it would first go against the first group of bonds, then against the second, and so on. Thus, the highest rate of interest would be for the first group and it would decrease in the subsequent groups. Thus, an investor would get the option to go for the bond which he thinks is satisfactory for the risk he is willing to take, *e.g.*, a middle-of-the-road bond for an insurance company or a high-yielding risk for a hedge fund.
- Principal-only (PO) and Interest-only (IO) division could be made. The PO bonds would be sold at discount which would make them bonds with zero coupon. For such bonds, if it is bought, let's say for \$800 each and will mature at \$1000 without the need to pay cash interest, then those investors, who feel that prepayment may entail reinvestment risk when the interest rates decline, would be satisfied. Rather, the investors would be getting larger yield on their investment. The IO bonds would only have payments linked to interest on the original loan pool. Depending on the interest rate movements, their value would change. So, higher prepayments would result in lesser interest payments and higher interest rates, but lower prepayments would result in higher interest payment for a longer time. Thus, investors can opt for IO or PO bonds depending on their susceptibility to interest rates so as to muddle through price changes related to changes in interest rates.

Credit Tranching, Overcollateralization and Excess Spread

Credit Tranching is the most widely used method of credit protection. It refers to the situation wherein the credit losses are taken-in by the class of

bondholders who are junior-most so that their investment's principal value becomes zero. The credit is absorbed by the subsequent class of bonds and this goes on until the senior bonds start making loss. Usually, a deal has certain 'triggers' attached to it, which relate to amount of defaults in the loan pool backing the mortgage asset. Interest and principal that are reserved for paying junior bondholders can be used for the purpose of paying off the principal balance of the seniors, in cases where the balance of the loans crosses the trigger point, thus reducing the senior bonds' tenor.

The issuer sells bonds in which the value of the principal is lesser than the original mortgage value, creating surplus collateral in CMOs which are backed by lower credit quality loans, *e.g.*, subprime mortgage loans. So, investors in such a CMO do not undergo losses till the time a certain level is reached in defaults on the underlying loans. If the 'over-collateralization' turns into 'under-collateralization,' when assumptions made as to the default rate are not adequate, there is a default in CMO.

One more method of enhancing the protection of credit is by issuing bonds for enhancing protection, particularly bonds in which rate of interest is lower than that of the underlying loans which are essentially mortgages. For example, if the weighted coupon of the mortgage pool is 8% (average equivalent interest rate), the CMO issuer would have a choice of bond issuance that pays a fixed coupon of 6%. The extra interest or the 'excess spread' would be allocated to a 'spread account' till the maturity of some or all of the bonds that comprise the deal. In case, a few mortgage loans default, then the cash that lies in the account of the 'excess spread' would be utilized as a fund for payment of bondholders. It is a very useful method to protect the interests of the bondholders against defaults. Defaults that occur later in the lifetime of the deal are paid by the funds available in the excess spread account, which would be sufficient to cover the losses.

11.11 SECURITIZING MORTGAGES: WHAT WENT WRONG

There are multiple motivations for originators of mortgage to fund their undertakings by issuing mortgage-backed securities (MBS):

- Alter comparatively illiquid, singular financial assets into capital market products that are liquid and capable of being traded.
- Allow originators to use the funds for additional activities, since the funds can be replenished.

- Are useful for Wall Street bankers to monetize the credit spread that exists between underlying mortgage being originated and the bond yield.
- Are considered effectual and affordable financing source compared to other financing alternatives.
- Allow diversification of financing sources of issuers by providing alternate forms of financing through equity and debt.
- Allow removal of assets from balance sheets by the issuers, which would cause improvement in different financial ratios and would lead to efficient utilization of capital to make it compliant with risk-based capital standards.

We finally discuss how the subprime housing market dynamics manifested in the credit derivatives market with the help of a case study of the now infamous ABACUS deal structured by Goldman Sachs.

11.12 CASE STUDY: GOLDMAN SACHS ALTERNATIVE MORTGAGE PRODUCTS TRUST

First of all, my apologies to Goldman Sachs (as if they would care) for picking this deal and also for sounding a little pontificating and at times sarcastic. After all, with hindsight, everybody's vision is 20/20. It was difficult for most people to know way back in 2006 that the subprime mortgage story would go as bad as it has. The subprime stuff comprises more than a trillion USD of loans, more than \$200 billion of losses, thousands of families in various states in the United States confronting foreclosure, innumerable politicians yammering, that it is like that country's federal budget: it is just too big to be comprehensible.

So, let us reduce to a human scale this macro story to better understand it. The Goldman Sachs Alternative Mortgage Products (GSAMP) Trust 2006-S3 resulted in a \$494 million decline in the junk-mortgage tranche, which was a component of more than \$500 billion of MBS issued in 2006. It is considered among the top three worst deals to have ever been formulated by a top-tier mortgage maven structure in the Wall Street.

This issue was considered to be the catalyst for the housing bubble and its subsequent bust as it was backed by ultra-risky second-mortgage loans. Not only has it got search features for fast gains in housing markets; it also has loans that are badly drafted and whose sole reason for introducing the scheme was the demand from buyers. As the adage on Wall Street goes, "When the ducks quack, feed them."

Unfortunately, the duck-feeding business turned out to be a loss-making experience for those involved. Within 18 months of its inception, default had been made by 1/6th of the buyers, which resulted in heavy losses for investors who had agreed to pay face value for the securities. These investors had wanted to receive interest more than what they would get on equivalent bonds.

Loss was suffered by the investors whose securities were either defaulted at 100% loss, or downgraded by credit-rating agencies and this led to a depression in market prices of securities. The chart (Exhibit 11.12) seems like something is falling off a cliff.

Even though the firm itself might have lost money on the scheme, but being Goldman, they were able to cover their losses by wagering fruitfully on the drop in price of the junk mortgages. As expected, Goldman already had a lot of experience in the market since the GSAMP trust was just 1 of 83 MBS issues totaling \$44.5 billion that Goldman had put up for sale in 2006.

Now, on analyzing the entire scheme, it can be found that Goldman put together 8274 second-mortgage loans originated by Fremont Investment & Loan, Long Beach Mortgage Co., and assorted other players in the spring of 2006. The state of California, being a hot market, accounted for more than one-third of the total loans. Being a run-of-the-mill deal, 916 residential MBS issues totaling \$592 billion were put up for sale in 2006.

Going into the details of this grisly deal, it is seen that the average size of the equity possessed by the second-mortgage borrowers in their homes was a meager 0.71%. It might look like a misprint, but it's not. The average loan-to-value of the issue's borrowers was 99.29%. It gets even shadier from here. Some 58% of the loans had either low-documentation or no-documentation. So, even though 98% of the borrowers claimed to be the occupants of their homes on which loan had been taken as 'owner-occupied' loans were supposed to be less risky than other, it was far away from the truth. Also, no one could say whether the claims made in front of the mortgage lender was anywhere near the actual assets of the borrowers.

The loans carried high rates of interest, but the borrowers were still interested in this because if a borrower opted for a second mortgage and a typical 80% first mortgage, he could buy a home without putting his money at risk. He could earn a profit when there were rise in house prices and if the prices went down, and he was unable to make his mortgage payments, he would still not lose any of his own money. It was the kind of go-go finance every US consumer loved.

What Goldman did was acquiring second-mortgage loans and then putting them together in the form of the GSAMP Trust 2006-S3. In order to

convert these into securities saleable to investors, it was then partitioned into tranches, meaning slices.

An analogy can be drawn from the case of oil firm, say 'OilCo,' which offers its customers petrol, diesel, jet fuel, kerosene, paraffin wax, *etc.*, rather than selling crude oil. OilCo is capable of making petrol, jet fuel, kerosene, paraffin wax, *etc.* out of crude oil and it gets more revenue for the derivatives than for the crude oil. Since they receive only the 'pay-off,' *i.e.*, product they want, the customers do not complain. This is similar to the trillions of dollars of MBS released by Goldman.

Similarly, mortgages are divided into tranches by Wall Street so that it can get more for the individual pieces. A major off-putting factor is that mortgages carry unpredictable maturities and have to be properly maintained by payment of real estate taxes, collection of monthly payments, going in pursuit of no-pay and slow-pay borrowers, releasing annual statements regarding taxes and interest paid. On the other hand, securities can be customized and are easier to deal with.

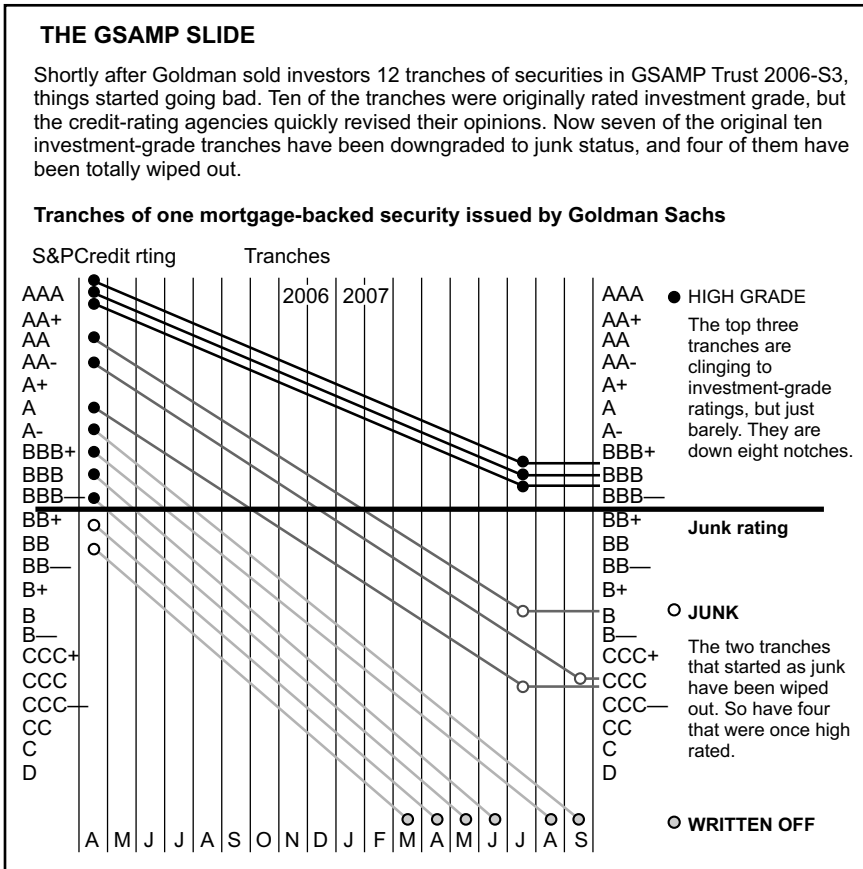
Someone wants a safe, short-term security with a moderately low-interest? Fine, we will structure an agreeable AAA-rated tranche that gets paid back speedily and is very improbable to default. Someone prefers a risky tranche with possibly a very high yield, a very long or even an indefinite maturity, and with perhaps no credit rating at all? An unrated X slice of the pie coming right up there. The investment banker serves his clients exactly what they choose to have.

In this particular CDO, \$494 million of second mortgages was carved by Goldman into 13 separate tranches, out of which the top tranches amounted to around \$336 million, namely A-1, A-2 and A-3, carried the lowest interest rates as well as lowest risk factor. The remaining tranches of \$123 million, mezzanine (M) 1 through 7, are then the next ones that get paid and these include progressively greater rates of interest.

The two non-investment-grade tranches that were sold by Goldman were B-1 (\$13 million) which was taken by UBS Absolute Return Fund based out of Luxembourg and meant for non-US investors and B-2 (\$8 million), which was taken by Morgan Keegan Select High Income fund. B-1 tranche contributed to GSAMP's problem beyond the US mainland.

There have been speculations that the 13th piece, the X tranche carrying a face value of \$14 million, was kept by Goldman as its remuneration for structuring the deal together. There have not been any explanations or justifications issued from Goldman's side to resolve this controversy. There are two options for a buyer to find out the credibility of the securities. The first would be reading the prospectus, which is all of 315-pages, along with the related documents with a cynical eye and to figure out if and how things could go haywire.

Exhibit 11.12: The Slide in GSAMP Ratings.



The second option would be to place reliance on the underwriters and the credit-rating agencies, which in this case were Moody's and Standard & Poor's. This is the most followed route. It is nearly not possible for investors to independently analyze the credibility of the borrowers' credit quality. This is mainly because in mortgage-backed deals the identity of borrowers is not revealed to the investors. Goldman's filing lists consists of more than a thousand pages of information on specific loans but they are by zip codes and code numbers, not by addresses and names.

What is startling is that 68% of the issue by the GSAMP, amounting to \$336 million, was given AAA rating by both agencies making them seem as safe as US Treasury instruments, even though the loans seem to be financial toxic waste in hindsight. Another \$123 million, 25% of the issue, was rated investment grade. So, 93% of the issue was rated investment grade by the two agencies, despite the issue being backed by dubious second mortgages on homes in which the borrowers, whose claims hadn't

been verified by Goldman, had less than 1% equity. Moreover, the GSAMP could not effectively foreclose on these.

11.13 CONCLUSION

As the Goldman Sachs case study illustrates, the credit derivatives market was a tertiary effect of the subprime housing crisis rather than a primary cause. The primary cause was the overhype of the housing market and the price bubble. The fact that loans were easily available and that interest rates were at an all-time-low made those loans affordable. The lending practices were quite lax, apart from it also being predatory to a certain extent. However, in the financial media, the credit derivative asset class was primarily blamed for the crisis. So, it was important to understand the primary reasons for the subprime debacle and the role of credit derivatives in it, to put things in perspective.

CHAPTER 12

CREDIT DERIVATIVES—OVER THE YEARS

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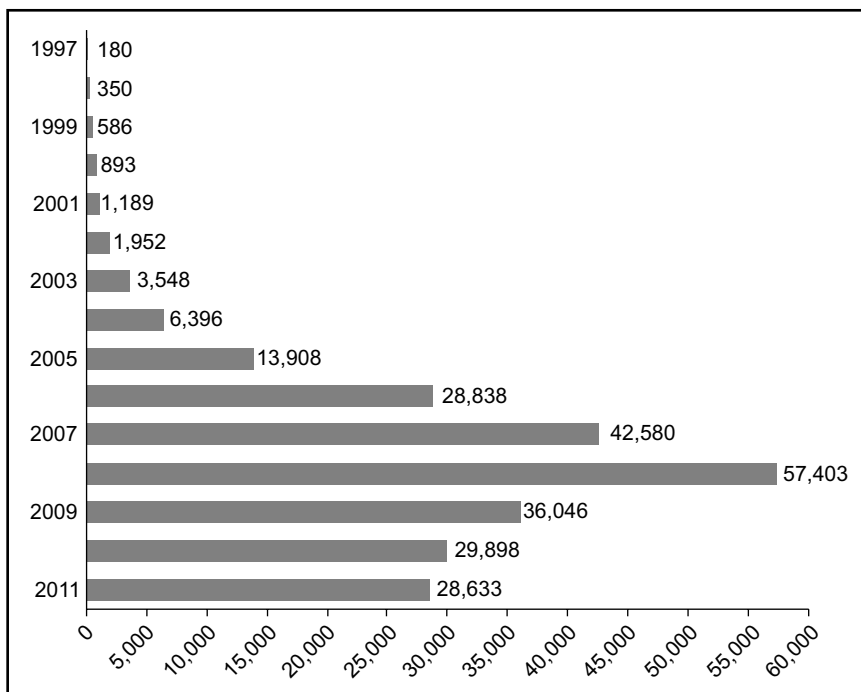
12.1 SYNOPSIS

Credit derivatives started out as a small, esoteric market catering to a few market participants in the late 1990s. The market has changed substantially since then. Over the past decade, this market has transformed into a mainstream market consisting of standardized products. The market had grown initially to satisfy the hedging needs of the managers who look over bank loans. Since then, it has widened to serve the needs of a broad category of financial market participants including hedge funds, insurance companies and asset managers.

In this chapter, we will discuss how the credit derivatives have enabled effective management of this largely unmanaged but all-pervasive risk—credit risk. We will review the growth of credit derivative markets and provide a perspective on its coming of age with the evolution of financial markets. We will also describe the credit derivatives market in its diverse facets: participants, geography, size, products, underlying entities, maturities, ratings, applications and constraints.

12.2 CURRENT MARKET SETTING

The importance of credit derivatives is underscored by their phenomenal growth globally from 2001 to 2008, followed by a maturing of the market from 2009 to 2012. In early years, they grew rapidly in both size and complexity. Their size soon exceeded that of corporate bonds and loans. When 2001 was coming to an end after the 9/11 incident in the United States, the market globally was valued at \$1189 billion. The market grew for the next 7 years quite swiftly (Exhibit 12.1). It expanded by nearly 74% year on

Exhibit 12.1: Global Credit Derivatives Market (\$ Billion).

year in the large part of last decade from 2001 to 2008. According to Bank of International Settlements estimates, the notional amounts outstanding of credit derivatives as of end of 2008 stood at \$57.4 trillion. In the next 4 years after 2008, however, the market shrunk from a total notional of \$57.4 trillion to \$28.6 trillion.

12.3 MARKET BREAKDOWN OF CREDIT DERIVATIVES

In 2002, the market was in a developing stage. According to a survey by Fitch, the total gross sold positions on a notional basis were valued at \$1300 billion which includes \$115 billion of collateralized debt obligations (CDOs). The United States dominated the market in 2002, accounting for \$728 billion, or 61% of the total, while the rest were from the European banks and insurance companies. Coming to the product-wise breakup, single-name CDS took a 47% share of the credit derivative market. Other portfolio credit default products include cash and synthetic CDOs, and had a share of 39% of the total market. Total return swaps and CLNs

represented 4% and 1%, respectively. Top ten institutions comprised 60% of total gross sold positions.

The market was on a rise in 2003 with gross sold outstanding expanding to \$2.8 trillion. If cash CDOs were included then the gross sold outstanding was \$3.0 trillion in 2003. That was an increase of 71% in comparison to that in 2002. The CDSs that have a single-name had the highest growth doubling its volume, rising by 100% to \$1.9 trillion of gross sold positions. Product-wise segmentation yielded (according to how much the protection has been sold, which includes cash CDOs) 64% single-name CDSs, 25% portfolio products (synthetic CDO/basket products), 1% CLNs, 5% cash CDOs and 5% others which includes options that have credit spread and total return swaps.

Market growth continued into 2004, which increased by 86% having a previous year notional amount of \$2.8 trillion to \$5.3 trillion of outstanding contracts in notional terms. Single-name CDSs continued to dominate the market with 88% of the whole market, two-thirds of all gross sold positions. Though CDS had a very healthy growth over the year, the actual surprise in 2004 was indices and index-related products, which increased by as much as 425%.

By year-end 2005, the market rose by 122% in absolute terms according to the Fitch survey. Indices and index-related products that had an increase of 425% in 2004, continued their meteoric rise into 2005 and showed an astounding increase of 900% and, at \$3.7 trillion, they comprised 31% of gross sold positions. Though CDS did not grow at a comparable pace to that of indices, riding on their previous market share, CDS had a 50% share of the gross sold positions. Globally, \$11.8 trillion of gross sold positions and \$11.4 trillion of gross bought positions were identified through the survey.

The consolidated number of bought and sold credit derivatives at the end of 2006 increased to \$49.9 trillion, an increase of an astonishing 113% over the \$23.4 trillion recorded at the end of 2005. Index-related products, following their rapid rise, managed to take over CDS in terms of the notional outstanding amount.

Since 2002, the market had been growing swiftly and in 2008, for the first time, there was a decline in the notional outstanding amount. This decrease was majorly attributed to the intent and efforts of various market participants to reduce the total trade notional, by compressing trades and also the virtual vacancy of second- and third-generation credit derivatives. Product-wise, there was not much change observed, with CDSs that have only one name and indices continuing to enjoy a major share of 88% in the market of the all the credit derivatives that were surveyed.

The domination of the market by single-name CDSs and indices did not see any change going into 2009 (Exhibit 12.2). Both these products constituted 90% of the total credit derivatives market. Indices and index-related products that had risen in volume exponentially since 2004 saw a decrease for the first time in 2009 (Exhibit 12.3).

Implications of regulations on the market brought a lid on the market growth and smoothened the rise in 2010. This, however, did not bring in much change in the constitution of the market. Single-name CDSs remained a dominant instrument, comprising 64% of total sold positions at year-end 2010 (Exhibit 12.4). Indices and index-related products continued to decline in 2010 and represented 25% of total sold positions (Exhibit 12.5). Total credit derivatives positions by product from 2002 to 2006 is shown in Exhibits 12.6 to 12.10. Total credit derivatives positions by sector from 2002 to 2006 is shown in Exhibits 12.11 to 12.15.

Exhibit 12.2: Areas of Credit Derivatives Market Exhibiting Growth.

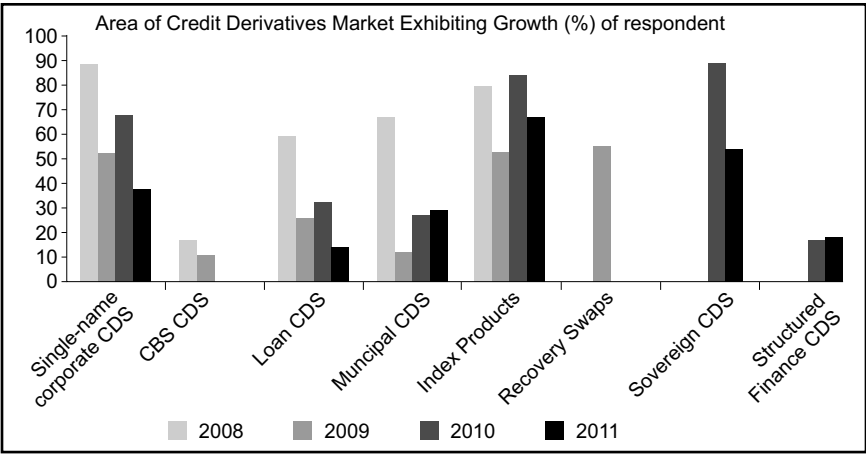


Exhibit 12.3: Indices Decline, Single-CDS Growth as percentage of Total.

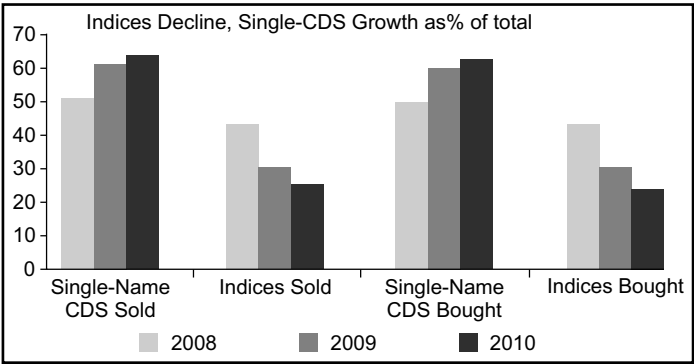


Exhibit 12.4: Single-Name CDS Growth as Percentage of Total: Comparisons of Relative Volumes.

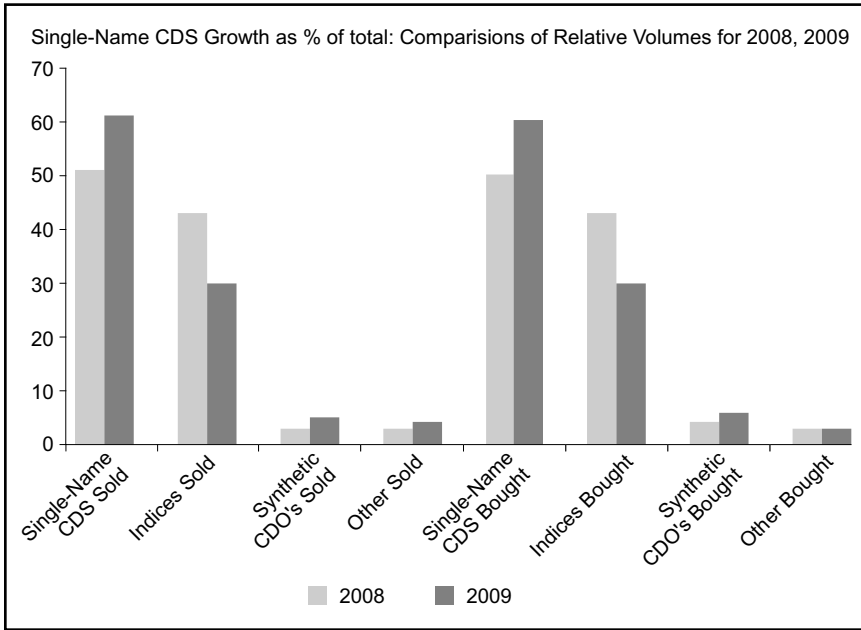


Exhibit 12.5: Comparison of Credit Derivatives Product Volumes.

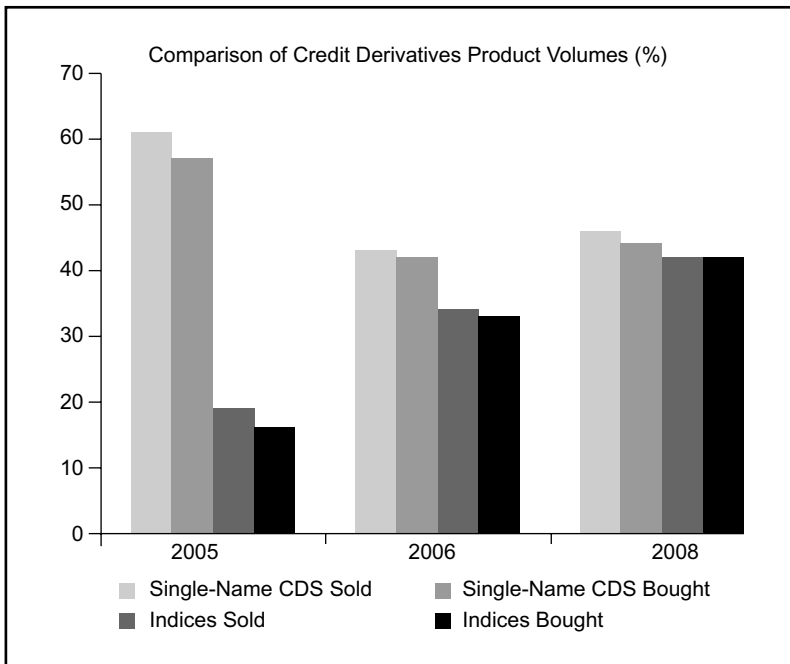


Exhibit 12.6: Total Credit Derivatives Positions by Product—2002.

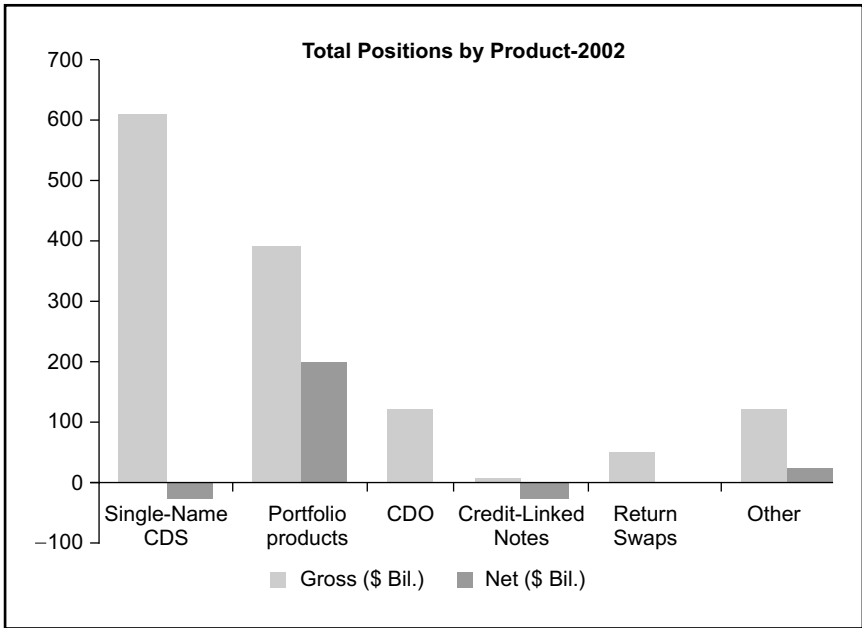


Exhibit 12.7: Total Credit Derivatives Positions by Product—2003.

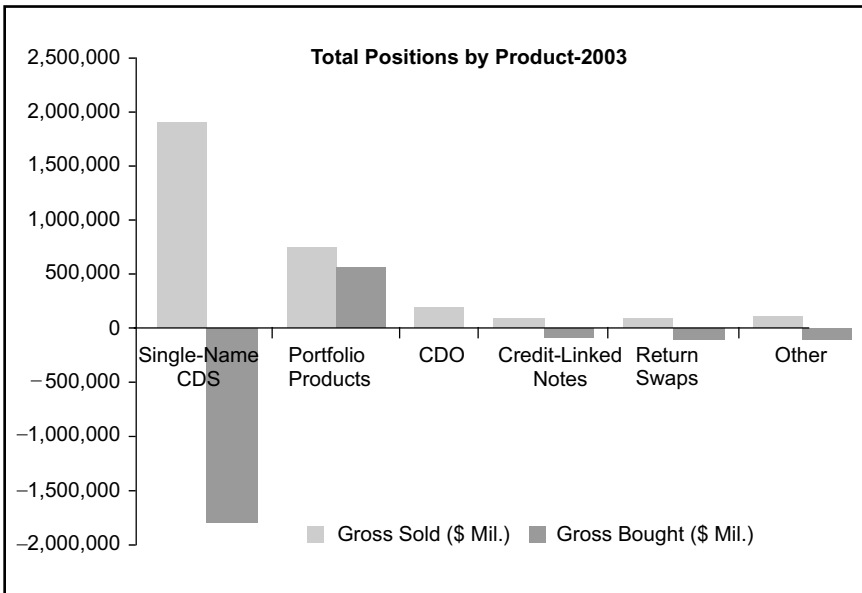


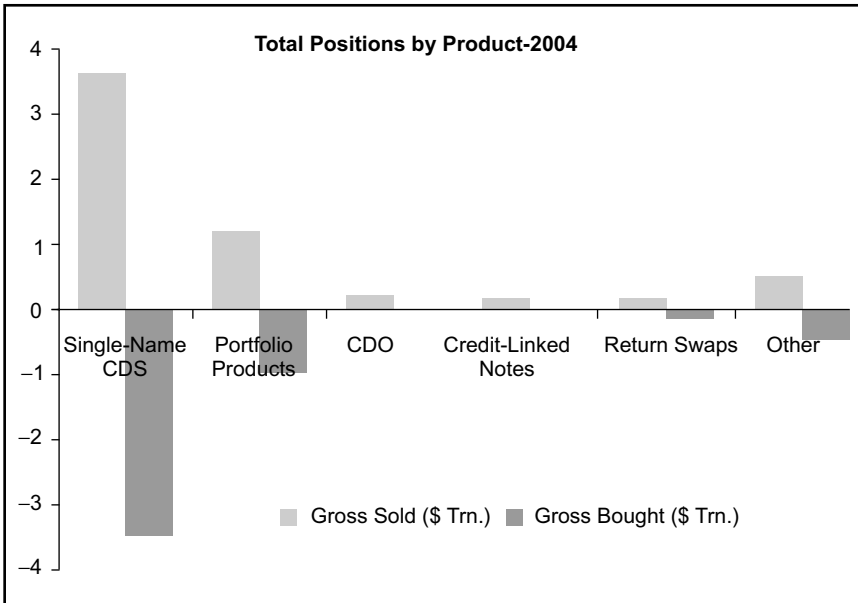
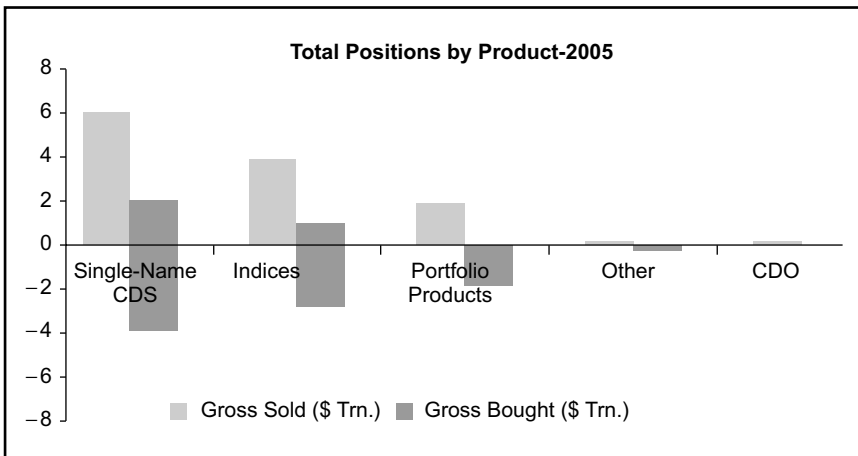
Exhibit 12.8: Total Credit Derivatives Positions by Product—2004.**Exhibit 12.9: Total Credit Derivatives Positions by Product—2005.**

Exhibit 12.10: Total Credit Derivatives Positions by Product—2006.

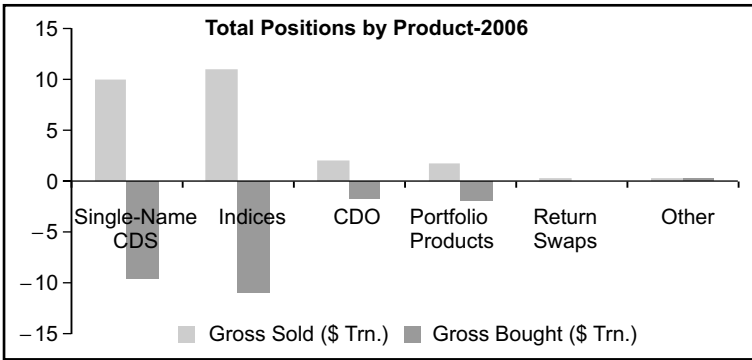


Exhibit 12.11: Total Credit Derivatives Positions by Sector—2002.

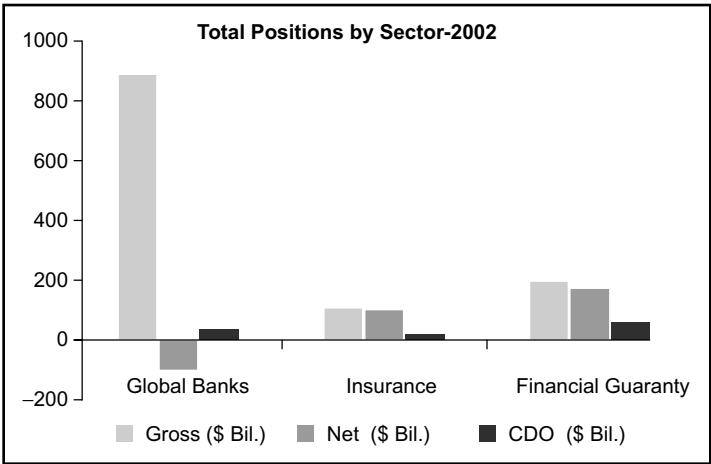


Exhibit 12.12: Total Credit Derivatives Positions by Sector—2003.

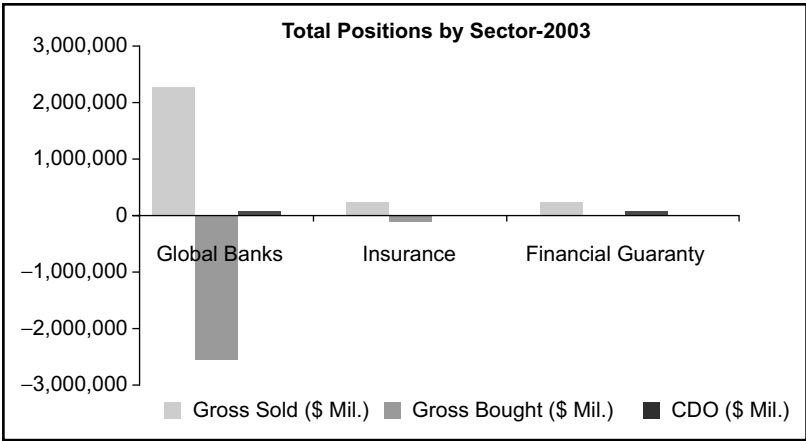
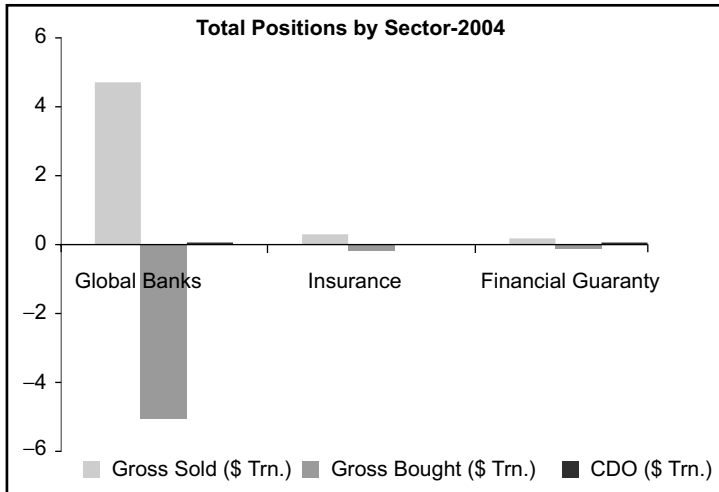
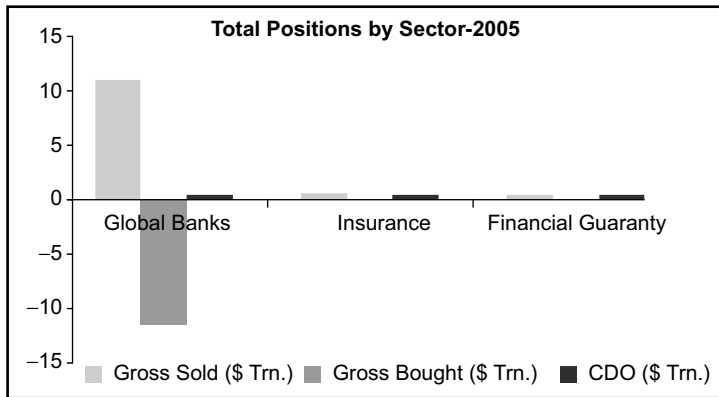
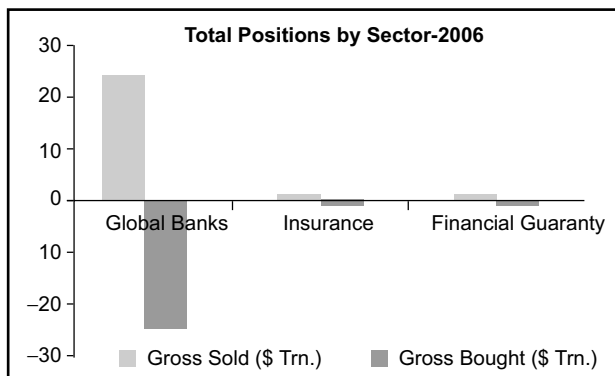


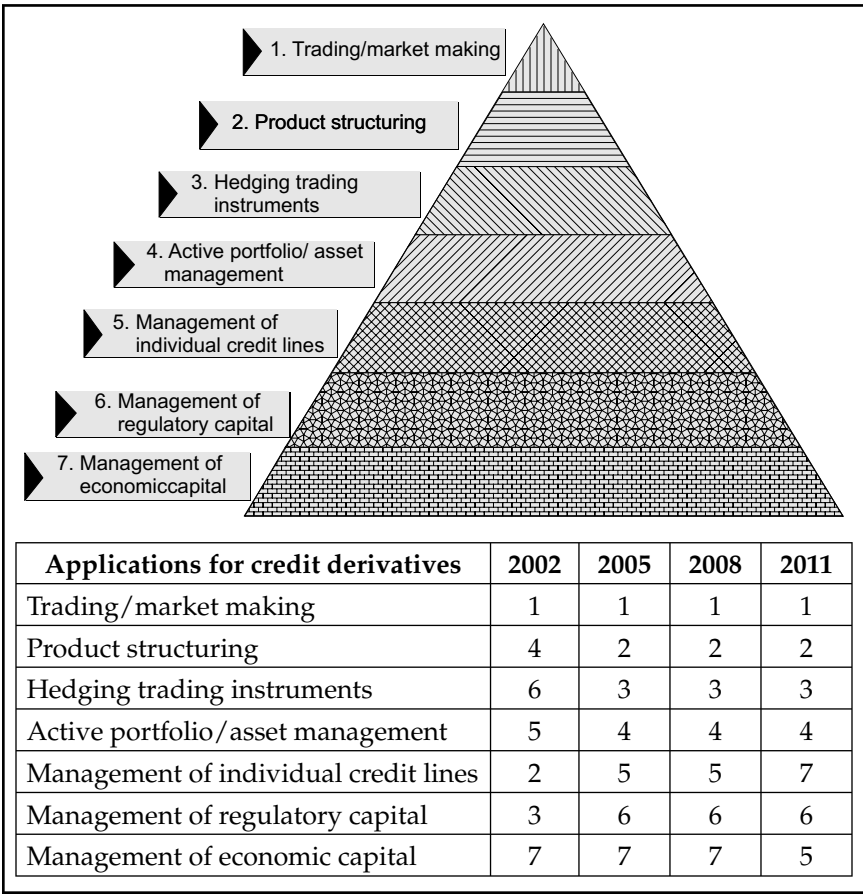
Exhibit 12.13: Total Credit Derivatives Positions by Sector—2004.**Exhibit 12.14: Total Credit Derivatives Positions by Sector—2005.****Exhibit 12.15: Total Credit Derivatives Positions by Sector—2006.**

12.4 APPLICATIONS OF CREDIT DERIVATIVES

A survey by the British Bankers' Association shows that the credit derivatives are most commonly applied for trading, product structuring, hedging, and active portfolio management and less commonly for the management of regulatory and economic capital (Exhibit 12.16).

The following exhibits (Exhibits 12.17—12.23) put across the motivations for credit derivative trades over the years, according to yearly surveys done by Fitch. In 2010, market making, trading and hedging credit risk were the top drivers followed by alternative asset and regulatory capital. In 2009, trading, hedging credit risk and market making were the top drivers followed by alternative asset and regulatory capital. In 2008 as well, credit risk management turned out to be the dominant motivation

Exhibit 12.16: *Applications for Credit Derivatives.*



for global banks to take part in the credit derivatives market, closely followed by trading.

Exhibit 12.17: Motivations for Credit Derivatives—2010.

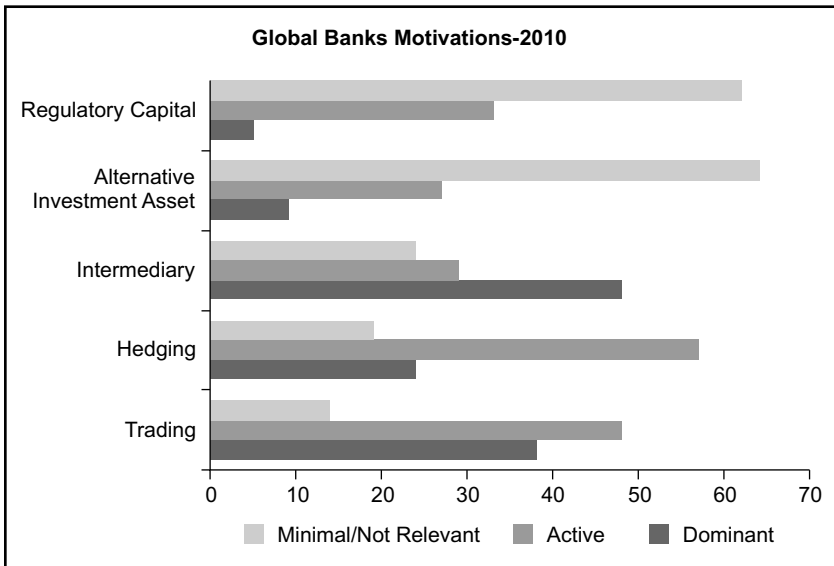


Exhibit 12.18: Motivations for Credit Derivatives—2009.

