Chapter 1: General Overview

Introduction

Credit derivatives are used to hedge the potential risk that borrowers might fail to repay their outstanding debt obligations (ie, their bonds or loans). They allow banks and others to hedge their credit risk in such debt obligations without selling or transferring them.

Dealers also trade them for arbitrage purposes, to make money from differences between spreads.

They are therefore used for risk management, investment and trading purposes.

By definition, derivatives arise from underlying product markets. Currency derivatives derive from the underlying foreign exchange market; equity derivatives from an underlying stock market and interest rate derivatives from an underlying money market. Credit derivatives are more intangible because they use creditworthiness itself (which is not a product) as an underlying pricing mechanism.

In fact, credit derivatives have turned creditworthiness into a tradable product.

There is no standard dictionary definition as to what credit derivatives are, partly because the term covers a number of products as we shall see. However, a possible starting point is this:

> Credit derivatives are customised contracts between two parties under which one party agrees to make a payment to the other party if an observable credit event occurs.

So credit derivatives describe contracts designed to assume or lay off credit risk on particular issuers or borrowers (Reference Entities) or on their loans, bonds and other liabilities (Obligations) in return for either swap or premium payments. Payout is usually but not always triggered by Credit Events. It depends on the type of product. The transfer of credit risk may be for the whole life of the asset, or for a shorter period, and it may be a complete or partial transfer of the credit risk.

Credit derivatives uncouple credit risk from funding. Investors can radically change their credit risk profiles without either buying or selling bonds or loans in the primary or secondary markets.

A credit derivative may be structured as a swap, an option or an embedded derivative (eg, a credit-linked note).

Credit derivatives are usually documented under an ISDA Master Agreement. This is a multi-currency cross border netting agreement, issued by the International Swaps and Derivatives Association, Inc. (ISDA), which covers all derivatives transactions between two parties.

Now that the 2003 ISDA Credit Derivatives Definitions (and previously the 1999 ISDA Credit Derivatives Definitions) have been published and adopted by the market, the legal minefield of producing customised long-form confirmations from the previous ISDA standard, and the frequent disputes relating to precise definitions and practices supposed to have been agreed at the time of trading, have all but disappeared. The situation has been improved even further by parties signing Master Confirmation Agreements with each other

(see Chapter 4, pages 175–176).

We shall be examining the 2003 ISDA Credit Derivatives Definitions in depth in Chapter 3.

Evolution of the credit derivatives market and market size

The credit derivatives market began in New York in 1992. It is now the fastest-growing sector of the derivatives market, having shown steady growth initially, followed by a dramatic expansion since 2000.

In April 2004, ISDA estimated total notional outstanding volume for credit derivatives as at 31 December 2003 of US$3.58 trillion (ie, US$3,580 billion), 33 per cent higher than as at 30 June 2003 and 19 times the level at the end of 1997. By the end of 2002 London, the main market for credit derivatives trading, had a market share of about 53 per cent and credit default swaps represented 45 per cent of total credit derivatives products outstanding.

A survey by the British Bankers' Association (BBA) in 2002 reported that banks, securities houses and hedge funds were the main protection buyers, but there was strong interest from insurance companies as protection sellers. They were then rivalling banks in this respect (33 per cent market share against 39 per cent for banks) and could overtake them by 2004. We await further figures.

This is somewhat surprising, given the legal debate in 1997/98 as to whether credit derivatives are insurance contracts in disguise, although the outcome of that discussion was that this is not the case (as we shall see in Chapter 2).

In contrast to 1996, when they represented 54 per cent of Reference Entities, sovereign entities were present in only 15 per cent of deals in 2002, while corporate Reference Entities made up 60 per cent of deals, up from 35 per cent in 1997/98. This considerable shift in the type of entities against which credit protection is taken is likely to continue.

According to the BBA, banks dominate the market, being protection buyers in 52 per cent of cases and protection sellers in 39 per cent of cases.

Finally, the BBA is forecasting a rise in credit derivatives' market volume in notional amount terms to US$4.8 trillion by the end of 2004. Even this will represent only 9 per cent of the size of the current global corporate bond market.

In its early days the market was largely one-way in nature, with most players seeking either to buy or to sell protection on the same name at the same time. Now the market is two-way and liquid, and standardised ISDA documentation has substantially removed documentation risk.

The credit derivatives market can be said to have come of age in 2001, for the following reasons.

- Funding, liquidity and credit quality concerns over the global economy, and uncertainties over combating terrorism, led to volatility in credit spreads and worries over defaults.
- The largest number of corporate defaults for many years led to significant hedging of loan portfolios by banks.
- The volatility in credit spreads and number of defaults encouraged new investors to enter the market, including hedge funds.
- More than 20 Credit Events affected well-known names, including Railtrack, Polaroid, Swissair, Enron, K-Mart and Argentina, the last named being the largest ever sovereign default. With the Enron default there were nearly 800 credit deriva-

tives contracts outstanding, representing more than US$8 billion in notional amount terms. Yet they were settled with no litigation, a good sign of the market's maturity and resilience.
- There was also uncertainty over credit triggers (which we shall study later).
- Overall, average recovery rates for sellers of credit default swaps were lower in 2001.
- Sophisticated products continued to be developed.

This was the first time in its short history, apart from the Asian and emerging market crises of 1997/98, that both the documentation and the credit derivatives market had been tested in a stressed environment. On the whole, the market performed well and the documentation proved robust.

Many further corporate defaults have occurred since 2001 (eg, TXU Europe Ltd and Parmalat). Some commentators have praised credit derivatives for helping the financial services industry to diversify, redistribute credit risk and reduce the danger of systemic risk (a collapse of the whole derivatives market).

