Credit Default Swap (CDS) Primer

I.   Introduction

A credit default swap (CDS) is a kind of insurance against credit risk. It is a privately negotiated bilateral contract. The buyer of protection pays a fixed fee or premium to the seller of protection for a period of time and if a certain pre-specified "credit event" occurs, the protection seller pays compensation to the protection buyer. A "credit event" can be a bankruptcy of a company, called the "reference entity," or a default of a bond or other debt issued by the reference entity. If no credit event occurs during the term of the swap, the protection buyer continues to pay the premium until maturity. In contrast, should a credit event occur at some point before the contract's maturity, the protection seller owes a payment to the buyer of protection, thus insulating the buyer from a financial loss.

CDSs can also be used as a way to gain exposure to credit risk. While the risk profile of a CDS is similar to a corporate bond of the reference entity, there are some important differences. A CDS does not require an initial funding, which allows leveraged positions. Moreover, a CDS transaction can be entered where a cash bond of the reference entity of a particular maturity is not available. Further, by entering a CDS as protection buyer, one can easily create a 'short' position in the reference credit. With all these attributes, CDSs can be a great tool for diversifying or hedging one's portfolio.

II.   What Does the Global CDS Market Look Like Today?

The CDS market originally evolved from privately tailored agreements between banks and their customers. Perhaps because of its over-the-counter character, it is not clear exactly when the CDS market came into existence.

A.   Size

According to the International Swap and Derivatives Association (ISDA), the total notional amount of interest rate and currency derivatives as of the end of 2003 stood at $142.3 trillion, while the total notional amount of credit default swaps outstanding was $3.58 trillion, or about 2.4% of the overall derivatives market. As recently as 2000, credit derivatives accounted for just 1% of the derivatives market globally. As a further sign of growth, now the credit derivatives market has surpassed the size of the equity derivatives market, which stood at $3.44 trillion at the end of 2003.[1]

B.   Players

The largest players in the CDS market are commercial banks. Traditionally, a bank's business has involved credit risk as it originates loans to corporations. The CDS market offers a bank an attractive way to transfer risk without removing assets from its balance sheet and without involving borrowers. Further, a bank may use CDSs to diversify its portfolio, which often is concentrated in certain industries or geographic areas. Banks are the net buyers of credit derivatives, and according to

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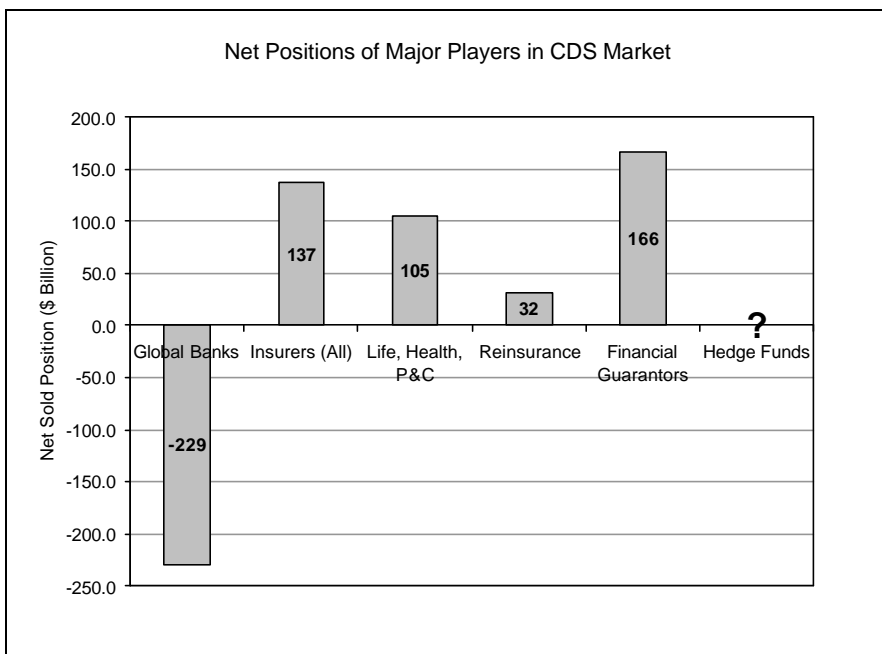New York, NY 10281-1198
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[1] ISDA's news release, 1 April 2004. These figures are based on a survey of 120 its member firms.