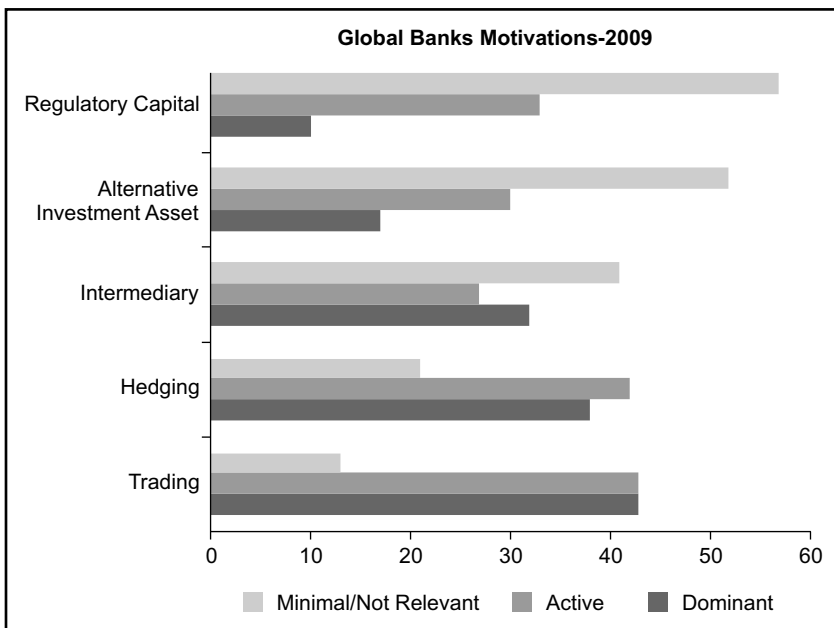


Exhibit 12.19: Motivations for Credit Derivatives—2008.

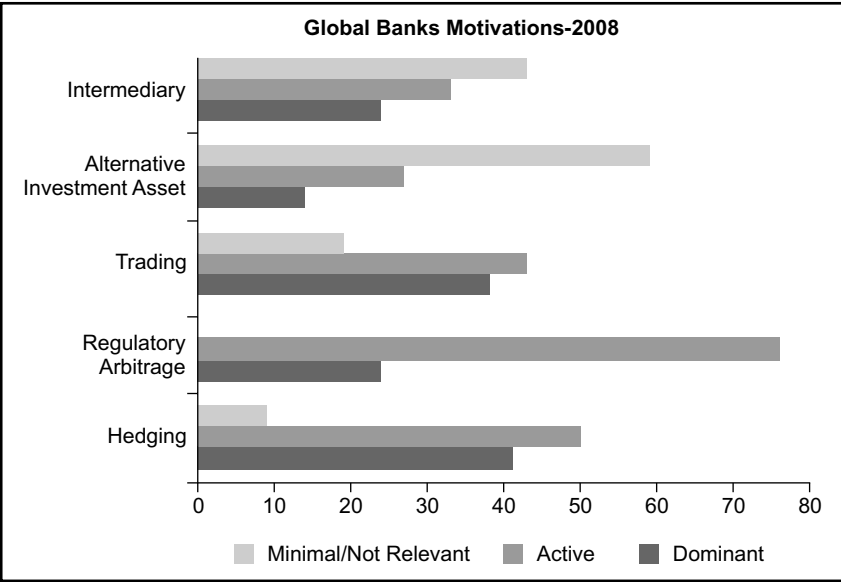
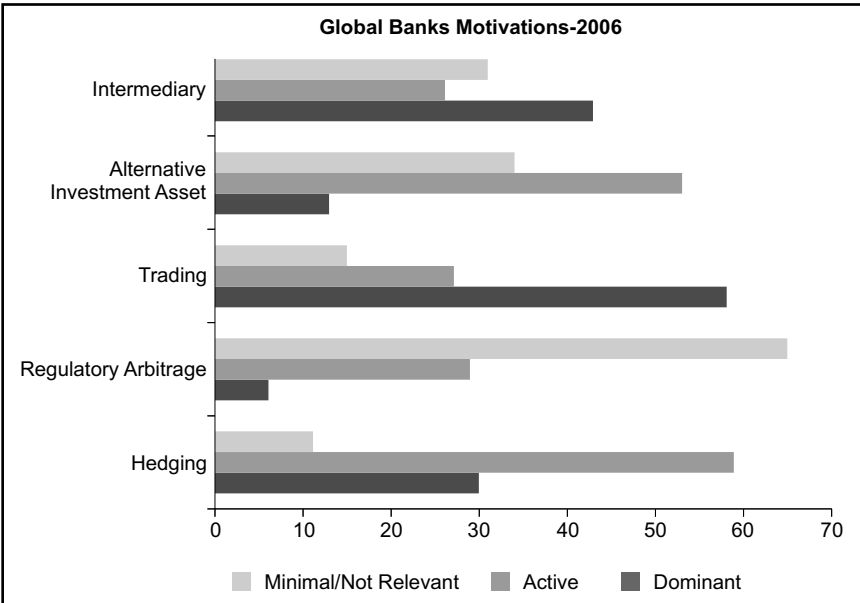
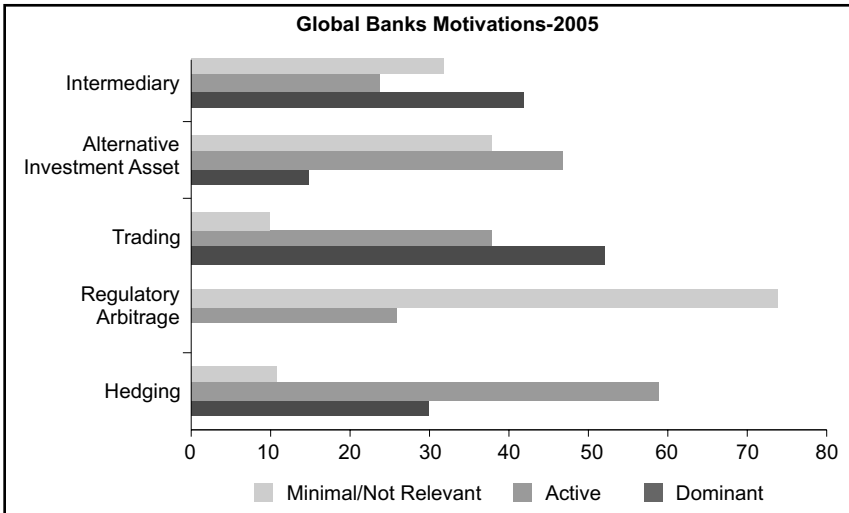


Exhibit 12.20: Motivations for Credit Derivatives—2006.



Market-making activities of banks were identified in 2005 as the prime driving factor in the then credit derivatives market. Previously, in 2003, it was identified that risk mitigation was the primary driver, which reflected

Exhibit 12.21: Motivations for Credit Derivatives—2005.

a substantial shift in the market. As before, credit derivatives as an alternative investment entity turned out to be a prime motivator.

The top motivations identified in 2004 were as follows:

1. Trading
2. Credit risk portfolio management
3. Alternative investment class

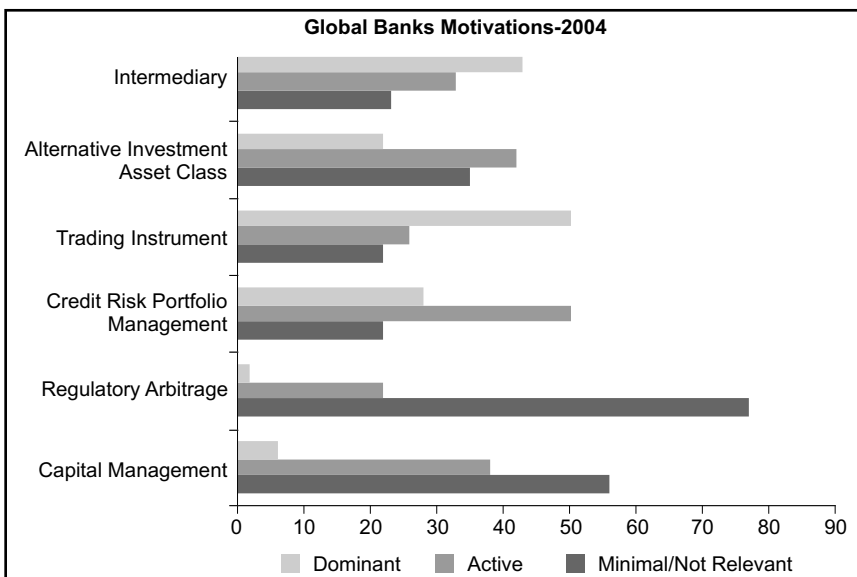
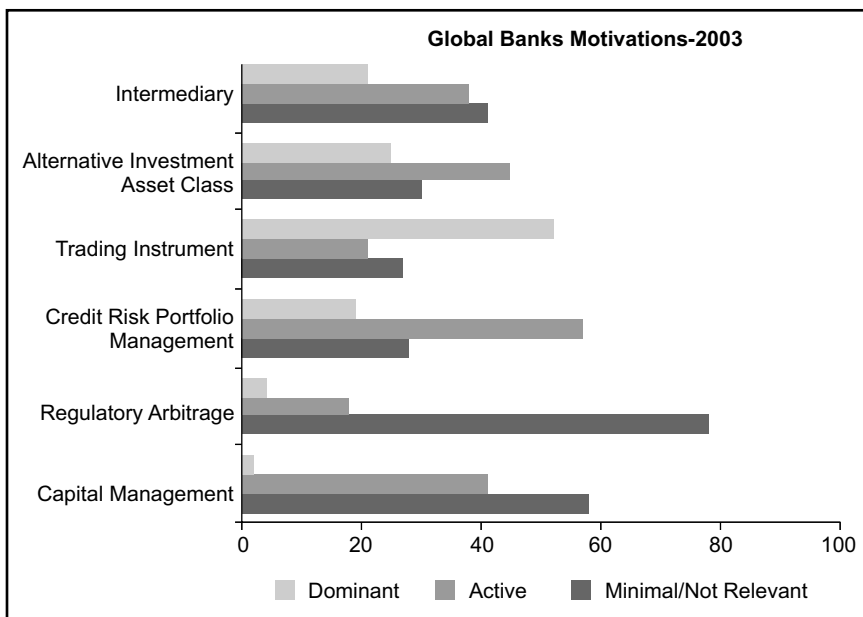
Exhibit 12.22: Motivations for Credit Derivatives—2004.

Exhibit 12.23: Motivations for Credit Derivatives—2003.

As part of an overall risk management strategy, the credit derivatives were dominantly used by banks to trade credit risk, to manage exposure concentrations, and to achieve geographically diverse risk transfer. In 2003, trading was cited as the dominating factor of motivation for usage of credit derivatives by 53% of the global banks. However credit risk portfolio management was cited by only 19% as a dominating factor. For firms who provide insurance, utilizing credit derivatives as an alternative investment asset class was the major motivating factor.

12.5 MARKET DESCRIPTION: PARTICIPANTS

The largest participants in the market for credit derivatives are banks, insurance companies and hedge funds.

Banks

Banks are the dominant users of credit derivatives especially as buyers of credit protection. Initially, the banks focused on utilizing credit derivatives to manage regulatory capital and credit risks at the portfolio level, but after the subprime crisis, they have now shifted to employing credit derivatives to manage economic capital and single-party credit

risks. Compared to their traditional role as buyers of credit protection, banks are also selectively utilizing credit derivatives to sell credit protection apart from utilizing credit derivatives to facilitate primary market syndications.

Hedge Funds

The involvement of hedge funds has given a definite fillip to the credit derivatives market. Contrary to initial expectations, the hedge funds have emerged as buyers of credit protection too, besides being important participants on the sell side. Their involvement on both sides of the market as speculators and arbitrageurs has provided depth to the market. Going forward, the hedge funds are expected to increasingly occupy larger share of the market.

The market share of hedge funds has increased significantly due to strategies such as convertible bond arbitrage. Since a convertible bond represents a composite position on a bond and a call option, convertible bond arbitrage uses CDS to hedge the credit risk underlying the bond. This enables creating a synthetic position in the equity call option, thus providing isolated exposure to equity options that are cheap and embedded. Its other uses are to combine long or short positions in CDS with offsetting positions in equities or equity derivatives to arbitrage capital structure--based pricing inefficiencies.

Insurance Companies

Insurance companies have been the significant users of credit derivatives, although not as much as was expected initially. In majority of the countries, companies who provide insurance have regulatory constraints that restrict using derivatives directly. Due to this very reason, the insurance companies invested in a large number of structured credit derivative transactions as funded principal-protected notes that are collateralized. Insurance companies also act as major investors in tranches composed of credit derivative indices. After 2008, the failure of AIG because of its involvement in credit derivatives has had a cautioning effect on all other insurance companies against the use of credit derivatives.

Other Players

Corporations are essentially buyers of credit protection. They usually buy protection to reduce the exposure that may have to the credit risk of their

customers through accounts receivables or vendor financing. In 2012, the presence of corporates, pension funds or mutual funds in the credit derivatives market was quite low than that of banks and hedge funds.

12.6 MARKET DESCRIPTION: REFERENCE ENTITIES

If we talk about the quality of credit, the majority in the initial years had been investment-grade exposures. In 2002, exposures to entities rated 'BBB' or higher was 93% of the \$1.2 trillion of global sold credit derivatives, exposure to entities rated 'BBB' was 28%, exposure to entities rated 'A' was 28% and to that rated 'AAA' and 'AA' was 37%. The remaining 7% or \$84 billion were below investment-grade entities ('BB+' or lower). Corporate sector accounted for 61% of the total positions that were sold. Financial institutions accounted for 23%, while sovereigns accounted for 11%.

The realization of actual potential of credit derivatives began in 2003, with the decline in the quality of ratings for the credit derivatives market, as the rate of below investment-grade and exposures which are not rated surged from 8% in 2002 to 18% in 2003, which reflected lesser demand for better-grade exposures and increased demand for lower-grade exposures. Better-grade exposures declined to 17% from 22% in 2002. If we consider it according to different sectors, 65% was taken-in by corporate names, financial institutions accounted for about 17%, sovereign entities took up about 6% and the rest accounted for 12% which included asset-backed securities (Exhibits 12.24–12.33).

In 2004, lower-grade exposures were an increasing trend in the underlying reference entities so as to cover for the risk associated with them. Low investment-grade exposures accounted for 24% of gross sold positions, as against 18% in 2003. And 'AAA' and other higher-rated exposures

Exhibit 12.24: Underlying Reference Entities by Type—2002.

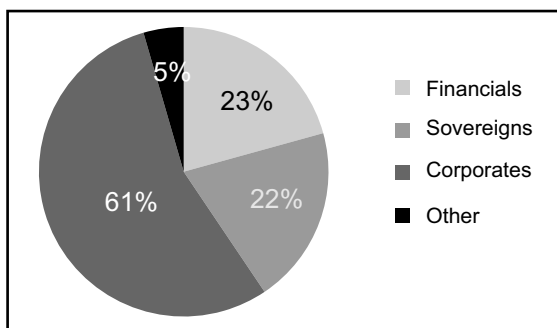


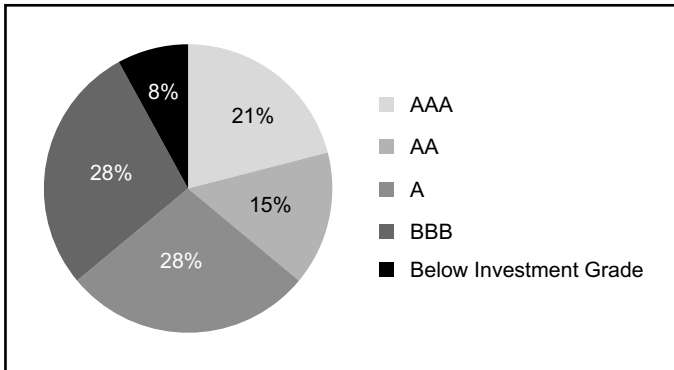
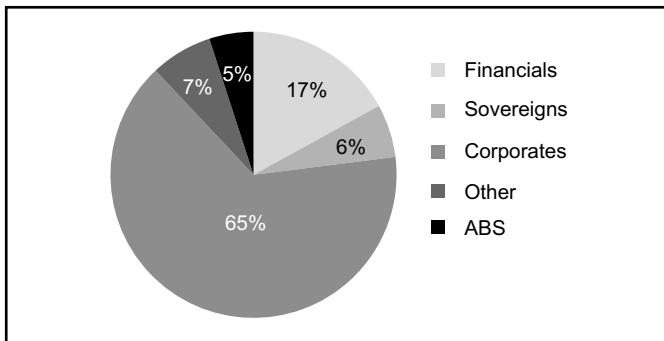
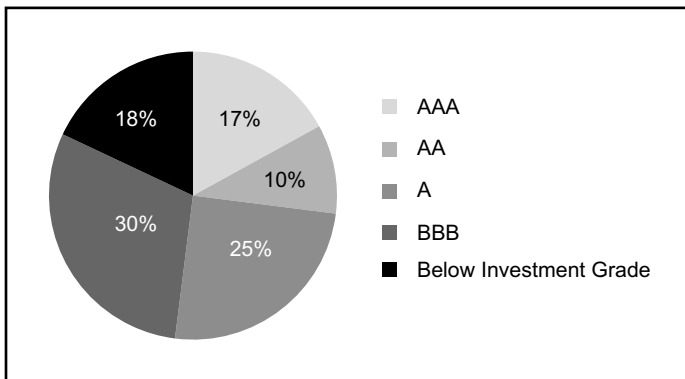
Exhibit 12.25: Underlying Reference Entities by Rating—2002.**Exhibit 12.26: Underlying Reference Entities by Type—2003.****Exhibit 12.27: Underlying Reference Entities by Rating—2003.**

Exhibit 12.28: Underlying Reference Entities by Type—2004.

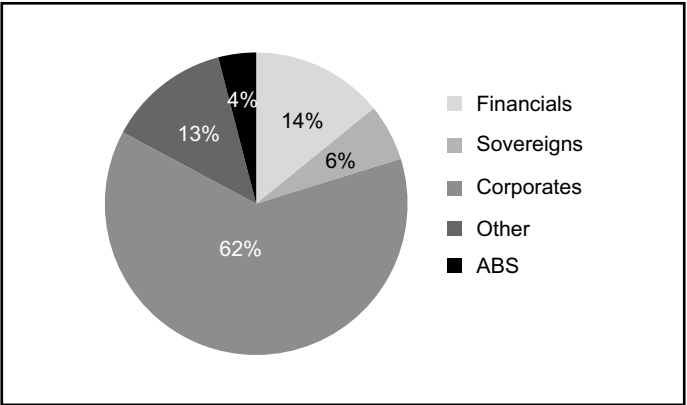


Exhibit 12.29: Underlying Reference Entities by Rating—2004.

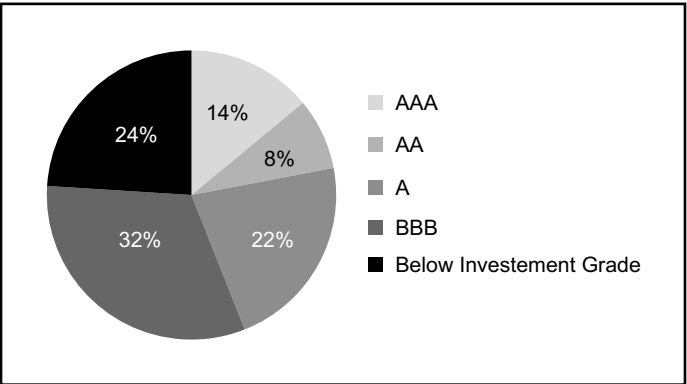


Exhibit 12.30: Underlying Reference Entities by Type—2005.

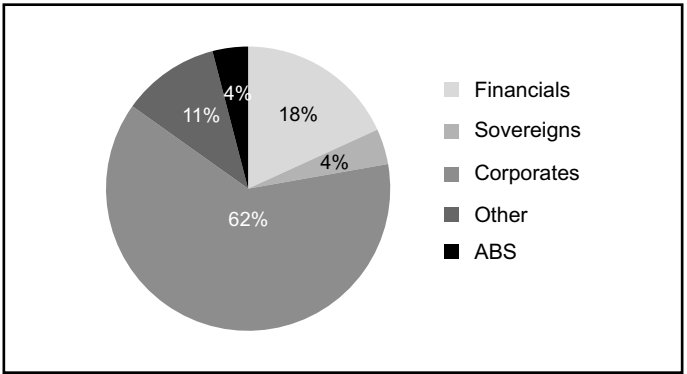
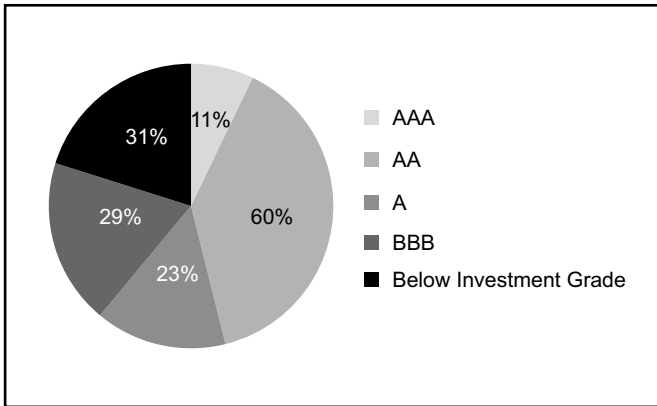
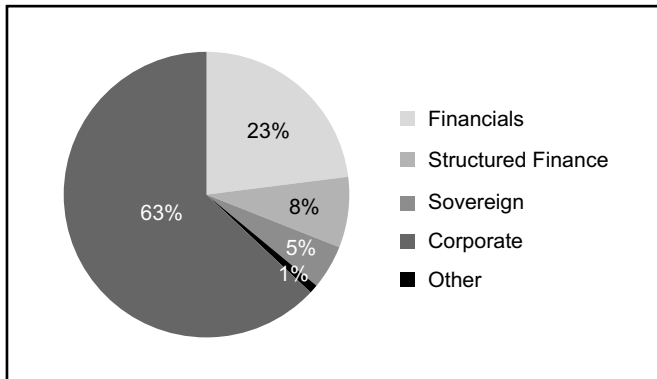
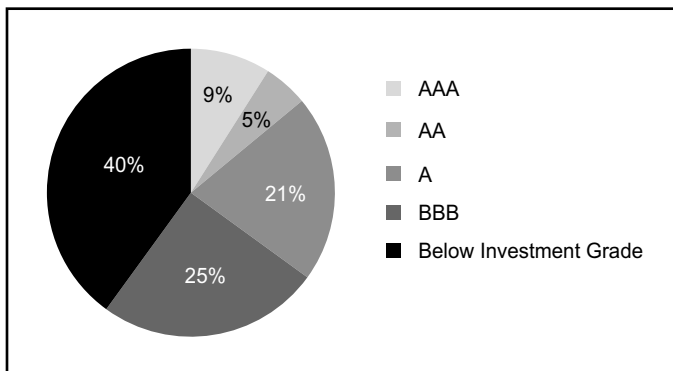


Exhibit 12.31: Underlying Reference Entities by Rating—2005.**Exhibit 12.32: Underlying Reference Entities by Type—2006.****Exhibit 12.33: Underlying Reference Entities by Rating—2006.**

dropped to 14% of notional outstanding sold from 17% in 2003, reflecting the growing maturity of the market, among a number of other factors. Corporate sector entities (62% of gross sold positions) were highly concentrated and financial institutions accounted for 14% and sovereigns for 6%.

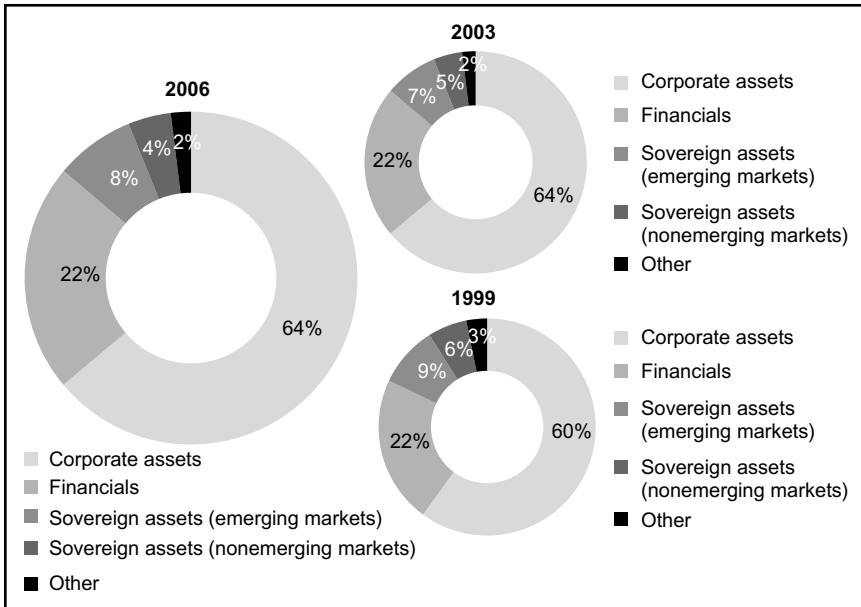
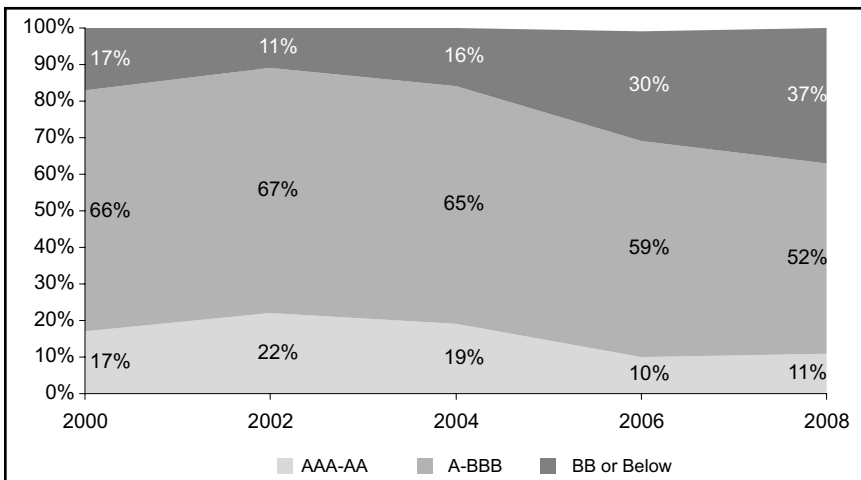
Gross notional sold amount for lower-rated exposures increased even more to 31% by year-end 2005. Since 2002, the lower-grade segment in the market had been on the rise, initializing at 8% in 2002, and surging to 18% in 2003 and 24% in 2004. It was observed that there was a simultaneous decline in the number of high investment-grade exposures along with the increase in lower-grade exposures. They declined to 11% at year-end 2005 on a gross notional sold basis from 14% in 2003 and from 22% in 2002. Sector-wise, 62% of the total volume was taken by non-financial corporate instruments, financial institutions taking up 18%, sovereigns at 4% and the rest accounted for 11%.

The growing trend towards lower-quality and under-rated reference entities continued into 2006. Approximately 38% of all credit derivatives at year-end 2006 were below investment grade or low-graded exposures, versus 34% at year-end 2005, and only 18% back in 2003. Continuing the decline, better-graded exposures fell to 9% by year-end 2006. By sector, 64% percent of the volume was taken by corporate instruments, 23% by the financial institutions, structured finance at 8%, sovereigns at 5%, and others at 1%.

In all of the years till 2008, automotive and telecommunications companies were the most frequently cited reference entities as a consequence of the ongoing issues surrounding the automobile industry and the collapse of the telecommunications industry in 2002. But, due to the market distress in 2008, financials and sovereigns were observed as the most referenced entities in terms of both sold and bought.

Automotive and telecommunications companies were again the top-most cited corporate reference entities in 2009. It was a heavily concentrated activity within the corporate reference entities, with 21% of total sold exposures, 19% of bought exposures being attributed to the top five in the segment. Automotive and telecommunication companies continued their reign at the top in 2009, with these companies being the most referenced entities in the corporate sector. The top seven protections sold corporate reference entities were from either the automotive or the telecommunication sector.

The corporate assets have the biggest percentage of credit derivatives written on them. In all, two-thirds of the underlying assets that were written by leading houses were on corporate reference entities. Sovereign assets as underlying reference entity have declined in preference (Exhibit 12.34).

Exhibit 12.34: *Category of Underlying Reference Entities.*Exhibit 12.35: *Credit Rating of Underlying Reference Entity.*

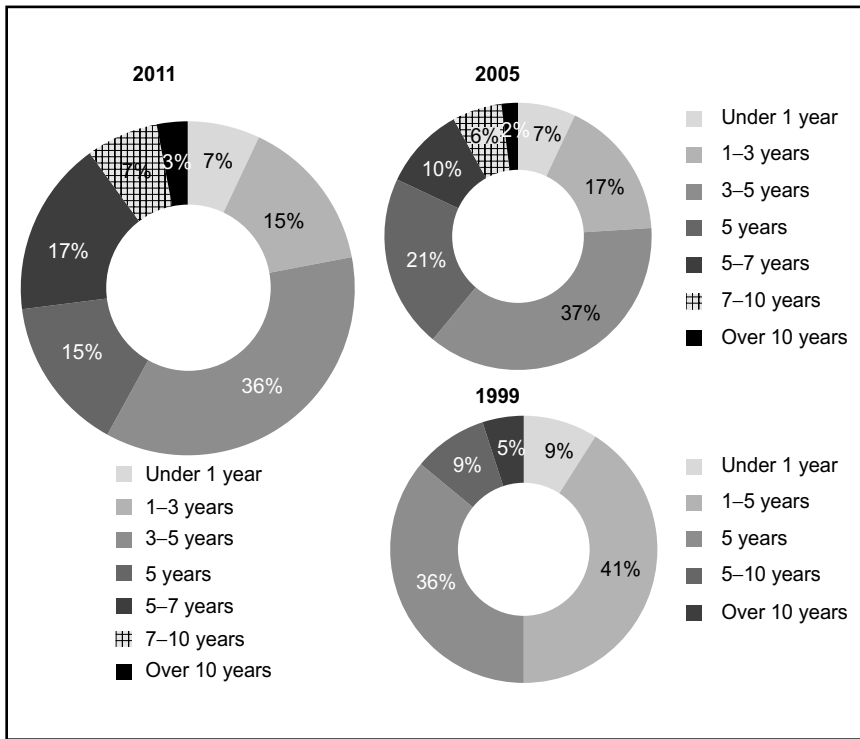
Around two-thirds of credit derivatives are written on credits that are ranked from A to BBB. However, this pattern is predicted to decrease in the future. Already, there has been an increase in reference entities rated BB or below. In general, the drifting from the AAA and AA entities that are rated at the top to the ones that have a lower rating would happen when

the market is liquid and during times when risk appetite of market participants is high. Conversely, during periods of risk aversion and illiquidity, the higher-rated reference entities are in vogue (Exhibit 12.35).

12.7 MATURITY DATE

CDS contracts for 5 and 10 years are the most frequently traded tenors, or maturity lengths, and have the maximum liquidity. In general, the most popular tenor of credit derivatives transactions is at 5 years maturity, with very little in the short-term maturity range. Credit derivatives with either very short (up to 1 year) or very long (over 7 years) maturity are still relatively unpopular. Currently, only 5% of all the outstanding credit derivatives transactions have a maturity of over 10 years. The range from 1 year up to and including 5 years maturity accounted for about 75% of the total outstanding credit derivatives transactions in 2005 and about 66% in 2011. The change from 2005 to 2011 was from the medium-term 5-year to the longer-term 5--7 year transactions have increased from 10% to 17% and the over 10-year category has jumped from 2% to 5% (Exhibit 12.36).

Exhibit 12.36: *Tenor Activity Concentration.*



As a natural consequence of investors wanting more spread in a spread-restricted market as well as the development of the market into trade across various tenors, the gross protection sold for 5 years maturity was on the rise. In 2005, approximately 32% of exposure to gross sold position was greater than 5 years' maturity in comparison with 23% in 1999. The shift towards longer tenors continued in 2005, with tenors ranging from 5 to 10 years increasing from 17% in 2003 to 38% in 2005.

With the credit derivatives market becoming well established, longer tenors being traded became a common sight in the market. At year-end 2006, tenors of 7 years (protection sold) or greater accounted for 25% of volume, up from 19% at year-end 2005 and 10% at year-end 2004. It appeared as though volume was shifting away from the 5-year point (Exhibits 12.37–12.38).

Exhibit 12.37: Global Credit Derivatives Exposures by Tenor Sold—2005.

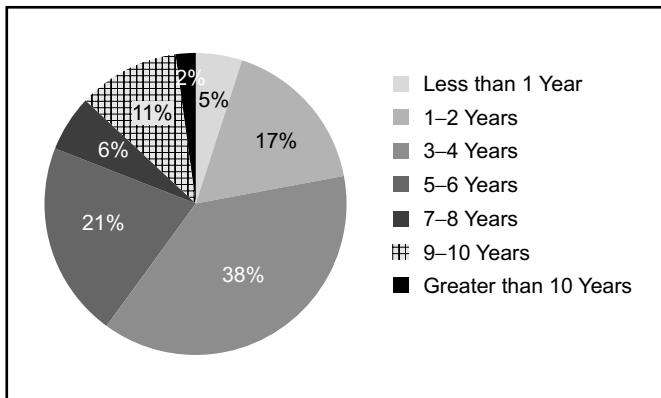
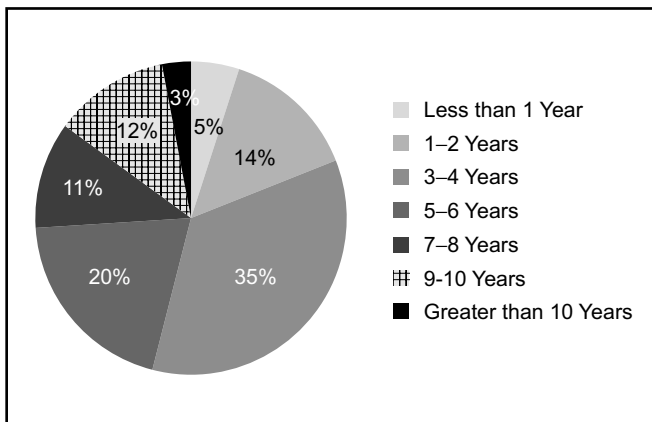


Exhibit 12.38: Global Credit Derivatives Exposures by Tenor Sold—2006.



12.8 BUYERS OF CREDIT PROTECTION

There has been a steady widening of the base of the users of credit derivatives over the past few years. Banks still remain the largest users as they often use the CDSs as hedging tools for their loan books and also because they participate actively in market making. The driving of hedging activity via issuing investment instruments, which have CDS as underlying, has satisfied this demand from banks.

Banks took a share of 51% of the buyers of credit protection at the end of 2003, but their share had dropped gradually. In 2006, they accounted for 43% of the market. Hedge funds' share at the end of 2003 equaled those of securities houses. They were jointly the second largest players on the buy side at the year-end 2003. However, since 2003, hedge funds had overtaken securities houses in the share of the buy side. The hedge funds had regular users of CDS especially through strategies such as convertible arbitrage. There has also been involvement of hedge funds in a large number of 'fallen angel' credits that have a considerable number of buyers of protection. Considering their leveraging potential, there has been a substantial increase in the volume of CDS contracts that have been traded and in quite a few cases it has not been in proportion with the absolute size.

Insurance companies were also important stakeholders in the markets of credit derivatives with an aggregate buy-side insurance market share of 7% in 2003, which increased to 9% in 2006. Insurance companies had become important players, primarily through their investments in investment-grade CDO tranches. Corporates were expected to become major players in the market on the buy side. However, this had not been the case. In fact, they fell back even further.

Based on Fitch's annual survey of only banks, the data on buyers of protection is given in Exhibits 12.39 and 12.40. The banking industry was

Exhibit 12.39: Institutions Using Credit Derivatives to Buy Protection—2011.

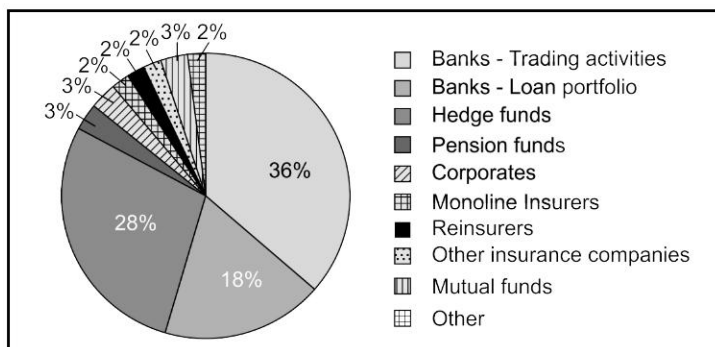
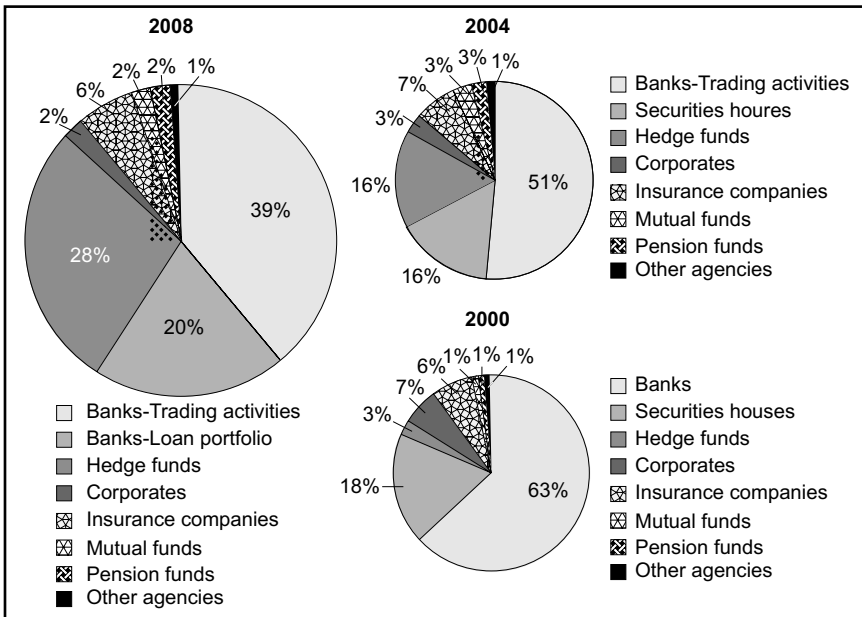


Exhibit 12.40: Distribution of Institutions on Buy Side.



the largest protection buyer in 2002, with a total bought position of \$97 billion, which implied that the banking industry had transferred a credit risk of almost \$100 billion.

Around the world, banks that had been surveyed by Fitch in 2002 sourced gross sold positions of \$880 billion from which \$454 billion were sourced from Europe and Asia and \$426 billion came from North America. Banks in United States had net bought positions of \$31 billion, whereas the European banks were at EUR 65 billion.

The global banks remained the net buyers of protection in 2003. Gross sold positions of \$2.4 trillion were reported. Gross bought positions also surged by a significant amount to \$2.6 trillion. In other words, credit risk worth \$260 billion was transferred to other institutions. One hundred thirty five billion USD of protection was bought by the European banks, \$92 billion by the North American banks and broker dealers and Australian and Asian banks accounted \$33 billion of protection.

Worldwide, the banking industry was a major protection buyer in 2004, with a total position of \$427 billion protections bought as to the \$260 billion recorded in 2003. Collectively, this represented a shift of credit risk worth \$427 billion outside the industry. Banks position as protection buyers from 2002 to 2006 is shown in Exhibits 12.41 to 12.45.

In 2005, though the global banks retained their position of being the largest buyers of protection, the net reported position went down by 37%

to \$268 billion from \$427 billion which was reported in 2004. The trend continued in 2006 as well, with the total positions amounting to \$304 billion at year-end 2006. Many banks individually, however, were net sellers of protection, the number being as much as 45% of the banks surveyed.

Although collectively the surveyed banks remained a net buyer of protection in 2008, with \$107 billion of notional credit being transferred to other banks, sectors and institutions, it was difficult to conclude that these banks were using CDS contracts to hedge the risk of loan defaulting as CDS exposures, as a percentage of total loans was not significant.

Exhibit 12.41: Banks Position as Protection Buyers—2006.

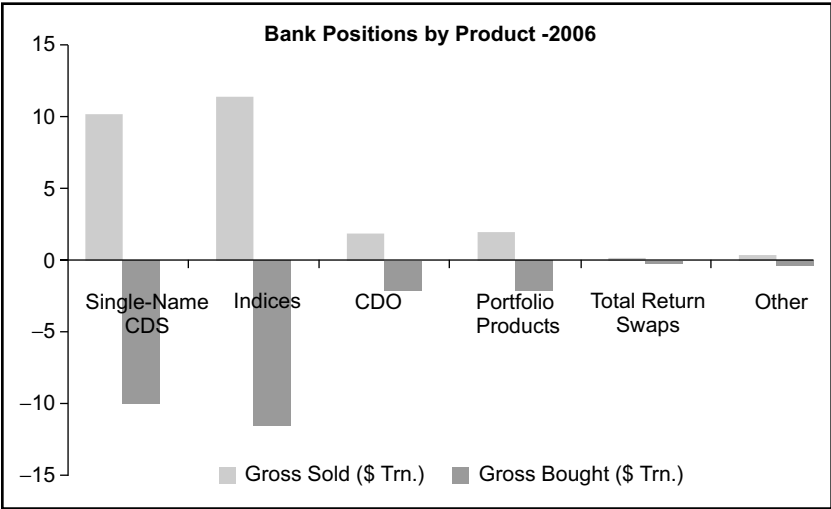
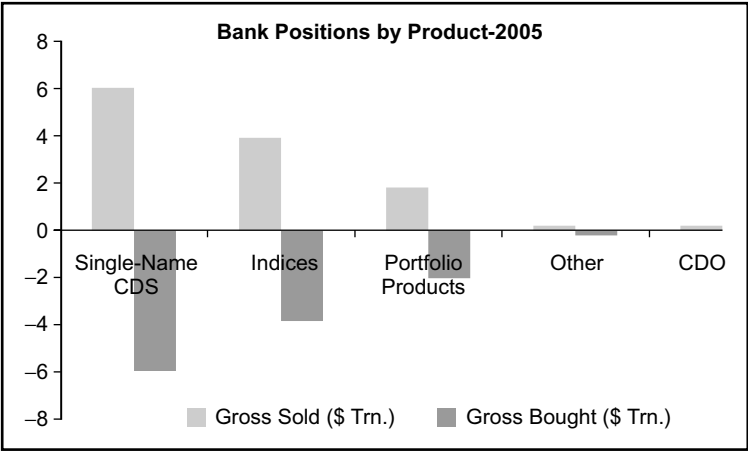


Exhibit 12.42: Banks Position as Protection Buyers—2005.



The banks surveyed in 2009 reported \$10.2 trillion of sold protections and \$10.6 trillion of bought protections. This reflected the fact that CDS activity largely included trading and market-making.

In 2010, the figures for protection sold and protection bought were \$7.84 trillion and \$8.16 trillion, respectively. This implies that a majority of the surveyed banks were net buyers of protection. In other words, it could be said that \$315 billion (\$295 billion and \$185 billion in 2009 and

Exhibit 12.43: Banks Position as Protection Buyers—2004.

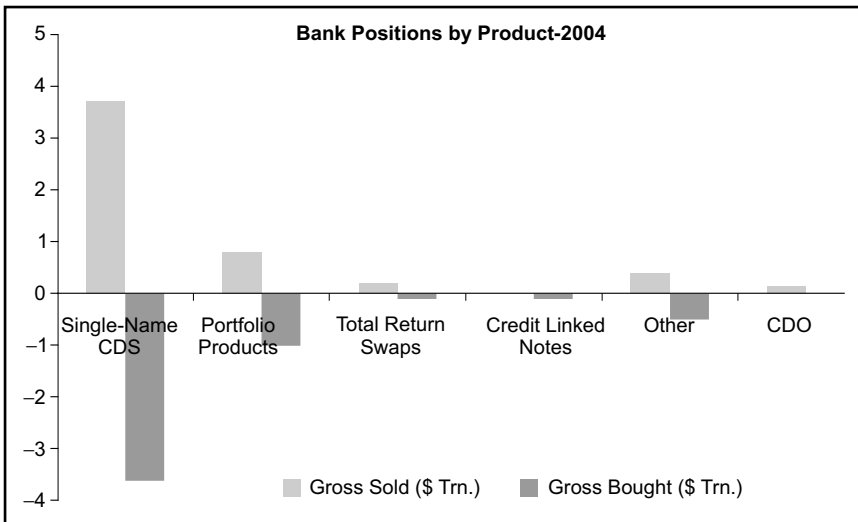


Exhibit 12.44: Banks Position as Protection Buyers—2003.