Fitch's 2003 survey, global banks held net bought positions of $229 billion in credit derivatives,[2] with gross sold positions of $1,324 billion.

Insurance companies are increasingly becoming dominant participants in the CDS market, primarily as sellers of protection, to enhance investment yields. Insurers also invest heavily in so-called "structured credit" products, such as credit link notes (CLNs) and collateralized debt obligations (CDOs). Globally, insurance companies had net sold positions of $137 billion in 2003.

Other players include financial guarantors, who are also big sellers of protection, with net sold positions of $166 billion. Global hedge funds are also rumored to be active players in the CDS market, but their activities are notoriously opaque and are not detected on any survey's radar screen.

Net Positions of Major Players in CDS Market

Y-axis: Net Sold Position ($ Billion), from -250.0 to 200.0

- Global Banks: -229
- Insurers (All): 137
- Life, Health, P&C: 105
- Reinsurance: 32
- Financial Guarantors: 166
- Hedge Funds: ?

C. Reference Entities

Sovereign names were prevalent as reference entities in the early days of the CDS market, but the share of sovereigns as reference entities had declined from over 50% in 1997 to less than 10% in 2003. In contrast, corporate reference entities have become more common, accounting for over 70% of all reference entities in 2003.[3] This reflects the rapid growth of the corporate bond market after the mid-1990s. Today, the most actively traded reference entities for the month of March 2004 were: Ford Motor, General Motors, Altria Group, Duke Energy, DaimlerChrysler, General Electric, MBIA Insurance, Verizon Communications, Eastman Kodak, and Rolls Royce. [4]

III. How Does It Really Work?

As described above, in a credit default swap, the buyer and the seller of protection enter into a contract where the protection buyer pays a fixed premium for protection against a certain "credit

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[2] The figures include single name CDS, basket, and synthetic CDOs. "Net bought" positions are calculated as gross bought positions minus gross sold positions for a financial institution. If the figure is negative, the institution has "net sold" positions. Fitch special report, "Global Credit Derivatives: A Qualified Success," 24 September 2003.

[3] Frank Packer and Chamaree Suthiphongchai, "Sovereign Credit Default Swaps," *BIS Quarterly Review*, December 2003.

[4] Top 10 reference entities listed on the credit derivatives section of Fitch's website (www.fitchratings.com).

event," such as a bankruptcy of the reference entity, or a default on debt issued by the reference entity. Usually there is no exchange of money when two parties enter in the contract, but they make payments during the term of the contract, thus explaining the term credit default "swap."

A.   CDS Spreads

The premium paid by the protection buyer to the seller, often called "spread," is quoted in basis points per annum of the contract's notional value and is usually paid quarterly. Note that these spreads are NOT the same type of concept as "yield spread" of a corporate bond to a government bond. Rather, CDS spreads are the annual price of protection quoted in bps of the notional value, and not based on any risk-free bond or any benchmark interest rates.[5] Periodic premium payments allow the protection buyer to deliver the defaulted bond at par or to receive the difference of par and the bond's recovery value. Therefore, a CDS is like a put option written on a corporate bond. Like a put option, the protection buyer is protected from losses incurred by a decline in the value of the bond as a result of a credit event. Accordingly, the CDS spread can be viewed as a premium on the put option, where payment of the premium is spread over the term of the contract. For example, the 5-year credit default swap for Ford was quoted around 160 bps on April 27, 2004. This means that if you want to buy the 5-year protection for a $10 million exposure to Ford credit, you would pay 40 bps, or $40,000, every quarter as an insurance premium for the protection you receive.