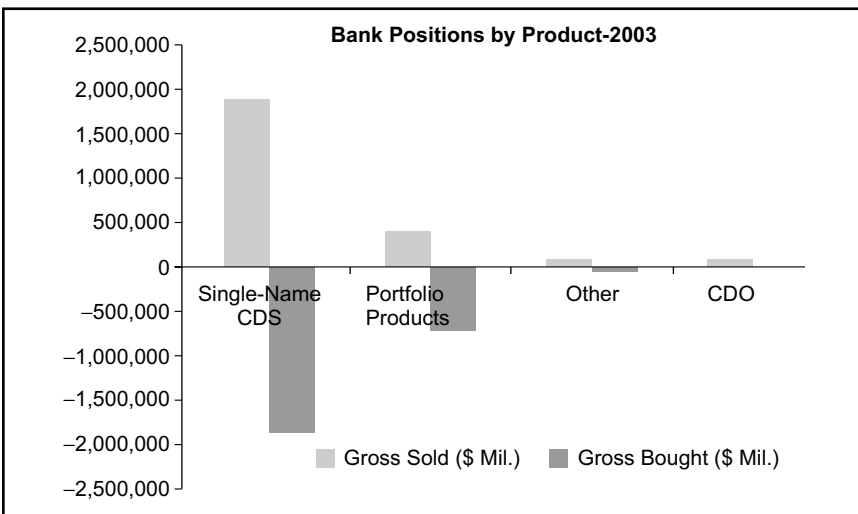
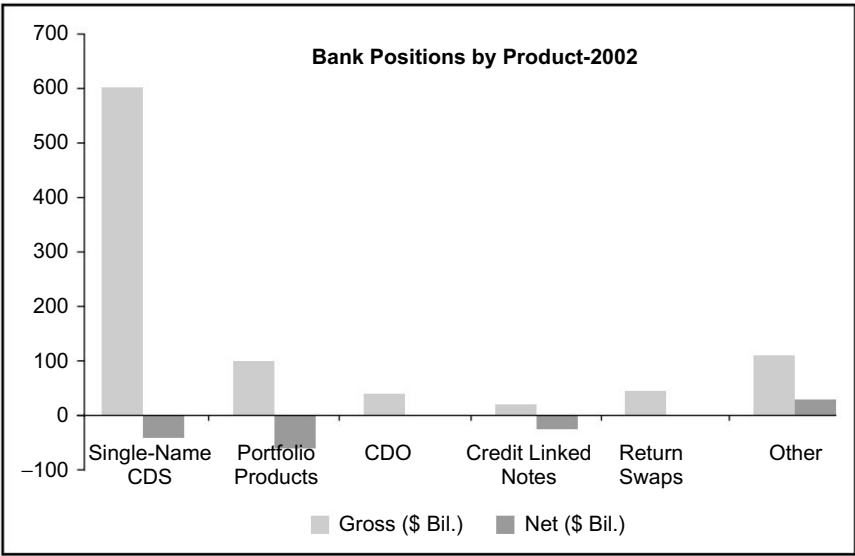


Exhibit 12.45: Banks Position as Protection Buyers—2002.

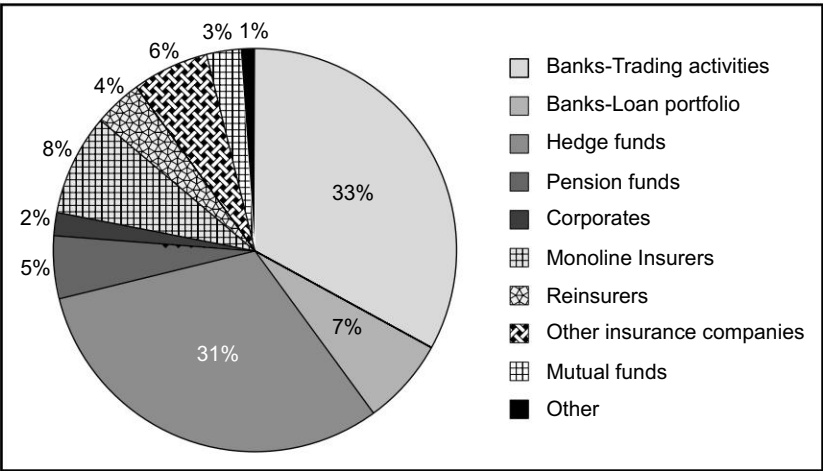


2008, respectively) of notional credit was transferred to other banks and institutions.

12.9 SELLERS OF CREDIT PROTECTION

In 2011, Banks’ market share of 34% on the sell side exceeded market expectations, although their share was predicted to drop as the base for

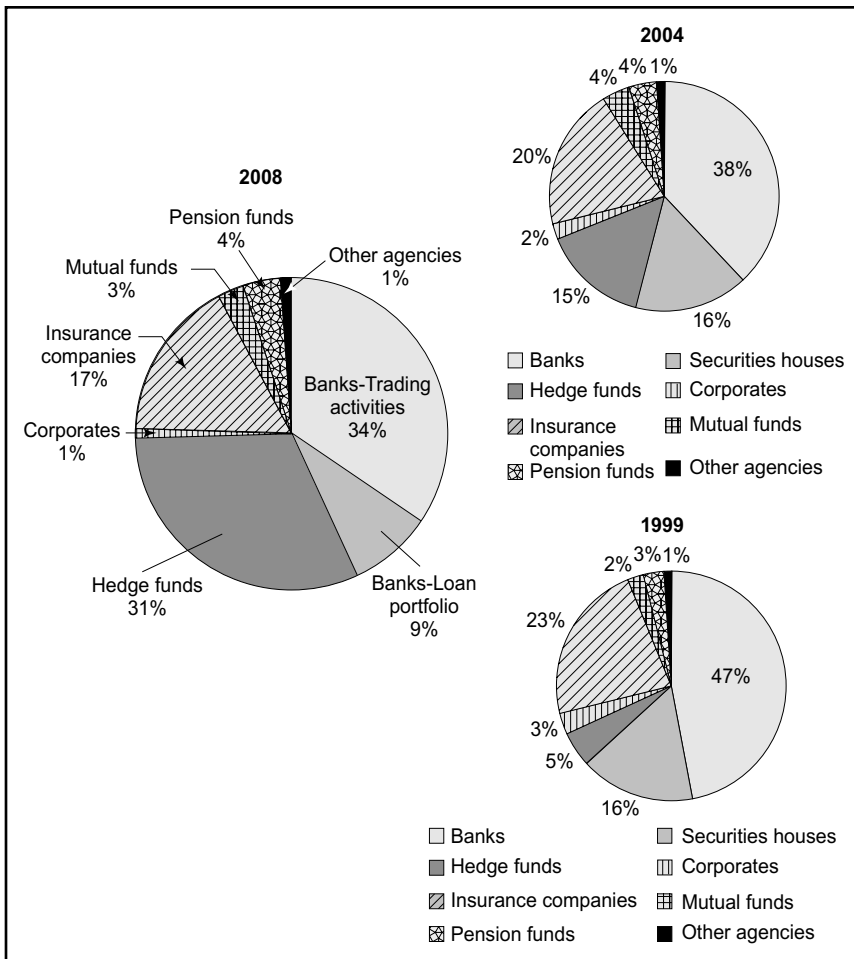
Exhibit 12.46: Institutions Using Credit Derivatives to Sell Protection—2011.



credit derivatives widened. Insurance companies remained the second biggest sellers of credit protection, although their market share of 20% was far less than earlier expectations of insurance companies occupying one-third of the sell side of the market. This fall in the market share mainly reflected slower growth in the insurance market in comparison with other participants, rather than a process of retrenchment from the market by the insurance companies.

There was a notable change with regard to hedge funds. While the market participants expected hedge funds to be more active on the buy side of the market driven by strategies like that of the convertible bond described earlier, the same was not expected on the sell side. However, the hedge funds' market share increased from 5% in 1999 to 15% in 2005, to 31% in

Exhibit 12.47: Distribution of Institutions on Sell Side.



2011. This growth has continued and they have now overtaken securities houses in their share of the sell-side market. Increased knowledge of the credit derivatives market combined with a prolonged low interest rate environment have led to hedge funds focusing on credit derivatives becoming more frequent. Furthermore, the introduction of indices made it easier for hedge funds to undertake their natural arbitrage business, which increased their involvement in the credit derivatives market.

Mutual funds and pension funds increased their market share slightly, albeit from a low base, while corporates remained a small part of the market. This trend is likely to continue in the near future (Exhibits 12.46 and 12.47). Banks position as protection sellers from 2002 to 2006 is shown in Exhibits 12.48 to 12.52.

Fitch Survey of Banks

Based on Fitch's annual survey of only banks, the data on sellers of protection is as follows. In 2002, the insurance companies were the largest sellers of protection, with a cumulative position (after deduction of protection that was bought) of \$283 billion. This marked the foray of the insurance sector into the credit derivatives market. The insurance industry was the largest seller even after excluding the financial guarantors, with cumulative sold positions of \$117.3 billion.

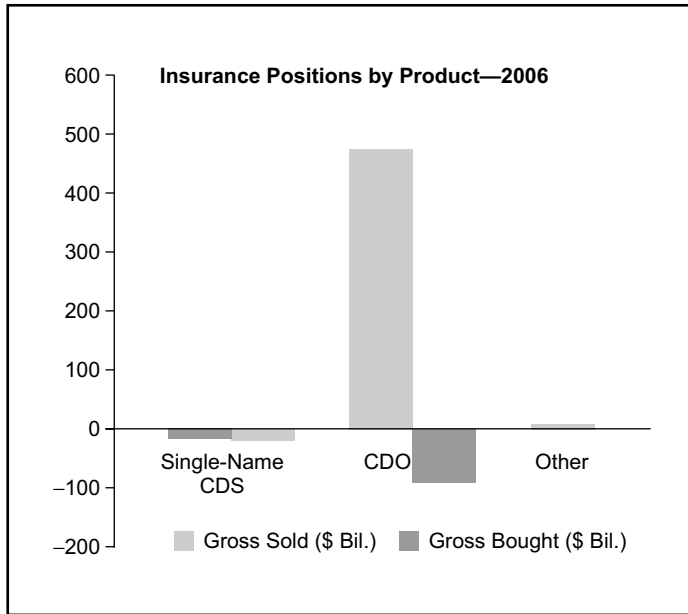
Insurance companies reported sold CDO positions of \$141 billion and other credit derivatives which included 3.3%, or \$4.7 billion of high-yield or below investment-grade entities. Ninety three per cent of the total was taken by synthetic and cash-funded CDOs.

Financial guarantors were the biggest sellers of credit protection on a cumulative basis. Collectively, protection worth \$222 billion was sold by the financial guarantors (\$56 billion CDOs and \$166 billion of credit derivatives).

In 2003, the biggest protection seller was the global insurance sector on a cumulative basis, just like it was observed in 2002 which recorded a total sold positions of \$258 billion. Geographically, exposures went down by 56% in North America and decreased by 21% in Europe.

In 2004, the insurance and financial guarantor industries were yet again the largest net sellers of protection at \$556 billion, which increased by 21% compared to the amount in 2003.

The global insurance sector matched with its reputation as the largest seller of protection, and recorded and amassed sold positions of \$514 billion, rising by 30% from \$397 billion in 2004 and \$258 billion in 2003. Eight financial guaranty companies that were surveyed had a total of gross sold protections worth \$365 billion outstanding as of year-end 2005.

Exhibit 12.48: Banks Position as Protection Sellers—2006.

At \$395 billion and \$355 billion, global insurance and monoline industries, respectively, were the major total sellers of protection at the end of 2006.

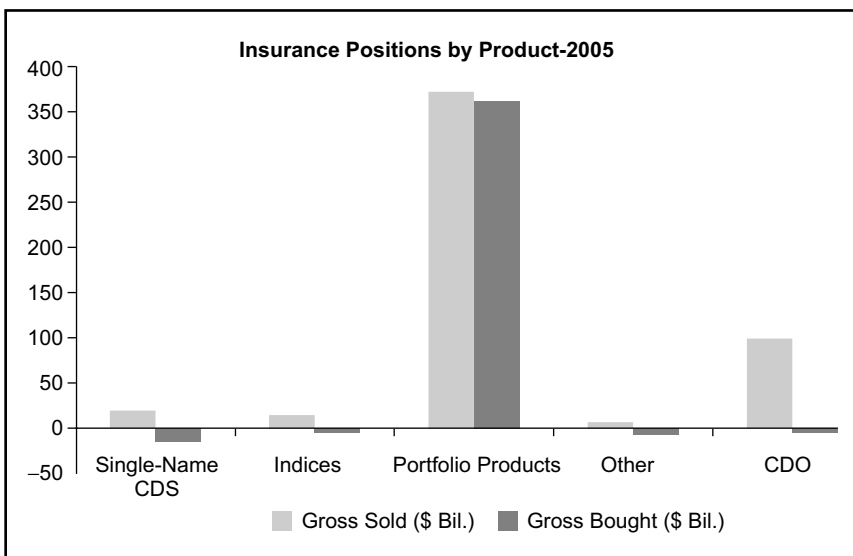
Exhibit 12.49: Banks Position as Protection Sellers—2005.

Exhibit 12.50: Banks Position as Protection Sellers—2004.

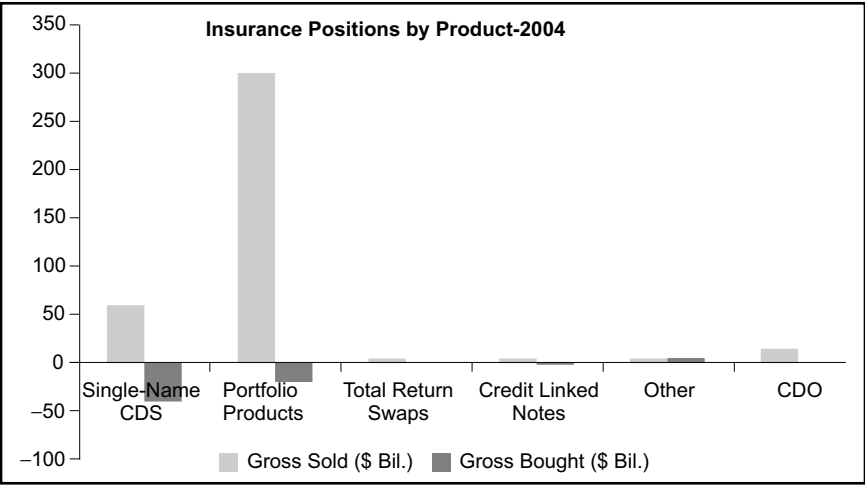
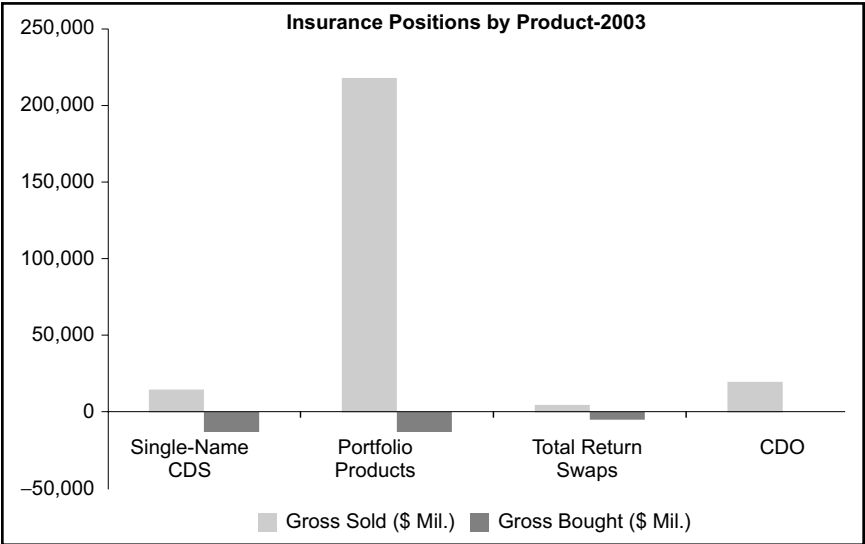
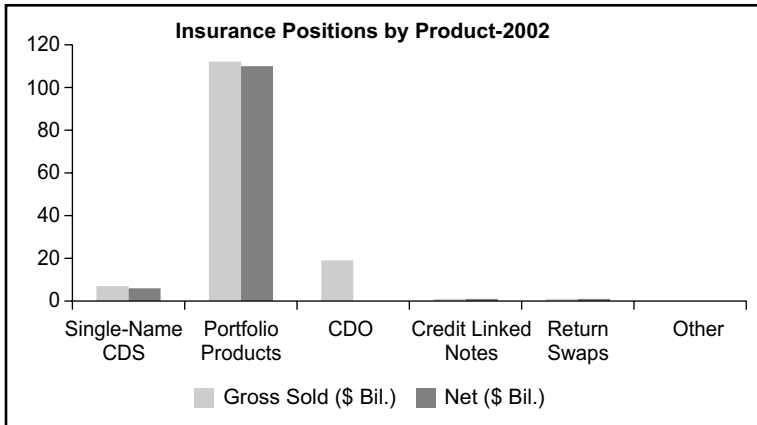


Exhibit 12.51: Banks Position as Protection Sellers—2003.



12.10 REGULATION

With the market growing at such a brisk pace, regulations needed to be imposed. The credit meltdown acted as a catalyst for the imposition of regulatory action. Systemic risk and transparency were two major factors which mandated regulations to be imposed.

Exhibit 12.52: Banks Position as Protection Sellers—2002.

While transparency has improved following the release of the DTCC volume data, there was still scope for improvement. In a 2009 survey done by Fitch, 73% of the respondents stated that they either agree or strongly agree that transparency should be improved further. To address the counterparty risk, almost all the respondents agreed that a central clearing house was needed. Netting is helpful in simplifying operational matters and reducing systemic risk. It was observed that 88% of the respondents were in favor of netting.

In 2010, views were even more pronounced in favor of increased transparency, central clearing of trades and the use of netting. This opinion was mainly because of a need to control counterparty risk highly prevalent in the market. Eighty per cent of the survey participants felt that centralized clearing of trades and netting could help bring in the necessary changes. But exchange trading, according to the majority of the respondents, did not serve the purpose (Exhibits 12.53 and 12.54).

12.11 MARKET DESCRIPTION: GEOGRAPHY

The main centers for credit derivatives markets are expectedly London and New York. London is the leading market center, accounting for 45% of the market, followed by America with 41% and Asia/Australia with 8%. London is estimated to have lost ground to New York in recent years in terms of market share, although it is still considered the main market center. The concentrated nature of financial services within this financial center has led to a clustering effect and combining it with an extremely skilled labor group has continued to strengthen London's reputation as

Exhibit 12.53: *Credit Derivative Regulatory Initiatives—2010.*

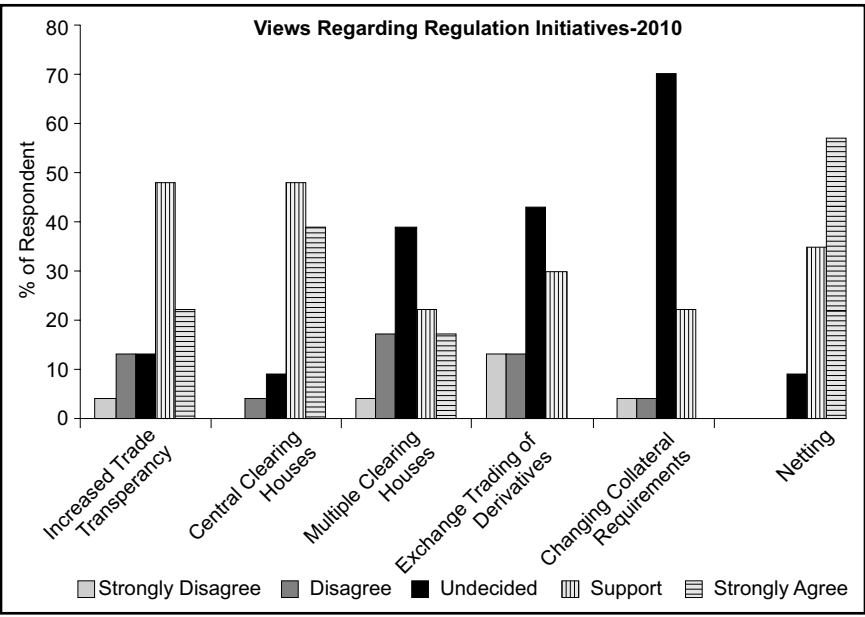
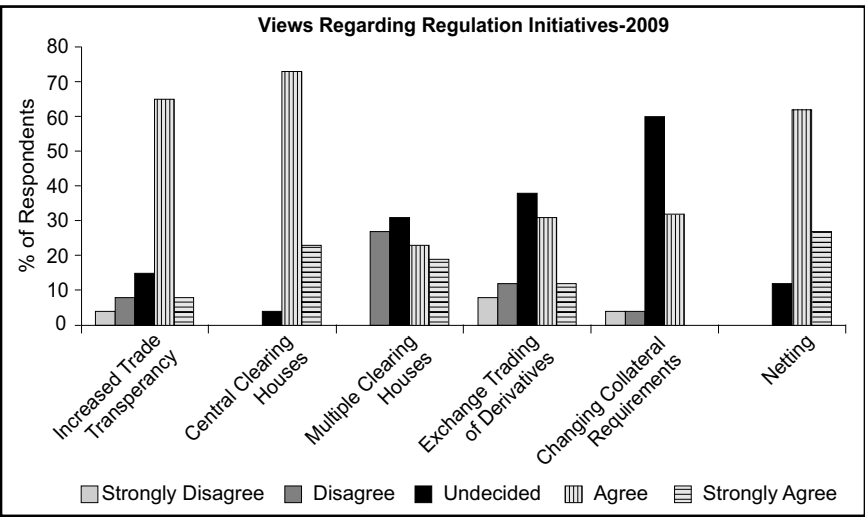


Exhibit 12.54: *Credit Derivative Regulatory Initiatives—2009.*



a highly established place in the global market for credit derivatives. The other aspects which support London’s position include time zone, English language, proximity of support services like legal, accountancy, actuarial, *etc.* Also, globally, London has a perception of proactive regulation and supervision.

The dynamism of banks is more in London whereas in New York, hedge funds are generally more active. The activeness of real money accounts in London is more in structured credit derivatives. However, the activeness of real money accounts in New York is found in index and single names. Also, in London, loan portfolio managers are quite active and make their presence felt because they increasingly use credit derivatives as a risk management tool.

In terms of where the trading books are managed, London remains the dominant center with two-thirds of the deals booked there. This indicates that even though deals may originate from other regions including the United States and Asia, most banks and security houses have their trading books centralized in London, thereby reinforcing its dominant position. The concentration of activity in these centers is expected to continue in the near future, although Asian markets are expected to grow at a faster pace than London and the United States (Exhibits 12.55–12.58).

Exhibit 12.55: Credit Derivatives by Region in 2011.

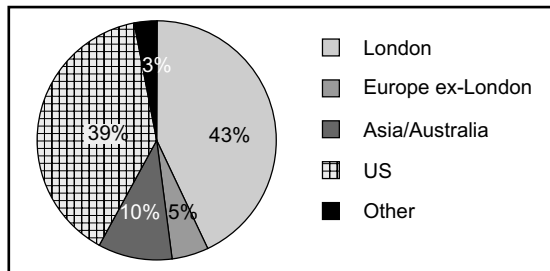


Exhibit 12.56: Credit Derivatives by Region in 2005 and 1999.

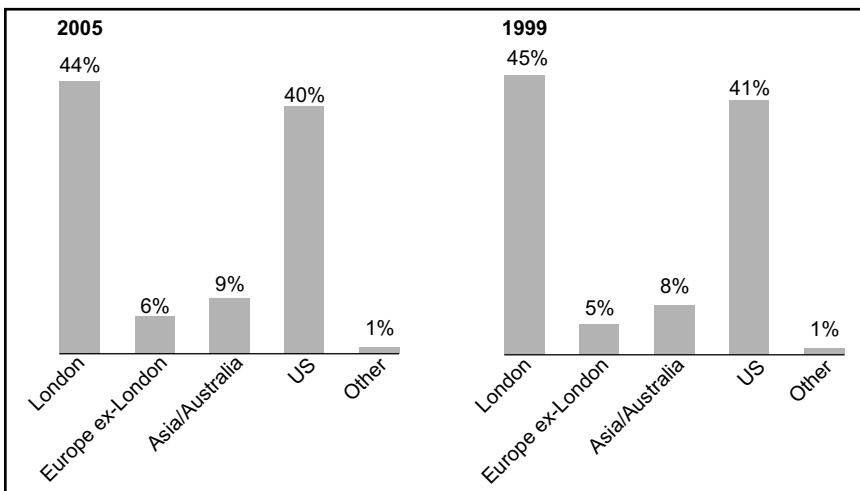


Exhibit 12.57: Credit Derivatives Booked by Region—2006.

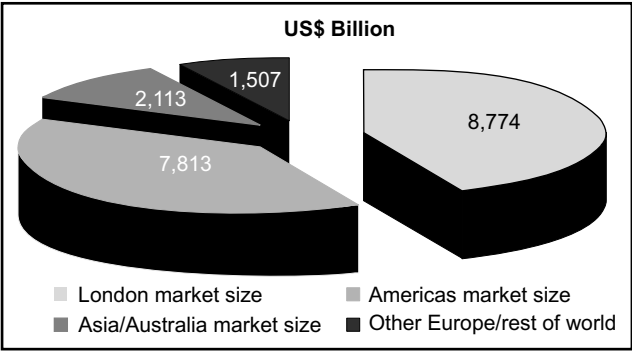


Exhibit 12.58: Credit Derivatives Market Size by Region.

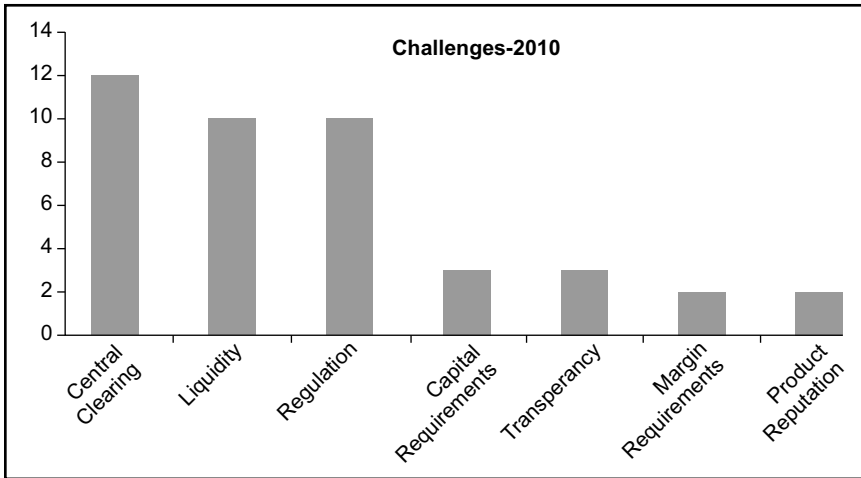
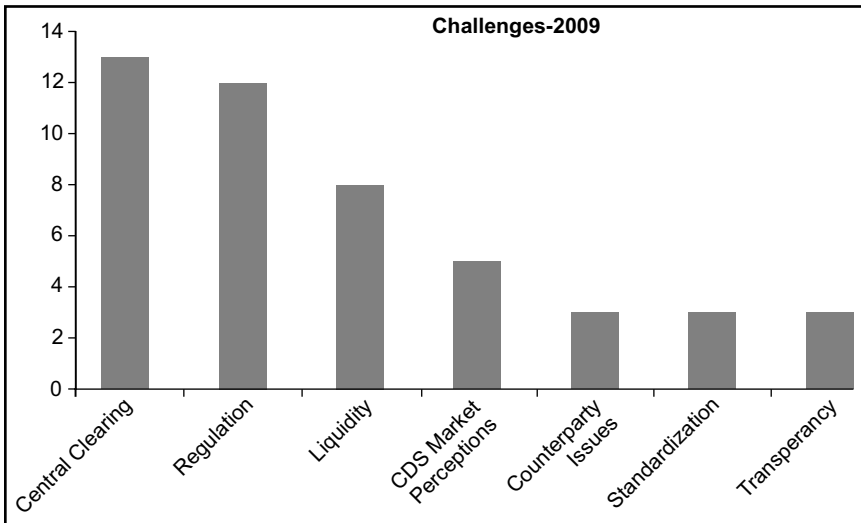
Credit derivatives market size (\$ billions)	2003	2004	2006
Global market size	3548	5021	20 207
London market size	1586	2,230	8774
Americas market size	1459	2000	7813
Asia/ Australia market size	287	446	2113
Other Europe/ rest of world	216	345	1507

12.12 PRESENT CHALLENGES AND CONSTRAINTS

Challenges

Central clearing, regulation and market liquidity were identified as the top challenges for the credit derivative market in 2010 (Exhibit 12.59). To take care of counterparty risk which got highlighted during the financial crisis in 2008, central clearing and regulatory initiatives were sought out. Operational challenges of compliance with various regulatory initiatives, uncertainty with regard to the final outcome of rule implementation and the risks of overregulation were some of the specific regulatory challenges noted.

With the financial crisis reaching its nadir in 2009, regulation was a widely agreed initiative to be taken. Regulation was one of the most often cited challenges, with fears ranging from the challenges of dealing with regulatory perceptions of the market, to the prospect of being over-regulated (Exhibit 12.60).

Exhibit 12.59: Global Credit Derivatives Market Challenges—2010.**Exhibit 12.60: Global Credit Derivatives Market Challenges—2009.**

The leading challenges cited in 2008, not surprisingly, were liquidity, regulatory changes, clearing and counterparty risk (Exhibit 12.61).

In case of changes in the credit cycle, the survey respondents in 2006 cited that it would be a challenge for the credit derivatives market to smoothly tackle the changes. Other challenges include liquidity concerns in case of such an incident. As far as challenges for short term were concerned, infrastructure, credit cycle, documentation and liquidity were the dominant issues (Exhibit 12.62).

Exhibit 12.61: *Global Credit Derivatives Market Challenges—2008.*

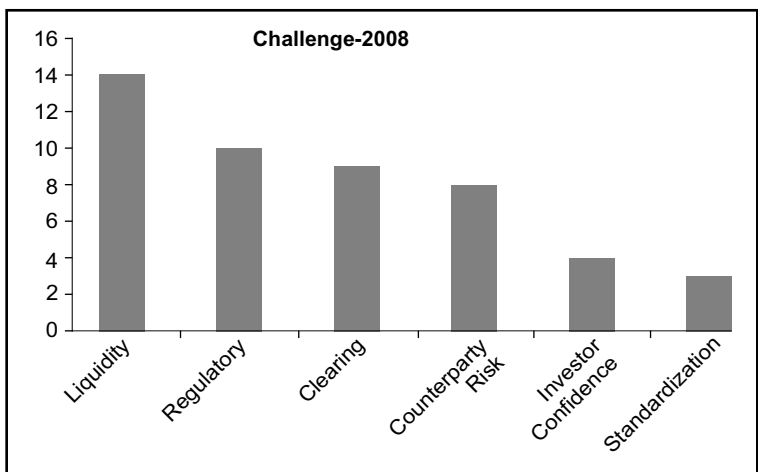
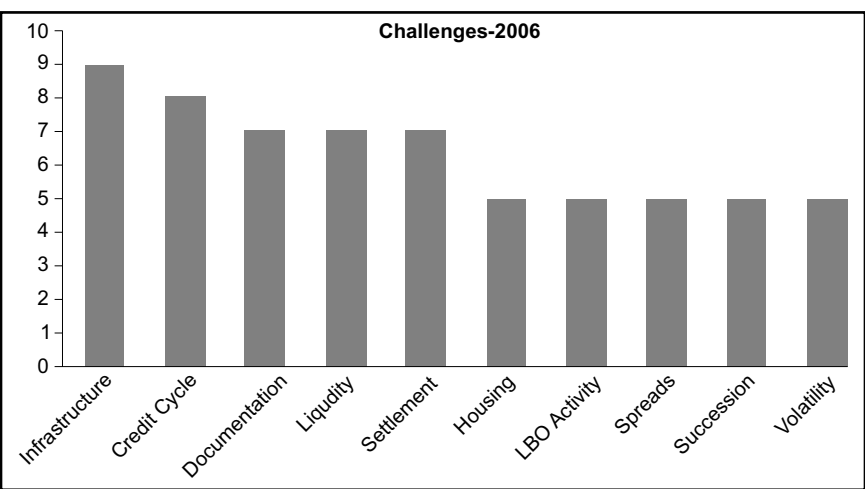


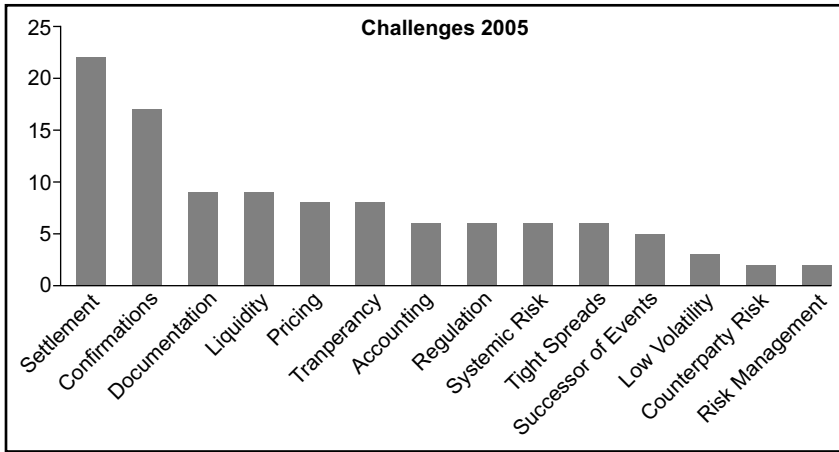
Exhibit 12.62: *Global Credit Derivatives Market Challenges—2006.*



In 2005, settlement upon the occurrence of a credit event and trade confirmations were identified as the foremost challenge by some distance. Relatively smaller challenges identified were liquidity, risk due to successor events and low volatility environment (Exhibit 12.63).

Market Constraints

Although it is clear that the global credit derivatives market is expected to grow slowly and gradually, there are constraints that may impede or

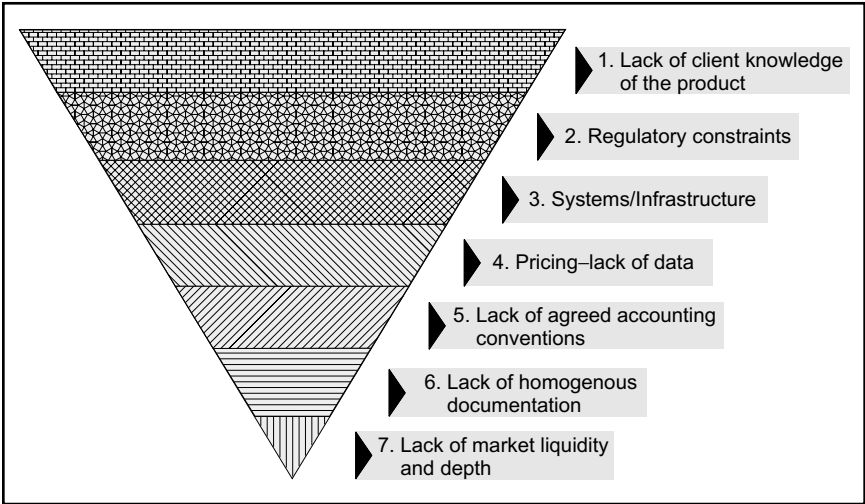
Exhibit 12.63: Global Credit Derivatives Market Challenges—2005.

retard its progress. One of the biggest constraints that the market has to contend with is the financial community's lack of knowledge regarding credit derivatives. Many market participants, especially in the developing markets, are averse to doing business in this asset class for lack of understanding. However, this state of affairs is changing quickly with the introduction of exchange-traded products and indices, as these standardized products encourage involvement and consequent spreading of knowledge. Consistency of documentation and clarity of the future regulatory environment would also help the market continue to grow.

In the initial years, liquidity in the credit derivatives markets was quite tight. Earlier, the market makers had limited ability to provide liquidity due to the restrictions on the amount of credit exposure they could own. Market makers have applied more effective hedging strategies which include using less capital to trade in a much more efficient manner. Through credit derivatives, the market makers can hold the inventory of bonds if a downturn occurs during the credit cycle and remaining neutral in terms of credit risk. To this end, the CDS trading and cash trading businesses have been integrated by the major investment banks and dealers in the process enhancing the liquidity of the market.

Accounting conventions including the Financial Accounting Standards (FAS) in the United States and International Financial Reporting Standards (IFRS) in Europe and Asia for accounting treatment of credit derivatives are a concern. However, given the extensive work done by the ISDA in standardizing the definitions, lack of homogenous documentation is expected to be less stifling in future. Pricing and lack of market data are among the other constraints that the market faces (Exhibit 12.64).

Exhibit 12.64: Constraints on Growth of Global Credit Derivatives Market.



CHAPTER 13

CREDIT DERIVATIVES AND SYSTEMIC RISK

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13.1 SYNOPSIS

While there are clear benefits from the evolution of the credit derivatives market including improved information that is useful for supervision and market surveillance, they also raise some supervisory concerns. This chapter will highlight the regulatory capital management, the structural frictions and impediments as well as the role of rating agencies in the credit derivatives space. Systemic risk and potential economic effects like dispersion of credit risk as well as market liquidity and other vulnerabilities including operational risk will be discussed. This chapter will conclude by looking at some of the policy implications due to these structural factors in the market.

13.2 OVERVIEW

The benefits of credit derivatives markets have been that they have enhanced the clarity of the financial market's shared view of credit risk. Thus, credit derivatives make available important information about the wide-ranging credit conditions, and help in setting the marginal price of credit. This is akin to the contribution of the bond markets, in determining the market price of credit risk. In this way, they encourage market discipline. Credit derivative markets assist supervisors in monitoring and regulating institutions using such information from credit markets. They also help public authorities keep an eye on any deterioration in credit quality of market participants. As the scope of products in the credit derivatives space has expanded into markets hitherto unexplored like credit card receivables, and student loans, they are in a way used as a forewarning

system about financial hassle in sectors apart from banking, as observed during the financial crisis. Moving ahead, the new instruments are expected to control the dynamics of credit cycles. Based on prior information related to credit quality, the credit portfolios could be adjusted proactively and gradually by the market participants which mainly includes banks. As a consequence, bank behavior is expected to become less pro-cyclical and credit cycles less volatile (Exhibit 13.1).

13.3 STRUCTURAL AND REGULATORY EFFECTS

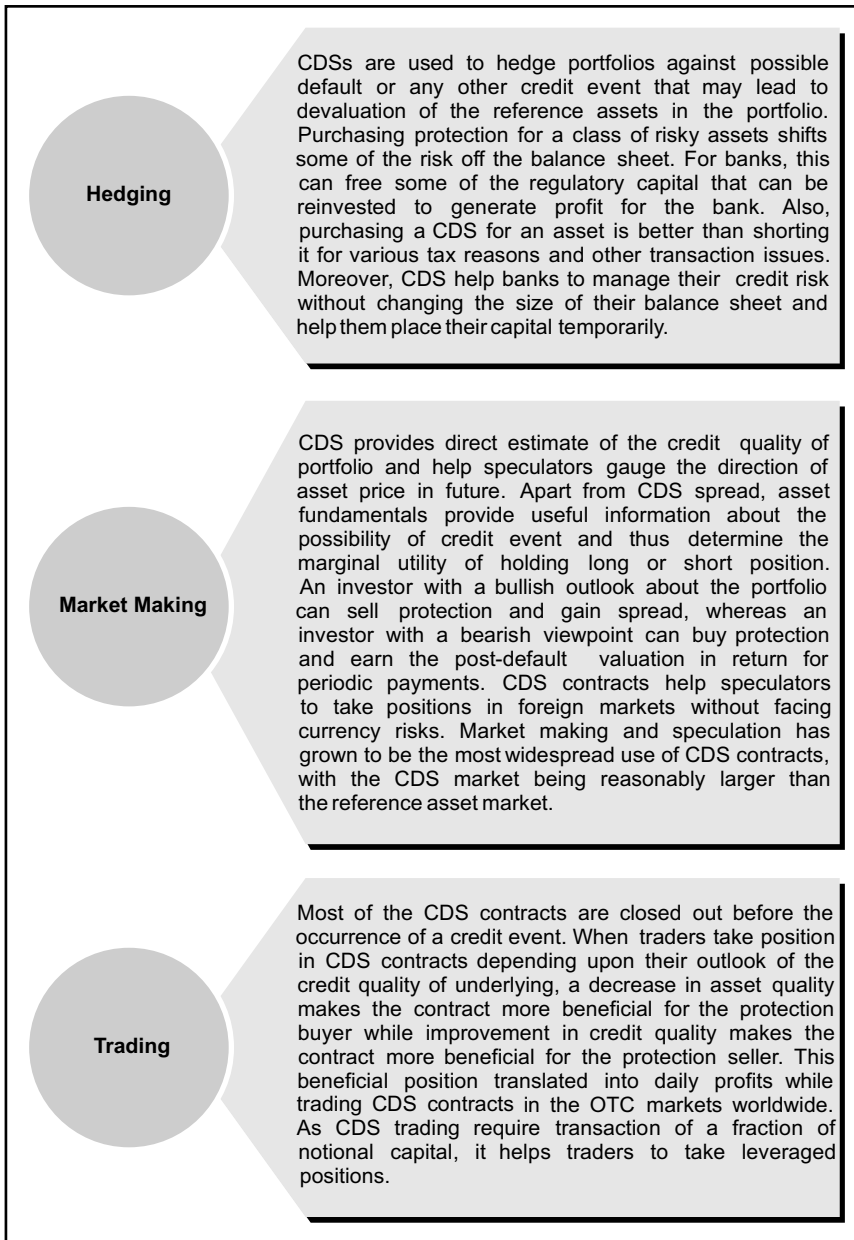
As discussed earlier, product innovation and market growth have been driven by rating agency support, legal and other institutional frictions apart from regulatory arbitrage. Of late, the motivational factor towards progress in the credit derivatives markets has been the increase in demand for instruments which are highly tailored, tradable and investment-grade in nature.

Regulatory Capital Management

Most of the initial work in the credit derivatives market had been encouraged by the regulatory arbitrage corresponding to regulatory capital arbitrage because of the uniform size of the Basel Capital Accord of 1988, popularly known as Basel I. Taking into consideration the bank-owned economic capital assessments, prescribing bigger requirements of capital on lower-risk assets and *vice versa* was the tendency of Basel I. Generally, a more suitable allotment of regulatory capital was targeted regularly by risk transfer activity, but a more risky credit portfolio was possibly developed due to the selling of lesser risk assets by banks. On the other hand, during 2008--2012, there was an increase in focus of the banks towards economic capital and attempts to improvise returns through balance sheet management. This happened because of larger investor inspection of bank returns and a surge in focus on prudent risk management.

Risk transfer activity that was mainly motivated by regulatory arbitrage expectedly diminished as a part of the Basel II Accord that aimed at enhanced alignment of economic and regulatory capital. Contrary to Basel I, Basel II increased perks for selling of assets with larger risk and increased the power of market processes on requisite funds.

Till date, the credit risk transfer is restricted in a lot of countries due to the lack of an inclusive and constant regulatory framework. Taking the example of few jurisdictions, there is still no clarity on the usage of credit derivatives by the financial institutions to buy or sell protection and often

Exhibit 13.1: *Benefits of CDS.*

the need arises for case-by-case approval for the transactions. Frequently in emerging markets and further developed markets, regulatory authorities are not experienced enough using these instruments so that they can approve the deals in a logically appropriate process.

Structural Frictions and Impediments

The conventional risk transfer methods generally engage intra-entity loan transfer and true sale of specific assets. In a few jurisdictions, legal and institutional frictions have stopped banks to transfer risks through these straightforward methods. These frictions consist of transfer taxes, insufficient or incoherent loan documentation, needs connected to borrowers' approval and other legal hassles. In overcoming these barriers, the role of synthetic risk transfer has been phenomenal. Definitely, much of the credit risk transfer has been obtained in a synthetic manner, partly due to market structure factors which includes incomplete bond markets and also having a relation with these frictions. However, considering removal of these frictions, growth of synthetic risk transfer activity is expected to carry on mainly due to the relative ease of execution.

The development of credit derivatives markets in Asia has been considerably behind partly due to the lack of developed bond markets. Banking systems in the neighboring countries generally lack competency and their capital markets are not developed much. As a result, banks in these areas are frequently short of perks and infrastructure for relocating or proactively managing credit risk. Legal and institutional frictions have their own importance in many Asian countries, like conflicting or less-complete legal regulations and principles like creditors' rights and bankruptcy proceedings.

Rating Agency Role

There is a want of credit rating on fixed-income holdings by majority of the investors. By itself, a major role has been played by the rating agencies in getting new products accepted by the investors notwithstanding the heavy reliance of rating and analysis of structured credit derivatives on high-level quantitative modeling. Needless to say, there has been a coincidence between growth of structured credit markets and a surge in the number of people skilled in financial engineering who are needed for measuring and managing the frequently occurring complex risks. Actually, for some, applying the financial engineering skills holds more importance than basic credit analysis.

Irrespective of the rating agencies playing a significant role for getting structured credit products accepted, doubts such as full understanding of the risk profile by all the investors remains, and the way it is different from those of corporate bonds which have a similar rating. The events leading to the subprime, especially, made it clear that investors do not fully understand the risk profile of sophisticated credit investments.

On the one hand, investors who are highly unlikely to welcome these nuances such as smaller regional and retail investors face the maximum risk. On the other hand, hedge funds and sophisticated investors dominate the market for more complex instruments, taking their understanding of the risks for granted and considering their modeling expertise equivalent to the rating agencies. However, there is a reliance on the ratings for internal and regulatory limits by insurers and pension funds holders who are generally buy-and-hold investors. Keeping such an important investors group in mind, there is an encouragement among the risk managers, regulators and the rating agencies, for improving their knowledge of the ratings method, particularly the performance expectations of these ratings during the credit cycle.

Investor and Cyclical Demand

Growth of products in credit derivatives is controlled mostly by distributors and sellers of credit risk. But, it is frequently determined by the demands of investors, with the increase in customized forms of the structures of credit risk. The investors' surging want for diversified portfolios and enhanced yield is reflected by the portfolio swap products. Investors commonly show a penchant for augmented complexity in product structures and leverage, instead of extended duration or maturity exposure or reflection of larger credit risk by lower credit ratings. It is expected that further advances in financial engineering will make it possible to coalesce other types of risk such as commodity risk and inflation risk, along with credit risk. This could possibly amplify systemic risk coagulation.

13.4 SYSTEMIC RISK AND POTENTIAL ECONOMIC EFFECTS

Dispersion of Credit Risk

Applications in credit derivatives have helped scale the allocation of credit risk among a wider group of investors, which is supposed to improve financial stability. Previously, banks usually stockpiled credit risk looking for condition against failures as the credit cycle--advanced economy deteriorated, often in a pro-cyclical way. Nowadays, supported by supervisors and shareholders, banks prefer to play the role of credit originators and shift credit exposures, in particular, concentrations to others through the credit derivatives market. During this activity, banks enthusiastically

handle a range of credit risks. These markets are also used by banks to increase their profitability and bring their capital base to an optimum. Thus, banks are generally expected to become more rigid and financially sound through the risk transfer and enhanced returns on their capital.

On the other hand, since these investors have a regular desire for buying and holding the acquired credit exposures, secondary market liquidity might suffer. The reason for making the primary market activity successful, *i.e.*, the specificity of risk transfer could also restrict liquidity in secondary markets. The entire banking system which includes the smaller banks can be made less vulnerable to credit shocks by shifting credit risk from banks through the instruments discussed earlier.

Additionally, the primary risk transfer activity has not been about just transferring portions of credit risk from the biggest banks or the banking sector to an extremely restricted number of investors or some other systemically important sector. A varied group of market participants has been attracted by the credit risk transfer markets, which has led to a broad spreading of credit risk. Definitely, credit-oriented hedge funds group is the investors group with the biggest capacity to store credit risk. Nevertheless, strong risk management skills are exhibited by these active traders, and stability concerns due to hedge fund failures are presented to the extent a regulated bank or broker-dealer experiences financial stress as a result. Focus on these issues has been increased by the supervisory authorities, which has led them to seek evaluation of counterparty risk management practices by banks and brokers trading actively with hedge funds. Sustained improvisations in counterparty risk management are critical to make sure that credit losses in the future are unlikely be a noteworthy policy matter. Additionally, management of positions has vital ramifications for financial steadiness.

During the initial popularity of credit derivatives, a probable source of vulnerability was congregation of market-making activity for credit derivative products among few dealers. Taking into consideration the financial steadiness, concerns were raised by very few market makers regarding maintenance of liquid markets in the case of no trading by a dealer for any random reason. Though in recent years, fast development of credit derivative markets has lessened those concerns, lots of surveys, which include the earlier discussed one related to the British Bankers' Association, specify that around 70% of the total net positions over the last many years have been shared by top 8--10 global dealers.

Nevertheless, the depth of congregation ranges by different amounts across various products, and the focus among top 2--3 dealers is generally lesser than previous times with the absence of a dominant single firm in

all or majority of the credit derivative markets. There is also a variation in the relative method of ranking among the elite institutions, indicating that product innovation has an important influence on a firm's short-term market share. It must be noted that comparable degrees of concentration can also be seen in the much larger interest rate market and foreign exchange derivative market. Although very unlikely because of their revenue contribution and solid credit standing, a major dealer's withdrawal might have a negative impact on the market as seen by Lehman Brothers' bankruptcy in September 2008.

13.5 MARKET LIQUIDITY AND OTHER VULNERABILITIES

Market Liquidity

Market liquidity can be defined as market participants' ability to participate in transactions in open financial markets in a range of varied circumstances. It is recognized that financial stability, through the resilience of the financial system, would depend on the markets' ability to see through unexpected or impermanent increase in the demand for liquidity without causing any major disturbances. The degree of market liquidity of credit market varies according to a number of factors. For example, there is a decrease in secondary market liquidity of structured transactions after issuance, partly due to the nature of such trades, which is typically "buy-and-hold." As part of the broader market structure, the market liquidity of credit instruments is influenced by these factors.

Credit risk transferability has become considerably superior with the advent of credit derivative products. Earlier, it was not possible to transfer such specific risk and simultaneously meet different investor demands. Once these specific risks have been transferred in the primary market, the concerns on liquidity of secondary market remain and perhaps are the most noteworthy stability risk arising from structured secondary credit derivative market. A major trial for those concerned with financial stability, like market participants, supervisors and other public officials is evaluation, management and reduction of liquidity risk. During the financial crisis, it was observed by the market participants that narrow bid-offer spreads and high transaction volumes are not reliable gauges of market liquidity. Although they may contain the appearance of liquidity, but if the market participants lack diversity, there may be significant one-way flows. In markets like these, real liquidity would be less than the alleged

or projected liquidity leading to the markets that are more volatile, disruptions in liquidity and price gapping. To achieve a two-way flow and to stabilize liquidity conditions, it becomes necessary to maintain diversity in the composition of market participants.

Liquidity Varies Across Products

Depending on the products available, there is a considerable variation in market liquidity of credit derivatives market. In recent years, development of the market in two opposite but complementary directions has been witnessed. After introduction, there has been a rapid growth of credit indices and standardized credit products to meet the demand for tools of trading and hedging. Simultaneous increase in demand for credit exposures that are more tailored has given rise to a market for bespoke transactions which has little or no secondary market liquidity.

Characteristics of the products and their liquidity reflect the underlying motivations. When it comes to index products, there has been an improvement in market liquidity. Different types of participants have been attracted to credit markets because of the emerging standardized CDS indices. This has resulted in an increase in the liquidity of the market for index tranches due to the entry of low-cost tools for trading and hedging of the credit. There is ready availability of two-way liquidity for on-the-run tranches of standard CDS indices.

The occasional divergence between actual liquidity and perceived liquidity can be illustrated by single-name CDS market. Composed of around 2000 reference names or more, including a growing number of high-yield and emerging market names, this market makes available the daily updated prices for not even a quarter of CDS names globally. Number of names that are traded regularly is even lesser, amounting to only around 100 in the US and European markets combined and approximately 30 to 40 in Asia Pacific markets, representing a market that is truly liquid.

Liquidity in the Asian CDS markets is quite restricted consisting of very few names, mainly sovereigns which trade regularly. Additionally, for standard quotes too in liquid Asian names, the distribution of bid-offer spreads is broader, and a higher spread volatility from that in the US and European names. Trading and liquidity in Asian CDS are principal indicators of movement in the underlying cash markets, with Asian names usually showing larger liquidity through the Hong Kong and Singapore trading hours. By itself, during this period, a small fraction of the latest market is represented by the Asian CDS products.

Generally considered the most proficient method to hedge a particular credit exposure, liquidity in single-name CDSs has a tendency to disperse rapidly if the market volatility increases even for the names having maximum liquidity. Through these specific time periods, the number of protection buyers is generally greater than the number of protection sellers. Thus, a significant component of CDS trading activity is highlighted, *i.e.*, a large number of non-banking participants, which includes credit risk recipients in the key markets, generally do not leverage single-name CDS to hedge credit exposures in an active manner and naturally look for hedging positions in response to recounting actions. During such an event, the risk of being encountered with vanishing or extremely expensive liquidity arises. In return, there has been a surge in usage of new and more liquid index products by the market participants to achieve credit exposure as well as hedge positions in particular, opposed to general credit spread broadening. By themselves, the index products partly assist to deal with these spontaneous manners. But on the other hand, this way of proxy hedging might assist to defend positions in opposition to general spread widening but their efficiency is less as a hedge to idiosyncratic risks.

Liquidity and Diversity

In credit derivative markets, hedge funds have always been a vital source of liquidity and encompass the skills to offer a stabilizing influence from this perspective. Nevertheless, combined with proprietary trading desks, hedge funds govern activity in some particular sectors of the portfolio swap market, leading to liquidity problems. Evidence of this was seen in September 2008 and in first half of 2012 when it became very tough for hedge funds to make an exit or hedge portfolio swap positions because their dealer counterparties often had comparable liquidity needs. Similarly, in May 2005 and in first quarter of 2007, fundamentals were inundated by technical aspects throughout this time, and therefore prices possibly undershot to the lower side. A further precise description might be that important single-way trading volume and comparatively tight bid-offer spreads made traders believe the fact that ample liquidity was present in these products. However, it was proven wrong when two-way flows were consequently hunted. As a result, as the May 2005 episode was sparked by credit events that involved General Motors and Ford and in the first quarter of 2007 by subprime mortgages leading to a so-called Minsky effect in the second quarter of 2007 happening primarily due to the liquidity disruptions. Nonetheless, the disruption continued to be comparatively restricted and ephemeral because new investors, mainly

hedge funds with more varied investment strategies such as 'macro' hedge funds or with access to new capital, made an entry into the market as they assumed prices to be quite less than the essential levels. Thus, significant market liquidity was provided by these investors which assisted in restoring stability.

Although investors having a longer-term horizon have contributed immensely to facilitate primary credit risk transfer as buyers of risk, their contribution to secondary market liquidity is very marginal. Buy-and-hold investors, like insurance companies and pension funds, have a tendency to control structured credit market. Historically, the practice of diversifying portfolios, hedging long-term liabilities and satisfying different strategies of asset-liability management has been insulating them from the volatility of the short-term market.

An important structural influence and deterrent to liquidity of secondary market is the lacking diversity in market participants and the large extent of market segmentation. Undoubtedly, primary market risk transfer has been enhanced by the ability to tailor risk, but presently, secondary liquidity is unreliable because of investors' homogeneity in the more segmented markets. The focus is not on understanding liquidity conditions better and identifying the potential sources of disruptions. Attention is to be paid by the market participants and supervisors to assessment of the possible impact of the ever-changing accounting, regulatory and prudential frameworks on investor behavior and market liquidity.

Operational Risks

Very often, operational shortcomings are considered a possible cause for disturbance in credit derivatives markets owing to the growing trading volume and the complexity associated with the new products. Concerns have been expressed by industry groups and the official sector over the increasing backlog of trades that have not been confirmed and the management of 'novations' or trade reassignments, as well as necessity of improving settlement procedures.

Exhibit 13.2 tabulates the position on backlogs on confirmations and assignments. Backlogs in the credit derivatives market have been one of the major issues. The regulatory spotlight has been focused particularly on this issue in order to avoid perceived risk of systematic failures.

Cases of inadequate investments by major dealers in their back-office capacity have reflected in the backlog of unconfirmed trades. Growth of credit derivatives parallels growth of financial innovations, and therefore the amount of unconfirmed trades is representative of the usual hurdles

Exhibit 13.2: Positions of Backlogs on Confirmations and Assignments.

Type	Length	Proportion
Documentation Backlog Confirmations	1–3 days	29%
Documentation Backlog Confirmations	3–7 days	18%
Documentation Backlog Confirmations	7–14 days	11%
Documentation Backlog Confirmations	14–30 days	25%
Documentation Backlog Confirmations	30–60 days	8%
Documentation Backlog Confirmations	over 60 days	9%
Documentation Backlog Assignments	1–3 days	28%
Documentation Backlog Assignments	3–7 days	15%
Documentation Backlog Assignments	7–14 days	17%
Documentation Backlog Assignments	14–30 days	23%
Documentation Backlog Assignments	30–60 days	10%
Documentation Backlog Assignments	over 60 days	7%

in the development of the credit derivatives market and is predicted to decrease with the maturation of the market similar to other markets.

In any case, regulators and supervisors in London and New York, where most of the credit derivatives market action is, *i.e.*, the Financial Services Authority (FSA) of the United Kingdom and the Federal Reserve Bank of New York, desire to make sure that banks and dealers implement satisfactory systems. They had asked for a collective commitment by major banks and dealers in order to have standards that are more exacting for operational performance. Commitment was made by major credit derivatives dealers to ensure significant reduction in the number of outstanding confirmations. Commitment was also made by the dealers to ensure strengthening of their operating efficiency, including procedures for enforcing the ISDA protocol with respect to improvement of information system and novation.

Due to hedge funds' entry as active traders in the credit markets, there have been procedural issues in trade settlement and confirmations exchange. One of the vexing issues has been in novations of credit derivative contracts. Contrary to the master agreement set out by the ISDA, the *de facto* standard settler, trades were executed by some participants without the original counterparty's approval. Counterparty risks are

raised and operational uncertainty is introduced because of such delays in confirmation and execution reassignments. The novations protocol has been refined by the ISDA and a permanent Web page has been started for the industry to point out its agreement as well as views with regard to the revised protocol. But in spite of the market participants broadly accepting the protocol, it is currently focused towards on-going technical considerations. Although the credit derivative markets functioned relatively smoothly during the subprime crisis, attention was focused on the settlement process due to the Delphi bankruptcy. The probable risks and challenges were highlighted which could arise if the notional value of the outstanding CDS contracts exceeds outstanding amount of deliverable obligations by a significant number taking into consideration the already present settlement procedures needing physical delivery. The probable settlement problems were lessened by a special cash settlement protocol by the ISDA for Delphi-referenced index-based products.

Supposedly, due to the Delphi experience, there has been a re-examination of the current settlement procedures and reconsideration of the greater use of cash settlement which includes single-name CDS. Furthermore, a preliminary point for improved settlement procedures in the future might be provided by the settlement protocol that was used for the Delphi settlement. There has been an active discussion among industry representatives on further improving and extending this protocol. There was a proposal by the ISDA on an auction mechanism through the CDS Small Bang in 2009 which would change the standard protocol for credit derivative transactions as cash settlement. Therefore, even though the pressures of deliverable bond market squeeze on CDS exceeding deliverable options that are outstanding may not be eliminated, the proposal would still contain elements of physical settlement.

13.6 PROVISION OF CREDIT AND CREDIT CYCLES

Credit and credit cycles are also affected by the credit derivatives markets in a lot of ways. First, the availability, quality and timeliness of information are improved by credit derivatives and thus, price discovery is enhanced and adjustment lags are reduced for banks. The extension of bank credit is not very dependent on bank-specific factors anymore due to the growing dependence of credit pricing on market factors. Second, due to increased sensitivity of credit risk management to market changes, including pro-cyclicality of bank lending, the dynamics of credit cycles are influenced by risk transfer.

Provision of Credit

More timely and better information about the conditions of credit markets is available due to the growing credit derivatives trading. Due to credit derivatives, improvement in price discovery is more efficient than in bond markets. Credit derivatives enhance how effective are the market prices by changing the CDS spreads such that there are short-run changes in bond, which increase the marginal price of credit risk.

Banks can do delinking of decision of loan origination from traditional risk management considerations because of the influence of loan pricing on the credit derivative markets. The ability to attract such market participants, like other banks that have the will and ability of holding and trading credit is a prerequisite. In the primary risk transfer markets, due to the customizability of credit exposures, varied investor profiles are attracted with the prospect of better satisfying their own investment and risk management objectives. Due to this diversity, buyers and sellers of credit are able to focus on the intermediation process because they would have a comparative advantage of banks having origination infrastructures and relationships and hedge funds that provide price discovery and liquidity, as well as insurers and pension funds that are holders of credit for a longer term for better matching their liability structures.

As opposed to the conventional lending limits with regard to a specific client, sector or geography, dependence is now placed on market prices for extending credit by big banks. Banks are able to preserve their customer relationships, even though adjustment of total or specific credit exposures by buying protection and reducing concentration risk is made by the risk managers. So, in the market, banks are able to improve their credit portfolios in accordance with risk management strategy, that is chosen, and to adjust credit exposures, more actively. The credit provision and efficacy of the system are positively affected by credit derivatives. However, the inabilities of transferring risks, thus incentivizing banks that overextend their credit assuming credit risk in excess is a matter of concern. Many concerns are also present regarding adverse effects on financial stability due to risk transfer by lessening the perks for banks to scrutinize and keep a constant check on the borrowers.

During the initial days of credit risk transfer market, concerns were present regarding information asymmetries and adverse selection possibilities. These concerns though have vanished due to the rapid evolution and maturing of the market. The surge in market depth and transparency in price, including the involvement of rating agency and bigger experience, enhances the ability of the investors to autonomously value

and scrutinize the corporate credits that are included in structured credit portfolios. Certainly, rating agency models and established indices and sub-index pricing have provided investors with the ability to scrutinize and hedge a variety of risks. One significant aspect that needs to be noted is that the banks working most actively in these risk transfer markets should protect their market credibility to assure sustained market access for themselves and as a result, it is unlikely that they would look for a temporary increase with superior long-term costs.

Actually, unnecessary credit extension is mitigated by market forces. Taking an example of banks which do systematic mispricing of credit risk later discovered how higher premiums make buying protection uneconomical and this leads to lesser returns to the bank and/or higher borrowing costs passed through to customers, thus limiting the amount of extended credit. Banks that choose to ignore this market information end up developing reduced credit portfolios. But, even then the enhancement of supervisory surveillance and dialogue with the help of market information has to be addressed by these institutions through provisioning and improved risk management practices.

Although the credit market activity is improved by the bond markets, they have been taken to a new level by credit derivatives. Loan pricing affected by the credit derivatives at the largest banks provides credit decisions that are more informed and thus reduce the chances of overextension of credit.

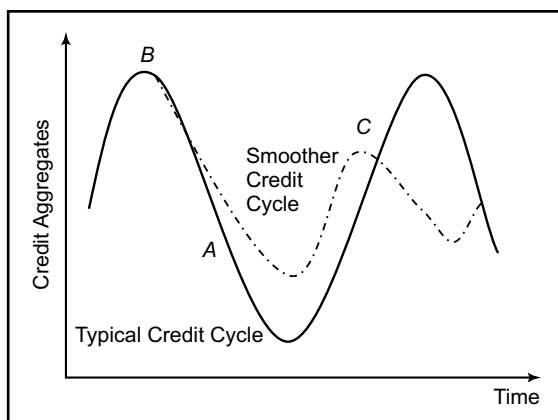
Implications for Credit Cycles

The dynamics of credit cycles are affected by financial innovations, such as credit derivatives as well as any increase in the role of market prices. Based on the increasing importance of credit derivatives to set the marginal price of credit, including bank loans, it can be surmised that credit markets will, eventually, be influenced more by credit derivatives than bonds. The volatility of the credit cycles could be lessened by the surged transparency of credit pricing and credit quality that are provided by the market. Especially due to these market innovations and influences, many continuing, near-term credit portfolio adjustments are induced, chiefly among banks as compared to additional pro-cyclical performance in financial systems dominated by the banks. In lending or borrowing, such marginal behavior is vital holding more relevance than collective or average measures of credit. Additionally for the wider economy, the volatility of such cycles might be affected by such marginal adjustments and related smoothing of investment and consumption. Though short and probably

sharp market corrections within particular asset classes could be produced by market adjustments occasionally, the dampening of historical large swings could be the broader effect.

Evaluation of historical bank behavior could help gauge the potential impact on credit cycles. Exhibit 13.3 shows a typical credit cycle in the absence of relatively developed credit derivative markets. In such cases, a turn in the credit cycle was typically only apparent with a significant lag, as banks realized and reported increasing nonperforming loans and increased provisioning (point A). Certainly, the review process of a bank is usually much less recurrent or demanding as compared with market trading and pricing of corporate credit, including its MTM discipline available today for the largest corporate credits in the bond and derivative markets. Consequently, in such a system, a downturn in the credit cycle may be well advanced before adjustments are initiated. Additionally, as the worsening of credit quality is identified, credit and related liquidity are typically withdrawn or withheld, which, other things being equal, aggravates the recurring decrease.

Due to the arrival of credit derivative markets having more liquidity and more depth, the credit turning points could be identified by the bank and the market participants including supervisors at a much initial stage (point B). If the credit cycle is peaking, as typically first signaled by non-investment-grade spread widening and various broad market and idiosyncratic event risks rising, for example, bankruptcies rising, increasing leveraged buyout activity, moderating or declining corporate earnings growth, rising M&A activity and increased dividends and share buybacks, banks and other participants may be expected to manage credit risk more proactively and in a more gradual manner. Similarly, during the downturn of a credit cycle, credit exposure might be bought by new, different and dedicated investor groups much before the historical cycle bottoms out. By itself, the depth of credit markets could increase and there should be an improvement in the liquidity due to a broader and more diverse investor base. Again, other things being equal, dampening of credit cycle might occur over time (a move to the dotted line and point C). This activity suggests that shift in market pricing, progressively first reflected in credit derivatives, might work to hold back credit availability in a cycle upswing as well as amplify credit availability in the downswing, potentially smoothing and decreasing the volatility of credit cycle. Obviously, these benefits depend mainly on survival of comparatively liquid markets and varied investor participation. Undoubtedly, changes in risk appetite have a tendency for a more pronounced and probably an added amplifying consequence on these markets via liquidity disruptions and price

Exhibit 13.3: Credit Cycle Dynamics.

gapping without the diversity and related liquidity. Thus, due to the reason mentioned earlier, the diversity of investors and the liquidity of markets are set as vital preconditions for increased stability of markets and enhanced cycle dynamics.

Due to the increase in dependence of the financial system on the markets, changes in the credit cycle dynamics might continue and there could be a broadening of economic benefits. The monetary policy transmission channels might also be influenced by advances in credit derivatives markets, probably due to changes in the flow of credit in financial markets. Additionally, wider dissemination of informed credit information is provided by structural and market changes, which includes the credit derivative markets, indicates that asset price signals may gain importance for regulatory, supervisory and broader policy considerations.

13.7 POLICY IMPLICATIONS

Financial stability is improved by the credit derivative products that partake in the process of credit risk distribution. Systemically, significant institutions like banks are able to reallocate credit risk to diverse types of investors by these markets. Thus, such institutions, in particular, and banking system, in general, are less susceptible to credit shocks. During the period of 2009–2012, it was found that credit derivatives present the enhanced financial stability that has already been mentioned is for the primary risk transfer market. In these cases, the risk is shifted to a better ‘warehouse’ of risk by the seller. The growth of this activity of risk relocation has been sustained by this ability to modify and wrap-up risks that

are more specific. Development of a secondary market with more liquidity in a number of market segments would result in a more complete and stable market. Major stability concerns include potential for disruptions of the liquidity in the secondary market, which is mostly related to gaps that exist between real and perceived liquidities and to the homogeneity of market participants of a particular segment as was highlighted acutely during the financial crisis post 2008.

Market Liquidity

Due to the spurt in the use of credit derivatives for the purpose of transferring risk, financial stability in these leveraged markets becomes dependent on liquidity considerations. Recently, a growth in the 'primary' risk transfer market liquidity has been witnessed in developed markets in the United States and Europe, which seems reliable. Over time, these trends will develop in India as well. However, even in the developed markets, primary market activity may be affected by products like credit derivative instruments which are more advanced, in which market segments are particularly susceptible to disruptions to liquidity in secondary markets. Thus, supervisors and regulators need to be more aware of the potential for such disruptions.

There are a lot of concerns related to the management of liquidity risks. There is a requirement for having more dialogues between market participants and supervisors for measuring, monitoring and managing liquidity, which includes the design of suitable liquidity cushions at individual firms and within sectors. To evaluate the ability for withstanding liquidity disruptions, conducting stress testing is vital. It is imperative that the market participants and regulators leverage the Basel-III framework for refining these practices. The supervisory efforts can be supported by in-depth exchanges within and across sectors for identifying ex-ante areas of possible liquidity flaws and sources of contamination.

To have a successful coordination during a liquidity crisis, there needs to be dialogue and cooperation among public officials and emergency plans should be kept for backup in case of such an event. This type of cooperation might involve creating new indicators for examining liquidity across sectors and asset classes which also includes better identification of holders of particular types of credit risk. Such a thing needs more focused surveillance activities rather than new or additional regulation and also requires the supervisors to have detailed information about the activities of unregulated market participants.

Policymakers should look out for encouraging involvement of a highly varied investor base, as in the case of other markets. Generally, different

investment and trading strategies are reflected in a well-functioning market that has more resilience to shocks. A plethora of factors drive a diverse investor base which includes various vital influences on market behavior, such as regulatory and prudential frameworks, accounting, rating agencies and the wider market structure. There needs to be an understanding among the policymakers as to how initiatives such as Basel III, Solvency II and fair value accounting would change the behavior of chief market participants and, thus influence market liquidity and stability.

Considering this more exclusively, there is a need to create or fortify institutional, legal and regulatory infrastructures that are required to catch the attention of a varied and committed investor base and also to make sure that the risk flows freely and in an orderly manner within and among the markets. Additionally, a very efficient market ambience would be provided due to the reduction of market frictions and consistent application of regulations. At the same time, this generally generates more complexity in transactions, especially in markets with less liquidity. Investors who have the aptitude to look for returns from many various markets and asset classes include large global markets and smaller local markets. This investor base prefers legal, tax and regulatory clarity as also comparatively enhanced market infrastructures such as trading and settlement systems. If these are made available, investors often are ready for a longer-term investment perspective and eventually chip in to support market liquidity and stability. Nonetheless, with no such clarity and infrastructure, there is a likelihood that the investor base would avoid these markets and look out for short-term arbitrage trading gains generally through highly structured or derivative transactions, which might act to restrict wider market liquidity.

As it might be too complex to develop liquid markets in the credit derivatives market, there lies the need for exploring the potential for regional or global markets and infrastructures. Correspondingly, careful assessment of regulations is also required which put a stop to local institutions from taking part more fully in market activity. Particularly, the risk of outside contamination that regulations generally intend to stop needs to be reasonable with the risks and costs stemming from narrow local markets and related illiquidity.

Operational Risks

Regulators and supervisors are a little apprehensive with regard to the potential of operational failures to cause or enhance financial disturbances due to the swift growth of credit derivative markets. The buildup of unconfirmed trades, which resulted in part from underinvestment in back-

office capacity by the major dealers, has been addressed in response to issues expressed by the New York Federal Reserve Bank and the FSA. Delays in reassigning trades, *i.e.*, novations, mainly reflect the amplified presence of hedge funds as participants actively trading in these markets. Due to this, there has been a proposal by the ISDA to streamline the novations protocol, and there has been a green signal by the industry for enforcing these novation procedures. Required efforts need to be put to steer clear of probable disputes, in the case of occurrence of a credit event.

Implications for Financial Supervision and Surveillance

Regulators including the RBI are eager to make sure that credit risk recipients have the risk management systems and skills that are required to handle such exposures, which ensures that the benefits from risk dispersion are materialized. This might hold relevance particularly for second-tier banks and non-bank financial institutions, and definitely include enhanced counterparty risk management.

The treatment of risk transfer techniques for non-bank institutions should be clarified by the policymakers and supervisory authorities. Nevertheless, these developments are being reserved due to lack of clarity with regard to the regulatory and rating agency treatment of such transactions. There should be more support for ongoing international initiatives for promoting risk-based supervisory frameworks for insurers and pension funds, as they promote more practical risk management practices by these institutions.

Regarding hedge funds, vigilance must be kept by regulators about risk management practices and counterparty exposures at the regulated banks and brokers, in particular those concerning credit products. There has been a significant contribution to the growth of credit derivative markets by hedge funds, and important liquidity has also been provided by the hedge funds regularly. But hedge funds are also active in the most illiquid parts of the market where disruptions are most likely. As a component of the Dodd-Frank Act, during 2011 regulators in the United States, where hedge funds are most active, amplified the supervisory dialogue and surveillance with regard to the bank and dealer counterparty risk management related to hedge funds. Improved screening of counterparty risk has become a top priority for the market participants and supervisors in all jurisdictions. The need for cooperation and exchange of information among regulators is highlighted by the importance of hedge funds to these risk transfer markets.

The information required for monitoring credit flows, credit quality and concentrations across sectors and within institutions is provided by the credit derivatives and therefore could contribute to highly efficient financial sector surveillance. There is either no timely availability of traditional bank credit aggregates or it is available in extremely disaggregated way, for informing surveillance activities. Due to financial systems becoming more market based, this concern is even more valid. If these concerns are addressed, information derived from credit derivative markets might be more up-to-date. Additionally, screening of probable weaknesses beyond the banking sectors should be done using these market indicators.

Reduction of frictions should be facilitated by the policymakers and institutions that restrain the expansion of markets and, additionally, search for improving the efficiency of financial markets. There has been a regular observation by the global investors in the Asian markets that direct investment in local credit markets can be impeded by the institutional shortcomings and frictions, such as transfer taxes, creditor rights, bankruptcy codes and clearing and settlement systems, which can restrict the probable stability gains from amplified foreign investment and enhanced market liquidity. Thus, there is a need for efforts for strengthening the key aspects of local frameworks as well as that of the underlying markets.

Credit Cycle Dynamics

Deeper, efficient and liquid credit markets could influence the dynamics of credit cycles. As pricing of credit risk is made more transparent by credit derivatives, credit cycles might be dampened by the ensuing proactive portfolio adjustments by banks. This has implications for better acclimatized market surveillance and better recognition of possible changes in the flow of risk in reaction to financial innovations and structural developments. Encouragement should be given to these innovations and developments, as the enhanced risk management focus they support might prevent big and/or pro-cyclical adjustments that can strengthen credit cycles. Eventually, there might be a need to amplify the screening of asset markets by policymakers for better understanding of credit flows because of the underlying inter-linkages between asset price shifts and economic fundamentals.

Broader Financial and Economic Considerations

The greatest financial stability cushion could be liquidity. Nonetheless, the development of national markets might not always be steered by the

efforts for developing and deepening capital markets. Development of markets which includes risk transfer markets should be given continued support by policymakers, which will promote economic and financial efficiency as well as develop financial stability.

Sustained evolution from mainly a bank-based financial system to a more market-based system is facilitated by credit derivative markets. The volatility inherent in credit is made clear by these instruments, which was formerly covered by bank balance sheets. The banking system and the overall financial system might become more efficient and more stable by transferring and managing more credit risk in the capital markets. Certainly, there have been instances in the past which show that this might not be a linear process. Financial stability and market vulnerabilities might face new challenges. Obviously, financial innovation doesn't end at the doorsteps of credit derivatives. The materialization of these new risks and their drastic impact would significantly be driven by the growth and development of the credit derivatives market and how efficiency of risk transfer and distribution across the financial landscape is enhanced by new innovations like credit derivatives.

APPENDIX 1

VALUATION METHODOLOGY FOR LIQUID AND ILLIQUID NAMES

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1. THE VALUATION METHODOLOGY FOR LIQUID NAMES AND OTHER THAN LIQUID NAMES

1.1 Liquid Names

(a) Traded Curve Points

1. Validity Period: If the particular point on the curve is traded on the day of valuation, the weighted average price for that day should be used for valuation.
2. Threshold amount: The minimum traded threshold amount is Rs. 25 crore, *i.e.*, traded data is to be used only if there have been trades for more than Rs. 25 crore.

(b) Non-traded Curve Points: The CDS curve as provided by the Polling Agent to be used for valuation:

1. For the sake of clarity, the Polling Agent superimposes all Traded Curve Points (after filtering for Lookback period and Threshold Amount) over the results of its daily polling process to provide one consolidated valuation curve for all Liquid Names.

This information is published by the FIMMDA on its Web site on a daily basis. This data is published by end-of-day on the same day.

1.2 Other than Liquid Names

(a) Traded Curve Points

1. **Validity Period:** If the particular tenor on CDS has traded in any of the past 15 days, such most recent traded CDS price should be used for valuation.
2. **Threshold amount:** The minimum traded threshold amount is Rs. 25 crore, *i.e.*, traded data is to be used only if there have been trades for more than Rs. 25 crore on the day of trade.

(b) Non-traded Curve Points

1. The corporate bond spread matrix (published by the FIMMDA) for the relevant sector type is taken.
2. CDS-Bond Basis (published by the FIMMDA) is applied to the spread matrix to arrive at the CDS price for valuation.

For the sake of clarity, the Polling Agent consolidates all Traded Curve Points from CCIL (after filtering for Validity period and Threshold amount) and provides a list of name-wise traded curve points.

The Polling Agent also provides the average bond basis across tenors.

This information is published by the FIMMDA on its Web site on a daily basis.

- CDS trades for tenors more than 10 years are to be valued at the 10-year point, *i.e.*, curve is assumed to be flat after 10 years.
- Market participants have a discretion of 25 bps above/below the CDS spread determined for valuation using the above methodology for up to AA rating and 50 bps for AA– and below. The rating to be used for this purpose is the credit rating of the Reference Obligation.
- The applicable credit rating (of the Reference Obligation) is the lowest available public rating (among the SEBI-registered accredited credit rating agencies), who have rated the Reference Obligation.

2. PROCESS FOLLOWED BY THE FIMMDA TO PROVIDE THE VALUATION CURVES

2.1 Liquid Names

1. The FIMMDA to publish a list of Liquid Names along with the sector classification.
2. This list is provided on a monthly basis as approved by the FIMMDA Valuation Committee.

3. The list of Liquid Names to contain a minimum of 5 and a maximum of 10 entities across sectors.

2.2 Participants List

1. The FIMMDA to provide a Participant List consisting of Market-makers, Users and Brokers to be polled for daily CDS price.
2. The number of participants is a minimum of 5 and a maximum of 15.
3. The mix of Market-makers, Users and Brokers is decided by the FIMMDA Valuation Committee and the list is provided on a monthly basis to the Polling Agent.
4. The participants are selected on a voluntary basis and if a minimum Quorum of 5 is not achieved, the FIMMDA nominates from among the Market-makers.

2.3 Polling

The FIMMDA has appointed Markit, an external vendor ("Polling Agent") to poll for CDS prices for Liquid Names across tenors daily.

1. CDS prices polled are "flat spreads." The polled prices are for a standard recovery rate assumption, seniority in the capital structure and risk-free curve which is provided to the Polling Agent.

Flat Spreads is the market quotation standard. For example, if the flat spread for a 5-year CDS is 150 bps, then 150 bps is the spread assumed for all tenors from 1-year to 5-year for valuation and calculation of upfront consideration.

2. Polling is conducted for 1, 2, 5 and 10 years.
3. The polled data is randomized, cleaned for outliers and CDS curves for each of the liquid names to be calculated ("Polled Curves").

2.4 Procedure for Calculation of CDS-Bond Basis

1. CDS curve points for Liquid Names daily are taken from Polled Curves.
2. Corresponding bond spreads are taken from the daily published FIMMDA bond spread matrix.
3. CDS-Bond basis is calculated for each Liquid Name across tenors.
4. Average CDS-Bond basis is calculated across tenors.

Example

The CDS prices for liquid names are polled as below:

	1 Year	2 Year	5 Year	10 Year
PFC	100	100	70	80
EXIM	100	105	72	78
REC	100	100	70	80
HDFC	130	120	100	100
IDFC	125	115	90	80

The bond spreads for the Liquid Names are taken from the FIMMDA Bond spread matrix for the corresponding entity type. For example, PFC is of entity-type PSU; so, credit spreads for each tenor is taken from the PSU-category Bond Spread matrix.

Credit Spread over Gsecs

	1 Year	2 Year	5 Year	10 Year
PFC	145	150	90	96
EXIM	135	145	88	94
REC	145	150	90	96
HDFC	175	170	120	120
IDFC	170	165	110	100

Finally, the CDS-Bond Basis is calculated as following:

CDS-Bond Basis

	1 Year	2 Year	5 Year	10 Year
PFC	-45	-50	-20	-16
EXIM	-35	-40	-16	-16
REC	-45	-50	-20	-16
HDFC	-45	-50	-20	-20
IDFC	-45	-50	-20	-20
Average	-43	-48	-19	-18

2.5 Data for Valuation

The FIMMDA publishes the following data daily:

1. The sector-specific corporate bond spread matrices (across ratings and tenors).

2. The CDS curves for individual Liquid Names.
3. The CDS-Bond Basis curve as calculated earlier to be applied to "Other than Liquid Names."
4. Traded curve points to be used for valuation of "Other than Liquid Names."

APPENDIX 2

INDIAN CREDIT DERIVATIVES DETERMINATIONS COMMITTEE RULES

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1. COMPOSITION OF THE FIRST INDIAN CREDIT DERIVATIVES DETERMINATIONS COMMITTEE

1.1 General

- (a) **Committee:** The Indian Credit Derivatives Determinations Committee (the Committee) is established for purposes of making determinations in connection with credit derivative transactions in respect of which the confirmation is either a Market-maker MCA or a User MCA (each such credit derivative transaction, a Relevant Transaction).
- (b) **The Secretary:** The Fixed Income Money Market and Derivatives Association of India (FIMMDA) [or any other entity as nominated by the Reserve Bank of India (RBI) from time to time] will serve as the secretary of the Committee (the DC Secretary) and will perform administrative duties and make certain determinations as provided for under the Rules. Communications to the DC Secretary under the Rules will be made in the manner prescribed and in accordance with the contact information published from time to time for this purpose by the DC Secretary on its Web site. Unless otherwise specified, all determinations by the DC Secretary under the Rules will be made in a commercially reasonable manner.
- (c) **Rules for the Committee:** In respect of the First Scheduled Committee Term, the Committee is governed by the rules set forth in these Indian Credit Derivatives Determinations Committee Rules (the Rules). Before the end of the First Scheduled Committee Term, the Committee will amend the Rules in accordance with Section

5.2(b) (*Amendments to the Rules*) to provide for, among other things, the selection and composition of the Committee following the end of the First Scheduled Committee Term.

- (d) **Effectiveness of Notices:** Determinations of effectiveness of notices under the Rules will be made in accordance with Section 12(a) of the 2002 ISDA Master Agreement, except as modified by the Rules. Each reference to written notice in the Rules will be interpreted to include notice via facsimile and/or email.

1.2 Participating Institutions

- (a) **List of Participating Institutions:** The DC Secretary will compile on the Initial List Review Date and thereafter maintain an up-to-date list of each User FIMMDA Member and each Market-maker FIMMDA Member that, respectively, has notified the DC Secretary that it (or an Affiliate) wishes to be considered for membership on the Committee (together, the List of Participating Institutions). Each such institution will identify itself as either a Market-maker FIMMDA Member or a User FIMMDA Member. For each Market-maker FIMMDA Member on the List of Participating Institutions, its self-identified classification as a “Public Sector Bank,” “Private Indian Bank,” “Foreign Bank” or “Market-maker Non-Banking Financial Company” (each a Market-maker Category) will also be included. For the avoidance of doubt, no FIMMDA Member may be considered for membership on the Committee as both a Market-maker FIMMDA Member and a User FIMMDA Member.
- (b) **List of Authorized Contacts:** Each Participating Institution will designate, from time to time, one or more individuals as points of contact at the relevant institution with respect to the Committee (each, an Authorized Contact) and will notify the DC Secretary, from time to time, of the identities and contact information (including the telephone number and email address) of each such Authorized Contact. Authorized contacts may be changed at any time upon effective receipt by the DC Secretary of written notice from the relevant Participating Institution. The DC Secretary will maintain a list of all current Authorized Contacts and may rely on the identities and contact information provided by the relevant Participating Institution until such time as the DC Secretary is effectively notified of a change.

1.3 Relevant Lists for Market-makers and Users

- (a) **List of Ineligible Institutions:** The DC Secretary will compile on the Initial List Review Date and thereafter maintain an up-to-date list of (i) each Participating Institution that, at any given time, is ineligible for membership of the Committee for one or more of the reasons set out in Section 1.5(b) (*Standard Agreement*), 1.6(c) (*Failure to Pay a FIMMDA Invoice*), 1.6(d) (*Failure to Attend Meetings*) or 1.6(f) (*Resignation*) [or 1.6(h) (*Maintenance of Market-maker Status*)]; (ii) the reason(s) for each such Participating Institution's ineligibility and (iii) the expiration date for each such reason for ineligibility (such list, the List of Ineligible Institutions and each institution on such list, an Ineligible Institution). A Participating Institution will be removed from the List of Ineligible Institutions once all reasons for ineligibility for such Participating Institution have expired in accordance with the relevant expiration date under the Rules. For the avoidance of doubt, the resignation of a Participating Institution in accordance with Section 1.6(f) (*Resignation*) will not result in the removal of such institution from the List of Ineligible Institutions until all reasons for ineligibility for such Participating Institution have expired in accordance with the relevant expiration date under the Rules.
- (b) **Lists of Eligible Market-makers:** The DC Secretary will compile on the Initial List Review Date and thereafter maintain an up-to-date list of (i) each participating Market-maker institution that is not an Ineligible Institution; (ii) each such participating Market-maker institution's self-identification as a "Public Sector Bank," "Private Indian Bank," "Foreign Bank" or "Market-maker Non-Banking Financial Company" and (iii) a designation of whether each such participating Market-maker institution has been previously identified to serve on the Committee (such list, the List of Eligible Market-maker Members and each institution on such list, an Eligible Market-maker). Each time an Eligible Market-Maker is selected as a Designated Market-Maker Member under the Rules, the DC Secretary will immediately update the designation of such eligible Market-maker on the List of Eligible Market-maker Members as having been previously identified to serve on the Committee and such designation will remain until reset even if the relevant Market-maker is later removed from the List of Eligible Market-maker Members and then is re-added to such list at a later time. Once each institution on

the List of Eligible Market-maker Members has been designated as having been previously identified to serve on the Committee, the DC Secretary will reset the designations so that each institution on the List of Eligible Market-maker Members will be deemed to have not been previously identified to serve on the Committee. Each participating Market-maker Institution that is added to the List of Eligible Market-maker Members on a date on which there is at least one institution on the List of Eligible Market-maker Members that is designated as not having been previously identified to serve on the Committee will be designated as having been previously identified to serve on the Committee.