B.   Contract Size and Maturity

There are no limits on the size or maturity of CDS contracts. However, most contracts fall between $10 million to $20 million in notional amount. Maturity usually ranges from one to ten years, with the 5-year maturity being the most common tenor.

C.   Trigger Events

ISDA's standard documents for CDS provide for six kinds of trigger events.[6] However, market participants generally view the following three to be the most important:

- Bankruptcy
- Failure to Pay
- Restructuring

Bankruptcy, the clearest concept of all, is the reference entity's insolvency or inability to repay its debt. Failure-to-Pay occurs when the reference entity, after a certain grace period, fails to make payment of principal or interest. Restructuring refers to a change in the terms of debt obligations that are adverse to the creditors.

Restructuring is by far the most problematic of these trigger events, because "adverse change" is an ambiguous concept. Accordingly, some market participants prefer to exclude the restructuring provision from a credit derivative contract altogether, or to restrict the scope of the provision. Currently, a credit derivative contract may be entered with any one of the four options available with regard to restructuring (more on this later.)

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[5] However, the protection seller may occasionally demand an upfront payment of premium in a case of distressed credit.

[6] The six items in ISDA's 2003 definitions are; (1) bankruptcy, (2) failure to pay, (3) repuidation/moratorium, (4) obligation Acceleration, (5) obligation default, and (6) restructuring. Repuidation/moratorium is only relevant in emerging markets and sovereign entities. For more detail, see "2003 ISDA Credit Derivatives Definitions," released on 11 February 2003.

CDS spreads (bps)

Protection Buyer

Protection Seller

1 – Recovery rate (%)

Reference Entity

Trigger event
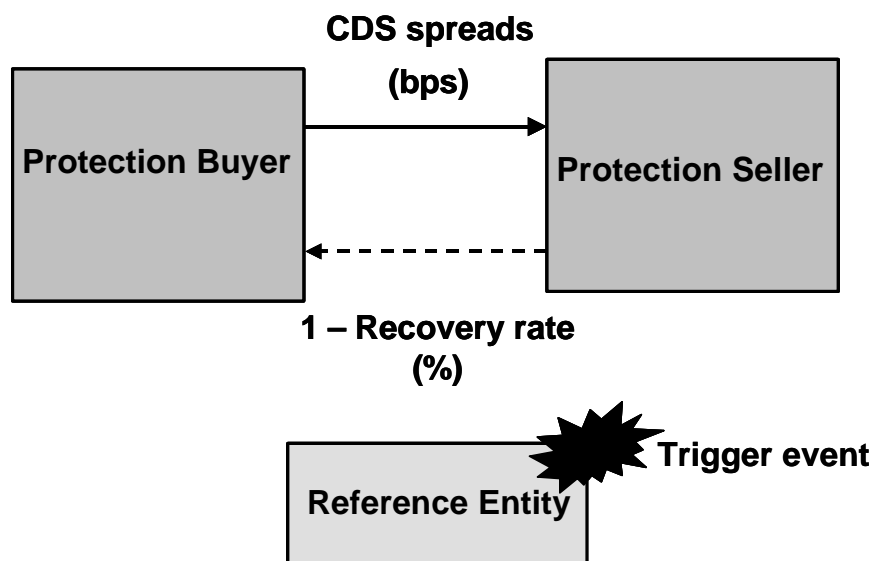
D.   Pricing

In the early days of the CDS market, pricing of contracts was more an art than a science. Today, however, pricing is more quantitatively based, using parameters such as, (1) the likelihood of default, (2) the recovery rate when default occurs, and (3) some consideration for liquidity, regulatory, and market sentiment about the credit. In theory, CDS spreads should be closely related to bond yield spreads, or excess yields to risk-free government bonds.

To see this, consider, on one hand, a portfolio composed of (1) a short position (*i.e.* selling protection) in the CDS of a company and (2) a long position in a risk free bond. On the other, consider an outright long position in the company's corporate bond, all with the same maturity and par and notional values of $100. These two investments should provide identical returns, resulting in the CDS spread equaling the corporate bond spread.

If no default occurs, principal payoff at maturity of the portfolio of a CDS and a risk-free bond will be $100, as no payment is made on the CDS short position and a risk-free bond pays $100. The corporate bond will also pay 100, if no default occurred. On the other hand, if a default occurs, the portfolio of a CDS and a risk-free bond will pay the amount equal to 100 minus the contingent payment on the CDS upon default. This payment depends on the recovery rate of the defaulted corporate bond. If we assume, for example, the recovery rate of 45%, the protection seller must pay $55, or 55%, on $100 notional. Using the same recovery rate, the investment in the corporate bond would also result in a payoff value of $55 upon default. These two investments have the identical payoff and risk profile. Accordingly, the CDS and the corporate bond' should be traded at the same spread level.

In pricing a CDS, one must know, or make assumptions about, the likelihood of default over the term of the swap, the recovery rate, and discount factors (or the yield curve). See the appendix for technical notes on the CDS pricing methods that are generally used in the market.

IV.   So... What Happens If the Bad Thing Happens?

The first step taken after a credit event occurs is a delivery of a "Credit Event Notice," either by the protection buyer or the seller. Then, the compensation is to be paid by the protection seller to the buyer via either (1) physical settlement, or (2) cash settlement, as specified in the contract.

Physical Settlement: In a physical settlement, the protection seller buys the distressed loan or bond from the protection buyer at par. Here the bond or loan purchased by the seller of protection is called the "deliverable obligation." Physical settlement is the most common form of settlement in the CDS market, and normally takes place within 30 days after the credit event.

Cash Settlement: The payment from the seller of protection to the protection buyer is determined as the difference between the notional of the CDS and the final value of the reference obligation for the same notional. Cash settlement is less common because obtaining the quotes for the distressed reference credit often turns out to be difficult. A cash settlement typically occurs no later than five business days after the credit event.

V.   What is the Standardized Documentation for the CDS?

Through its early stages of development, the credit default swap market has experienced many problems in the absence of widely accepted standardized documentation, since the terms and conditions of contracts were not precise enough, leaving many blind spots and technical loopholes. As credit events occurred, disputes often erupted between the buyers and the sellers over the specific terms and conditions of the CDS contract. The problem is that the protection buyer would want to interpret the scope of protection as widely as possible, while the seller would want to interpret it narrowly. This is understandable because a CDS is like an insurance policy, and the protection buyer, as the insured, would want to claim as much as possible for the insurance coverage, while the insurance company would always like to find the way to deny a claim and to pay as little as possible.

The lack of the standardized documentation was so aggravating that it became an impediment to the growth of the CDS market. In 1999, a major breakthrough came when ISDA published its new Master Agreement designed for credit derivatives contracts, followed with a series of amendments to improve the documentation for credit derivatives. More recently, ISDA published its new 2003 ISDA credit derivatives definitions and 2002 Master Agreement, addressing the issues that had been raised earlier. The new definitions significantly clarified many of the key concepts, and, therefore, cleared several sticky issues, which are summarized below.

A.   Definition of "Bankruptcy"

Under the new definitions, a bankruptcy is deemed to have occurred only if it results in the default of the reference entity's obligations. The key difference for the new definitions is that ISDA has removed a clause in the 1999 definition stating that a bankruptcy may be deemed to have occurred if the company has taken any action towards a default. In the new definitions, on the contrary, controversy is less likely to erupt over whether bankruptcy has occurred or not, because a written admission of a company's inability to pay its debt must be made in a judicial, regulatory, or administrative filing.

B.   Four options for "Restructuring"

As mentioned before, restructuring has been the most problematic credit event. The main issue is that, unlike bankruptcy or failure to pay, some restructuring of debt may not lead to losses for investors. Moreover, even if investors suffer financial losses, the amount of losses is more difficult to determine, if restructuring of debt involves an exchange of bonds with different coupons and/or maturities. Accordingly, the current ISDA agreement offers four options for treating the issue of restructuring as follows:

- **No Restructuring (NR):** This option excludes restructuring altogether from the contract, eliminating the possibility that the protection seller suffers a "soft" credit event that does not necessarily result in losses to the protection buyer.
- **Full Restructuring:** This allows the protection buyer to deliver bonds of any maturity after restructuring of debt in any form occurs.