- (c) **Lists of Eligible Users:** The DC Secretary will compile on the Initial List Review Date and thereafter maintain an up-to-date list of (i) each Participating User Institution that is not an Ineligible Institution and (ii) a designation of whether each such Participating User Institution has been previously identified to serve on the Committee (such list, the List of Eligible User Members and each institution on such list, an Eligible User). Each time an Eligible User is selected as a Designated User Member under the Rules, the DC Secretary will immediately update the designation of such Eligible User on the List of Eligible User Members as having been previously identified to serve on the Committee and such designation will remain until reset even if the relevant Eligible User is later removed from the List of Eligible User Members and then is re-added to such list at a later time. Once each institution on the List of Eligible User Members has been designated as having been previously identified to serve on the Committee, the DC Secretary will reset the designations so that each institution on the List of Eligible User Members will be deemed to have not been previously identified to serve on the Committee. Each Participating User Institution that is added to the List of Eligible User Members on a date on which there is at least one institution on the List of Eligible User Members that is designated as not having been previously identified to serve on the Committee will be designated as having been previously identified to serve on the Committee.
- (d) **List of Missed Meetings:** The DC Secretary will, in accordance with Section 1.6(d) (*Failure to Attend Meetings*), maintain an up-to-date list of (i) each Participating Institution that, while serving as a Convened DC Member, in contravention of the Rules, (A) failed to be present at a Convened DC meeting where one or more binding votes are held, (B) was present at a Convened DC meeting where

one or more binding votes were held but failed to vote in each such binding vote or (C) failed to submit an email vote in respect of a Mandatory Email Vote within the required timeframe, in each case, other than pursuant to Section 2.3(c) (*Abstention*); (ii) the total number of entries for each such Participating Institution and (iii) the date of each such entry (such list, the List of Missed Meetings). With respect to a Participating Institution, all entries on the List of Missed Meetings will be deleted on (A) each Term Start Date for such Participating Institution where such Participating Institution is not on the List of Ineligible Institutions for “Failure to Attend Meetings” and (B) each List Review Date where such Participating Institution is not on the List of Ineligible Institutions for “Failure to Attend Meetings”; provided that sub-clause (B) will not apply on a List Review Date with respect to a Participating Institution if entries on the List of Missed Meetings for such participating institution have been deleted pursuant to sub-clause (A) in respect of a Term Start Date that occurred with respect to such Participating Institution since the List Review Date immediately before such List Review Date.

1.4 Identifying DC Members

- (a) **Identifying Market-maker Members on the Initial List Review Date:** On the Initial List Review Date, the DC Secretary will attempt to identify seven Eligible Market-Makers from the List of Eligible Market-maker Members (each, a Designated Market-maker Member) in accordance with the following process:
- (i) First, separate the List of Eligible Market-maker Members into the following categories: “Public Sector Banks,” “Private Indian Banks,” “Foreign Banks” and “Market-maker Non-Banking Financial Companies”;
 - (ii) Second, the DC Secretary will attempt to select at random (A) two Eligible Market-Makers that are categorized as a “Public Sector Bank”; (B) two Eligible Market-Makers that are categorized as a “Private Indian Bank”; (C) two Eligible Market-Makers that are categorized as a “Foreign Bank”; and (D) one Eligible Market-Maker that is categorized as a “Market-maker Non-Banking Financial Company”;
 - (iii) Third, in the event that any Market-maker category is under-represented following the Selection pursuant to sub-paragraph (ii) above, the DC Secretary will identify the requisite

number of additional Eligible Market-Makers by selecting Eligible Market-Makers at random from the List of Eligible Market-maker Members without regard to the Market-maker categories and excluding those Eligible Market-Makers that have already been selected pursuant to sub-paragraph (ii) above;

- (iv) In the event that the DC Secretary is unable to select seven Eligible Market-Makers in accordance with the provisions set out above, Section 1.4(c) (*Insufficient Number of Eligible Market-makers or Eligible Users on the Initial List Review Date*) will apply.

- (b) **Identifying User Members on the Initial List Review Date:** On the Initial List Review Date, the DC Secretary will attempt to identify four Eligible Users by selecting at random four Eligible Users on the List of Eligible User Members (each, a Designated User Member), provided that a Designated User Member with respect to the Initial List Review Date will not be an affiliate of a Designated Market-Maker Member that is identified with respect to the Initial List Review Date.

In the event that the DC Secretary is unable to select four Eligible Users in accordance with the provisions set out above, Section 1.4(c) (*Insufficient Number of Eligible Market-makers or Eligible Users on the Initial List Review Date*) will apply.

- (c) **Insufficient Number of Eligible Market-makers or Eligible Users on the Initial List Review Date:** If the DC Secretary is unable to select the appropriate number of Designated DC Members under Sections 1.4(a) (*Identifying Market-maker Members on the Initial List Review Date*) or 1.4(b) (*Identifying User Members on the Initial List Review Date*), for each empty position, the DC Secretary will attempt to select Ineligible Institutions as follows:

- (i) First, the DC Secretary will identify as a potential Market-maker member or User Member, as applicable, each Ineligible Institution that (A) would otherwise be eligible to be selected under the relevant sub-clause but for being an Ineligible Institution, (B) is a Participating Institution and (C) is on the List of Ineligible Institutions solely for "Failure to Pay a FIMMDA Invoice" provided that an Ineligible Institution that is on the List of Ineligible Institutions for "Failure to Execute the Standard Agreement" or "Maintenance of Market-maker Status" will not be so identified and
- (ii) second, (A) if there is shortage of Market-maker members, the DC Secretary will select the requisite number of Market-

maker Ineligible Institutions at random from any Market-makers identified in sub-paragraph (i) above and (B) if there is shortage of User Members, DC Secretary will select the requisite number of User Ineligible Institutions at random from any Users identified in sub-paragraph (i) above.

Any Market-maker that is selected in accordance with the above provisions will be deemed to be a Designated Market-Maker Member and any User that is selected in accordance with the above provisions will be deemed to be a Designated User Member.

(d) Failure to Identify Eleven DC Members on the Initial List Review

Date: In respect of the Initial List Review Date, if the DC Secretary is unable to select the seven Market-makers and/or four Users pursuant to Sections 1.4(a) (*Identifying Market-maker Members on the Initial List Review Date*), 1.4(b) (*Identifying User Members on the Initial List Review Date*) or 1.4(c) (*Insufficient Number of Eligible Market-makers or Eligible Users on the Initial List Review Date*) for each empty Committee position, each Convened DC will comprise the number of DC Members existing until such time as the DC Secretary is able to fill any empty position as follows:

(i) **Identifying Seven Market-maker Members:** In connection with the Initial List Review Date, if fewer than seven Designated Market-Maker Members are identified, the DC Secretary will continue to attempt to identify the requisite number of additional Market-makers until there are seven Designated Market-Maker Members. Each such additional Designated Market-Maker Member will be an Eligible Market-Maker that is:

- (A) first, not a Designated Market-Maker Member, Adhered Market-maker Member or Market-maker DC Member;
- (B) second, identified in the List of Eligible Market-maker Members as belonging to the Market-maker category that corresponds to the relevant empty position (provided that if there are no such Eligible Market-Maker members, the relevant Eligible Market-Maker may be identified as belonging to any Market-maker category) and
- (C) third, selected at random by the DC Secretary, provided that any such additional Eligible Market-Maker will not be an affiliate of a Market-maker member. Any Market-maker that is selected in accordance with the above provisions will be deemed to be a Designated Market-Maker Member.

- (ii) **Identifying Four User Members:** In connection with the Initial List Review Date, if fewer than four Designated User Members are identified, the DC Secretary will continue to attempt to identify the requisite number of additional Users until there are four Designated User Members. Each such additional Designated User Member will be an Eligible User that is:
 - (A) first, not a Designated User Member, Adhered User Member or User DC Member and
 - (B) selected at random by the DC Secretary, provided that any such additional Eligible User will not be an affiliate of a Market-maker member.

Any User that is selected in accordance with the above provisions will be deemed to be a Designated User Member.

1.5 Procedures for Becoming a DC Member

- (a) **Notifying Designated DC Members:** Each Designated DC Member will be notified promptly by the DC Secretary that it has been identified by the DC Secretary as a Designated DC Member.
- (b) **Standard Agreement:** As of the Initial List Review Date (or, if later, the date of Selection as a Designated DC Member), the DC Secretary will Cause to have in place a Standard Agreement, pursuant to which Designated DC Members (or, with respect to any particular Designated DC Member, an affiliate of such Designated DC Member representing such Designated DC Member on the Committee) and the DC Secretary will each acknowledge and agree to their respective rights and responsibilities as described in the Rules (the Standard Agreement). In order to be eligible to participate on the Committee, each Designated DC Member (or affiliate representing such Designated DC Member) will effectively enter into, or accede to the Standard Agreement before [5:00 p.m.] Indian Standard Time on a day falling [ten] Mumbai Business Days immediately after becoming a Designated DC Member with respect to the Initial List Review Date (the DC Participation Deadline) provided that if a Designated DC Member is identified following the Initial List Review Date, the DC Participation Deadline will be [5:00 p.m.] Indian Standard Time on the day falling [ten] Mumbai Business Days immediately following the date of effective receipt by such Designated DC Member of valid notice from the DC Secretary that it has been selected by the DC Secretary as a Designated DC Member. In the

event that a Designated DC Member (or affiliate representing such Designated DC Member) does not effectively enter into, or accedes to the Standard Agreement on or before the DC Participation Deadline, such Designated DC Member will be immediately removed from the Committee, the List of Eligible Market-maker Members and the List of Eligible User Members, as applicable, upon effective receipt by such Designated DC Member of valid written notice from the DC Secretary. Upon effective removal, such Designated DC Member will also be added to the List of Ineligible Institutions for Failure to Execute the Standard Agreement and the expiration date for being on the List of Ineligible Institutions for Failure to Execute the Standard Agreement will be the day immediately preceding the second List Review Date immediately following the date of such effective removal. Upon effective removal from the Committee, a Replacement DC Member will be selected in respect of such Committee in accordance with Section 1.7 (*Replacement*).

A Designated DC Member that has entered into or acceded to the Standard Agreement in accordance with its terms will be an Adhered DC Member and will cease to be a Designated DC Member.

- (c) **Term of Membership on the Committee:** In respect of the First Scheduled Committee Term, each Adhered DC Member will begin its term on the later of (A) [•], 2011 and (B) the date of becoming an Adhered DC Member (such later date, the Term Start Date) (each Adhered DC Member will become a DC Member from its Term Start Date and, for purposes of the Rules, will no longer be considered to be an Adhered DC Member from the start of such Adhered DC Member's term). Each Adhered DC Member will serve on the Committee until resigning or being removed in accordance with the Rules. Following the First Scheduled Committee Term, the Term Start Date in respect of each Adhered DC Member will be the later of (A) the day falling 30 calendar days after the List Review Date for the relevant calendar year and (B) the date of becoming an Adhered DC Member.
- (d) **Publication of DC Members:** The DC Secretary will, on the Term Start Date, promptly publish on its Web site the identity of each then-current DC Member. The identity of any DC Member that replaces a DC Member will also be promptly published by the DC Secretary on its Web site along with the identity of the institution such DC Member is replacing.

1.6 Removal from the Eligible Lists and the Committee

- (a) **Term End Date for a Market-maker DC Member:** The term of each Market-maker DC Member will end on the earlier of (i) the date on which such Market-maker is replaced in accordance with Section 1.7 (*Replacement*) and (ii) the relevant Term Start Date under Section 1.5(c) (*Term of Membership on the Committee*) for the new Market-maker DC Member replacing such Market-maker DC Member. For the avoidance of doubt, a Market-maker DC Member being replaced under this Section 1.6(a)(ii) (*Term End Date for a Market-maker DC Member*) will be permitted to finish serving on each Convened DC that is deliberating at the time.
- (b) **Term End Date for a User DC Member:** The term of each User DC Member will end on the earlier of (i) the date on which such User DC Member is replaced in accordance with Section 1.7 (*Replacement*) and (ii) the relevant Term Start Date under Section 1.5(c) (*Term of Membership on the Committee*) for the new User DC Member replacing such User DC Member. For the avoidance of doubt, a User DC Member being replaced under this Section 1.6(b)(ii) (*Term End Date for a User DC Member*) will be permitted to finish serving on each Convened DC that is deliberating at the time.
- (c) **Failure to Pay a FIMMDA Invoice:** If any Participating Institution, or any affiliate of any Participating Institution, has an invoice from FIMMDA that (i) remains unpaid for more than [one year] after effective receipt of such invoice by such Participating Institution or affiliate, as applicable, (ii) has not been challenged in good faith by such Participating Institution or affiliate, as applicable, and (iii) such Participating Institution has not been previously added to the List of Ineligible Institutions on account of such invoice, such Participating Institution will be added to the List of Ineligible Institutions for “Failure to Pay a FIMMDA Invoice” and the expiration date for being on the List of Ineligible Institutions for “Failure to Pay a FIMMDA Invoice” will be the date on which payment in full of such invoice is effectively received by FIMMDA. If a Participating Institution is added to the List of Ineligible Institutions for “Failure to Pay a FIMMDA Invoice”, such Participating Institution will also be removed from the Committee (if it serves on the Committee at such time), the List of Eligible Market-maker Members and the List of Eligible User Members, as applicable. Upon effective

removal of a Participating Institution from the Committee, a Replacement DC Member will be selected in respect of such Committee in accordance with Section 1.7 (*Replacement*). Notwithstanding the above, the DC Secretary may waive or postpone the application of this Section 1.6(c) (*Failure to Pay a FIMMDA Invoice*) at any time in its sole discretion.

- (d) **Failure to Attend Meetings:** Each time a Convened DC Member, in contravention of Section 2.3(b) (*Voting and Participation*), (i) fails to be present at a Convened DC meeting where one or more binding votes are held, (ii) is present at a Convened DC meeting where one or more binding votes are held but fails to vote in each such binding vote or (iii) fails to submit an email vote in respect of a Mandatory Email Vote within the required timeframe, in each case, other than pursuant to Section 2.3(c) (*Abstention*), such Convened DC Member will be deemed to have missed a meeting and the DC Secretary will enter the name of such Convened DC Member on the List of Missed Meetings. Each time a DC Member accumulates an entry on the List of Missed Meetings that results in such DC Member having two or more entries on the List of Missed Meetings since the most recent Term Start Date for such DC Member, such DC Member will be immediately removed from the Committee (if it serves on the Committee at such time), the List of Eligible Market-maker Members and the List of Eligible User Members, as applicable, upon effective receipt by such DC Member of valid written notice from the DC Secretary. Upon effective removal, such DC Member will also be added, unless already on the List of Ineligible Institutions for “Failure to Attend Meetings,” to the List of Ineligible Institutions for “Failure to Attend Meetings.” Upon effective removal, the expiration date for being on the List of Ineligible Institutions for “Failure to Attend Meetings” will be the [day immediately preceding the second List Review Date immediately following the date of such effective removal]. Upon effective removal from the Committee, a Replacement DC Member will be selected in respect of such Committee in accordance with Section 1.7 (*Replacement*).
- (e) **Bankruptcy Event of Default:** A Convened DC may Resolve, by a Supermajority, that an event under [Section 5(a)(vii) (1), (4), (5) or (6) (or under Section 5(a)(vii) (8) or (9) to the extent either Section 5(a)(vii) (8) or (9) would apply with respect to Section 5(a)(vii) (1), (4), (5) or (6)) of the 2002 ISDA Master Agreement] has occurred and is continuing with respect to a Participating Institution. If the Participating Institution with respect to which such event occurs

and is continuing as one of the Convened DC Members, such Participating Institution will not participate in the vote. Following a DC resolution under this Section 1.6(e) (*Bankruptcy Event of Default*) that such event has occurred and is continuing with respect to a Participating Institution, such Participating Institution will be immediately removed from the Committee (if it serves on the Committee at such time) upon effective receipt by such Participating Institution of valid written notice from the DC Secretary. In addition, such Participating Institution will be removed from the List of Participating Institutions, the List of Eligible Market-maker Members and the List of Eligible User Members, as applicable, and will not be permitted to be included on the List of Participating Institutions until a Convened DC Resolves by a Supermajority to allow such inclusion; provided that inclusion on the List of Participating Institutions will in no event occur earlier than the day immediately preceding the second List Review Date immediately following the date of such effective removal. Upon effective removal from the Committee, a Replacement DC Member will be selected in respect of such Committee in accordance with Section 1.7 (*Replacement*).

- (f) **Resignation:** Any Participating Institution may at any time request to resign from the List of Participating Institutions, the List of Eligible Market-maker Members or the List of Eligible User Members, as applicable, and the Committee by written notice to the DC Secretary. Such resignation will be effective from the date of effective receipt by the DC Secretary of valid notice and, upon effective resignation from the Committee, a Replacement DC Member will be selected with respect to such Committee in accordance with Section 1.7 (*Replacement*). For the avoidance of doubt, a Participating Institution may not request to resign from only a specific list or the Committee. Upon effective resignation from the Committee, a Participating Institution will be added to the List of Ineligible Institutions for “resignation.” The expiration date for being on the List of Ineligible Institutions for “Resignation” will be the day immediately preceding the second List Review Date immediately following the most recent date of such Participating Institution’s effective removal from the Committee. For the avoidance of doubt, the resignation of a Participating Institution will not result in the removal of such institution from the List of Ineligible Institutions.
- (g) **Reinstatement:** Any institution that has resigned under Section 1.6(f) (*Resignation*) may at any time request to be reinstated to the List of Participating Institutions, the List of Eligible Market-maker

Members and the List of Eligible User Members, as applicable, by written notice to the DC Secretary. Upon effective receipt by the DC Secretary of valid notice, such reinstatement will be immediately effective but, if applicable, such institution will remain an Ineligible Institution until the expiration of all reasons for ineligibility for such institution (including, for the avoidance of doubt, ineligibility for “Resignation”).

- (h) **Maintenance of Market-maker Status:** If any participating Market-maker institution no longer satisfies the definition of “Market-maker” because it is no longer specified as such on the RBI Web site, such Participating Institution will be added to the List of Ineligible Institutions for “Maintenance of Market-maker Status” and the expiration date for being on the List of Ineligible Institutions for “Maintenance of Market-maker Status” will be the date on which it satisfies the definition of “Market-maker”. If such a Participating Institution is added to the List of Ineligible Institutions for “Maintenance of Market-maker Status,” such Participating institution will also be removed from the Committee (if it serves on the Committee at such time) and the List of Eligible Market-maker Members. Upon effective removal of a Participating Institution from the Committee, a Replacement DC Member will be selected in respect of such Committee in accordance with Section 1.7 (*Replacement*).
- (i) **Affiliates and Mergers:** A Convened DC may Resolve by a Majority (i) that one or more institutions (including another Participating Institution) (A) have consolidated or amalgamated with, or merged into, or transferred all or substantially all their assets to, a Participating Institution or (B) are or have become affiliates of a Participating Institution and (ii) the date of such occurrence (following such DC Resolution, such institutions, together, will be an Affiliate Group). The Convened DC Members, if any, that are part of a potential Affiliate Group will not participate in any vote under this Section 1.6(h) (*Affiliates and Mergers*). An Affiliate Group is entitled to one entry on the List of Participating Institutions, the List of Eligible Market-maker Members and the List of Eligible User Members, as applicable, and will, promptly and jointly, notify the DC Secretary of the appropriate Participating Institution to include and the identity and contact information of the joint Authorized Contact(s) of the affiliate group. The DC Secretary will also include only such Participating Institution notified by the Affiliate Group on each other list maintained in accordance with the Rules. In addition, an Affiliate Group will be limited to one voting represen-

tative and one vote for each Convened DC. Any resulting empty position(s) on the Committee will be filled by the Selection of one or more Replacement DC Members in respect of the Committee in accordance with Section 1.7 (*Replacement*). For the avoidance of doubt, the foregoing determinations may be made with respect to events that may have occurred before such Participating Institution being added to the List of Participating Institutions.

- (j) **Removal from the Committee:** Each DC Member that resigns, is replaced or is removed from the Committee will no longer be a DC Member for purposes of the Rules.

1.7 Replacement

- (a) **The Replacement Process:** Each Designated DC Member, Adhered DC Member or DC Member that is to be replaced pursuant to the Rules (each, a Replaced Institution) will be replaced by a Participating Institution (the Replacement DC Member) in accordance with the provisions of this Section 1.7 (*Replacement*).
- (b) **Identifying Eligible Replacement Institutions for Market-maker Members.** If the Replaced Institution is a Designated Market-maker Member, Adhered Market-maker Member or Market-maker DC Member, the DC Secretary will attempt to identify a Replacement DC Member as being an Eligible Market-maker that is:
 - (i) not a Designated Market-maker Member, Adhered Market-maker Member or Market-maker DC Member;
 - (ii) identified in the List of Eligible Market-maker Members as belonging to the same Market-maker category as the relevant Replaced Institution (provided that if there are no such Eligible Market-maker Members, the Replacement DC Member may be identified as belonging to any Market-maker category) and
 - (iii) selected at random by the DC Secretary from (A) those Eligible Market-Makers designated as not having been previously identified to serve on the Committee or (B) if no such Eligible Market-Makers remain, any Eligible Market-Maker, provided that the Replacement DC Member will not be an affiliate of a Market-maker member.
- (c) **Identifying Eligible Replacement Institutions for User Members.** If the Replaced Institution is a Designated User Member, Adhered User Member or User DC Member, the DC Secretary will attempt to identify a Replacement DC Member as being an

Eligible User that is (I) not a Designated User Member, Adhered User Member or User DC Member and (II) selected at random by the DC Secretary from (A) those Eligible Users designated as not having been previously identified to serve on the Committee or (B) if no such Eligible Users remain, any Eligible User, provided that the Replacement DC Member will not be an affiliate of a Market-maker member.

- (d) **Inability to Identify a Replacement DC Member:** If the DC Secretary is unable to identify a Replacement DC Member in accordance with Sections 1.7(b) (*Identifying Eligible Replacement Institutions for Market-maker Members*) or 1.7(c) (*Identifying Eligible Replacement Institutions for User Members*), the DC Secretary will attempt to identify a Replacement DC Member in accordance with the provisions of Section 1.7(e) (*Identifying Ineligible Replacement Institutions*).
- (e) **Identifying Ineligible Replacement Institutions:** Each time that the DC Secretary applies this Section 1.7(e) (*Identifying Ineligible Replacement Institutions*), the DC Secretary will, by reference to the relevant sub-clause of Section 1.7(b) (*Identifying Eligible Replacement Institutions for Market-maker Members*) or 1.7(c) (*Identifying Eligible Replacement Institutions for User Members*) that is applicable based on the position being filled, identify one or more Ineligible Institutions in accordance with the following priority, provided that an Ineligible Institution that is on the List of Ineligible Institutions for “Failure to Execute the Standard Agreement” and/or “Maintenance of Market-Maker Status” will not be so identified:
 - (i) first, the DC Secretary will identify as a potential replacement each Ineligible Institution that (A) would otherwise be selected under the relevant sub-clause but for being an Ineligible Institution, (B) is a Participating Institution and (C) is on the List of Ineligible Institutions solely for “Failure to Pay a FIMMDA Invoice”;
 - (ii) second, to the extent that no Ineligible Institution satisfying sub-clause (i) exists, the DC Secretary will identify as a potential replacement each Ineligible Institution that (A) would otherwise be selected under the relevant sub-clause but for being an Ineligible Institution, (B) is a Participating Institution, (C) is on the List of Ineligible Institutions solely for “Failure to Attend Meetings” and, if applicable, “Failure to Pay a FIMMDA Invoice” and (D) has the least number of entries on the List of Missed Meetings out of such Ineligible Institutions and

- (iii) third, to the extent that no Ineligible Institution satisfying sub-clause (ii) exists, the DC Secretary will identify as a potential replacement each Ineligible Institution that (A) would otherwise be selected under the relevant sub-clause but for being an Ineligible Institution, (B) is a Participating Institution and (C) is on the List of Ineligible Institutions solely for “Resignation” and, if applicable, “Failure to Attend Meetings” and/or “Failure to Pay a FIMMDA Invoice.”

The Replacement DC Member will be selected at random from the Ineligible Institutions identified as potential replacements.

- (f) **Subsequent Replacements:** In the event that a Replacement DC Member selected in accordance with this Section 1.7 (*Replacement*) is currently serving as a Designated DC Member, Adhered DC Member or DC Member immediately before being designated as a Replacement DC Member, the empty position resulting from the operation of this Section 1.7 (*Replacement*) will also be filled in accordance with this Section 1.7 (*Replacement*).
- (g) **Notifying the Replacement DC Member:** Each Replacement DC Member will promptly be notified by the DC Secretary, in writing and/or by telephone, that it has been identified as a Replacement DC Member. For purposes of Section 1.5(b) (*Standard Agreement*), the DC Participation Deadline will be [5:00 p.m.] Indian Standard Time on the day falling 10 Mumbai Business Days immediately following the date of effective receipt by the Replacement DC Member of valid notice from the DC Secretary that such Replacement DC Member has been selected by the DC Secretary as a Replacement DC Member, provided that if a Replacement DC Member identified pursuant to Section 1.7(e) (*Identifying Ineligible Replacement Institutions*) is the same as the Replaced Institution, such Replacement DC Member will not be required to re-execute the Standard Agreement.
- (h) **Proper Designation under the Rules:** For purposes of the Rules, a Replacement DC Member will be considered a Designated Market-maker Member or Designated User Member, as applicable, based on the designation of the position being filled, and the Replaced Institution will no longer be considered as such. If the Replaced Institution was a DC Member immediately before being replaced, the Replacement DC Member will begin its term on the Committee and will be deemed to be a DC Member immediately upon becoming an Adhered DC Member, notwithstanding Section 1.5(c) (*Term of Membership on the Committee*).

- (i) **Failure to Identify a Replacement DC Member.** In the event that, with respect to a Replaced Institution, no Replacement DC Member has been selected under this Section 1.7 (*Replacement*), the Committee will be composed of the remaining DC Members until such time as the DC Secretary is able to fill the empty position(s) through the replacement provisions of this Section 1.7 (*Replacement*).

2. PROCEDURES OF CREDIT DERIVATIVES DETERMINATIONS COMMITTEE

2.1 Convening the Committee

- (a) **Notifying the DC Secretary:** In order to convene the Committee, an Eligible Market Participant must request a meeting of the Committee by notifying the DC Secretary of the issue(s) it believes should be deliberated by such Committee (each, a Potential DC Issue). All requests to the DC Secretary should include a reasonably detailed description of all of the issues that the relevant Eligible Market Participant believes the Committee should deliberate and, if applicable, supporting information that is consistent with the definition of publicly available information. For the avoidance of doubt, a Potential DC Issue regarding the potential occurrence of a credit event may relate to a potential credit event that is not continuing at the time of the request to convene the Committee. The DC Secretary will notify the relevant DC Members of the request for a meeting of the Committee in accordance with Section 2.2(a) (*Notifying the Committee*). Any Potential DC Issue may be withdrawn by the Eligible Market Participant that submitted such Potential DC Issue to the DC Secretary at any time before the earlier of (i) the first meeting at which deliberations are held with respect to such Potential DC Issue and (ii) the time of such first meeting, as determined in accordance with Section 2.4(b) (*Convening the Committee for the First Time*), without regard to any deferral of such meeting by the Convened DC Members. Any such withdrawal will constitute a dismissal of such Potential DC Issue for purposes of the Definitions (but, for the avoidance of doubt, will not constitute a rejection, or deemed rejection, of such Potential DC Issue for purposes of Section 2.5(a) (*General Interest Questions*)). Any Potential DC Issue may be designated as a “General Interest Question” by the Eligible Market Participant submitting such Potential DC Issue (a General Interest Question), in which case the identity of such Eligible Market Participant will

not be disclosed by the DC Secretary. For the avoidance of doubt, each Potential DC Issue that has been designated as a General Interest Question will be treated in the same manner as any other Potential DC Issue under the Rules, unless otherwise specified herein.

- (b) **Publicly Available Information:** For each Potential DC Issue relating to whether a credit event has occurred, the Committee may not deliberate the issue until such Committee determines, in accordance with Section 3.1(a) (*Publicly Available Information Resolution*), that publicly available information has been provided to the DC Secretary; provided that (i) the references to “a party” or “the parties” in Section 3.5(a) of the Definitions will be deemed to refer to the Eligible Market Participant submitting the information, (ii) the references to “Credit Event Notice” in Section 3.5(a) of the Definitions will be deemed to refer to requests submitted to the DC Secretary, (iii) for purposes of Section 3.5(a)(i) of the Definitions, the Specified Number is two and (iv) the reference to Buyer and Seller in Section 3.5(b) of the Definitions will be deemed to refer to the Eligible Market Participant submitting the information and the DC Secretary, respectively. Each Eligible Market Participant submitting information to the DC Secretary will be deemed to represent and warrant that such information has been disclosed and can be made public without violating any law, agreement or understanding regarding the confidentiality of such information and the DC Secretary and each DC Member may rely on such representation in addition to the assumption of Section 3.5(c) of the Definitions.
- (c) **Convening the DC Members:** Following effective receipt of a request for a meeting of the Committee, the DC Secretary will convene the relevant DC Members (each such DC Member, with respect to a Convened DC, a Convened DC Member).
- (d) **Reducing the Size of the Convened DC in Certain Situations:** If, with respect to the Committee, fewer than seven Convened DC Members that are Market-maker DC Members are identified by the DC Secretary under Section 2.1(c) (*Convening the DC Members*) following effective receipt of a request for a meeting of the Committee, the following provisions will apply:
 - (i) the number of Convened DC Members that are Market-maker DC Members will be subtracted from the number seven (such result, the Market-maker Shortage) and
 - (ii) the Market-maker shortage will be divided by [1.75] and rounded [down] to the nearest whole number (such result, the User Reduction Amount).

The number of Convened DC Members that are User DC Members will be reduced by an amount equal to the User Reduction Amount. The DC Secretary will select each User DC Member to be removed from the Convened DC at random from the User DC Members that have not been previously designated as a Removed User, and each such User DC Member will be immediately removed from the Convened DC upon effective receipt by the relevant User DC Member of valid written notice from the DC Secretary (such User DC Member, a Removed User). For purposes of this sub-clause, once each User DC Member has been designated as a Removed User, the DC Secretary will reset the designations described above so that each User DC Member will be deemed to have not been previously designated as a Removed User.

[Working Group: If there are less than four Users, should the number of Market-makers be reduced proportionately? There is no equivalent provision in the offshore DC Rules.]

2.2 Notifying the Committee and Determining the DC Questions

- (a) **Notifying the Committee:** Following the identification of the relevant DC Members in accordance with Section 2.1(c) (*Convening the DC Members*) (the Committee composed by such Convened DC Members, a Convened DC), the DC Secretary will promptly notify, in writing (including by email) and/or by telephone, the Authorized Contact(s) of each Convened DC Member of each Potential DC Issue, provided that if the DC Secretary effectively receives two substantially similar Potential DC Issues on or around the same time on the same calendar day (as determined by the DC Secretary in its sole discretion), at least one of which is submitted by a Convened DC Member, the DC Secretary may, in its sole discretion, decide not to notify such Authorized Contacts of the Potential DC Issue submitted by the Convened DC Member and instead request such Convened DC Member to agree to deliberate the other substantially similar Potential DC Issue. In circumstances where such Convened DC Member does not agree to deliberate the other substantially similar Potential DC Issue, the DC Secretary will promptly notify, in writing (including by email) and/or by telephone, the Authorized Contact(s) of each Convened DC Member of the Potential DC Issue submitted by such Convened DC Member.

In order to hold a meeting of a Convened DC to deliberate a Potential DC Issue, at least one Convened DC Member must have agreed to deliberate such Potential DC Issue by notifying the DC Secretary, provided that, with respect to a Potential DC Issue that has been designated as a General Interest Question, at least two Convened DC Members must have agreed to deliberate such Potential DC Issue (in either case, such agreed Potential DC Issue, a DC Issue). In instances where a Convened DC Member proposes a Potential DC Issue to be deliberated by a Convened DC, such Convened DC Member will count towards satisfying the applicable agreement requirements specified in the immediately preceding sentence. The DC Secretary will not disclose the identity of any Convened DC Member that agrees to deliberate a Potential DC Issue. If the DC Secretary does not effectively receive agreement from the required number of Convened DC Members to deliberate a Potential DC Issue by [5:00 p.m.] Indian Standard Time on the [second] Mumbai Business Day immediately following the date on which the DC Secretary notified the Convened DC Members of such Potential DC Issue in accordance with this Section 2.2(a) (*Notifying the Committee*), such Potential DC Issue will be deemed to have been rejected by the Convened DC. In each instance where a Potential DC Issue is deemed to have been rejected, the DC Secretary will publish notice on its Web site in accordance with Section 2.5(d)(iv) (*Publication on the DC Secretary Web site*). For the avoidance of doubt, the Committee may refuse to consider a Potential DC Issue that is merely a matter of bilateral dispute solely between two Eligible Market Participants.

- (b) **Determining and Rephrasing the DC Questions:** With respect to a Convened DC, the DC Secretary will form the meeting agenda by phrasing specific questions for each of the DC Issues (each, a DC Question) in order to allow the Convened DC to make each determination that a Convened DC is permitted to make under the Rules. Where applicable, DC Questions should be phrased in order to resemble, as closely as practicable, the standard format of the relevant question in 0 to the Rules; provided that the relevant question in 0 may be broken down into component questions for a specific DC Issue, which will each constitute a DC Question for purposes of the Rules. For example, whether Failure to Pay has occurred would be a component of the question of whether a credit event has occurred. Furthermore, whether an obligation satisfies the Not Contingent Deliverable Obligation Characteristic would be

a component of the question of whether an obligation is a Deliverable Obligation. Similarly, whether an event results from a deterioration in the creditworthiness or financial condition of a reference entity would be a component question of whether a restructuring has occurred. DC Questions relating to DC Issues that fall under Section 3.6 (*Other Determinations Relating to the Overall Indian Market*) should be phrased as “yes” or “no” questions to the extent practicable and will, as equitably as practicable, not be framed in a manner as to be suggestive of any given result. The DC Secretary may, whenever it deems necessary, solicit additional information from the Convened DC Members for purposes of phrasing a DC Question. A Convened DC may Resolve by a Majority to rephrase, with respect to a DC Question, the phrasing determined by the DC Secretary.

2.3 Quorum, Participation and Voting Procedures for a Convened DC

- (a) **Quorum:** A Convened DC will not engage in any deliberations or take any vote unless a Quorum is obtained. If a Quorum is not obtained at the first meeting of a Convened DC, such Convened DC will reconvene at [9:00 a.m.] Indian Standard Time on the immediately following Mumbai Business Day and, in each case, every 24 hours after the first meeting (provided that the Convened DC will only reconvene on a Mumbai Business Day) until a Quorum is obtained. If a Quorum is not obtained at any subsequent meeting of the Convened DC, additional meetings will be scheduled in accordance with Section 2.4(a) (*Meetings of the Convened DC*). At least 80% of the Convened DC Members, of whom at least [two] are User DC Members, must be present (either in person or by telephone, videoconference or Web conference) to engage in any deliberations or take any vote at a meeting of a Convened DC (such requirement, the 80% Requirement); provided that, if the 80% Requirement is not satisfied at any meeting of the Convened DC, (i) at least 60% of the Convened DC Members, without regard to the number of User DC Members included in such 60%, must be present for the next meeting and all subsequent meetings of such Convened DC (such requirement, the 60% Requirement) and (ii) if the 60% Requirement is not satisfied at a relevant meeting, at least 50% of the Convened DC Members, without regard to the number of User DC Members

included in such 50%, must be present for all subsequent meetings of such Convened DC (such applicable required threshold, the Quorum).

- (b) **Voting and Participation:** Each Convened DC Member will have one vote on a Convened DC. Each Convened DC Member is required to vote in all binding votes held by the Convened DC, subject to the abstention provisions of Section 2.3(c) (*Abstention*).
- (c) **Abstention:** If a Convened DC Member, or any of its affiliates is the Affected Reference Entity, such Convened DC Member may decide not to participate and will not vote in any meeting of such Convened DC, notwithstanding Section 2.3(b) (*Voting and Participation*). For the avoidance of doubt, each Convened DC Member abstaining under this Section 2.3(c) (*Abstention*) will not be added to the List of Missed Meetings for such failure to vote or such failure to be present at a meeting where a binding vote is held with respect to such Convened DC Member or affiliate thereof, as applicable, and will not be included in any relevant voting threshold or Quorum determination under the Rules. For the avoidance of doubt, if a Convened DC Member is present at a meeting where neither such Convened DC Member nor any of its affiliates is an Affected Reference Entity in respect of such Convened DC and such Convened DC Member does not vote in any binding vote of such Convened DC in contravention of Section 2.3(b) (*Voting and Participation*), the DC Secretary will enter the name of such Convened DC Member on the List of Missed Meetings in accordance with Section 1.6(d) (*Failure to Attend Meetings*), as if such Convened DC Member had failed to attend the relevant meeting of such Convened DC.
- (d) **Voting Representative:** Each Convened DC Member must choose one individual to cast votes on its behalf before a Convened DC. Such individual must be able to cast votes on behalf of the relevant Convened DC Member at any time without further consultation or approval of any other member or officer of such Convened DC Member or its affiliates. Any individual purporting to represent a Convened DC Member before a Convened DC will be deemed to have validly exercised such Convened DC Member's vote unless the DC Secretary has actual knowledge that the relevant individual is not authorized to bind the relevant Convened DC Member in a vote of the Convened DC, in which case such Convened DC Member will be deemed to have failed to have voted and an entry with respect to such Convened DC Member will be added to the List of

Missed Meetings. For the avoidance of doubt, more than one representative of a Convened DC Member may participate in the discussions of a Convened DC and, subject to appropriate authorization of the relevant Convened DC Members, a single individual may exercise the vote of more than one Convened DC Member.

2.4 Procedures of a Convened DC

- (a) **Meetings of the Convened DC:** [Meetings of the Convened DC may be held in [person, by telephone, by videoconference and/or by Web conference]; provided that a Convened DC Member may participate by telephone in any meetings of the Convened DC. Following the first meeting of a Convened DC scheduled under Section 2.4(b) (*Convening the Committee for the First Time*), subsequent meetings may be convened either (i) by a Majority, which may specify an alternate location or method of meeting or (ii) by the DC Secretary by providing the Convened DC Members with the equivalent notice as would be required under Section 2.4(b) (*Convening the Committee for the First Time*) for convening the initial meeting of the Convened DC (determined for purposes of this provision as if agreement to deliberate a Potential DC Issue was effectively received at the moment notice of the subsequent meeting is provided to the Convened DC Members by the DC Secretary), unless an earlier meeting time is determined by the DC Secretary, in its sole discretion, to be required in order to comply with a deadline imposed by these Rules. In the event that a meeting of a Convened DC is to be held in person, it will be held in [Mumbai] [and may be held at the DC Secretary's offices in Mumbai]. Deliberations of a Convened DC can occur at any time among the Convened DC Members by email. Convened DC Members may deliberate any of the DC Questions at any meeting of the Convened DC.
- (b) **Convening the Committee for the First Time:** Following receipt by the DC Secretary under Section 2.1(a) (*Notifying the DC Secretary*) of a request for the DC Secretary to convene a meeting of the Committee and upon the satisfaction of the requirements of Section 2.2(a) (*Notifying the Committee*), the DC Secretary will give notice to the Authorized Contact(s) of each Convened DC Member, in writing (including by email) and/or by telephone, (i) that a meeting of the Committee is to take place in person, by telephone, by videoconference and/or by Web conference, (ii) the time, place and/or confer-

ence call details, as applicable, of such meeting and (iii) the relevant DC Question(s). Upon effective receipt by the DC Secretary at or before [4:00 p.m.] Indian Standard Time on a Mumbai Business Day of (A) valid notice of the agreement of the requisite number of Convened DC Members to deliberate a Potential DC Issue under Section 2.2(a) (*Notifying the Committee*) or (B) a request from a Convened DC Member that the DC Secretary convene a meeting under Section 2.1(a) (*Notifying the DC Secretary*) with respect to a potential DC Issue that such Convened DC Member has not designated as a General Interest Question, the time of the meeting of the Committee will be [9:00 a.m.] Indian Standard Time on the [second] Mumbai Business Day immediately following such effective receipt by the DC Secretary unless modified by the Convened DC Members in accordance with this Section 2.4(b) (*Convening the Committee for the First Time*). Otherwise, the time of the meeting of the Committee will be [9:00 a.m.] Indian Standard Time on the [third] Mumbai Business Day immediately following such effective receipt by the DC Secretary, unless modified by the Convened DC Members in accordance with this Section 2.4(b) (*Convening the Committee for the First Time*). The Convened DC Members may agree by unanimity to meet for purposes of holding a binding vote with respect to a DC Question at an earlier time than otherwise provided for in the Rules or may agree by Supermajority to defer holding the first meeting to deliberate the relevant DC Question for a period of time or otherwise meet in an alternate manner than as provided for in this Section 2.4(b) (*Convening the Committee for the First Time*).

- (c) **Dismissing a Particular DC Question:** A Convened DC may Resolve to dismiss a DC Question, for any reason, by a Supermajority. For the avoidance of doubt, the dismissal of a DC Question will not constitute a DC Resolution with respect to whether or not the matter referenced in such DC Question has occurred, exists or is satisfied and, for the avoidance of doubt, will not constitute a rejection, or deemed rejection, of such DC Question for purposes of Section 2.5(a) (*General Interest Questions*).
- (d) **Binding Votes:** A binding vote is necessary in order to Resolve any DC Question and will be taken whenever a Majority of the Convened DC Members participating in a meeting of a Convened DC request a binding vote and a Quorum has been obtained for such meeting. Unless otherwise specified in the Rules, a Convened DC must hold a binding vote on each DC Question by [5:00 p.m.] Indian Standard Time on the [second] Mumbai Business Day after the

day on which the first meeting at which such DC Question was deliberated is held. For the avoidance of doubt, a Convened DC may not commence deliberations in respect of a DC Question until a separate but related DC Question completes External Review. Notwithstanding the above, the Convened DC may Resolve by a Supermajority to extend the deadline for holding a binding vote with respect to any DC Question. During a meeting of a Convened DC, the Convened DC Members may agree by Majority to hold a binding vote by email (a Mandatory Email Vote). Once the Convened DC Members agree to hold a Mandatory Email Vote, a vote must be submitted within [twenty-four hours] of such agreement in order to be counted, provided that the Convened DC may alter this timing when agreeing to hold a Mandatory Email Vote. In addition, the Convened DC Members may, at any time, hold a binding vote by email without previously agreeing to do so (a Non-mandatory Email Vote), provided that the failure of a Convened DC Member to submit an email vote in respect of a Non-mandatory Email Vote will not result in such Convened DC Member being entered on the List of Missed Meetings in accordance with Section 1.6(d) (*Failure to Attend Meetings*). For purposes of either a Mandatory Email Vote or a Non-mandatory Email Vote, a DC Question will be considered Resolved once (i) the applicable voting threshold with respect to such DC Question has been satisfied and (ii) a Quorum satisfying the 80% Requirement is obtained by reference to the email votes effectively received, provided that votes will be accepted by the DC Secretary, and any related DC Resolution will not be published by the DC Secretary pursuant to 2.5(d)(iii) (*Publication on the DC Secretary Web site*), until any deadline established for the relevant Mandatory Email Vote or Non-mandatory Email Vote, as applicable, has expired.

- (e) **Adding DC Issues:** Any Eligible Market Participant [via the DC Secretary in accordance with the procedural requirements of Section 2.1(a) (*Notifying the DC Secretary*)] or any Convened DC Member may request, at any time before the Convened DC has Resolved all of the DC Questions with respect to all DC Issues for which such Convened DC has been convened, that an additional Potential DC Issue be deliberated by such Convened DC. Such additional Potential DC Issue should relate to an Affected Reference Entity and/or its affiliates and may relate to any determination that the Convened DC is permitted to make under Section 3 (*Resolutions of a Convened DC*). Upon effective receipt of a request for an additional Potential

DC Issue to be deliberated by a Convened DC, the DC Secretary will follow the procedures of Section 2.2(a) (*Notifying the Committee*) and 2.2(b) (*Determining and Rephrasing the DC Questions*), as if the request for an additional Potential DC Issue to be deliberated by such Convened DC was a request for the DC Secretary to convene a meeting of a Committee, and will forward each request in substantially the same form as the request was originally submitted.