- **Modified Restructuring:**   Modified restructuring has become common practice in North America in last few years, which limits deliverable obligations to bonds with maturity of less than 30 months after a restructuring.

- **Modified Modified Restructuring:** This is a "modified" version of the modified restructuring option, which resulted from the criticism of the modified restructuring that it was too strict with respect to deliverable obligations. Under the modified-modified restructuring, which is more popular in Europe, deliverable obligations can be maturing in up to 60 months after a restructuring.

C.   Definitions of "Deliverable Obligations"

Under the 2003 definitions, the protection buyer is required to send the notice of physical settlement (NOPS), indicating exactly what obligation is going to be delivered. Note that in a physical delivery, the buyer of protection can choose, within certain limits, what obligation to deliver. This allows the buyer to deliver an obligation that is "cheapest-to-deliver." In general, the buyer can deliver the following obligations after a credit event:[7]

- Direct obligations of the reference entity

- Obligations of a subsidiary of the reference entity (This is known as "qualifying affiliate guarantees," and the reference entity must hold 50% or more of the subsidiary's voting shares.)

- Obligations of a third party guaranteed by the reference entity (known as "qualifying guarantees," this option requires the option of "all guarantees" to be selected in the contract.)

In a CDS contract, parties can select what kind of obligations (*i.e.* payment, bond and/or loan) to be included in "deliverable obligations," as well as the characteristics (subordination level, currency denomination, listed/non-listed, etc.) of such obligations. Under the new documentations, the conditions are specified in more details in order to avoid disputes between the swap parties.

VI.   Conclusion and Preview of Structured Credit

CDSs can be a useful tool to manage one's exposure to credit risk. There are several important features that make CDS very unique. While risk profile of a CDS is very similar to that of corporate bonds, a plain vanilla CDS, unlike a corporate bond, does not require an initial funding, and sometimes is called "un-funded." In addition, a CDS transaction can be entered where a cash bond of a particular reference entity and/or of a particular maturity is not available. Further, by buying a credit protection via CDS, one can easily create a "short" position in a reference credit. With all these unique attributes, CDSs can be a great means to diversify or hedge a credit portfolio.

While an investor can enter into a CDS transaction to get an exposure to single-name credit, trading based on indexes of CDSs has become more popular in recent years. While there have been two competing index families, Trac-X and iBoxx, the latest reports suggest that the merger of the two indices is imminent.[8]   The CDS indexes are linked to the 100-125 most liquid CDSs, equally weighted, and allow a quick diversification of CDS exposure.

Another application of CDSs is a securitization product called synthetic collateralized debt obligations (CDO). While so-called cash CDOs involve a pool of corporate bonds or structured

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[7] With regard to the issue of "deliverable obligations," Nomura won a landmark case in February 2003 against CSFB in London, when the English High Court held that convertible bonds can be deliverable obligations for the purpose of CDS transactions within the ISDA framework. This case involved a CDS transaction where CSFB refused to accept delivery of £10 million of convertible bonds issued by a company called Railtrack. Prior to the court ruling, ISDA also had expressed its view that convertibles are deliverable. *Nomura International Plc v Credit Suisse First Boston International [2003] EWHC 160.*

[8] J.P. Morgan and Deutsche Bank, the main backers of Trac-X and iBoxx, respectively, were reported to have reached an agreement to merge their flagship indexes in North America. The new index family will be called the Dow Jones CDX Indices. (Bloomberg News, 29 April 2004)

finance assets, such as RMBS, CMBS, and ABS, synthetic CDOs are formed from a large pool (usually more than 100 names) of CDSs. Synthetic CDOs have become very popular in recent years, especially in Europe where over 90% of deals are synthetic. In the U.S., synthetic deals account for one third of all arbitrage CDOs[9]. Synthetic CDOs allow more flexible structure than cash CDOs, thanks to the unique characteristics of CDS discussed in this report.