- (f) **Outside Discussions:** Subject to Sections 4.5(a) (*Advocates*) and 5.2(a) (*Confidentiality*), a Convened DC Member may engage in any communication with another Convened DC Member outside of the Convened DC.
- (g) **Completing the Agenda:** Upon disposing of all of the DC Questions being deliberated by a Convened DC by either Resolving or dismissing such DC Questions, such Convened DC will dissolve.

2.5 General Provisions

- (a) **General Interest Questions:** Following (i) satisfaction of the agreement requirements with respect to a General Interest Question in accordance with Section 2.2(a) (*Notifying the Committee*) and (ii) publication of notice of the Committee being convened following satisfaction of such agreement requirements in accordance with Section 2.5(d) (*Publication on the DC Secretary Web site*), any Convened DC Member may require the DC Secretary to instruct such counsel that the DC Secretary may have appointed from time to time in accordance with Section 2.5(e) (*Third-Party Advice and Legal Sub-Committees*) to present a summary of the issues pertinent to the determination of the General Interest Question and neither the DC Secretary nor such counsel will disclose the identity of the Convened DC Member(s) that requested such summary. Any General Interest Question that has been rejected, or deemed to have been rejected, by a Convened DC may not be re-submitted for consideration by an Eligible Market Participant unless new information or analysis with respect to such General Interest Question that was not previously presented to the Convened DC becomes known and is included in any subsequently submitted request to the DC Secretary. For the avoidance of doubt, in any such subsequently submitted request, the relevant potential DC Question may, but need not, be designated as a General Interest Question. Nothing in Section 2.1(a) (*Notifying the DC Secretary*), Section 2.2(a) (*Notifying the Committee*) or this Section 2.5(a) (*General Interest Questions*) purports to

affect any obligation of the DC Secretary to disclose any information as may be required of the DC Secretary by applicable law, regulation or court order.

- (b) **DC Resolutions:** Each DC Member will perform its obligations under the Rules in a commercially reasonable manner in Resolving a DC question and will base its vote on information that is either public or can be published by the Convened DC in accordance with Section 2.5(d)(v) (*Publication on the DC Secretary Web site*); provided that neither the DC Secretary nor any DC Member is under any obligation to research, investigate, supplement, or verify the veracity of, any information on which the Convened DC bases its Decision. Each DC Question will be Resolved based on the provisions of the Definitions (taking into consideration any amendments thereto contemplated in the relevant DC Question) or the provisions of such other documents as contemplated in the relevant DC Question and each DC Resolution will only apply to Relevant Transactions for which the relevant provisions are not materially inconsistent with such provisions in the Definitions (including any such amendments) or such other documentation and notwithstanding the use of terms in the Rules that are defined in the Definitions. To the extent practicable, each DC Resolution should be as specific as possible as to what was Resolved. A DC Question that has been Resolved, including following a decision of the relevant External Reviewers, may not be re-deliberated or voted on again by a Convened DC, except (i) if new information that was not previously known to the Convened DC becomes known to the Convened DC with respect to such DC Question and (ii) subject to Section 9.1(c) (iii) of the Definitions.
- (c) **No Reversal of Explicit Agreement:** A DC Resolution will have effect from the time such DC Resolution is published by the DC Secretary in accordance with Section 2.5(d) (*Publication on the DC Secretary Web site*), unless the DC Resolution specifies an alternate date of effectiveness. Notwithstanding the above, no DC Resolution will have retroactive effect with respect to a Relevant Transaction by overruling any inconsistent determination explicitly agreed to between the parties under, and made in accordance with, the terms of such Relevant Transaction.
- (d) **Publication on the DC Secretary Web site:** The DC Secretary will promptly publish on its Web site:
 - (i) (A) each request that the DC Secretary receives in accordance with Section 2.1(a) (*Notifying the DC Secretary*), other than a Potential DC Issue that the DC Secretary considers is sub-

- stantially similar to another Potential DC Issue pursuant to Section 2.2(a) (*Notifying the Committee*), (B) in circumstances where the Potential DC Issue specified in any such request has not been designated as a General Interest Question, the identity of the Eligible Market Participant that submitted such request and (C) each piece of supporting information submitted with such request;
- (ii) notice of the Committee being convened under Section 2.4(b) (*Convening the Committee for the First Time*) following agreement by the requisite number of Convened DC Members to deliberate one or more Potential DC Issues in accordance with Section 2.2(a) (*Notifying the Committee*) and the relevant DC Questions for such Convened DC;
 - (iii) subject to Section 4.2(c) (*Approval and Adherence*), each binding vote of a Convened DC, the DC Question or issue corresponding to such binding vote, the identity and vote of each Convened DC Member with respect to such binding vote and whether the DC Question has been Resolved or is being referred to External Review, as applicable;
 - (iv) any Decision by a Convened DC not to deliberate a Potential DC Issue in accordance with Section 2.2(a) (*Notifying the Committee*) or dismiss a DC Question under Section 2.4(c) (*Dismissing a Particular DC Question*) and
 - (v) any information relating to the deliberations of a Convened DC that such Convened DC Resolves by a Majority to publish, acting in a commercially reasonable manner.
- (e) **Third-Party Advice and Legal Sub-Committees:** A Convened DC may Resolve to solicit information, advice or commentary from any third party by a Majority. Legal counsel or third-party professionals may be hired, if necessary, by (i) a Convened DC by a Majority, (ii) Convened DC Members and/or (iii) the DC Secretary at any time to assist in the performance of their respective duties under the Rules. A Convened DC may also Resolve by a Majority to form legal sub-committees, composed of each Convened DC Member of the Convened DC, to consider questions relevant to the Indian credit derivatives market generally. The Convened DC Members comprising any such legal sub-committee will enjoy the applicable rights and be bound by the applicable obligations set forth in Section 5.1 (*Waivers and Disclaimers*) and Section 5.2(a) (*Confidentiality*) as though the meetings of such legal sub-committee were meetings of the Convened DC.

3. RESOLUTIONS OF A CONVENED DC

3.1 Credit Event Resolutions

- (a) **Publicly Available Information Resolution:** A Convened DC may Resolve, with respect to an Affected Reference Entity, by a Majority, the date on which the DC Secretary first effectively received both a request to convene the Committee for a DC Question falling under this Section 3.1 (*Credit Event Resolutions*) and publicly available information that satisfies the requirements of Section 2.1(b) (*Publicly Available Information*) for purposes of such DC Question; provided that (i) determinations of effectiveness of notices for purposes of this clause will be determined in accordance with Section 1.10 of the Definitions and (ii) each reference to “Calculation Agent City time” and “Calculation Agent City Business Day” will be deemed to refer to “Indian Standard Time” and “Mumbai Business Day” (such DC Resolution, a Credit Event Request Resolution).
- (b) **Credit Event Resolution:** Following a Credit Event Request Resolution, a Convened DC may Resolve, with respect to an Affected Reference Entity, by a Supermajority:
 - (i) whether a credit event of the type referenced in the relevant DC Question has occurred and
 - (ii) if applicable, the date of the occurrence of such credit event, by reference to Indian Standard Time (such DC Resolution, together with the related Credit Event Request Resolution, a Credit Event Resolution).

3.2 Succession Event Resolutions

- (a) **Succession Event Request:** A Convened DC may Resolve, with respect to an Affected Reference Entity, by a Majority, the date on which the DC Secretary first received a request to convene the Committee for a DC Question falling under this Section 3.2 (*Succession Event Resolutions*); provided that (i) determinations of effectiveness of notices for purposes of this clause will be determined in accordance with Section 1.10 of the Definitions and (ii) each reference to “Calculation Agent City time” and “Calculation Agent City Business Day” will be deemed to refer to “Indian Standard Time” and “Mumbai Business Day”, respectively (such DC Resolution, a Succession Event Request Resolution).

- (b) **Occurrence of a Succession Event:** A Convened DC may Resolve, with respect to an Affected Reference Entity, by a Supermajority:
- (i) whether an event that is a succession event has occurred (such DC Resolution, a **Succession Event Occurrence Resolution**) and
 - (ii) the legally effective date of any such succession event (such DC Resolution, together with the related succession event occurrence resolution and the related succession event request resolution, a Succession Resolution).
- (c) **Identity of the Successor(s):** Following a Succession Resolution, the Convened DC (i) will reconvene at [9:00 a.m.] Indian Standard Time (or, if later, immediately upon Resolving the legally effective date of the succession event under sub-clause (B) below) on the later of (A) the Mumbai Business Day occurring on or immediately following the day that falls 30 calendar days after the date that the Convened DC Resolves to be the legally effective date of the succession event and (B) the Mumbai Business Day on which such Convened DC Resolves the legally effective date of the succession event and (ii) at such reconvening, may Resolve by a Majority to take no action on such date and to reconvene at [9:00 a.m.]. Indian Standard Time on the day that falls [3] Mumbai Business Days thereafter (the later of (i) or (ii), as applicable, the Reconvening Date). On the Reconvening Date, the Convened DC may Resolve, notwithstanding the definition of best available information and solely on the basis of information that is publicly available as of the Reconvening Date, with respect to an Affected Reference Entity, by a Supermajority:
- (i) the relevant obligation(s) of the Affected Reference Entity, if any;
 - (ii) the outstanding principal balance of any relevant obligation(s) and
 - (iii) the proportion of the relevant obligation(s) to which each purported successor succeeds.

Following, and by reference to the DC Resolutions under Sections 3.2(c)(i), (ii) and (iii) [*Identity of the Successor(s)*], the Convened DC will Resolve the identity of the successor(s) by a Majority.

In any instance where a Reviewable Question falling under this Section 3.2(c) [*Identity of the Successor(s)*] is returned to the Convened DC by the External Reviewers under Section 4.6(a) (*Returning the Reviewable Question to the Convened DC*), the Reconvening Date will

be deemed to be the date on which the Convened DC first deliberates the returned Reviewable Question.

3.3 Substitute Reference Obligation Resolutions

Substitute Reference Obligations: A Convened DC may Resolve, with respect to an Affected Reference Entity, by a Supermajority:

- (i) whether circumstances have occurred in respect of one or more Relevant Transactions that require a substitute reference obligation to be identified and
- (ii) any substitute reference obligation, while preserving the economic equivalent, as closely as practicable, of the delivery and payment obligations of two hypothetical parties to a Relevant Transaction that would be affected by the identification of a substitute reference obligation.

3.4 Merger of Reference Entity and Transaction Party or of Transaction Parties

A Convened DC may Resolve by a Supermajority whether:

- (i) a transaction party or the Affected Reference Entity has consolidated or amalgamated with, or merged into, or transferred all or substantially all its assets to, the Affected Reference Entity or the transaction party, as applicable, or that transaction party and the Affected Reference Entity have become affiliates;
- (ii) a transaction party has consolidated or amalgamated with, or merged into, or transferred all or substantially all its assets to, the other transaction party, or the transaction parties have become affiliates or
- (iii) a transaction party is a related party in respect of the other transaction party or in respect of the Affected Reference Entity, in each case, at the time that the Relevant Transaction was entered into.

3.5 Reference Obligation Criteria

A Convened DC may Resolve by a Supermajority whether an obligation of the Affected Reference Entity satisfied the requirements of the definition of reference obligation as set out in the Definitions.

3.6 Other Determinations Relating to the Overall Indian Market

Any other matter of contractual interpretation relevant to the Indian credit derivatives market generally (that is not merely a matter of bilateral dispute solely between two Eligible Market Participants) may be Resolved by a Supermajority, separately, of the Committee, as determined by the DC Secretary. For the avoidance of doubt, the relevant Convened DC Members may engage in consultations with other market participants for purposes of Resolving the relevant DC Question.

4. EXTERNAL REVIEW

4.1 Referral to External Review

- (a) **Eligible DC Questions for Review:** Any DC Question relating to DC Resolutions under Sections 3.1(b) (*Credit Event Resolution*), 3.2(b)(i) or 3.2(b)(ii) (*Occurrence of a Succession Event*), 3.2(c)(i), 3.2(c)(ii) or 3.2(c)(iii) [*Identity of the Successor(s)*], 3.3 (*Substitute Reference Obligation Resolutions*) or 3.4 (*Merger of Reference Entity*) and or 3.5 (*Reference Obligation Criteria*) will be referred to the External Review process described in this Section 4 (*External Review*) (such process, External Review) if a Convened DC holds a binding vote on, but is unable to Resolve by a Supermajority, such DC Question (such DC Question, an Eligible Review Question). Furthermore, any DC Question relating to DC Resolutions under Section 3.6 (*Other Determinations Relating to the Overall Indian Market*) will be referred to External Review if a Convened DC Resolves by a Majority to send such DC Question to External Review. The referral of an Eligible Review Question will occur at such time when there are at least three External Reviewers selected in accordance with Section 4.3(a) (*Conflicts*) and Section 4.3(b) (*Selection of External Reviewers*).
- (b) **Forming Reviewable Questions:** Upon referral of an Eligible Review Question to the DC Secretary for External Review in accordance with Section 4.1(a) (*Eligible DC Questions for Review*), the DC Secretary will rephrase such Eligible Review Question in order to resemble, where applicable, the standard format of the relevant Reviewable Question in 0 to the Rules; provided that the phrasing may be modified to accurately reflect an Eligible Review Question that is a component question of the relevant Reviewable Question

in 0 (each such rephrased Eligible Review Question, a **Reviewable Question**). Each Eligible Review Question falling under Sections 3.1(b)(ii) (*Credit Event Resolution*), 3.2(b)(ii) (*Occurrence of a Succession Event*), 3.2(c)(ii) or 3.2(c)(iii) [*Identity of the Successor(s)*], in accordance with the applicable standard format for Reviewable Questions specified in 0 to the Rules, will include the two answers that were supported by the most Convened DC Members during the binding vote held by the Convened DC with respect to the DC Question corresponding to such Eligible Review Question; provided that, if the number of votes in favor of either of the two answers that were supported by the most Convened DC Members is tied with one or more other answers, all such tied answers will be included in such Eligible Review Question. Each Eligible Review Question falling under Section 3.6 (*Other Determinations Relating to the Overall Indian Market*) will be phrased in the manner Resolved by the Convened DC.

- (c) **Presented Positions:** The positions to be presented to the External Reviewers (each, a Presented Position) with respect to any Reviewable Question will be as follows:
 - (i) in the case of a Reviewable Question phrased to be answered either “yes” or “no,” the Presented Positions will be the respective arguments in favor of the “yes” and “no” answers and
 - (ii) in the case of a Reviewable Question not phrased to be answered either “yes” or “no,” the Presented Positions will consist of the arguments in favor of the two answers that were supported by the most Convened DC Members during the binding vote held by the Convened DC with respect to such Reviewable Question; provided that, if the number of votes in favor of either of the two answers that were supported by the most Convened DC Members is tied with one or more other answers, all such tied answers will be included as Presented Positions.
- (d) **Publishing Reviewable Questions:** All Reviewable Questions will be promptly published by the DC Secretary on its Web site, along with the answer relating to each Presented Position and the Submission Deadline with respect to such Reviewable Question.

4.2 Pool Members

- (a) **Terms of Engagement:** The DC Secretary will cause to have in place standard Terms of Engagement, pursuant to which Pool Members

and the DC Secretary will acknowledge and agree to their respective rights and responsibilities as described in the Rules (the Terms of Engagement). The Terms of Engagement will include provisions to pay compensation to External Reviewers and will allow Pool Members to rescue themselves from External Review in situations where they believe a potential conflict of interest exists. The DC Secretary and a Pool Member may agree at any time to extend the term of the Terms of Engagement with respect to such Pool Member rather than allowing the Terms of Engagement to expire with respect to such Pool Member.

- (b) **Nominating Pool Members:** Any FIMMDA Member may nominate one or more individuals to be a Pool Member by notice to the DC Secretary of each such nomination (each such individual, a Potential Pool Member). Each nomination notified to the DC Secretary will be deliberated for purposes of confirming the nomination in accordance with Section 4.2(c) (*Approval and Adherence*) the next time a meeting of a Convened DC is convened; provided that the DC Secretary may convene a Convened DC once per month solely for the purpose of deliberating Potential Pool Member nominations. An individual nominated to be a Potential Pool Member must be willing to provide a resume, biography or other background materials requested by the DC Secretary or the Convened DC in order to permit the Convened DC to deliberate.
- (c) **Approval and Adherence:** A Potential Pool Member will be able to participate in External Review only after (i) a Convened DC Resolves to confirm the nomination of the relevant individual as a Potential Pool Member by a Majority; provided that a Convened DC may not confirm the nomination of an individual that is a current employee of either a DC Member or an affiliate of a DC Member and (ii) such Potential Pool Member adheres to the Terms of Engagement described in Section 4.2(a) (*Terms of Engagement*) (each such approved and adhering Potential Pool Member, a Pool Member). Notwithstanding Section 2.5(d) (*Publication on the DC Secretary Web site*), the DC Secretary will not publish the binding vote taken for purposes of confirming a Potential Pool Member.
- (d) **External Review Panel List:** The DC Secretary will maintain a list of all Pool Members (the External Review Panel List). The DC Secretary will publish the members of each External Review Panel List from time to time on its Web site. Any Pool Member may resign from an External Review Panel List at any time upon effective receipt by the DC Secretary of valid written notice from such Pool Member.

- (e) **Removal:** A Convened DC may Resolve to remove a Pool Member by a Majority; provided that a Pool Member that is currently serving as an External Reviewer may be removed from the External Review Panel only for fraud, willful misconduct or voluntary breach of an express term of the Terms of Engagement (Cause). Following a DC Resolution to remove a Pool Member, the Terms of Engagement with respect to the relevant Pool Member will terminate upon effective receipt by such Pool Member of valid written notice from the DC Secretary.

4.3 Composition of the External Review Panels

- (a) **Conflicts:** Upon the existence of an Eligible Review Question, any Convened DC Member may identify any Pool Member from the External Review Panel List for purposes of analyzing their availability and potential conflicts of interest with respect to such Eligible Review Question (each such Pool Member, a Potential External Reviewer). Each Potential External Reviewer will notify the Convened DC, via the DC Secretary, by [5:00 p.m.] Indian Standard Time on the [first] Mumbai Business Day after being designated a Potential External Reviewer or such other time as the Convened DC Resolves by a Majority, of its availability and disclose to the Convened DC any conflict of interest which exists or is foreseeable with respect to either the Reviewable Question or the related DC Questions which may be deliberated by the Convened DC. Any Convened DC Member may also raise an existing or potential conflict of interest with respect to a Potential External Reviewer or may ask for additional information to be disclosed.
- (b) **Selection of External Reviewers:** Following the disclosure of availability and potential conflicts of interest in accordance with Section 4.3(a) (*Conflicts*), the Convened DC may Resolve by [unanimity] to select up to five Potential External Reviewers (of which the fourth and fifth, if any, will be designated as the first and second alternate, respectively). If the Convened DC fails to select a total of five Potential External Reviewers [and Resolves by a Majority to have the DC Secretary select the remaining Potential External Reviewers required, the DC Secretary will select, at random, the number of remaining Potential External Reviewers necessary in order to reach a total of five selected Potential External Reviewers] (or all remaining

Potential External Reviewers if there are fewer than five in total) (of which the fourth and fifth, if any, will be designated as the first and second alternate, respectively), provided that each Potential External Reviewer selected by the DC Secretary can be dismissed by the Convened DC resolving by a Majority. The Convened DC may also follow the procedures in Section 4.3(a) (*Conflicts*) and this Section 4.3(b) (*Selection of External Reviewers*) to select additional Potential External Reviewers as necessary at any time during External Review to maintain three External Reviewers on the External Review Panel and up to two alternates. For purposes of the Rules, each Potential External Reviewer that (i) is not designated as an alternate and (ii) is either (A) selected by unanimity by the Convened DC or (B) is selected at random by the DC Secretary and is not dismissed by the Convened DC in accordance with this Section 4.3(b) (*Selection of External Reviewers*) will be an External Reviewer and upon the existence of three External Reviewers, an External Review Panel will be deemed to have been formed.

- (c) **Resignation:** Any Potential External Reviewer may resign from being considered under Section 4.3(a) (*Conflicts*) for an External Review Panel due to unavailability or an existing or potential conflict of interest and any External Reviewer may resign from an External Review Panel due to an existing or potential conflict of interest. Such resignation will be effective upon effective receipt by the DC Secretary of valid written notice from such Potential External Reviewer or External Reviewer, as applicable.
- (d) **Scope of the External Review Panel:** Each External Review Panel formed with respect to a Reviewable Question will also review any other Reviewable Questions originating from the same Convened DC. For the avoidance of doubt, the External Review Schedule will apply separately with respect to each Reviewable Question but, if possible, the External Reviewers should group two or more Reviewable Questions together for purposes of efficiency (such as multiple Reviewable Questions relating to obligations of an Affected Reference Entity).
- (e) **Replacement of an External Reviewer:** If an External Reviewer is effectively removed for Cause or resigns at any point during External Review, the first alternate will no longer be designated as an alternate and will be deemed to be an External Reviewer under the Rules following effective receipt of notice from the DC Secretary. Upon the effective replacement of an External Reviewer, (i) on or before the Submission Deadline for the relevant Reviewable

Question, the External Review Schedule will remain unchanged or (ii) after the Submission Deadline for the relevant Reviewable Question, the External Review Schedule will be reset to the Submission Deadline and proceed accordingly.

- (f) **Replacement of Alternates:** If at any time, the first alternate is removed by the Convened DC in accordance with Section 4.3(b) (*Selection of External Reviewers*), resigns under Section 4.3(c) (*Resignation*) or is no longer designated as an alternate, the second alternate will immediately become the first alternate and a new second alternate will be selected by the Convened DC in accordance with the procedures of Section 4.3(a) (*Conflicts*) and Section 4.3(b) (*Selection of External Reviewers*).
- (g) **Failure to Form a Complete External Review Panel:** If, at any time, an External Review Panel does not contain three External Reviewers (taking into account each designated alternate, if any), the External Review process will be suspended until a sufficient number of External Reviewers have been selected by the Convened DC in accordance with this Section 4 (*External Review*).

4.4 The External Review Schedule

- (a) **External Review Schedule:** The following schedule will apply to External Review unless modified in accordance with Section 4.4(b) (*Modification to the Schedule*) (the External Review Schedule):
 - (i) Within [4] Mumbai Business Days from the referral of an Eligible Review Question to the DC Secretary for External Review, the External Reviewers and the Advocates will hold an administrative meeting [subject to the provisions of Section 4.5(b) (*Administrative Meetings*)].
 - (ii) Written materials will be submitted to the External Reviewers no more than [7] Mumbai Business Days after the referral of an Eligible Review Question to the DC Secretary for External Review (the Submission Deadline).
 - (iii) Oral Argument will be heard at a time and on a Mumbai Business Day specified by the External Reviewers, but in no event before [2] Mumbai Business Days following the Submission Deadline and in no event later than [4] Mumbai Business Days after the Submission Deadline.
 - (iv) The External Reviewers will render their Decision by [5:00 p.m.]. Indian Standard Time no later than [5] Mumbai Business Days after the Submission Deadline (the Decision Deadline).

- (b) **Modification to the Schedule:** The Convened DC may, at any time, Resolve by a Supermajority to modify the External Review Schedule for a particular Reviewable Question. The DC Secretary will promptly notify the External Reviewers of any modification to the External Review Schedule, and in cases where the External Review Schedule is modified before the start of External Review, the DC Secretary will notify the External Reviewers before the first administrative meeting.

4.5 General External Review Procedures

- (a) **Advocates:** The Convened DC Members who support a particular Presented Position will identify one or more persons to coordinate their communications with the External Reviewers, present their arguments to the External Reviewers and participate in Oral Arguments (each such identified persons, an Advocate). Such Convened DC Members will notify the DC Secretary and the External Reviewers of the identity of, and contact information for, their Advocate(s). All communication by the External Reviewers with the Convened DC will be via either the DC Secretary or the Advocates. There will be no oral communication between the External Reviewers and any individual Advocate unless an Advocate for each Presented Position is given the opportunity to be present during or is otherwise included in such communication. Communication in writing between the External Reviewers and an Advocate must also be transmitted contemporaneously to all other Advocates. Advocates may, but need not, be legal counsel selected by the relevant Convened DC Members. For the avoidance of doubt, an Advocate may be a Convened DC Member.
- (b) **Administrative Meetings:** In addition to the administrative meeting scheduled under Section 4.4(a)(i) (*External Review Schedule*), the External Reviewers may call other administrative meetings, in each case on no less than [3 hours'] notice to all of the Advocates. Administrative meetings may be commenced at any time between [10:00 a.m.] and [6:00 p.m.] Indian Standard Time on a Mumbai Business Day, or at any other time agreed to by the External Reviewers and all of the Advocates. All of the Advocates must be given the opportunity to be present at each administrative meeting and the External Reviewers must provide notice of (i) an administrative meeting taking place and (ii) the time, place and/or conference call details, as applicable, of such meeting. Administrative meetings may be

held in person or by telephone, videoconference or Web conference at the discretion of the External reviewers. To the extent that in-person meetings are held, any Advocate will be permitted to participate by telephone.

(c) **Written Materials:** Certain materials in support of a Presented Position may be submitted to the External Reviewers via the DC Secretary by any FIMMDA Member. Allowed materials are the following (collectively, the Written Materials):

- (i) a Brief addressing the question before the External Reviewers consisting of no more than [20 single-sided, double-spaced pages in Times New Roman twelve-point font, with one inch margins, headers and footers, on A4 or 8 ½" by 11"] paper (the Brief) and
- (ii) any Exhibits in support of the Brief (the Exhibits). Unless requested or allowed by the External Reviewers, the Exhibits will not contain any witness affidavits or additional argument.

Written Materials that do not satisfy the requirements of Section 4.5(c)(i) (*Written Materials*) will only be accepted in the sole discretion of the External Reviewers. All Written Materials will only include information that was available to the Convened DC on or before the binding vote held for the DC Question corresponding to such Reviewable Question and the External Reviewers, in making their Decision, will disregard any additional information. Notwithstanding the above, Written Materials may identify new information that is relevant to the resolution of a Reviewable Question and that was not available to the Convened DC on or before the binding vote held for the DC Question corresponding to such Reviewable Question for purposes of returning the Reviewable Question to the Convened DC in accordance with Section 4.6(a) (*Returning the Reviewable Question to the Convened DC*), provided that such information is clearly identified to the External Reviewers. Each FIMMDA Member submitting information to the DC Secretary will be deemed to represent and warrant that such information has been disclosed and can be made public without violating any law, agreement or understanding regarding the confidentiality of such information and each DC Party may rely on such representation. All Briefs will be promptly published by the DC Secretary on its Web site, along with any accompanying Exhibits for which publicly available internet links acceptable to the DC Secretary are provided.

- (d) **Oral Argument:** The External Reviewers will hold one or more proceedings where the Advocates may orally present arguments in favor of their Presented Position (each such proceeding, an Oral Argument). An Oral Argument will only include information that was available to the Convened DC on or before the binding vote held for the DC Question corresponding to such Reviewable Question. Notwithstanding the above, Oral Argument may identify new information that is relevant to the resolution of a Reviewable Question and that was not available to the Convened DC on or before the binding vote held for the DC Question corresponding to such Reviewable Question for purposes of returning the Reviewable Question to the Convened DC in accordance with Section 4.6(a) (*Returning the Reviewable Question to the Convened DC*), provided that such information is clearly identified to the External Reviewers. Unless the External Reviewers have altered the duration of an Oral Argument under Section 4.5(e)(ii) (*Powers of the External Reviewers*), the Advocates for each Presented Position will be allocated an aggregate of [1 hour] in which to present their arguments. All Advocates must be given the opportunity to be present for the duration of an Oral Argument and the External Reviewers must provide reasonable prior notice of (i) an Oral Argument taking place and (ii) the time, place and/or conference call details, as applicable, of such Oral Argument. Oral Argument may be held in [person, by telephone, by videoconference, by Web conference] or by other means established by the External Reviewers; provided that any Advocate may participate in any Oral Argument by telephone. [In the event that an Oral Argument is to be held in person, it will be held in (Mumbai) and may be held at the DC Secretary's offices (in Mumbai)].
- (e) **Powers of the External Reviewers:** The External Reviewers may, subject to the External Review Schedule of Section 4.4(a) (*External Review Schedule*), do any of the following at an administrative meeting or an Oral Argument, as applicable:
- (i) schedule the time and Mumbai Business Day of an Oral Argument;
 - (ii) establish or alter the place, duration, format or means of an Oral Argument;
 - (iii) alter the page limit of the Brief;
 - (iv) request additional Written Materials or Oral Argument on a particular subject or in response to arguments previously made, while satisfying the requirements of Section 4.6(c) (*Reviewable Information*) and/or

- (v) upon request by a Convened DC Member, allow witness affidavits as Exhibits or witness testimony at Oral Argument.
- (f) **Procedural Decisions by External Reviewers:** Unless otherwise specified, all the procedural decisions contemplated under the Rules to be taken by the External Reviewers will be decided by a majority.
- (g) **Expenses:** Any expenses incurred by a Convened DC Member in connection with the support of a Presented Position will be borne by such Convened DC Member.

4.6 The Review Process

- (a) **Returning the Reviewable Question to the Convened DC:** At any time before the Final Decision, a Convened DC may Resolve by a Majority to withdraw a Reviewable Question from External Review if new information exists that is relevant to the resolution of such Reviewable Question and was not available to the Convened DC on or before the binding vote held for the DC Question corresponding to such Reviewable Question. In addition, the External Reviewers will inform the Convened DC, and may decide to return the Reviewable Question back to the Convened DC (even if the Convened DC has not withdrawn the Reviewable Question), if they determine that new information exists that is relevant to the resolution of such Reviewable Question and that it was not available to the Convened DC on or before the binding vote held for the DC Question corresponding to such Reviewable Question. In the event that a Reviewable Question is returned to a Convened DC for any reason, the External Reviewers may continue to deliberate but cannot reach a Decision on such Reviewable Question until the Convened DC has held a new binding vote with respect to such Reviewable Question. For the avoidance of doubt, the deadline for holding a binding vote under Section [2.4(d)] (*Binding Votes*) will be reset upon a Reviewable Question being returned to a Convened DC, but the External Review Schedule under Section 4.4(a) (*External Review Schedule*) will only be suspended (and not reset) until the Convened DC either Resolves the Reviewable Question or again fails to Resolve the Reviewable Question. In the case of a Reviewable Question being Resolved by a Convened DC, the DC Secretary will notify the External Reviewers to cease any deliberations with respect to such Reviewable Question.
- (b) **The DC Vote:** With respect to a Reviewable Question, the answer which was supported by the most Convened DC Members in the

binding vote held for the DC Question corresponding to such Reviewable Question will be the “**DC Vote.**” In instances where the number of votes in favor of the answer that was supported by the most Convened DC Members is tied with one or more other answers, the DC Vote for such Reviewable Question will be the deemed vote, if any, specified in 0 to the Rules for such Reviewable Question or, with respect to a Reviewable Question that relates to a component question of a DC Question, the deemed vote specified in 0 to the Rules for the Reviewable Question that relates to such DC Question.

- (c) **Reviewable Information:** When deciding a reviewable question, the External Reviewers will only consider information that was available to the Convened DC on or before the binding vote held for the DC Question corresponding to such Reviewable Question and will make their Decision solely based on such information. For purposes of this Section 4 (*External Review*), all information that was publicly available on or before the binding vote held for the DC Question corresponding to the Reviewable Question will be deemed to have been available to the Convened DC. For the avoidance of doubt, in cases where the Reviewable Question involves the identity of a purported successor, the External Reviewers will base their Selection solely on information that was available to the Convened DC as of the Reconvening Date, as modified in cases where the Reviewable Question is returned to the Convened DC under Section 4.6(a) (*Returning the Reviewable Question to the Convened DC*). With respect to a Reviewable Question, the Convened DC may disclose to the External Reviewers and Advocates what information was available to the Convened DC for purposes of its deliberations with respect to such Reviewable Question and the Advocates may jointly agree a list of the information that was available to the Convened DC and may be used for purposes of External Review. Any disputes among the Advocates regarding the composition of such list of information will be Resolved by the External Reviewers. Any agreed list of information will be published by the DC Secretary on its Web site.
- (d) **The Decision:** The External Reviewers must each, with respect to a Reviewable Question, select, without alteration, one of the Presented Positions (each selection, a Selection). The answer to the Reviewable Question will then be determined according to the sub-clauses below (such answer, the Decision, and the term Decided will be interpreted accordingly).

- (i) **More than [60%] to less than [80%].** If more than [60%] of the Convened DC Members participating but less than a Supermajority voted for a specific outcome in the binding vote held for the DC Question corresponding to such Reviewable Question, the Reviewable Question will be Decided in accordance with the DC Vote of such Reviewable Question unless the External Reviewers unanimously conclude that another Presented Position is “the better answer,” in which case the Reviewable Question will be Decided in accordance with the Selection of the three External Reviewers.
 - (ii) **Less than or equal to [60%].** If less than or equal to [60%] of the Convened DC Members participating voted for a specific outcome in the binding vote held for the DC Question corresponding to such Reviewable Question, the Reviewable Question will be Decided in accordance with the DC Vote of such Reviewable Question unless [at least two out of the three] External Reviewers conclude that another Presented Position is “the better answer,” in which case the Reviewable Question will be Decided in accordance with the Selection of the Majority of the External Reviewers.
- (e) **Relevant Governing Law:** The External Reviewers will interpret the Reviewable Question in accordance with the laws of India. Any Decision made by the External Reviewers will be made without regard to the governing law of any Relevant Transaction.
- (f) **Publishing the Decision:** With respect to each Reviewable Question, the External Reviewers will notify the DC Secretary by the Decision Deadline of each of their votes with respect to the Presented Positions for such Reviewable Question and will produce a single summary explaining their reasoning and analysis (including any dissenting views). In addition, the External Reviewers will notify the DC Secretary by the Decision Deadline of the Decision reached in accordance with Section 4.6(d) (*The Decision*). The DC Secretary will publish the votes of the External Reviewers, the written summary and the Decision on its Web site [as soon as reasonably practicable after] receiving such information from the External Reviewers (once published, the decision is a Final Decision).
- (g) **Adopting the Decision:** The Convened DC will be deemed to ratify the Final Decision, without any amendment or further action, at the time such Final Decision is published and such Final Decision will constitute a DC Resolution for purposes of the Rules.

- (h) **Failure to Arrive at a Decision:** If the External Review Panel, for any reason, fails to make a Decision within the timeframe established by the External Review Schedule, a new External Review Panel will be selected in accordance with Section 4.3 (*Composition of the External Review Panels*) and External Review will re-commence with respect to the relevant Reviewable Question.

5. ADDITIONAL PROVISIONS

5.1 Waivers and Disclaimers

- (a) **Waiver by DC Parties:** Each DC Party will be deemed to agree:
 - (i) that no DC Party and no legal counsel or other third-party professional hired by any DC Party in connection with any DC Party's performance of its duties under the Rules will be liable, whether for negligence or otherwise, to such DC Party for any form of damages, whether direct, indirect, special, consequential or otherwise, that might arise in connection with any DC Party's performance of its duties, or any advice given by legal counsel or any other third-party professional hired by any DC Party in connection with any DC Party's performance of its duties under the Rules, except in the case of fraud or willful misconduct on the part of the relevant DC Party, legal counsel or other third-party professional, as applicable.
 - (ii) to waive any claim, whether for negligence or otherwise, that may arise against any DC Party and any legal counsel or other third-party professional hired by any DC Party in connection with any DC Party's performance of its duties under the Rules, except in the case of fraud or willful misconduct on the part of the relevant DC Party, legal counsel or other third-party professional, as applicable.

Notwithstanding the above, legal counsel or a third-party professional hired by a DC Party may still be liable to such DC Party.

- (b) **Disclaimer by the DC Parties:** No DC Party and no legal counsel or other third-party professional hired by any DC Party in connection with any DC Party's performance of its duties under the Rules will undertake any duty of care or otherwise be liable to any party to a Relevant Transaction for any form of damages, whether direct, indirect, special, consequential or otherwise, that might arise in

connection with any DC Party's performance of its duties, or any advice given in connection with any DC Party's performance of its duties, under the Rules, except in the case of fraud or willful misconduct on the part of the relevant DC Party, legal counsel or other third-party professional, as applicable. No DC Party and no legal counsel or other third-party professional hired by any DC Party will undertake any duty or otherwise be liable to any party to a Relevant Transaction for any action, including one based on negligence, that might arise in connection with any DC Party's performance of its duties, or any advice given by legal counsel or any other third-party professional hired by any DC Party in connection with any DC Party's performance of its duties under the Rules, except in the case of fraud or willful misconduct on the part of the relevant DC Party, legal counsel or other third-party professional, as applicable. Notwithstanding the above, legal counsel or a third-party professional hired by a DC Party may still be liable to such DC Party.

5.2 Other Provisions

- (a) **Confidentiality:** Except as (i) expressly contemplated by the Rules or (ii) as may be required by applicable law or court order or requested by a regulatory, self-regulatory or supervising authority having appropriate jurisdiction, each DC Party (and any legal counsel or other third-party professional hired by such DC Party in connection with such DC Party's performance of its duties under the Rules) agrees to maintain confidentiality as to all non-public deliberations occurring under the Rules, including, without limitation, any discussions, deliberations or proceedings relating to a DC Question or Reviewable Question, the results of any non-binding vote and the location, timing and/or access details for any meeting (the Confidential Material). In the event that a DC Party is served with, or otherwise subject to, legal process (including subpoena or a discovery notice) requiring it to testify about, to produce or otherwise to divulge Confidential Material, to the extent permitted by law, the DC Party subject to such process will, as soon as practicable, inform the DC Secretary, who will in turn notify each DC Party so that any DC Party may seek a protective order or other remedy if desired. In the event that such protective order or other remedy has not been obtained and the DC Party is advised, in the opinion of counsel, that it is legally compelled to disclose any of the Confi-

dential Material, the DC Party may disclose only such Confidential Material so advised to be disclosed. If a DC Party is requested by a regulatory, self-regulatory or supervising authority having appropriate jurisdiction to disclose any Confidential Material, to the extent permitted by law, the DC Party subject to such process may comply with such request but will, as soon as practicable, inform the DC Secretary, who will in turn notify each DC Party so that any DC Party may seek a protective order or other remedy, if desired. Following publication by the DC Secretary of any Confidential Material, a DC Party will have no duty of confidentiality with respect to such Confidential Material. Following publication by the DC Secretary of the outcome of a binding vote of a Convened DC in accordance with Section 2.5(d)(iii) (*Publication on the DC Secretary Web site*), a DC Party will have no duty of confidentiality with respect to Confidential Material relating to such binding vote.

(b) Amendments to the Rules

(i) First Scheduled Committee Term

Before the end of the First Scheduled Committee Term, the Committee will amend the Rules in accordance with Section 5.2(b)(iii) (*Amendment Procedure*) below to provide for, among other things, the Selection and composition of the Committee following the end of the First Scheduled Committee Term. For the purpose of the Amendment Procedure, the amendment proposal will be deemed to be from a DC Member.

(ii) Other amendments to the Rules

Other than the amendments to the Rules as set out in Section 5.2(b)(i) above, a FIMMDA Member or the DC Secretary may suggest amending the Rules in accordance with the Amendment Procedure.

(iii) Amendment Procedure

A FIMMDA Member or the DC Secretary may propose an amendment to the Rules (including the Schedules attached hereto) by providing the DC Secretary with the text of such proposed amendment. Following effective receipt of any such proposed amendment, the DC Secretary will consider such proposed amendment as a request for a meeting of the Committee under Section 2.1(a) (*Notifying the DC Secretary*) and unless otherwise provided in the Rules, will convene the Committee; provided that the DC Secretary will not be required to convene a meeting of the Committee more than once every six months for amendment proposals from FIM-

MDA Members that are not DC Members. Any Eligible Market Participant will be allowed to provide comment on such proposed amendment to the DC Secretary until [5:00 p.m.] Indian Standard Time on the Mumbai Business Day on or immediately following the seventh calendar day after publication of such proposed amendment by the DC Secretary on its Web site. By [7:00 p.m.] Indian Standard Time on the Mumbai Business Day on or immediately following the seventh calendar day after the publication of such proposed amendment by the DC Secretary on its Web site, the DC Secretary will notify the Convened DC Members of all comments received by the DC Secretary with respect to such proposed amendment. Any proposed amendment under this Section 5.2(b) (*Amendments to the Rules*) will only become effective if such proposed amendment is Resolved by a Supermajority of the Convened DC Members after notification is given by the DC Secretary of all comments received. Notwithstanding the above, the provisions of this Section 5.2(b) (*Amendments to the Rules*) can be overridden by a Convened DC Resolving by a Supermajority to allow amendment to the Rules with a shorter public comment period or without a public comment period altogether. Following the effectiveness of any amendment, either the relevant amendment or a revised version of the Rules will be published by the DC Secretary on its Web site.

- (c) **Governing Law:** The Rules will be governed by, and interpreted in accordance with, the laws of India.
- (d) **Headings:** All headings in the Rules are for convenience of reference only and will not affect the construction or interpretation of any provision of the Rules.

6. DEFINITIONS

All capitalized terms used but not defined in the Rules will have the meanings given to such terms in the Definitions, a form of which will be published by the ISDA on its Web site from time to time and may be amended from time to time.

As used in the Rules, the following terms will have the following meanings unless the context clearly indicates otherwise:

“**60% Requirement**” has the meaning specified in Section 2.3(a).

“**80% Requirement**” has the meaning specified in Section 2.3(a).

“Adhered DC Member” has the meaning specified in Section 1.5(b).

“Adhered First Term User Member” means an Adhered DC Member that was a Designated User Member at the time of becoming an Adhered DC Member and is designated as a “First Term User”.

“Adhered Market-maker Member” means an Adhered DC Member that was a Designated Market-maker Member at the time of becoming an Adhered DC Member.

“Adhered Second Term User Member” means an Adhered DC Member that was a Designated User Member at the time of becoming an Adhered DC Member and is designated as a “Second Term User”.

“Adhered Third Term User Member” means an Adhered DC Member that was a Designated User Member at the time of becoming an Adhered DC Member and is designated as a “Third Term User”.

“Adhered User Member” means an Adhered DC Member that was a Designated User Member at the time of becoming an Adhered DC Member.

“Advocate” has the meaning specified in Section 4.5(a).

“Affected Reference Entity” means the Reference Entity that is the subject of the request for a meeting of the Committee.

“Affiliate Group” has the meaning specified in Section 1.6(i).

“Amendment Procedure” means the procedure for amendment of the Rules set out in Section 5.2(b)(iii).

“Authorized Contact” has the meaning specified in Section 1.2(b).

“Banking Company” means a ‘Banking Company’ as such term is defined in the Banking Regulation Act, 1949.

“Brief” has the meaning specified in Section 4.5(c)(i).

“Cause” has the meaning specified in Section 4.2(e).

“Commercial Bank” means any Foreign Bank, Private Indian Bank and Public Sector Bank that is not a Market-maker.

“Committee” has the meaning specified in Section 1.1(a).

“Confidential Material” has the meaning specified in Section 5.2(a).

“Convened DC” has the meaning specified in Section 2.2(a).

“Convened DC Member” has the meaning specified in Section 2.1(c).

“Credit Event Resolution” has the meaning specified in Section 3.1(b)(ii).

“Credit Event Request Resolution” has the meaning specified in Section 3.1(a).

“DC Issue” has the meaning specified in Section 2.2(a).

“DC Member” has the meaning specified in Section 1.5(c).

“DC Participation Deadline” has the meaning specified in Section 1.5(b).

“DC Party” means the DC Secretary, a DC Member, an External Reviewer or an Advocate, or any Affiliates of any thereof, as applicable.

“DC Question” has the meaning specified in Section 2.2(b).

"DC Resolution" has the meaning specified in the definition of "Resolve".

"DC Secretary" has the meaning specified in Section 1.1(b).

"DC Vote" has the meaning specified in Section 4.6(b).

"Decided" has the meaning specified in Section 4.6(d).

"Decision" has the meaning specified in Section 4.6(d).

"Decision Deadline" has the meaning specified in Section 4.4(a)(iv).

"Definitions" means the 2003 ISDA Credit Derivatives Definitions (as published by the ISDA), as amended and supplemented by the July 2009 Supplement, as amended and supplemented by Annex 2 (Amendments to the Credit Derivatives Definitions) of the Market-maker MCA or User MCA, as applicable.