VII.   Technical Appendix: CDS Pricing

A typical CDS contract usually specifies two potential cash flow streams – a fixed leg and a contingent leg. On the fixed leg side, the buyer of protection makes a series of fixed, periodic payments of CDS premium until the maturity, or until the reference credit defaults. On the contingent leg side, the protection seller makes one payment only if the reference credit defaults. The amount of a contingent payment is usually the notional amount multiplied by $(1 - R)$, where R is the recovery rate, as a percentage of the notional. Hence, the value of the CDS contract to the protection buyer at any given point of time is the difference between the present value of the contingent leg, which the protection buyer expects to receive, and that of the fixed leg, which he expects to pay, or,

Value of CDS (to the protection buyer) = PV [contingent leg] – PV [fixed (premium) leg]

In order to calculate these values, one needs information about the default probability (*i.e.* credit curve) of the reference credit, the recovery rate in a case of default, and risk-free discount factors (*i.e.* yield curve). A less obvious contributing factor is the counterparty risk. For simplicity, we assume that there is no counterparty risk and the notional value of the swap is $1 million.

First, let's look at the fixed leg. On each payment date, the periodic payment is calculated as the annual CDS premium, S, multiplied by d_i, the accrual days (expressed in a fraction of one year) between payment dates. For example, if the CDS premium is 160 bps per annum and payments are made quarterly, the periodic payment will be:

$$d_i S = 0.25(160) = 40 \text{ bps}$$

However, this payment is only going to be made when the reference credit has NOT defaulted by the payment date. So, we have to take into account the survival probability, or the probability that the reference credit has not defaulted on the payment date. For instance, if the survival probability of the reference credit in the first three months is 90%, the *expected* payment at t_1, or 3 months later, is:

$$q(t_i)d_iS = 0.9(.25)(160) = 36 \text{ bps}$$

where $q(t)$ is the survival probability at time t. Then, using the discount factor for the particular payment date, $D(t_i),$ the present value for this payment is $D(t_i)q(t_i)Sd_i$. Summing up PVs for all these payments, we get

$$\sum_{i=1}^{N} D(t_i)q(t_i)Sd_i \qquad \text{-- (1)}$$

However, there is another piece in the fixed leg - the accrued premium paid up to the date of default when default happens between the periodic payment dates. The accrued payment can be approximated by assuming that default, if it occurs, occurs at the middle of the interval between consecutive payment dates. Then, when the reference entity defaults between payment date t_{i-1} and payment date t_i, the accrued payment amount is $Sd_i/2$. This accrued payment has to be adjusted by

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[9] The figures are by deal count for 2003. See Standard and Poor's Special Report, "Global CDO Issuance on the Rebound as Default Levels Stabilize in 2004," 28 Jan 2004.

the probability that the default actually occurs in this time interval. In other words, the reference credit survived through payment date t_{i-1}, but NOT to next payment date, t_i. This probability is given by

$$\{q(t_{i-1}) - q(t_i)\}.$$

Accordingly, for a particular interval, the expected accrued premium payment is

$$\{q(t_{i-1}) - q(t_i)\}S\, d_i/2.$$

Therefore, present value of all expected accrued payments is given by

$$\sum_{i=1}^{N} D(t_i)\{q(t_{i-1}) - q(t_i)\}S\frac{d_i}{2} \qquad \text{--(2)}$$

Now we have both components of the fixed leg. Adding (1) and (2), we get the present value of the fixed leg:

$$PV\,[\text{fixed leg}] \;=\; \sum_{i=1}^{N} D(t_i)q(t_i)Sd_i + \sum_{i=1}^{N} D(t_i)\{q(t_{i-1}) - q(t_i)\}S\frac{d_i}{2}. \qquad \text{--(3)}$$