"Deliverable Obligation" has the meaning specified in the Definitions.

"Designated DC Member" means a Designated Market-maker Member or Designated User Member, as applicable.

"Designated Market-maker Member" has the meaning specified in Section 1.4(a).

"Designated User Member" has the meaning specified in Section 1.4(b).

"Eligible Market-maker" has the meaning specified in Section 1.3(b).

"Eligible Market Participant" means a party to a Relevant Transaction.

"Eligible User" has the meaning specified in Section 1.3(c).

"Eligible Review Question" has the meaning specified in Section 4.1(a).

"Exhibits" has the meaning specified in Section 4.5(c)(ii).

"External Review" has the meaning specified in Section 4.1(a).

"External Reviewer" has the meaning specified in Section 4.3(b).

"External Review Panel" has the meaning specified in Section 4.3(b).

"External Review Panel List" has the meaning specified in Section 4.2(d).

"External Review Schedule" has the meaning specified in Section 4.4(a).

"FIMMDA" has the meaning specified in Section 1.1(b).

"FIMMDA Member" means any entity that is a [member] of FIMMDA, from time to time, as determined by the DC Secretary.

"Final Decision" has the meaning specified in Section 4.6(f).

"First Scheduled Committee Term" means the period from and including the Initial List Review Date to but excluding the date that is 30 calendar days following the immediately following List Review Date.

"Foreign Bank" means a 'Banking Company' which is a foreign company within the meaning section 591 of the Companies Act, 1956.

"Foreign Institutional Investor" means a 'Foreign Institutional Investor' as such term is defined in the Securities and Exchange Board of India (Foreign Institutional Investors) Regulations, 1995.

"General Interest Question" has the meaning specified in Section 2.1(a).

"Housing Finance Company" means a 'Housing Finance Company' as such term is defined in The Housing Finance Companies (NHB) Directions, 2010.

"Ineligible Institution" has the meaning specified in Section 1.3(a).

"Initial List Review Date" means [] October, 2011.

"Insurance Company" means (i) an 'Indian Insurance Company' as such term is defined in the Insurance Act, 1938; (ii) the entities nationalised under General Insurance Business (Nationalisation) Act, 1972 and (iii) The Life Insurance Corporation of India established under the Life Insurance Corporation Act, 1956.

"ISDA" means the International Swaps and Derivatives Association, Inc.

"July 2009 Supplement" means the 2009 ISDA Credit Derivatives Determinations Committees, Auction Settlement and Restructuring Supplement to the 2003 ISDA Credit Derivatives Definitions.

"List of Eligible Market-maker Members" has the meaning specified in Section 1.3(b).

"List of Eligible User Members" has the meaning specified in Section 1.3(c).

"List of Ineligible Institutions" has the meaning specified in Section 1.3(a).

"List of Missed Meetings" has the meaning specified in Section 1.3(d).

"List of Participating Institutions" has the meaning specified in Section 1.2(a).

"List Review Date" means the Initial List Review Date and the Mumbai Business Day occurring on or immediately before [March 30] of each calendar year thereafter.

"Listed Corporate" means a 'Public Company' as such term is defined in the Companies Act, 1956 which is listed on a recognised stock exchange in India;

"Majority" means more than 50% of those participating in a binding vote have voted in favor of a particular answer.

"Mandatory Email Vote" has the meaning specified in Section 2.4(d).

"Market-maker" means, on any date, [each entity specified as such on the RBI Web site].

"Market-maker Category" has the meaning specified in section 1.2(a).

"Market-maker MCA" means either (i) the form of "Market-maker Master Credit Derivatives Confirmation Agreement for Indian Corporate Bonds" or (ii) the form of "Standardised Market-maker Master Credit Derivatives Confirmation Agreement for Indian Corporate Bonds," in each case, as published by the ISDA and the relevant transaction

supplement in relation thereto (which incorporates by reference the Definitions).

“Market-maker Member” means a Designated Market-maker Member, Adhered Market-maker Member or Market-maker DC Member, as applicable.

“Market-maker Non-Banking Financial Company” means a Non-Banking Financial Company that is a Market-maker.

“Market-maker Shortage” has the meaning specified in Section 2.1(d)(i).

“Market-maker DC Member” means a DC Member that was an Adhered Market-maker Member at the time of becoming a DC Member.

“Mumbai Business Day” means a day on which banks and foreign exchange markets are generally open to settle payments in Mumbai.

“Mutual Funds” means a ‘Mutual Fund’ as such term is defined in the Securities and Exchange Board of India (Mutual Fund) Regulations, 1996.

“Non-mandatory Email Vote” has the meaning specified in Section 2.4(d).

“Non-Banking Financial Company” means a company registered under the Companies Act, 1956 and registered with the RBI to commence or carry on any business of a non-banking financial institution.

“Oral Argument” has the meaning specified in Section 4.5(d).

“Participating Market-maker Institution” means a Market-maker FIMMDA Member (or Affiliate of such institution, as applicable) on the List of Participating Institutions.

“Participating Institution” means each institution (or Affiliate of such institution, as applicable) on the List of Participating Institutions.

“Participating User Institution” means a User FIMMDA Member (or Affiliate of such institution, as applicable) on the List of Participating Institutions.

“Pool Member” has the meaning specified in Section 4.2(c).

“Potential DC Issue” has the meaning specified in Section 2.1(a).

“Potential External Reviewer” has the meaning specified in Section 4.3(a).

“Potential Pool Member” has the meaning specified in Section 4.2(b).

“Presented Position” has the meaning specified in Section 4.1(c).

“Primary Dealer” means any standalone primary dealer that is not a Market-maker.

“Private Indian Bank” means a ‘Banking Company’ as such term is defined in the Banking Regulation Act, 1949, but does not include a Foreign Bank.

“Provident Fund” means a ‘Fund’ as such term is defined in Employees’ Provident Fund and Miscellaneous Provisions Act, 1952.

“Public Sector Bank” means (i) the banks nationalized and constituted under the Banking Companies (Acquisition and Transfer of Undertak-

ings) Act, 1970, or Banking Companies (Acquisition and Transfer of Undertakings) Act, 1980; (ii) the State Bank of India constituted under the State Bank of India Act, 1955, and (iii) its subsidiaries constituted under the State Bank of India (Subsidiary Banks) Act, 1959.

"Quorum" has the meaning specified in Section 2.3(a).

"RBI" has the meaning specified in Section 1.1(b).

"RBI Web site" means www.rbi.org.in or any successor Web site of the RBI.

"Reconvening Date" has the meaning specified in Section 3.2(c).

"Relevant Transaction" has the meaning specified in Section 1.1(a).

"Removed User" has the meaning specified in Section 2.1(d).

"Replaced Institution" has the meaning specified in Section 1.7(a).

"Replacement DC Member" has the meaning specified in Section 1.7(a).

"Resolve," "Resolved," "Resolves" and "Resolving" mean a Convened DC making (a) a specific determination through a binding vote that satisfies the applicable voting threshold and (b) where the applicable voting threshold is not met, the specific determination that is deemed to be made by a Convened DC following a Final Decision of the External Reviewers or the failure of the External Reviewers to come to a Decision (and each such determination, a **DC Resolution**).

"Reviewable Question" has the meaning specified in Section 4.1(b).

"Rules" has the meaning specified in Section 1.1(c).

"Selection" has the meaning specified in Section 4.6(d).

"Standard Agreement" has the meaning specified in Section 1.5(b).

"Submission Deadline" has the meaning specified in Section 4.4(a)(ii).

"Succession Event Occurrence Resolution" has the meaning specified in Section 3.2(b)(i).

"Succession Event Request Resolution" has the meaning specified in Section 3.2(a).

"Succession Resolution" has the meaning specified in Section 3.2(b)(ii).

"Supermajority" means at least 80% of those participating in a binding vote have voted in favor of a particular answer.

"Term Start Date" has the meaning specified in Section 1.5(c).

"Terms of Engagement" has the meaning specified in Section 4.2(a).

"User" means any of Commercial Banks, Primary Dealers, User Non-Banking Financial Companies, Mutual Funds, Insurance Companies, Housing Finance Companies, Provident Funds, Listed Corporates, Foreign Institutional Investors and any other institution specifically permitted by the RBI.

"User MCA" means the form of "User Master Credit Derivatives Confirmation Agreement for Indian Corporate Bonds" as published by

the ISDA and the relevant transaction supplement in relation thereto (which incorporate by reference the Definitions).

“User Member” means Designated User Member, Adhered User Member or User DC Member, as applicable.

“User Non-Banking Financial Company” means a Non-Banking Financial Company that is not a Market-maker.

“User Reduction Amount” has the meaning specified in Section 2.1(d)(ii).

“User DC Member” means a DC Member that was an Adhered User Member at the time of becoming a DC Member.

“Web site” means “[www.fimmda.org]” or any successor Web site of FIMMDA; provided that if the Web site is unavailable for any reason, another comparable media outlet may be used by the DC Secretary as a replacement for purposes of publication of information that the DC Secretary is required to publish in accordance with the Rules.

“Written Materials” has the meaning specified in Section 4.5(c).

FORM OF STANDARD QUESTIONS

Section	DC Question	Reviewable Question	Deemed Vote (if the vote of the Convened DC is tied)
Credit Event Questions:			
3.1(a)	What is the date on which the DC Secretary first effectively received both a request to convene the Committee and Publicly Available Information that satisfies the requirements of Section 2.1(b) for the [<i>Credit Event</i>] with respect to [<i>Affected Reference Entity</i>]? Has a [<i>type of Credit Event</i>] Credit Event occurred with respect to [<i>Affected Reference Entity</i>]? [As modified for any component DC Question]	Not Reviewable	N/A
3.1(b)(i)	What is the date of the [<i>Credit Event</i>] that has occurred with respect to [<i>Affected Reference Entity</i>]? [As modified for any component DC Question]	Has a [<i>type of Credit Event</i>] Credit Event occurred with respect to [<i>Affected Reference Entity</i>]? [As modified for any component DC Question]	No (or for any component DC Question, in favor of the answer which negates the occurrence of a Credit Event)
3.1(b)(ii)	What is the date of the [<i>Credit Event</i>] that has occurred with respect to [<i>Affected Reference Entity</i>]? [As modified for any component DC Question]	Is the date of the [<i>Credit Event</i>] that has occurred with respect to [<i>Affected Reference Entity</i>] [<i>date with the highest Convened DC votes</i>] or [<i>date with the second highest Convened DC votes</i>]?	In favor of the most recent date out of the choices sent to External Review

(Contd.)

Section	DC Question	Reviewable Question	Deemed Vote (if the vote of the Convened DC is tied)
Succession Event Questions:			
3.2(a)	What is the date on which the DC Secretary first effectively received a request to convene the Committee to consider whether an event constitutes a Succession Event with respect to [<i>Affected Reference Entity</i>]?	Not reviewable	N/A
3.2(b)(i)	Has a Succession Event occurred with respect to [<i>Affected Reference Entity</i>]?	Has a Succession Event occurred with respect to [<i>Affected Reference Entity</i>]?	No
3.2(b)(ii)	What is the legally effective date of the Succession Event with respect to [<i>Affected Reference Entity</i>]?	Is the legally effective date of the Succession Event with respect to [<i>Affected Reference Entity</i>] [<i>date with the highest Convened DC votes</i>] or [<i>date with the second highest Convened DC votes</i>]?	In favor of the most recent date out of the choices sent to External Review
3.2(c)(i)	Is the obligation with [<i>CUSIP/ISIN</i>] number [<i>relevant number</i>] a Relevant Obligation for purposes of the Succession Event that has occurred with respect to [<i>Affected Reference Entity</i>]? [As modified for any component DC Question]	Is the obligation with [<i>CUSIP/ISIN</i>] number [<i>relevant number</i>] a Relevant Obligation for purposes of the Succession Event that has occurred with respect to [<i>Affected Reference Entity</i>]? [As modified for any component DC Question]	No (or for any component DC Question, in favor of the answer which makes the obligation not a Relevant Obligation)

(Contd.)

Section	DC Question	Reviewable Question	Deemed Vote (if the vote of the Convened DC is tied)
3.2(c)(ii)	What is the outstanding principal balance of the Relevant Obligation with [CUSIP/ISIN] number [relevant number] for purposes of the Succession Event that has occurred with respect to [Affected Reference Entity]?	Does the obligation with [CUSIP/ISIN] number [relevant number] have an outstanding principal balance of [balance with the highest Convened DC votes] or [balance with the second highest Convened DC votes]?	In favor of the lowest outstanding principal balance out of the choices sent to External Review
3.2(c)(iii)	What provision of Section 2.2(a) of the Definitions applies for purposes of the Succession Event that has occurred with respect to [Affected Reference Entity]?	Does [the provision of Section 2.2(a) of the Definitions with the highest Convened DC votes] or [the provision of Section 2.2(a) of the Definitions with the second highest Convened DC votes] apply for purposes of the Succession Event that has occurred with respect to [Affected Reference Entity]?	In favor of the provision which results in the fewest Successors, or if the provisions result in the same number of Successors, the provision under which the most Relevant Obligations remain with the Reference Entity.
3.3(c)	What is the identity of the Successor(s)?	Not reviewable	N/A
Substitute Reference Obligation Questions:			
3.3(i)	Have circumstances occurred in respect of one or more Relevant Transactions that require a Substitute Reference Obligation to be identified with respect to [Affected Reference Entity]?	Have circumstances occurred in respect of one or more Relevant Transactions that require a Substitute Reference Obligation to be identified with respect to [Affected Reference Entity]?	No

(Contd.)

Section	DC Question	Reviewable Question	Deemed Vote (if the vote of the Convened DC is tied)
	[Does the obligation with [CUSIP/ISIN] number [relevant number] of [Affected Reference Entity] satisfy the requirements set out in Section 2.30 (Substitute Reference Obligation)?]	[Does the obligation with [CUSIP/ISIN] number [relevant number] of [Affected Reference Entity] satisfy the requirements set out in Section 2.30 (Substitute Reference Obligation)?]	No (or for any component DC Question, in favor of the answer which makes the obligation not a Substitute Reference Obligation)
3.3(ii)	Is the obligation with [CUSIP/ISIN] number [relevant number] a Substitute Reference Obligation of [Affected Reference Entity], while preserving the economic equivalent, as closely as practicable, of the delivery and payment obligations of two hypothetical parties to a Relevant Transaction that would be affected by the identification of a Substitute Reference Obligation?	Is the obligation with [CUSIP/ISIN] number [relevant number] a Substitute Reference Obligation of [Affected Reference Entity], while preserving the economic equivalent, as closely as practicable, of the delivery and payment obligations of two hypothetical parties to a Relevant Transaction that would be affected by the identification of a Substitute Reference Obligation? [As modified for any component DC Question]	No (or for any component DC Question, in favor of the answer which makes the obligation not a Substitute Reference Obligation)

(Contd.)

Section	DC Question	Reviewable Question	Deemed Vote (if the vote of the Convened DC is tied)
Merger of Reference Entity and Transaction Party or of Transaction Parties Questions:			
3.4	Has a Transaction Party or [<i>Affected Reference Entity</i>] consolidated or amalgamated with, or merged into, or transferred all or substantially all its assets to, [<i>Affected Reference Entity</i>] or the Transaction Party, as applicable, or has a Transaction Party and [<i>Affected Reference Entity</i>] become Affiliates?	Has a Transaction Party or [<i>Affected Reference Entity</i>] consolidated or amalgamated with, or merged into, or transferred all or substantially all its assets to, [<i>Affected Reference Entity</i>] or the Transaction Party, as applicable, or has a Transaction Party and [<i>Affected Reference Entity</i>] become Affiliates?	No
3.4	Has a Transaction Party consolidated or amalgamated with, or merged into, or transferred all or substantially all its assets to, the other Transaction Party, or have the Transaction Parties become Affiliates?	Has a Transaction Party consolidated or amalgamated with, or merged into, or transferred all or substantially all its assets to, the other Transaction Party, or have the Transaction Parties become Affiliates?	No

(Contd.)

Section	DC Question	Reviewable Question	Deemed Vote (if the vote of the Convened DC is tied)
3.4	Was a Transaction Party a Related Party in respect of the other Transaction Party or in respect of [<i>Affected Reference Entity</i>], in each case, at the time that the Credit Derivative Transaction was entered into?	Was a Transaction Party a Related Party in respect of the other Transaction Party or in respect of [<i>Affected Reference Entity</i>], in each case, at the time that the Credit Derivative Transaction was entered into?	No
Reference Obligation Criteria			
3.5	Does [<i>obligation specified as Reference Obligation or identified as a Substitute Reference Obligation</i>] satisfy the requirements of the definition of Reference Obligation as set out in the Definitions?	Does [<i>obligation specified as Reference Obligation or identified as a Substitute Reference Obligation</i>] satisfy the requirements of the definition of Reference Obligation as set out in the Definitions?	No

APPENDIX 3

USER MASTER CREDIT DERIVATIVES CONFIRMATION AGREEMENT FOR INDIAN CORPORATE BONDS

.

This User Master Credit Derivatives Confirmation Agreement for Indian Corporate Bonds (“Master Confirmation Agreement”) is dated as of [*insert date*] between [*Insert full legal name of Party A*] (“Party A”) and [*Insert full legal name of Party B*] (“Party B”).

The parties wish to facilitate the process of entering into and confirming credit derivative transactions and accordingly agree as follows:

1. **Credit Derivatives Definitions:** This Master Confirmation Agreement (which term includes all Annexes hereto) incorporates by reference the 2003 ISDA[®] Credit Derivatives Definitions as amended and supplemented by the 2009 ISDA Credit Derivatives Determinations Committees, Auction Settlement and Restructuring Supplement to the 2003 ISDA Credit Derivatives Definitions (together, the “Credit Derivatives Definitions”) as amended by Annex 2 (*Amendments to the Credit Derivatives Definitions*). Any capitalized term not otherwise defined herein shall have the meaning assigned to such term in the Credit Derivatives Definitions.
2. **Confirmation Process:** The parties intend to enter into separate Credit Derivative Transactions (each a “Transaction”) with respect to each Reference Entity set out in a Transaction Supplement substantially in the form attached as Annex 3 (a “Transaction Supplement”). The confirmation applicable to each Transaction, which shall constitute a “Confirmation” for the purposes of, and will supplement, form a part of, and be subject to, the ISDA Master Agreement between Party A and Party B dated as of [____], as amended

and supplemented from time to time (the “Master Agreement”), shall consist of this Master Confirmation Agreement including the Standard CDS Terms attached as Annex 1 (the “Standard CDS Terms”), as supplemented by the trade details applicable to such Transaction as set forth in the relevant Transaction Supplement. All provisions contained in the Master Agreement govern each Confirmation except as expressly modified in this Master Confirmation Agreement, the Standard CDS Terms and the relevant Transaction Supplement.¹

In the event of any inconsistency between (i) this Master Confirmation Agreement (including all Annexes hereto) and a Transaction Supplement, the Transaction Supplement shall govern for the purpose of the relevant Transaction and/or (ii) this Master Confirmation Agreement (including all Annexes hereto) and the Credit Derivatives Definitions, this Master Confirmation Agreement (including all Annexes hereto) shall govern for the purpose of the relevant Transaction. The Transaction Supplement shall set forth, at a minimum, all of the information set out in the applicable form of Transaction Supplement attached hereto as Annex 3.

3. **Non-Exclusive:** The parties acknowledge and agree that the execution of this Master Confirmation Agreement does not require them

¹If the parties have not yet executed an ISDA Master Agreement, the following language shall be included: “The confirmation applicable to each Transaction shall consist of this Master Confirmation Agreement including the Standard CDS Terms attached as Annex 1 (the “Standard CDS Terms”), as supplemented by the trade details applicable to such Transaction as set forth in the Transaction Supplement and shall constitute a “Confirmation” as referred to in the Master Agreement specified below. The Confirmation applicable to each Transaction will evidence a complete and binding agreement between the parties as to the terms of the Transaction to which such Confirmation relates. In addition, the parties agree to use all reasonable efforts promptly to negotiate, execute and deliver an agreement in the form of an ISDA Master Agreement, with such modifications as the parties in good faith agree. Upon execution by the parties of such an agreement (the “Master Agreement”), each Confirmation already executed in connection with this Master Confirmation Agreement and all future Confirmations executed in connection with this Master Confirmation Agreement will supplement, form a part of, and be subject to, that Master Agreement. All provisions contained in or incorporated by reference in that Master Agreement upon its execution will govern each Confirmation except as expressly modified below. Until the parties execute and deliver that Master Agreement, each Confirmation confirming a Transaction entered into between the parties in connection with this Master Confirmation Agreement (notwithstanding anything to the contrary in a Confirmation), shall supplement, form a part of, and be subject to, an agreement in the form of the [1992] [2002] ISDA Master Agreement as if the parties had executed an agreement in such form (but without any Schedule except for the election of [English law] [the laws of the State of New York] [Indian law] as the governing law and [INR] as the Termination Currency) on the Trade Date of the first such Transaction between the parties in connection with this Master Confirmation Agreement. In the event of any inconsistency between the provisions of that agreement and a Confirmation, the Confirmation will prevail for purposes of the relevant Transaction.”

to document Transactions in accordance with this Master Confirmation Agreement.

4. **Preparation of Transaction Supplements:** The preparation of a Transaction Supplement shall be the responsibility of the Seller in respect of the Transaction to which the relevant Transaction Supplement relates.
5. **Miscellaneous:**
 - (a) **Entire Agreement:** This Master Confirmation Agreement constitutes the entire agreement and understanding of the parties with respect to its subject matter and supersedes all oral communication and prior writings with respect specifically thereto.
 - (b) **Amendments:** An amendment, modification or waiver in respect of this Master Confirmation Agreement will only be effective if in writing (including a writing evidenced by a facsimile transmission) and executed by each of the parties or confirmed by an exchange of telexes or by an exchange of electronic messages on an electronic messaging system.
 - (c) **Counterparts:** This Master Confirmation Agreement and each Transaction Supplement documented hereunder may be executed in counterparts, each of which will be deemed an original.
 - (d) **Headings:** The headings used in this Master Confirmation Agreement are for convenience of reference only and shall not affect the construction of or be taken into consideration in interpreting this Master Confirmation Agreement.
 - (e) **Governing Law:** This Master Confirmation Agreement and each Transaction confirmed by a Confirmation documented hereunder and any non-contractual obligations arising out of or in connection this Master Confirmation Agreement and each Transaction confirmed by a Confirmation documented hereunder will be governed by and construed in accordance with the law specified in the Master Agreement.
 - (f) **Third Party Rights:** If English law applies to this Master Confirmation Agreement, no person that is not a party to the Master Confirmation Agreement has any right under the Contracts (Rights of Third Parties) Act, 1999, to enforce any of the terms of this Master Confirmation Agreement.

IN WITNESS WHEREOF the parties have executed this agreement with effect from the date specified on the first page of this agreement.

[Insert full legal name of Party A]

[Insert full legal name of Party B]

By:_____

By:_____

Name:

Name:

Title:

Title:

Date:

Date:

ANNEX 1

Standard CDS Terms

The general terms of each Transaction to which this Standard CDS Terms relates are as follows, as supplemented by the relevant Transaction Supplement related to such Transaction:

1. General Terms

Trade Date:	As shown in the Transaction Supplement.
Effective Date:	As shown in the Transaction Supplement.
Scheduled Termination Date:	As shown in the Transaction Supplement.
Floating Rate Payer:	As shown in the Transaction Supplement (the "Seller").
Fixed Rate Payer:	As shown in the Transaction Supplement (the "Buyer").
Calculation Agent:	Seller.
Calculation Agent City:	Mumbai.
Business Day:	Mumbai.
Business Day Convention:	Following (which, subject to Sections 1.4, 1.6, 1.23 and 2.2(i) of the Credit Derivatives Definitions, shall apply to any date referred to in this Standard CDS Terms or in the related Transaction Supplement that falls on a day that is not a Business Day).
Reference Entity:	As shown in the Transaction Supplement.
Reference Obligation(s):	As shown in the Transaction Supplement.
Reference Price:	100%.

2. Fixed Payments

Fixed Rate Payer	The Floating Rate Payer Calculation Amount.
Calculation Amount:	
Fixed Rate Payer Payment	March 20, June 20, September 20 and December 20.
Dates:	
Fixed Rate:	As shown in the Transaction Supplement.

Fixed Rate Day Count Fraction: As shown in the Transaction Supplement.

Initial Payment Payer: As shown in the Transaction Supplement.

Initial Payment Amount: As shown in the Transaction Supplement.

Initial Fixed Rate Payer Calculation Period: Notwithstanding Section 2.9 of the Credit Derivatives

Definitions, the initial Fixed Rate Payer Calculation Period shall commence on, and include, the Fixed Rate Payer Payment Date falling on or immediately prior to the calendar day immediately following the

Trade Date.

For purposes of this provision, Section 2.10 of the Credit Derivatives Definitions shall be deemed amended by deleting the words “during the term of the Transaction.”

3. Floating Payment

Floating Rate Payer Calculation Amount: An amount denominated in Indian Rupee (“INR”) as shown in the Transaction Supplement.

Conditions to Settlement: Credit Event Notice

Notifying Parties: Buyer or Seller

Notice of Physical Settlement.

Notice of Publicly Available Information: Applicable

Credit Event: Standard Credit Events or Extended Credit Events, as shown in the Transaction Supplement.

Standard Credit Events: Bankruptcy
Failure to Pay

Payment Requirement: INR 10,000,000 (or the relevant Obligation Currency Equivalent as of the occurrence of the relevant Failure to Pay)

Grace Period Extension: Not Applicable

	Restructuring
Extended Credit Events:	Bankruptcy
	Failure to Pay
	Payment Requirement: INR 10,000,000 (or the relevant Obligation Currency Equivalent as of the occurrence of the relevant Failure to Pay) Grace Period Extension: Not Applicable
	Restructuring
	Obligation Default
	Default Requirement: INR 10,000,000 (or the relevant Obligation Currency Equivalent as of the occurrence of the relevant Obligation Default.)
Obligation Currency Equivalent:	In respect of any date and an Obliga- tion Currency other than INR (the “Other Currency”), an amount that is equal to INR 10,000,000 converted into such Other Currency by reference to the relevant exchange rate pub- lished by the Reserve Bank of India (“RBI”) on the website www.rbi.org . in in the case of a conversion between INR and USD, EUR, GBP, JPY or any Other Currency published on such Web site (each being a “RBI Reference Rate”) at approximately 12:30 p.m. (Indian Standard Time), or as soon thereafter as practicable, on such date. In case the RBI Reference Rate is not published on any date or the relevant Other Currency is exchange rate shall be equal to the spot exchange rate as determined by the Calculation Agent for the purchase of such Other Currency with INR at or about 12:30 p.m. (Indian Standard Time) on such date as would be customary for the determination of such a rate for the purchase of such Other Currency.
Obligation(s):	For the purposes of the table below: “Yes” shall mean that the relevant selection is applicable; and

“No” shall mean that the relevant selection is not applicable.

Obligation Categories (Select only one)		Obligation Characteristics (Select all that apply)	
No	Payment	Yes	Not Subordinated
No	Borrowed Money	No	Specified Currency – Standard Specified Currencies
No	Reference Obligation(s) Only	Yes	Not Sovereign Lender
No	Bond	No	Not Domestic Currency
No	Loan	No	Not Domestic Law issuance

Excluded Obligations:

Short-Term Instruments
Interest Receivables

4. Settlement Terms

Settlement Method:

Physical Settlement.

Terms Relating to Physical Settlement

Settlement Currency:

INR.

Physical Settlement Period:

Ten (10) Business Days.

Deliverable Obligations:

Exclude Accrued Interest.

Deliverable Obligation

Reference Obligation(s) Only.

Category and Characteris-
tics:

Excluded Deliverable
Obligations:

Short-Term Instruments
Asset-Backed Securities
Convertible Obligations
Exchangeable Obligations
Interest Receivables
Any obligation with terms that in-
clude a Call Right and/or a Put Right
Applicable.

Escrow:

60 Business Days Cap on Not Applicable.
Settlement:

5. Amendments to the Credit Derivatives Definitions

The Credit Derivatives Definitions are amended and supplemented as set out in Annex 2 (*Amendments to the Credit Derivatives Definitions*).

6. Definitions

Capitalized terms used in this Annex 1 (*Standard CDS Terms*) but not defined in the Credit Derivatives Definitions or this Annex 1 (*Standard CDS Terms*) will have the meanings ascribed to such terms in Paragraph 20 (*Definitions*) of Annex 2 (*Amendments to the Credit Derivatives Definitions*).

7. Notice and Account Details

Notice and Account Details
for Party A:

Notice and Account Details
for Party B:

ANNEX 2

Amendments to the Credit Derivatives Definitions

Capitalized terms used in this Annex 2 (*Amendments to the Credit Derivatives Definitions*) but not defined in the Credit Derivatives Definitions or Annex 1 (*Standard CDS Terms*) will have the meanings ascribed to such terms in Paragraph 23 (*Definitions*).

1. **Section 1.18 (2002 ISDA Master Agreement).** Section 1.18 (2002 ISDA Master Agreement) will be deleted in its entirety and replaced with the following:

“Section 1.18 (2002 ISDA Master Agreement). The terms ‘Additional Termination Event,’ ‘Affected Party,’ ‘Affected Transaction,’ ‘Affiliate,’ ‘Close-out Amount,’ ‘Early Termination Date,’ ‘Event of Default,’ ‘Stamp Tax,’ ‘Tax,’ ‘Terminated Transaction,’ ‘Termination Event’ and ‘Unpaid Amounts’ shall have the meanings given to those terms in the standard form 2002 ISDA Master Agreement (the ‘2002 ISDA Master Agreement’).”

2. **Section 1.22 (Credit Derivatives Determinations Committees).** Section 1.22 (*Credit Derivatives Determinations Committees*) will be deleted in its entirety and replaced with the following:

Section 1.22 (Credit Derivatives Determinations Committees). “Credit Derivatives Determinations Committees” means the committees established by the Fixed Income Money Market and Derivatives Association of India (FIMMDA) (or any other entity as nominated by the RBI from time to time) for purposes of reaching certain DC Resolutions in connection with Credit Derivative Transactions, as more fully described in the Credit Derivatives Determinations Committees Rules, as published by the FIMMDA (or any other entity as nominated by the RBI from time to time) from time to time and as amended from time to time in accordance with the terms thereof (the ‘Rules’).”

All references in the Credit Derivatives Definitions to the ISDA making a public announcement in respect of the Credit Derivatives Determinations Committee or otherwise acting in connection with the Credit Derivatives Determinations Committee will be deemed to be references to the FIMMDA (or any other entity as nominated by the RBI from time to time) acting in the equivalent capacity.

3. All references in the Credit Derivatives Definitions to the term "Greenwich Mean Time" will be deleted and replaced with the term "Indian Standard Time."
4. **Section 1.26 (*Exercise Cut-off Date*)**. Section 1.26 (*Exercise Cut-off Date*) will be deleted in its entirety and replaced with the following: "**Section 1.26 (*Exercise Cut-off Date*)**. 'Exercise Cut-off Date' means, with respect to a Restructuring Credit Event, the date that is 21 calendar days following the date of the relevant DC Credit Event Announcement Date."
5. **Section 1.30 (*DC Credit Event Announcement*)**. Section 1.30 (*DC Credit Event Announcement*) will be amended by deleting all of the following:

"(ii) the Trade Date occurs on or prior to the Auction Final Price Determination Date, the Auction Cancellation Date, or the date that is 21 calendar days following the No Auction Announcement Date, if any, as applicable."

and replacing it with:

"(ii) the Trade Date occurs on or prior to the date that is 21 calendar days following the date of the relevant DC Credit Event Announcement Date."
6. **Section 2.1 (*Reference Entity*)**. Section 2.1 (*Reference Entity*) will be deleted in its entirety and replaced with the following

"**Section 2.1 (*Reference Entity*)**. 'Reference Entity' means the entity or entities specified as such in the related Confirmation provided that, at the time that a Credit Derivative Transaction is entered into, any Reference Entity:

 - (i) must be an Indian Resident; and
 - (ii) must not be a Related Party of Buyer or Seller.

Any Successor to a Reference Entity either (a) identified by the Calculation Agent pursuant to Section 2.2 on or following the Trade Date or (b) in respect of which the FIMMDA (or any other entity as nominated by the RBI from time to time) publicly announces on or following the Trade Date that the Credit Derivatives Determinations Committee has Resolved, in respect of a Succession Event Resolution Request Date, a Successor in accordance with the Rules shall, in each case, be the Reference Entity for the relevant Credit Derivative Transaction or a New Credit Derivative Transaction as determined pursuant to such Section 2.2."
7. **Section 2.2 (*Provisions for Determining a Successor*)**. Section 2.2 (*Provisions for Determining a Successor*) will be amended by the deletion of the word "fourteen" in the definition of "Best Available

Information” in sub-paragraph (g) thereof and its replacement with the word “thirty.”

8. **Section 2.3 (Reference Obligation).** Section 2.3 (*Reference Obligation*) will be deleted in its entirety and replaced with the following:

“Section 2.3 (Reference Obligation).

- (a) ‘Reference Obligation’ means each obligation specified as such or of a type described in the related Confirmation and any Substitute Reference Obligation provided that each such obligation (at all times except where indicated below) and any Substitute Reference Obligation (at all times from and including the time that such Substitute Reference Obligation is identified except where indicated below):

- (i) must be:

- (A) a Bond that is denominated in INR;
- (B) a direct obligation of the Reference Entity;
- (C) in dematerialised format;
- (D) a Bond that is transferable without any contractual, statutory or regulatory restriction, including without limitation, being free from any lock up period (or similar restriction on transfer) that is imposed by the Securities and Exchange Board of India; and

- (E) any one or more of the following:

- (1) Listed at the time that the Credit Derivative Transaction is entered into or, in respect of a Substitute Reference Obligation, at the time that the Substitute Reference Obligation is identified only; and/or
- (2) if the Reference Entity is an Infrastructure Company, rated by any Rating Agency at the time that the Credit Derivative Transaction is entered into or, in respect of a Substitute Reference Obligation, at the time that the Substitute Reference Obligation is identified only; and/or
- (3) an obligation in respect of which the Reference Entity is an Eligible SPV that is an Affiliate of an Infrastructure Company; and

- (ii) must not be any of the following:

- (A) a Short-Term Instrument;
- (B) an Asset-Backed Security;

- (C) a Convertible Obligation;
 - (D) an Exchangeable Obligation;
 - (E) an Interest Receivable; or
 - (F) an obligation with terms that include a Call Right and/or a Put Right.
- (b) In the event that the Calculation Agent determines that an obligation that is specified as the Reference Obligation did not satisfy the requirements set out in Section 2.3(a)(i) and (ii) above at the time the Credit Derivative Transaction was entered into or that an obligation that was identified as a Substitute Reference Obligation did not satisfy the requirements set out in Section 2.3(a)(i) and (ii) above at the time that such Substitute Reference Obligation was identified:
 - (i) the Calculation Agent will notify both parties as soon as reasonably practicable after making such determination;
 - (ii) the date that such notice to both parties is effective will be an Early Termination Date in respect of which the Credit Derivative Transaction will be the only Terminated Transaction;
 - (iii) no amount will be payable by either party pursuant to Section 6 of any ISDA Master Agreement between them (except in respect of any Unpaid Amounts); and
 - (iv) any failure to satisfy the requirements set out in Section 2.3(a)(i) and (ii) above will not be an Event of Default or Termination Event for the purpose of any ISDA Master Agreement between the parties.
- (c) In the event that the Calculation Agent determines that an obligation that is specified as the Reference Obligation satisfied the relevant requirements set out in Section 2.3(a)(i) and (ii) above at the time that the Credit Derivative Transaction was entered into but does not satisfy such relevant requirements at any time thereafter or that an obligation that was identified as a Substitute Reference Obligation satisfied the relevant requirements set out in Section 2.3(a)(i) and (ii) above at the time that such Substitute Reference Obligation was identified but does not satisfy such relevant requirements at any time thereafter:
 - (i) such obligation will not be characterised as a 'Reference Obligation' [except to the extent set out in the provisions of Section 2.30 (*Substitute Reference Obligation*)];

- (ii) the provisions of Section 2.30 (*Substitute Reference Obligation*) will apply; and
 - (iii) any such failure to satisfy such requirements will not be an Event of Default or Termination Event for the purpose of any ISDA Master Agreement between the parties."
- 9. **Section 2.14 (*Obligation*).** Section 2.14 (*Obligation*) will be deleted in its entirety and replaced with the following:
"Section 2.14 (*Obligation*). 'Obligation' means (a) any direct obligation of a Reference Entity determined pursuant to the method described in Section 2.19 (but excluding any Excluded Obligation), (b) each Reference Obligation, unless specified in the related Confirmation as an Excluded Obligation and (c) any other direct obligation of a Reference Entity specified as such in the related Confirmation provided that any such obligation is not an Excluded Obligation."
- 10. **Section 2.15 (*Deliverable Obligation*).** Section 2.15 (*Deliverable Obligation*) will be deleted in its entirety and replaced with the following:
"Section 2.15 (*Deliverable Obligation*). 'Deliverable Obligation' means:
 - (a) any direct obligation of a Reference Entity determined pursuant to the method described in Section 2.20 (but excluding any Excluded Deliverable Obligation) that (i) is payable in an amount equal to its outstanding principal balance or Due and Payable Amount, as applicable, and (ii) is not subject to any counterclaim, defense (other than a counterclaim or defense based on the factors set forth in Section 4.1(a)–(d)) or right of set off by or of a Reference Entity;
 - (b) each Reference Obligation unless specified in the related Confirmation as an Excluded Deliverable Obligation and
 - (c) any other Bond that is a direct obligation of a Reference Entity specified as such in the related Confirmation unless specified in the related Confirmation as an Excluded Deliverable Obligation,
 provided that, on the Delivery Date, the relevant obligation must be denominated in INR and be in dematerialised format."
- 11. **Section 2.20 (*Method for Determining Deliverable Obligation*).** The first paragraph of Section 2.20 (*Method for Determining Deliverable Obligation*) will be deleted in its entirety and replaced with the following:
"Section 2.20 (*Method for Determining Deliverable Obligations*). For purposes of Section 2.15, the term 'Deliverable Obligation' may

be defined as each direct obligation of each Reference Entity that (i) is described by the Deliverable Obligation Category specified in the related Confirmation; (ii) has each of the Deliverable Obligation Characteristics, if any, specified in the related Confirmation and (iii) satisfies the other requirements set out in Section 2.15, in each case, as of the Delivery Date. The following terms shall have the following meanings:"

12. **Section 2.30 (*Substitute Reference Obligation*).** Paragraphs (a) to (e) (inclusive) of Section 2.30 (*Substitute Reference Obligation*) will be deleted in their entirety and replaced with the following and paragraph (f) of Section 2.30 (*Substitute Reference Obligation*) will be renumbered as paragraph "(e)":

"Section 2.30 (*Substitute Reference Obligation*). 'Substitute Reference Obligation' means one or more direct obligations of the Reference Entity that will replace one or more Reference Obligations, identified by the Calculation Agent in accordance with the following procedures:

- (a) Upon the occurrence of (i) a Substitution Trigger Event or (ii) a Substitution Characterisation Event, the Calculation Agent shall (after consultation with the parties) identify one or more Obligations to replace such Reference Obligation.

For this purpose:

Substitution Trigger Event means either (i) a Reference Obligation is redeemed in whole or (ii) in the opinion of the Calculation Agent, (A) the aggregate amounts due under any Reference Obligation have been materially reduced by redemption or otherwise (other than due to any scheduled redemption, amortization or prepayments) or (B) for any other reason, other than due to the existence or occurrence of a Credit Event, any Reference Obligation is no longer an obligation of a Reference Entity.

Substitution Characterisation Event means that the Calculation Agent determines that an obligation that is specified as the Reference Obligation satisfied the relevant requirements set out in Section 2.3(a)(i) and (ii) above at the time that the Credit Derivative Transaction was entered into but does not satisfy such relevant requirements at any time thereafter or that an obligation that was identified as a Substitute Reference Obligation satisfied the relevant requirements set out in Section 2.3(a)(i) and (ii) above at the time that such Substitute Reference Obligation was identified but does not satisfy such relevant requirements at any time thereafter.

- (b) Any Substitute Reference Obligation or Substitute Reference Obligations shall be an Obligation that (i) satisfies the requirements set out in Section 2.3 (*Reference Obligation*); (ii) ranks *pari passu* in priority of payment with the ranking in priority of payment of each of the Substitute Reference Obligation and such Reference Obligation (with the ranking in priority of payment of such Reference Obligation being determined as of the date as of which such Reference Obligation was issued or incurred and not reflecting any change to such ranking in priority of payment after such date); (iii) preserves the economic equivalent, as closely as practicable as determined by the Calculation Agent in consultation with the parties, of the delivery and payment obligations of the parties to the Credit Derivative Transaction and (iv) is a direct obligation of the relevant Reference Entity. The Substitute Reference Obligation or Substitute Reference Obligations identified by the Calculation Agent shall, without further action, replace such Reference Obligation or Reference Obligations.
- (c) **Substitution Trigger Event.**
- (i) If one Reference Obligation is identified as a Reference Obligation in relation to a Credit Derivative Transaction and a Substitution Trigger Event has occurred with respect to such Reference Obligation, the Calculation Agent shall (after consultation with the parties) attempt to identify one Obligation to replace such Reference Obligation until the earliest to occur of (i) 10 Business Days following the date of the relevant Substitution Trigger Event and (ii) the Extension Date (the earliest such date being the 'Substitution Deadline').
 - (ii) In the event that the Substitution Deadline is the Extension Date, the parties' obligations to each other under the Credit Derivative Transaction shall cease as of the end of the day on the Extension Date (determined by reference to Indian Standard Time).
 - (iii) In the event that the Substitution Deadline is not the Extension Date and a Substitute Reference Obligation has not been identified on or prior to the Substitution Deadline:
 - (A) the Business Day immediately following the Substitution Deadline will be an Early Termination Date in respect of which the Credit Derivative

Transaction will be the only Terminated Transaction; and

- (B) no amount will be payable by either party pursuant to Section 6 of any ISDA Master Agreement between them (except in respect of any Unpaid Amounts).
- (iv) In the event that the Substitution Deadline is not the Extension Date and a Substitute Reference Obligation has been identified on or prior to the Substitution Deadline (such identification of a Substitute Reference Obligation being a 'Substitution Termination Event'):
 - (I) the Substitution Termination Event will not be an Event of Default or Termination Event for the purpose of any ISDA Master Agreement between the parties;
 - (II) the Credit Derivative Transaction will be terminated on the Business Day immediately following the date on which the Seller gives written notice to the Buyer that a Substitution Termination Event has occurred (such Credit Derivative Transaction, a "Substitute Reference Obligation Transaction" and such Business Day, the 'Substitution Termination Date');
 - (III) except as set out in sub-paragraph (IV) below, each of the Buyer's and Seller's obligations in respect of the Substitute Reference Obligation Transaction will cease absolutely on the Substitution Termination Date; and
 - (IV) the Buyer will on demand indemnify and hold harmless the Seller for and against all CDS Transaction Costs incurred by the Seller in connection with the termination of the Substitute Reference Obligation Transaction.

For the avoidance of doubt, no amount shall be payable in respect of the Substitute Reference Obligation Transaction pursuant to Section 6 of any ISDA Master Agreement between the parties (save to the extent that any CDS Transaction Costs constitute an Unpaid Amount) and any payments made by either party prior to the Credit Derivative Transaction being terminated as a result of being characterized as an Substitute Reference

Obligation Transaction will not be affected or returned to the relevant payer.