Next, we compute the present value of the contingent leg. Assume the reference entity defaults between payment date t_{i-1} and payment date t_i. The protection buyer will receive the contingent payment of (*1-R*), where *R* is the recovery rate. This payment is made only if the reference credit defaults, and, therefore, it has to be adjusted by $\{q(t_{i-1}) - q(t_i)\}$, the probability that the default actually occurs in this time period. Discounting each expected payment and summing up over the term of a contract, we get

$$PV\,[\text{contingent leg}] = (1 - R)\sum_{i=1}^{N} D(t_i)\{q(t_{i-1}) - q(t_i)\} \qquad \text{--(4)}$$

Plugging equation (3) and (4) into the equation in the beginning, we arrive at a formula for calculating value of a CDS transaction.

When two parties enter a CDS trade, the CDS spread is set so that the value of the swap transaction is zero (*i.e.* the value of the fixed leg equals that of the contingent leg). Hence, the following equality holds:

$$\sum_{i=1}^{N} D(t_i)q(t_i)Sd_i + \sum_{i=1}^{N} D(t_i)\{q(t_{i-1}) - q(t_i)\}S\frac{d_i}{2} = (1 - R)\sum_{i=1}^{N} D(t_i)\{q(t_{i-1}) - q(t_i)\}$$

Given all the parameters, *S*, the annual premium payment is set as:

$$S = \frac{(1 - R)\displaystyle\sum_{i=1}^{N} D(t_i)(q_{i-1} - q_i)}{\displaystyle\sum_{i=1}^{N} D(t_i)q(t_i)d_i + \sum_{i=1}^{N} D(t_i)(q_{i-1} - q_i)\frac{d_i}{2}}$$

Pricing Example:

Let's see how we can value a hypothetical CDS trade. Consider a 2-year CDS with quarterly premium payments. Spread is 160 bps, as before, and the discount factors and the survival probability for each payment date are as shown below:

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Month	Discount Factor	Survival Probability to Period (%)	Fixed Periodic Payment (bps)	Expected Value of Fixed Payment (bps) (2) x (3)	PV of Fixed Payment $1M x (4) x (1)	Default Probability for the Period (%)	Expected Accrued Payment (bps) (3)/2 x (6)	PV of Accrued Payment $1M x (7) x (1)	Expected Contingent Payment (bps) at R=45% (1-R) x (6)	PV of Contingent Payment $1M x (9) x (1)
0	1	100.0	0	0.00	0	0.0	0.00	0.00	0.00	0
3	0.99	99.9	40	39.96	3,956	0.1	0.02	1.98	5.50	544
6	0.98	99.6	40	39.84	3,904	0.3	0.06	5.88	16.50	1,617
9	0.97	99.1	40	39.64	3,845	0.5	0.10	9.70	27.50	2,668
12	0.96	98.4	40	39.36	3,779	0.7	0.14	13.44	38.50	3,696
15	0.95	97.5	40	39.00	3,705	0.9	0.18	17.10	49.50	4,703
18	0.94	96.4	40	38.56	3,625	1.1	0.22	20.68	60.50	5,687
21	0.93	95.2	40	38.08	3,541	1.2	0.24	22.32	66.00	6,138
24	0.92	94.0	40	37.60	3,459	1.2	0.24	22.08	66.00	6,072
				Sum of PV ($)	29,814		Sum of PV	113.18	Sum of PV	31,125

Notional amount = $1 million

1. Valuing Fixed Leg – Fixed, periodic payments

The present value of all expected fixed payments is found by multiplying each period's fixed payment by the respective survival probability, discounted at the risk-free rate and summed over the term of the CDS. The bottom number of row (5) in the table above, $29,814, is the present value of this segment for $1 million notional amount.

2. Valuing Fixed Leg – Accrued payments

Assuming that default occurs, if any, at the middle of time interval between two payment dates, the value of the accrued premium payment if a default occurs is a half of 40 bps, or 20 bps. Then, the expected value of the accrued payment for each period is 20 bps multiplied by the probability of default for that period, as in column (7) in the table above. Discount these values for all periods and summing them up over the term of the CDS, we get a value of $113.18 (see the bottom of column (8)), which is the present value of expected accrued fixed payments. Apparently, this is a very small number, but this is as expected because these are products of the default probability for each period and the accrued payment if a default occurs is 20 bps, which are both small numbers.

From above, we can see that the present value of the fixed leg, or the present value of the expected payments by the protection buyer over the 2-year term, is (29,814 + 113.18 =) $29,927.18 for the notional value of $1 million.

3. The Contingent Leg

Finally, we can calculate the value of the contingent leg. The expected value of the contingent payment if a default occurs during each period is (*1-R*) multiplied by the probability of default for that period (column (9) in the table). Assuming a recovery rate of 45%, the expected contingent payment is 0.55 multiplied by the each period's default probability. Discount this for each period and summing over the whole term of the CDS, we get a value of $31,125, as in column (10), which is the present value of expected contingent payments.

Hence, we can find the value of this CDS to the protection buyer (or the fixed payer) when the spread is 160 bps per annum as:

Value of CDS = PV [expected contingent payment] - PV [fixed leg] = $31,125 – $29,927 = $1,198

for the notional value of $1 million.

To see this result intuitively, the average default probability over the term of the CDS is 3% per year (because the survival rate after 2 years is 94%), and with recovery rate of 45%, the average expected loss per year is: (1-.45)3% = 1.65%. The CDS spread is 160 bps per year, which means that in this example the protection buyer gets protection for credit risk with the expected loss of 165 bps for a premium of only 160 bps! Not at all surprisingly, this is a valuable transaction for the CDS buyer, with a positive CDS value to the protection buyer, calculated above to be $1,198, or 11.98 bps, for $1 million notional.

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VIII. Recent Nomura Fixed Income Research

Fixed Income General Topics
- ABS/MBS Disclosure Update #2 (5 May 2004)
- ABS/MBS Disclosure Update (29 April 2004)
- Report from Arizona 2004: Coverage of Selected Sessions of the Winter Securitization Conferences (10 February 2004)
- U.S. Fixed Income 2004 Outlook/2003 Review (18 December 2003)
- NERA Study of Structured Finance Ratings – Market Implications (6 November 2003)
- U.S. Fixed Income 2003 Mid-Year Outlook/Review (27 June 2003)
- Off-Balance Sheet Update (24 November 2003)
- NERA Study of Structured Finance Ratings – Market Implications (6 November 2003)

MBS
- Monthly Update on FHA/VA Reperforming Mortgages: Historical Prepayment Speeds, Default Losses, and Total Returns (5 February 2004)
- Australian MBS Primer (9 September 2003)
- Agency Capped Callable LIBOR Floaters Offer Structuring Flexibility to Create Investment Profiles That May Be Difficult to Create in New Issue CMO Floaters (2 July 2003)
- A Journey to the Alt-A Zone (3 June 2003)

CMBS
- Update: Have the Courts Upheld Prepayment Premiums and Defeasance Provisions? (28 January 2004)
- GNMA Project Loan Prepayment Report (15 January 2004)
- GNPL REMIC Factor Comparison (28 October 2003)
- CMBS Watchlistings, Downgrades, and Surveillance (2 October 2003)
- Temporal Aspects of CMBS Downgrades and Surveillance (1 July 2003)
- Some Investment Characteristics of GNMA Project Loan Securities (1 May 2003)
- CMBS Credit Migrations (4 December 2002)

ABS
- ABS Gold Coast Report: Coverage of Selected Sessions of ABS East 2003 (20 October 2003)
- What a Coincidence? – One Reason Why CDOs and ABS Backed by Aircraft, Franchise Loans, and 12b 1 Fees Performed Poorly in 2002 (19 May 2003)

Corporates
- U.S. Corporate Monthly - January (11 February 2004)
- U.S. Corporate Monthly - December (9 January 2004)
- U.S. Corporate Monthly - November (8 December 2003)
- Toys "R" Us, Inc. - (18 November 2003)
- U.S. Corporate Monthly - October (10 November 2003)
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