(d) Substitution Characterisation Event

- (i) If one Reference Obligation is identified as a Reference Obligation in relation to a Credit Derivative Transaction, a Substitution Characterisation Event has occurred with respect to such Reference Obligation and the Calculation Agent determines (after consultation with the parties) that no Substitute Reference Obligation is available for that Reference Obligation, then the Calculation Agent shall continue to attempt to identify a Substitute Reference Obligation until the Extension Date.
- (ii) In the circumstances that either (A) 'Cash Settlement' is specified as the Settlement Method in the related Confirmation (or is applicable pursuant to the Fallback Settlement Method in accordance with Section 12.1) and the Cash Settlement Amount is determined by reference to a Reference Obligation or (B) either "Auction Settlement" or "Physical Settlement" is specified as the Settlement Method in the related Confirmation (or, in the case of Physical Settlement, is applicable pursuant to the Fallback Settlement Method in accordance with Section 12.1) and, in each case, the Reference Obligation is the only Deliverable Obligation:
 - (I) the timing requirements of Sections 3.2(c), 3.4, 7.2, 7.8, 8.1 and 8.6, as applicable, and any other section of the Credit Derivatives Definitions that pertains to settlement, shall toll and remain suspended until the earlier to occur of the Extension Date and the date on which a Substitute Reference Obligation is identified; and
 - (II) if a Substitute Reference Obligation has not been identified on or prior to the Extension Date, the relevant obligation that is specified as the Reference Obligation or that was identified as a Substitute Reference Obligation, as applicable, will be deemed to be a valid Reference Obligation on the Extension Date for the purposes of Cash Settlement, Physical Settlement or Auction Settlement, as applicable (notwithstanding that such obliga-

tion does not satisfy the requirements set out in Section 2.3 (Reference Obligation) at such time)."

13. **Section 2.31 (*Merger of Reference Entity and Seller*).** Section 2.31 (*Merger of Reference Entity and Seller*) will be deleted in its entirety and replaced with the following:

"Section 2.31 (*Merger of Reference Entity and Transaction Party or of Transaction Parties*).

- (a) In the event that any Transaction Party or a Reference Entity consolidates or amalgamates with, or merges into, or transfers all or substantially all its assets to, the Reference Entity or the Transaction Party, as applicable, or a Transaction Party and a Reference Entity become Affiliates, an Additional Termination Event under the 2002 ISDA Master Agreement will be deemed to have occurred with Seller as the sole Affected Party (where the Transaction Party is Seller) or with Buyer as the sole Affected Party (where the Transaction Party is Buyer), with each Credit Derivative Transaction involving such Reference Entity as the Affected Transactions and Close-out Amount as applicable (irrespective of the payment measure specified by the parties in any master agreement between them) and each such Credit Derivative Transaction will be terminated in accordance with any applicable provisions set forth in the 2002 ISDA Master Agreement.
- (b) In the event that any Transaction Party consolidates or amalgamates with, or merges into, or transfers all or substantially all its assets to, the other Transaction Party, or the Transaction Parties become Affiliates, an Additional Termination Event under the 2002 ISDA Master Agreement will be deemed to have occurred with both Seller and Buyer as the Affected Parties, with each Credit Derivative Transaction as the Affected Transactions and Close-out Amount as applicable (irrespective of the payment measure specified by the parties in any master agreement between them) and each such Credit Derivative Transaction will be terminated in accordance with any applicable provisions set forth in the 2002 ISDA Master Agreement.
- (c) In the event that the Calculation Agent determines that the Transaction Parties are Related Parties in respect of each other or in respect of the Reference Entity, in each case, at the time that the Credit Derivative Transaction was entered into:

- (i) the Calculation Agent will notify both parties as soon as reasonably practicable after making such determination;
- (ii) the date that such notice both parties is effective will be an Early Termination Date in respect of which the Credit Derivative Transaction will be the only Terminated Transaction;
- (iii) no amount will be payable by either party pursuant to Section 6 of any ISDA Master Agreement between them (except in respect of any Unpaid Amounts) and
- (iv) the circumstances described above will not be an Event of Default or Termination Event for the purpose of any ISDA Master Agreement between the parties."

14. **Section 3.5 (Publicly Available Information).** Section 3.5 (*Publicly Available Information*) is modified by:

- (A) the deletion of sub-paragraphs (iii) and (iv) of paragraph (a) thereof and replacing them with the following sub-paragraphs (iii) and (iv):

"(iii) is information contained in any petition or filing instituting a proceeding described in Section 4.2(d) or 4.7(a) against a Reference Entity or any register or other record of a court or other body responsible for recording such petition or filing or (iv) is information contained in any official gazette, order, decree, notice or filing, however described, of or filed with the central or federal or a state government, a court, tribunal, exchange, regulatory authority or similar administrative, regulatory or judicial body." and

- (B) including the following paragraph (d) immediately following paragraph (c) and re-numbering paragraph (d) as (e):

"(d) In relation to any information of the type described in Section 3.5(a)(iii), where the relevant Credit Event is a Restructuring under the terms of Section 4.7(a) and the information is contained in a register or other record of a court or other body responsible for recording such petition or filing, a written copy of which is not made available by such court or other body, the Notifying Party shall be required to deliver to the other party the sworn affidavit of (i) a qualified lawyer that is currently practicing in a law firm that is a member of ISDA or (ii) a qualified lawyer that is working as in-house counsel or otherwise in the legal department in India of an entity that is a member of the ISDA or the FIMMDA, in each case, certifying that such person has received the verbal confirmation of an officer of the relevant court or other body that the relevant petition or filing has been made."

15. **Section 4.1 (*Credit Event*).** Section 4.1 (*Credit Event*) is modified by deleting sub-paragraph (c) in its entirety and replacing it with the following:
“(c) any applicable law, order, regulation, decree or notice, however described, or the promulgation of, or any change in, the interpretation by any court, tribunal, regulatory authority or similar administrative or judicial body with competent or apparent jurisdiction of any applicable law, order, regulation, decree or notice, however described, or the declaration or imposition of a moratorium, stand-still, roll-over or deferral, by any regulatory authority or Government Authority, whether de facto or de jure, or.”
16. **Section 4.7 (*Restructuring*).** Section 4.7 (*Restructuring*) is deleted in its entirety and replaced with the following:
“**Section 4.7 (*Restructuring*).** Restructuring means that any one or more of the following events occur:
 - (a) the Reference Entity is subject to an order passed by the BIFR under section 17 of the Sick Industrial Companies (Special Provisions) Act, 1985 (as may be amended from time to time);
 - (b) the Reference Entity is declared a ‘relief undertaking’ within the meaning of the term as defined under the Bombay Relief Undertakings (Special Provisions) Act, 1958 (as may be amended from time to time) or any analogous law applicable to the Reference Entity or any of the assets or undertakings of the Reference Entity, or is otherwise granted statutory protection from its creditors or from enforcement of any monetary claims; or
 - (c) the Reference Entity is referred to a Corporate Debt Restructuring Empowered Group by a Corporate Debt Restructuring Cell, the nodal agency of the Corporate Debt Restructuring Forum, or any analogous action is taken under any analogous or successor mechanism thereto whether or not statutory or voluntary in nature
provided that the occurrence of any of the events described in Section 4.7(a) to (c) (inclusive) will not be a Restructuring if such event does not directly or indirectly result from a deterioration in the creditworthiness or financial condition of the Reference Entity.”
17. **Section 4.9. (*Limitation on Obligations in Connection with Section 4.7*).** Section 4.9 (*Limitation on Obligations in Connection with Section 4.7*) is deleted in its entirety.
18. **Section 7.15 (*Dealer*).** Section 7.15 (*Dealer*) will be deleted in its entirety and replaced with the following:

“Section 7.15 (Dealer). ‘Dealer’ means a Market-maker (other than one of the parties or any Affiliate of one of the parties, unless otherwise specified in the related Confirmation) in obligations of the type of Obligation(s) for which Quotations are to be obtained, including each Dealer specified in the related Confirmation (provided that any entity that is specified in the Confirmation must be a Market-maker). If no Dealers are specified in the related Confirmation, the Calculation Agent shall select the Dealers in consultation with the parties, provided that in the case of Section 9.9, Seller shall select the Dealers in good faith and in a commercially reasonable manner. Upon a Dealer no longer being in existence (with no successors), or not being an active dealer in the obligations of the type for which Quotations are to be obtained, the Calculation Agent may substitute any other Dealer(s) for one or more of the foregoing after consultation with the parties.”

19. **Section 9.1 (Additional Representations and Agreements of the Parties).** Section 9.1 (*Additional Representations and Agreements of the Parties*) will be amended by the addition of the following new paragraphs (e) and (f) immediately following paragraph (d):

“(e) At the time a Credit Derivative Transaction is entered into, Seller represents to Buyer that:

- (i) it is a Market-maker; and
- (ii) it is an Indian Resident.

(f) Buyer represents to Seller that:

- (i) at the time a Credit Derivative Transaction is entered into (A) it is a User; and (B) it is an Indian Resident or a Foreign Institutional Investor; and
- (ii) at all times whilst the Credit Derivative Transaction is outstanding, it is the beneficial owner of a Due and Payable Amount of the obligation that is specified as the Reference Obligation (or the obligation that has been identified as a Substitute Reference Obligation) of not less than the Floating Rate Payer Calculation Amount. Buyer undertakes to deliver to Seller an auditor’s certificate or custodian’s certificate verifying such holding (A) on or prior to the Effective Date of the relevant Credit Derivative Transaction, and (B) promptly and in any event within 10 Business Days of any request from Seller.

In the event that the Buyer’s representation set out in Section 9.1(f)(ii) above proves to have been incorrect or misleading

in any respect on any date when made or repeated and/or the Buyer does not deliver an auditor's certificate or custodian's certificate in accordance with the provisions set out in Section 9.1(f)(ii) above (such occurrence, an 'Uncovered CDS Event'):

- (I) the Uncovered CDS Event will not be an Event of Default or Termination Event for the purpose of any ISDA Master Agreement between the parties; and
- (II) the Credit Derivative Transaction will be terminated on the Business Day immediately following the date on which the Seller gives written notice to the Buyer that an Uncovered CDS Event has occurred (such Credit Derivative Transaction, an 'Uncovered CDS Transaction' and such Business Day, the '**Uncovered CDS Date**');
- (III) except as set out in sub-paragraph (IV) below, each of the Buyer's and Seller's obligations in respect of the Uncovered CDS Transaction will cease absolutely on the Uncovered CDS Date and
- (IV) the Buyer will on demand indemnify and hold harmless the Seller for and against all CDS Transaction Costs incurred by the Seller in connection with the termination of the Uncovered CDS Transaction.

For the avoidance of doubt, no amount shall be payable in respect of the Uncovered CDS Transaction pursuant to Section 6 of any ISDA Master Agreement between the parties (save to the extent that any CDS Transaction Costs constitute an Unpaid Amount) and any payments made by either party prior to the Credit Derivative Transaction being terminated as a result of being characterized as an Uncovered CDS Transaction will not be affected or returned to the relevant payer."

20. **Section 9.2 (Additional Representations and Agreements for Physical Settlement).**

Section 9.2(c)(ii) (*Additional Representations and Agreements for Physical Settlement*) will be deleted in its entirety and replaced with the following:

"(ii) Subject to Section 9.3, Buyer may Deliver only the Deliverable Obligations specified in the Notice of Physical Settlement or any NOPS Amendment Notice, as applicable, and only in the amounts specified therein.

Buyer may not continue to attempt to Deliver any of the Deliverable Obligations specified in the Notice of Physical Settlement or

any NOPS Amendment Notice, as applicable, after the Physical Settlement Date. If Buyer fails to Deliver any Deliverable Obligations on or prior to the Physical Settlement Date, as specified in the Notice of Physical Settlement or any NOPS Amendment Notice, as applicable, such failure shall not constitute an event of default as agreed to between the parties in any master agreement governing the Credit Derivative Transaction.

Subject to Section 9.3, the earliest of (i) the date that Buyer completes Delivery of the Deliverable Obligations specified in the Notice of Physical Settlement or any NOPS Amendment Notice, as applicable, and (ii) the date that is one Business Day following the Physical Settlement Date, shall be deemed to be the Termination Date."

21. **Section 9.7 (*Latest Permissible Physical Settlement Date*).** Section 9.7 (*Latest Permissible Physical Settlement Date*) is deleted in its entirety and replaced with the following:

"'Latest Permissible Physical Settlement Date' means, in respect of Section 9.3, the Physical Settlement Date."

22. **Section 9.9 (*Buy-in of Bonds Not Delivered*).** Section 9.9 (*Buy-in of Bonds Not Delivered*) is deleted in its entirety.

23. **Definitions**

"**Asset-Backed Security**" means any security that evidences a beneficial interest in Underlying Assets that are held by a bankruptcy remote entity for the benefit of the security holders without recourse to the originator of such Underlying Assets.

"**BIFR**" means the Board for Industrial and Financial Reconstruction set up under the provisions of the Sick Industrial Companies (Special Provisions) Act, 1985 (as may be amended from time to time) and shall include references to (i) any statutory agency, authority or body set up, constituted, organised or recognized as a successor to it; (ii) any statutory agency, authority or body set up to whom any powers, functions or duties under such Act are transferred, assigned or delegated; or (iii) any court, tribunal, other judicial or quasi-judicial body, whether in existence or constituted for this purpose, to whom the powers, functions or duties under such Act are transferred, assigned or delegated.

"**Call Right**" means a right that an issuer or obligor may elect to exercise to redeem the relevant obligation prior to the Scheduled Termination Date of the Credit Derivative Transaction (except in connection with a redemption event or an event of default (howsoever described) pursuant to the terms of the relevant obligation).

“CDS Transaction Costs” means, with respect to the Seller and a Substitute Reference Obligation Transaction pursuant to the provisions set out at Section 2.30(c) (*Substitution Trigger Event*) or an Uncovered CDS Transaction pursuant to the provisions set out in Section 9.1 (*Additional Representations and Agreements of the Parties*), as applicable, the amount of all losses, costs and expenses (including any legal fees) of the Seller that are or would be incurred under the prevailing circumstances in connection with the termination of the relevant Substitute Reference Obligation Transaction or Uncovered CDS Transaction, as applicable, including, but not limited to, any loss of bargain, cost of funding or, at the election of the Seller, without duplication, loss or cost incurred as a result of its terminating, liquidating, obtaining or re-establishing any hedge or related trading position.

Any CDS Transaction Costs will be determined by the Seller (or its agent), which will act in good faith and use commercially reasonable procedures in order to produce a commercially reasonable result. The CDS Transaction Costs will be determined as of the Substitution Termination Date or Uncovered CDS Date, as applicable, or, if that would not be commercially reasonable, as of the date or dates thereafter as would be commercially reasonable.

CDS Transaction Costs will include the Seller’s legal fees and out-of-pocket expenses in connection with the relevant Substitute Reference Obligation Transaction or Uncovered CDS Transaction, as applicable, and any payments required to have been made (assuming satisfaction of each applicable condition precedent and as if the Credit Derivative Transaction was not terminated) on or before the relevant Substitution Termination Date or Uncovered CDS Date, as applicable, but have not been made.

In determining the CDS Transaction Costs, the Seller may consider any relevant information, including, without limitation, the types of information specified in, and on the basis set out in, the definition of “Close-out Amount.”

“Corporate Debt Restructuring Cell” means the ‘CDR Cell’ as such term is described in the Annexure to the Revised Guidelines on Corporate Debt Restructuring (CDR) Mechanism bearing reference DBOD.No.BP.BC. 45 / 21.04.132/ 2005-06 dated 10 November 2005 (as may be amended from time to time).

“Corporate Debt Restructuring Empowered Group” means the ‘CDR Empowered Group’ as such term is described in the Annexure to the Revised Guidelines on Corporate Debt Restructur-

ing (CDR) Mechanism bearing reference DBOD.No.BP.BC. 45 / 21.04.132/ 2005-06 dated 10 November 2005 (as may be amended from time to time).

“Corporate Debt Restructuring Forum” means the ‘CDR Standing Forum’ as such term is described in the Annexure to the Revised Guidelines on Corporate Debt Restructuring (CDR) Mechanism bearing reference DBOD.No.BP.BC. 45 / 21.04.132/ 2005-06 dated 10 November 2005 (as may be amended from time to time).

“Eligible SPV” means a special purpose vehicle that discloses its structure, usage, purpose and performance in its financial statements.

“Foreign Institutional Investor” means a ‘Foreign Institutional Investor’ as such term is defined in the Securities and Exchange Board of India (Foreign Institutional Investors) Regulations, 1995 (as amended from time to time).

“Indian Resident” means a “person resident in India” as such term is defined in Section 2(v) of The Foreign Exchange Management Act, 1999, of India (as may be amended from time to time).

“Infrastructure Company” means any entity which is engaged in the list of items included in the infrastructure sector as defined in the DBOD circular RBI/2011-12/58DBOD. No.Dir.BC.7/13.03.00/ 2011-12 dated 1 July 2011 (as may be amended from time to time).

“Interest Receivable” means any obligation that represents only the interest component of another obligation that has been separated into principal and interest components.

“Market-maker” means, on any date, a ‘market-maker’ as such term is described in the RBI circular IDMD.PCD.No. 5053/14.03.04/20010-111 dated 23 May 2011 (as may be amended from time to time) and any other institution specifically permitted by the RBI.

“Put Right” means a right that may be exercised by some or all of the holder(s) of an obligation pursuant to which the relevant issuer or obligor will be required to redeem such obligation prior to the Scheduled Termination Date of the Credit Derivative Transaction (except in connection with a redemption event or an event of default (howsoever described) pursuant to the terms of the relevant obligation).

“Rating Agency” means any of the ‘credit rating agencies’ as such term is defined at Section 2(1)(h) of the Securities and Exchange Board of India (Credit Rating Agencies) Regulations, 1999 (as may be amended from time to time).

“Related Party” means, in respect of any party to the Credit Derivative Transaction, either:

- (i) as defined at clause 10 (*Definitions*) of “Accounting Standard (AS) 18. Related Party Disclosures”; or
- (ii) any Affiliate.

“Reuters Screen” means, when used in connection with any designated page and any currency exchange rate to be determined by reference to that page, the display page so designated on the Reuter Monitor Money Rates Service (or any successor service thereof), or such other page as may replace that page on that service for the purpose of displaying a currency exchange rate comparable to such currency exchange rate.

“Short-Term Instrument” means any obligation (including, but not limited to, Bonds, certificates of deposit and debentures) that has a scheduled maturity date or scheduled repayment date (howsoever described) that is one year or less following its issue date.

“Transaction Party” means either of Buyer and its Related Parties or Seller and its Related Parties.

“Underlying Assets” means, with respect to an Asset-Backed Security, a pool of specified financial assets, either fixed or revolving, that by their terms convert into cash within a finite time period, together with rights or other assets designed to assure the servicing or timely distribution of proceeds to the holders of such Asset-Backed Security.

“User” means, on any date, a ‘user’ as such term is described in the RBI circular IDMD.PCD.No. 5053/14.03.04/20010-111 dated 23 May 2011 (as may be amended from time to time) and any other institution specifically permitted by the RBI.

ANNEX 3

[Buyer Contact Information:]

[Seller Contact Information:]

TRANSACTION SUPPLEMENT

Dear Sir or Madam,

This Transaction Supplement is entered into between the Buyer and Seller listed below on the Trade Date set forth below.

The purpose of this communication is to confirm the terms and conditions of the Credit Derivative Transaction entered into between us on the Trade Date specified below (the "Transaction"). This Transaction Supplement is entered into under the User Master Credit Derivatives Confirmation Agreement for Indian Corporate Bonds dated as of [_____] and, together with the User Master Credit Derivatives Confirmation Agreement for Indian Corporate Bonds and the Standard CDS Terms attached thereto, constitutes a "Confirmation" as referred to in the Master Agreement between the parties, as amended and supplemented from time to time.

The terms of the Transaction to which this Transaction Supplement relates are as follows:

Reference Entity:	[⌘]
Reference Obligation:	The obligation[s] identified as follows:
	Primary Obligor: [⌘]
	Guarantor: [⌘]
	Maturity: [⌘]
	Coupon: [⌘]
	ISIN: [⌘]
Trade Date:	[⌘]
Effective Date:	[⌘]
Scheduled Termination Date:	[⌘]
Floating Rate Payer:	[⌘] (the "Seller")
Fixed Rate Payer:	[⌘] (the "Buyer")
Initial Payment Payer:	[⌘]
Initial Payment Amount:	[⌘]

Fixed Rate: [] per cent.
Fixed Rate Day Count Fraction: [Actual/Actual] [Actual/365 (Fixed)]
Floating Rate Payer Calculation: INR []
Amount:
Credit Events: [Standard Credit Events]
[Extended Credit Events]
[Additional Terms: []

Please confirm your agreement to be bound by the terms of the foregoing by executing a copy of this Transaction Supplement and returning it to us [at the contact information listed above].

[_____]

[_____]

By: _____

By: _____

Name:

Name:

Title:

Title:

APPENDIX 4

GUIDELINES ON CAPITAL ADEQUACY AND EXPOSURE NORMS FOR CREDIT DEFAULT SWAPS

.. ..

1. INTRODUCTION

With a view to providing market participants, a tool to transfer and manage credit risk associated with corporate bonds, the Reserve Bank of India has introduced credit default swaps (CDS) on corporate bonds. Stand-alone Primary Dealers (PDs) can undertake transactions in CDS, both as market-makers and users. As a user, a PD can use CDS to hedge credit risk in corporate bonds held in its trading book. The guidelines on capital adequacy and exposure norms for CDS are dealt with in the following paragraphs.

2. DEFINITIONS

The following definitions are used in these guidelines:

- (i) **Credit event payment**---the amount which is payable by the credit protection seller to the credit protection buyer under the terms of the credit derivative contract following the occurrence of a credit event. The payment can be in form of **physical settlement** (payment of par in exchange for physical delivery of a deliverable obligation of the reference entity) or **cash settlement** (either a payment determined on a par-less-recovery basis, *i.e.*, determined using the par value of the reference obligation less that obligation's recovery value, or a fixed amount, or a fixed percentage, of the par amount).

- (ii) **Deliverable asset/obligation**---any obligation of the reference entity which can be delivered, under the terms of the contract, if a credit event occurs. A deliverable obligation is relevant for credit derivatives that are to be physically settled.
- (iii) **Reference obligation**---the obligation used to calculate the amount payable when a credit event occurs under the terms of a credit derivative contract. A reference obligation is relevant for obligations that are to be cash settled (on a par-less-recovery basis).
- (iv) Assets under (ii) and (iii) above, will rank at least *pari passu* or junior to the underlying obligation.
- (v) **Underlying asset/obligation**---The asset which a protection buyer is seeking to hedge.

3. CLASSIFICATION OF CDS AND OPERATIONAL REQUIREMENTS FOR CDS

3.1 Classification of CDS

A PD should allocate CDS transactions, which are held either with the trading intent or to hedge a credit risk of the underlying corporate bond, in its Trading Book.

3.2 Operational Requirements for CDS

- (a) A CDS contract should represent a direct claim on the protection seller and should be explicitly referenced to specific exposure, so that the extent of the cover is clearly defined and incontrovertible.
- (b) Other than non-payment by a protection buyer of premium in respect of the credit protection contract, it should be irrevocable.
- (c) There should be no clause in the contract that would allow the protection seller unilaterally to cancel the credit cover or that would increase the effective cost of cover as a result of deteriorating credit quality in the hedged exposure.
- (d) The CDS contract should be unconditional; there should be no clause in the protection contract outside the direct control of the PD that could prevent the protection seller from being obliged to pay out in a timely manner in the event that the original counterparty fails to make the payment(s) due.
- (e) The credit events specified by the contracting parties should at a minimum cover:

- (i) failure to pay the amounts due under terms of the underlying obligation that are in effect at the time of such failure (with a grace period that is closely in line with the grace period in the underlying obligation);
- (ii) bankruptcy, insolvency or inability of the obligor to pay its debts, or its failure or admission in writing of its inability generally to pay its debts as they become due, and analogous events and
- (iii) restructuring of the underlying obligation involving forgiveness or postponement of principal, interest or fees that results in a credit loss event;
- (iv) when the restructuring of the underlying obligation is not covered by the CDS, but the other requirements are met, partial recognition of the CDS is allowed. If the amount of the CDS is less than or equal to the amount of the underlying obligation, 60% of the amount of the hedge can be recognized as covered. If the amount of the CDS is larger than that of the underlying obligation, then the amount of eligible hedge is capped at 60% of the amount of the underlying obligation.
- (f) If the CDS specifies deliverable obligations that are different from the underlying obligation, the resultant asset mismatch will be governed under paragraph (k) given later.
- (g) The CDS will not terminate before expiration of any grace period required for a default on the underlying obligation to occur as a result of a failure to pay.¹
- (h) The CDS allowing for cash settlement are recognized for capital purposes insofar as a robust valuation process is in place in order to estimate loss reliably. There should be a clearly specified period for obtaining post-credit event valuations of the underlying obligation. If the reference obligation specified in the CDS for purposes of cash settlement is different than the underlying obligation, paragraph (k) given later governs whether the asset mismatch is permissible.
- (i) If the protection buyer's right/ability to transfer the underlying obligation to the protection seller is required for settlement, the terms of the underlying obligation should provide that any required consent to such transfer may not be unreasonably withheld.
- (j) The identity of the parties responsible for determining whether a credit event has occurred should be clearly defined. This determi-

¹Definition of maturity---the maturity of the underlying exposure and the maturity of the hedge should both be defined conservatively. The effective maturity of the underlying should be gauged as the longest possible remaining time before the counterparty is scheduled to fulfill its obligation, taking into account any applicable grace period.

nation should not be the sole responsibility of the protection seller. The protection buyer should have the right/ability to inform the protection seller of the occurrence of a credit event.

- (k) A mismatch between the underlying obligation and the reference obligation under the CDS (*i.e.*, the obligation used for purposes of determining cash settlement value or the deliverable obligation) is permissible if (1) the reference obligation ranks *pari passu* with or is junior to the underlying obligation and (2) the underlying obligation and reference obligation share the same obligor (*i.e.*, the same legal entity) and legally enforceable cross-default or cross-acceleration clauses are in place.
- (l) A mismatch between the underlying obligation and the obligation used for purposes of determining whether a credit event has occurred is permissible if (1) the latter obligation ranks *pari passu* with or is junior to the underlying obligation and (2) the underlying obligation and reference obligation share the same obligor (*i.e.*, the same legal entity) and legally enforceable cross-default or cross-acceleration clauses are in place.

4. CAPITAL CHARGE APPLICABLE ON CDS POSITIONS

The PDs as protection buyers and protection sellers will be required to maintain capital charge in respect of their exposures in the Trading Book as indicated in Table 1.

TABLE 1 Capital Charge for CDS Positions.

Particulars		Trading Book	
		Hedged Position	Unhedged Position
Protection buyer	User	(a) General market risk (b) Specific risk (c) Counterparty credit risk	Not permitted
	Market-maker	(a) General market risk (b) Specific risk (c) Counterparty credit risk	(a) General market risk (b) Specific risk (c) Counterparty credit risk

(Contd.)

(Contd.)

Particulars		Trading Book	
		Hedged Position	Unhedged Position
Protection seller	User	Not permitted	Not permitted
	Market-maker	(a) General market risk (b) Specific risk (c) Counterparty credit risk	(a) General market risk (b) Specific risk (c) Counterparty credit risk

5. CAPITAL ADEQUACY FOR CDS IN THE TRADING BOOK

5.1 Recognition of Positions

The general norms for recognizing positions by the PDs dealing in CDS are as under:

- A CDS does not normally create a position for general market risk.
- The premium payable/receivable creates notional positions in government securities of relevant maturity with the appropriate fixed or floating rate. These positions will attract appropriate capital charge for general market risk.
- A CDS creates a notional long or short position for specific risk in the reference asset/obligation (to the reference entity). The notional amount and the maturity of the CDS contract will be used instead of the maturity of the reference asset/obligation. The capital charge for specific risk is designed to protect against an adverse movement in the price of an individual security owing to factors related to the individual issuer. The specific risk charges for various kinds of exposures would be applied as detailed in Table 2:

TABLE 2 *Specific Risk Capital Charge for Bought and Sold CDS Positions*

Rating*	Residual Maturity	Specific Risk Capital Charge (%)
AAA to BBB	6 months or less	0.47
	More than 6 months and up to and including 24 months	1.90
	Exceeding 24 months	3.00

(Contd.)

(Contd.)

Rating*	Residual Maturity	Specific Risk Capital Charge (%)
BB and below	All maturities	22.5
Unrated (if permitted)	All maturities	15

*These ratings indicate the ratings assigned by the Indian rating agencies / External Credit Assessment Institutions (ECAIs) or foreign rating agencies. In the case of foreign ECAIs, the rating symbols used here correspond to Standard and Poor. The modifiers "+" or "-" have been subsumed with the main category.

- (d) A CDS contract creates a counterparty exposure on the protection seller on account of the credit event payment and on the protection buyer on account of the amount of premium payable under the contract. The credit exposure for the purpose of counterparty credit risk on account of CDS transactions will be calculated according to the Current Exposure Method [Sum of the current marked-to-market (MTM) value, if positive (zero, if MTM is negative) and the potential future exposure add-on factors]. No netting of positive and negative MTM values of the contracts with the same counterparty, including that in the case of hedged positions, will be allowed for the purpose of computing capital charge for counterparty credit risk.

5.2 Specific Risk Capital Charges for Positions Hedged by CDS²

- (i) PDs may fully offset the specific risk capital charges when the values of two legs (*i.e.*, long and short) always move in the opposite direction and broadly to the same extent. This would be the case when the two legs consist of completely identical CDS. In these cases, no specific risk capital requirement applies to both sides of the CDS position.
- (ii) PDs may offset 80% of the specific risk capital charges when the value of two legs (*i.e.*, long and short) always moves in the opposite direction but not broadly to the same extent.³ This would be the

²This paragraph will be applicable only in those cases where a CDS position is explicitly meant for hedging a Trading Book exposure. In other words, a PD cannot treat a CDS position as a hedge against any other Trading Book exposure if it was not intended to be as such *ab initio*.

³A cash position in corporate bond in Trading Book hedged by a CDS position, even where the reference obligation and the underlying bonds are the same, will not qualify for 100%

case when a long cash position is hedged by a CDS and there is an exact match in terms of the reference/deliverable obligation, and the maturity of both the reference/deliverable obligation and the CDS. In addition, key features of the CDS (*e.g.*, credit event definitions, settlement mechanisms) should not cause the price movement of the credit derivative to materially deviate from the price movements of the cash position. To the extent that the transaction transfers risk, an 80% specific risk offset will be applied to the side of the transaction with the higher capital charge, while the specific risk requirement on the other side will be zero.⁴

- (iii) PDs may offset partially the specific risk capital charges when the value of the two legs (*i.e.*, long and short) usually moves in the opposite direction. This would be the case in the following situations:
 - (a) The position is captured in paragraph 5.2(ii) but there is an asset mismatch between the cash position and the CDS. However, the underlying asset is included in the (reference/deliverable) obligations in the CDS documentation and meets the requirements of paragraph 3.2(k).
 - (b) The position is captured in paragraph 5.2(ii) but there is a maturity mismatch between credit protection and the underlying asset. However, the underlying asset is included in the (reference/deliverable) obligations in the CDS documentation.
 - (c) In each of the cases in paragraphs (a) and (b) earlier, rather than adding the specific risk capital requirements on each side of the transaction (*i.e.*, the credit protection and the underlying asset) only the higher of the two capital requirements will apply.

5.3 Specific Risk Charge in CDS Positions Which are Not Meant for Hedging

In cases not captured in paragraph 5.2, a specific risk capital charge will be assessed against both sides of the positions as detailed in paragraph 5.1(c).

offset because a CDS cannot guarantee a 100% match between the market value of CDS and the appreciation / depreciation in the underlying bond at all times.

⁴For example, if specific risk charge on long position (corporate bond) comes to Rs.1000 and that on the short position (credit protection bought through CDS) comes to Rs.700, there will be no capital charge on the short position while the long position will attract specific risk capital charge of Rs.200 (1000 - 80% of 1000). PDs will not be allowed to offset specific risk charges between two opposite CDS positions which are not completely identical.

5.4 Protection Seller

5.4.1 *Capital charge for market risk*

- (a) **General market risk:** The present value of premium receivable is sensitive to changes in the interest rates. In order to measure the interest rate risk in premium receivables, the present value of the premium receivable can be treated as a long notional position in government securities of relevant maturity with the appropriate fixed or floating rate. These positions will attract appropriate capital charge for general market risk.
- (b) **Specific risk:** Where a protection seller has sold credit protection through a CDS, it acquires exposure to the credit risk of the reference asset to the extent of the amount of protection sold. Thus, a CDS creates a notional long position for specific risk in the reference asset/obligation to the extent of the notional amount of the CDS, which must be used. The maturity of the CDS contract will be used instead of the maturity of the reference asset/obligation. Accordingly, a specific risk capital charge must be calculated on the notional long position in the reference entity (reference asset/obligation) as detailed in paragraph 5.1(c).

5.4.2 *Capital charge for credit risk*

Counterparty credit risk capital charge for exposure to the protection buyer: The protection seller should compute the counterparty capital charge using the current exposure method if fee/premia payments are outstanding. In such cases, the counterparty credit risk charge for single-name CDS transactions in the Trading Book will be calculated as the sum of the current MTM value,⁵ if positive (zero, if MTM is negative) and the potential future exposure add-on factors on the basis of Table 3:

⁵A CDS contract, which is required to be marked-to-market, creates bilateral exposure for the parties to the contract. The mark-to-market value of a CDS contract is the difference between the default-adjusted present value of protection payment (called "protection leg" / "credit leg") and the present value of premium payable called "premium leg." If the value of credit leg is less than the value of the premium leg, then the mark-to-market value for the protection seller is positive. Therefore, the protection seller will have exposure to the counterparty (protection buyer) if the value of premium leg is more than the value of credit leg. In case, no premium is outstanding, the value of premium leg will be zero and the mark-to-market value of the CDS contract will always be negative for the protection seller and therefore, protection seller will not have any exposure to the protection buyer.

TABLE 3 *Add-on Factors for Protection Sellers*
(As percentage of Notional Principal of CDS)

Type of Reference Obligation ⁶	Add-on Factor
Obligations rated BBB- and above	10%
Below BBB- and unrated	20%

5.5 Protection Buyer

5.5.1 Capital charge for market risk

- (a) **Capital charge for general market risk:** The present value of premium payable by the protection buyer is sensitive to changes in the interest rates. In order to measure the interest rate risk in premium payables, the present value of the premium payable can be treated as a short notional position in government securities of relevant maturity with the appropriate fixed or floating rate. These positions will attract appropriate capital charge for general market risk.
- (b) **Capital charge for specific risk:** A bought position in CDS creates a notional short position for specific risk in the reference asset/obligation. The notional amount of the CDS and the maturity of the CDS contract will be used instead of the maturity of the reference asset/obligation. Accordingly, a specific risk capital charge should be calculated on a short position in the reference entity (reference asset/obligation) as detailed in paragraph 5.1(c).

5.5.2 Capital charge for credit risk

Capital charge for counterparty credit risk: A CDS contract creates a counterparty exposure on the protection seller on account of the credit event payment. The counterparty credit risk charge for all short CDS positions in the Trading Book will be calculated as the sum of the current MTM value, if positive (zero, if MTM is negative) and the potential future exposure add-on factors based on Table 4:

⁶The add-on factors will be the same regardless of maturity of the reference obligations or CDS contract.

TABLE 4 *Add-on Factors for Protection Buyers*
(As percentage of Notional Principal of CDS)

Type of Reference Obligation ⁷	Add-on Factor
Obligations rated BBB- and above	10%
Below BBB- and unrated	20%

6. CAPITAL CHARGE FOR COUNTERPARTY RISK FOR COLLATERALIZED TRANSACTIONS IN CDS

Collaterals and margins have to be maintained by the individual market participants. The counterparty exposure for CDS traded in the OTC market will be calculated as per the Current Exposure Method. Under this method, the calculation of the counterparty credit risk charge for an individual contract, taking into account the collateral, will be as follows:

$$\text{Counterparty risk capital charge} = [(RC + \text{add-on}) - CA] \times r \times 15\%$$

where,

RC = the replacement cost,

add-on = the amount for potential future exposure calculated according to paragraphs 5.4.2 and 5.5.2 earlier.

CA = the volatility adjusted amount of eligible collateral or zero if no eligible collateral is applied to the transaction and

r = the risk weight of the counterparty.

7. TREATMENT OF EXPOSURES BELOW MATERIALITY THRESHOLDS

Materiality thresholds on payments below which no payment is made in the event of loss are equivalent to retained first loss positions and should be assigned risk weight of 667% ($1/0.15 \times 100$, as minimum CRAR requirement for PDs is 15%) for capital adequacy purpose by the protection buyer.

⁷The add-on factors will be the same regardless of maturity of the reference obligations or CDS contract.

8. PRUDENTIAL TREATMENT POST-CREDIT EVENT

8.1 Protection Buyer

In case the credit event payment is not received within the period as stipulated in the CDS contract, the protection buyer will ignore the credit protection of the CDS and reckon the credit exposure on the underlying asset and maintain appropriate level of capital and provisions as warranted for the exposure. On receipt of the credit event payment, (a) the underlying asset will be removed from the books if it has been delivered to the protection seller; or (b) the book value of the underlying asset will be reduced to the extent of credit event payment received if the credit event payment does not fully cover the book value of the underlying asset and appropriate provisions will be maintained for the reduced value.

8.2 Protection Seller

From the date of credit event and until the credit event payment is made in accordance with the CDS contract, the protection seller will debit the profit and loss account and recognize a liability to pay to the protection buyer, for an amount equal to fair value of the contract (notional of credit protection less expected recovery value). In case, the fair value of the deliverable obligation (in case of physical settlement) / reference obligation (in case of cash settlement) is not available after the date of the credit event, then until the time that value is available, the protection seller should debit the profit and loss account for the full amount of the protection sold and recognize a liability to pay to the protection buyer equal to that amount.

In case of physical settlement, after the credit event payment, the protection seller will recognize the assets received, if any, from the protection buyer at the fair value. Thereafter, the protection seller will subject these assets to the appropriate prudential treatment as applicable to corporate bonds.

9. EXPOSURE NORMS

A PD should not sell credit protection by writing a CDS on a corporate bond on the date of its issuance in the primary market or undertake, before or at the time of issuance of the bonds, to write such protection in future. Exposure on account of all CDS contracts will be aggregated and combined with other on-balance sheet and off-balance sheet exposures against the reference entity for the purpose of complying with the exposure norms.

9.1 Protection Buyer

- (i) In respect of obligations hedged in the Trading Book as indicated in paragraph 5.2(ii), the protection buyer will not reckon any exposure on the reference entity. The exposure will be deemed to have been transferred on the protection seller to the extent of protection available.
- (ii) In all other cases where the obligations in Trading Book are hedged by CDS positions, the protection buyer will continue to reckon the exposure on the reference entity equal to the outstanding position of the underlying asset.
- (iii) For all bought CDS positions (hedged and un-hedged) held in Trading Book, the protection buyer will also reckon exposure on the counterparties to the CDS contracts as measured by the Current Exposure Method using potential future exposure add-on factors based on Table 4 given in paragraph 5.5.2.
- (iv) The protection buyer needs to adhere to all the criteria required for transferring the exposures fully to the protection seller in terms of paragraph (i) above on an on-going basis so as to qualify for exposure relief on the underlying asset. In case any of these criteria are not met subsequently, the PD will have to reckon the exposure on the underlying asset. Therefore, PDs should restrict the total exposure to an obligor including that covered by way of CDS within an internal exposure ceiling considered appropriate by the Board of the PD in such a way that it does not breach the single / group borrower exposure limit prescribed by the RBI. In case of the event of any breach in the single / group borrower exposure limit, the entire exposure in excess of the limit will be risk weighted at 667%. In order to ensure that consequent upon such a treatment, the PD does not breach the minimum capital requirement prescribed by RBI, it should keep sufficient cushion in capital in case it assumes exposures in excess of normal exposure limit.
- (v) In respect of bought CDS positions held in Trading book which are not meant for hedging, the protection buyer will not reckon any exposure against the reference entity.
- (vi) No netting of positive and negative MTM values of the contracts with the same counterparty, including that in case of hedged positions will be allowed for the purpose of complying with the exposure norms.

9.2 Protection Seller

- (i) Protection seller will recognize an exposure to the reference entity of the CDS contract equal to the amount of credit protection sold.
- (ii) If a market-maker has two completely identical opposite positions in CDS held in the Trading Book forming a hedged position which qualifies for capital adequacy treatment in terms of paragraph 5.2(i), no exposure would be reckoned against the reference entity.
- (iii) PD as a protection seller will also recognize an exposure to the counterparty equal to the total credit exposure calculated under Current Exposure Method using potential future exposure add-on factors based on Table 3 given in paragraph 5.4.2. No netting of positive and negative MTM values of the contracts with the same counterparty will be allowed for the purpose of complying with the exposure norms.

10. REPORTING REQUIREMENTS

In addition to supervisory reporting requirements, PDs should report “total exposure” in all cases where they have assumed exposures against borrowers in excess of the normal single/group exposure limits due to the credit protections obtained by them through CDS or any other permitted instruments of credit risk transfer, to the Reserve Bank of India, on a quarterly basis.

11. DISCLOSURES

PDs will disclose in the “Notes on Accounts” to their balance sheets the details as per Table 5, in respect of the CDS transactions undertaken by them.

TABLE 5 *Format of Disclosure to be made in the Annual Financial Statements (Rs. crore)*

S. No.	Particulars	As Protection Buyer	As Protection Seller
1.	No. of transactions during the year (a) of which transactions that are / may be physically settled (b) cash settled		

(Contd.)

(Contd.)

S. No.	Particulars	As Protection Buyer	As Protection Seller
2.	Amount of protection bought / sold during the year (a) of which transactions which are / may be physically settled (b) cash settled		
3.	No. of transactions where credit event payment was received / made during the year (a) pertaining to current year's transactions (b) pertaining to previous year(s)' transactions		
4.	Net income / profit (expenditure / loss) in respect of CDS transactions during year-to-date: (a) premium paid / received (b) Credit event payments: <ul style="list-style-type: none"> • made (net of the value of assets realized) • received (net of the value of deliverable obligation) 		
5	Outstanding transactions as on March 31: (a) No. of Transactions (b) Amount of protection		
6.	Highest level of outstanding transactions during the year: (a) No. of Transactions (as on) (b) Amount of protection (as on.....)		

CDS Margining Policy

Overview

As part of the guidelines on CDS on corporate bonds, the RBI has asked the market participants to maintain margins on CDS transactions. Few salient points are as follows:

1. Market participants to have individual margining policy with prescribed minimum level of margin.

2. Margins can be maintained on net exposure to each counterparty on account of CDS transactions.
3. INR margined at least on weekly basis.

Margining

- Margin to be maintained by both the buyer and seller of protection unless specified otherwise.
- Margin can be maintained as both cash / government securities unless specified otherwise.
- The entire MTM of the trade is to be maintained as margin subject to minimum threshold limits.
- The frequency of the margining is weekly.
- MTM will be calculated as per the FIMMDA methodology (curve and model).
- There is an initial / additional margin in Market-Maker-User trades which is at the mutual discretion of the counterparties.

Under Current Guidelines

Trades Between Market-makers

Buyer of Protection (MM)	Seller of Protection (MM)	Margin Amount	Margining	Allowable Collateral	Threshold Limit Floor	Minimum Transfer Amount
Bank / PD	Bank / PD	MTM	Both ways	Cash/G sec	Zero	Rs. 2,00,000/-

Trades Between Market-maker/User

Buyer of Protection (User)	Seller of Protection (MM)	Margin Amount	Margining	Allowable Collateral	Threshold Limit Floor	Minimum Transfer Amount
Bank/NBFC/PD/MF/Insurance Company	Bank / PD	MTM	Both ways	Cash/G sec	Zero	Rs. 2,00,000/-
HFC/PF/Corporate	Bank/ PD	MTM	Both ways	Cash/G sec	Zero	Rs. 2,00,000/-
FII	Bank / PD	MTM	Buyer	Cash	Zero	Rs. 2,00,000/-

Threshold limit = Minimum MTM amount above which counterparty is liable for posting margin

Explanation

If the MTM crosses the threshold level, then margin amount would be equal to the whole MTM and not the excess of MTM over the threshold level.

For example:

- (a) If threshold level for margining is fixed at say, Rs. 10 lakh and MTM is 15 lakh, then the entire 15 lakh would be posted as margin and not 5 lakh.
- (b) Subsequently, if the MTM goes down by more than 2 lakh (minimum margin), then margin would be refunded to that extent. If MTM now reduces to say 11.5 lakh, then 3.5 lakh would be refunded to the party who posted the collateral.
- (c) However, if the MTM decreases below the threshold level, then the entire margin would be refunded. If MTM now reduces to say 9 lakh, then the entire margin would be refunded to the party who posted the collateral.

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