Uses of credit derivatives

In general, with credit derivatives there are three main users:

- banks, seen as hedgers;
- investors, seen as sellers or end-users; and
- market-makers, which act as middlemen and provide liquidity to the market.

There are many possible uses of credit derivatives.

Commercial banks

The uses of credit derivatives may include:

- changing the risk profile of their loan book as part of their credit portfolio management strategy;
- freeing up credit lines for more profitable business;
- hedging exposures for which they no longer have a risk appetite;
- reducing sector concentration risk (eg, having too many loans to one industrial or service sector) and overexposure to particular borrowers;
- adjusting credit exposure without any need for an underlying relationship with the Reference Entity concerned; and
- managing their return on regulatory capital.

Many commercial banks also act as market-makers in the credit derivatives market.

Investment banks

The main use of credit derivatives for investment banks is in hedging huge bond and deriv-

atives portfolios, especially their riskier portfolios, such as illiquid corporate and emerging markets bonds. They tend to manage these more dynamically than commercial banks because they have smaller balance sheets; because their portfolios are revalued or marked to market daily; and because they move in and out of fashionable sectors quickly. They are also keen to free up business lines. Investment banks also act as market-makers in the credit derivatives market.

Companies

Credit derivatives are useful for companies when they are overexposed to a single customer, or wish generally to hedge their receivables book. Many industrial companies are heavily exposed to a few key customers. Take a mining engineering company whose specialised equipment can take years to build. If its customer becomes insolvent, it could be left out of pocket and holding machinery that no one else will buy. If it thinks that the risk to its survival is serious, it can buy a credit default swap with a notional principal amount that gives it either the value of the machinery or a break-even amount.

Credit derivatives are also useful for corporate treasurers wishing to manage exposures to bank counterparties and funding requirements in respect of them. An example would be a company buying a cash-settled credit default swaption on itself, in order to lock in the spread on a future funding requirement.

Project financing

Credit derivatives are especially useful for investors in project finance deals with unacceptable sovereign risk. With project finance an equity sponsor may be happy with the operational and project risk, but not with the sovereign risk on the project equity. It may have protected itself against 75 per cent of this risk via a facility backed by an export credit agency, but now wants protection against the remaining 25 per cent. One option is to enter into a credit default swap with a notional principal equal to the amount not covered by the export credit agency's guarantee and with the same maturity, so that, if the sovereign defaulted, it would receive the 25 per cent project equity that should have been provided by the sovereign.

Employees

In the market's early days, employees worried about the safety of their bonuses occasionally used credit derivatives to hedge against the bankruptcy of their employer. I have heard of a credit derivative structure being used to protect dealers' deferred bonuses. Where a group of employees is owed significant deferred bonuses, they could pay a premium of a percentage of that bonus pool to insure themselves against the bankruptcy of their company. However, there is moral hazard here, because what is to stop them betting on their company when their maximum downside is to be fired with their bonuses intact? While this may have happened in isolated instances in the early days of the market, regulators would nowadays regard it as a market abuse.

Investors in the credit markets

As well as being used on the liability side, credit derivatives are increasingly being used to manufacture customised products for the significant number of investors that now invest in the credit markets. These include fund managers, pension funds, hedge funds and insurance companies.

Their main use: transferring risk to a third party

New assets and exposures can be created by credit derivatives to fill gaps in an investor's maturity and credit quality portfolio. For instance, an investor might want to obtain seven-year exposure on a certain corporate bond issuer, but its only issues are for five or ten years. Now it can enter into a seven-year credit default swap with the corporate as the Reference Entity.

Credit derivatives can also be used where an investor wants credit exposure on particular counterparties and markets, but, for legal or regulatory reasons, cannot invest in them directly. However, care is needed to ensure that protection is not bought from a Seller that is closely involved with the Reference Entity. This is called correlation risk and could lead in extreme cases to the joint default of the Reference Entity and the Seller.

Where credit derivatives are used to reduce risk and provided that they are transacted under a master netting agreement such as the ISDA Master Agreement, many regulators recognise them favourably, so that financial institutions can benefit from regulatory capital savings. (Regulatory capital is the amount of capital a bank needs to allocate to cover risk on its trading and banking books as required by its regulators.)

For example, Bank A makes a loan to a UK company. For regulatory capital purposes this transaction would have a risk weighting of 100 per cent. However, if Bank A bought credit protection on the UK company via a credit default swap from another OECD bank, Bank B, the 100 per cent risk weighting would be replaced by a 20 per cent risk weighting. This is because risk exposure on OECD banks is given a 20 per cent risk weighting by OECD regulators. In this example Bank B has assumed the credit risk on the UK company by selling credit protection to Bank A.

Therefore a bank can make regulatory capital savings if it can substitute credit exposure on a corporate obligor for that of another bank.

Moreover, rather than waiting for loans to mature or find a purchaser for a funded participation, a bank can now transfer its credit risk via a credit derivative and reduce its exposure to its customer, while retaining the customer relationship.

The fair value of a credit derivative transaction is driven by actual or perceived changes in the Reference Entity's credit rating. It will be more valuable to the Buyer if the Reference Entity's credit quality deteriorates.

Credit derivatives, like other derivatives, can be used for risk-taking or hedging.

The main credit derivatives products

The product descriptions in this section are necessarily brief, being intended to provide background for the legal and documentation issues discussed in Chapters 2 and 3.

Credit default swaps

Under a credit default swap in its simplest form, a Buyer buys credit default protection from a Seller on a particular obligation(s) of a third party called a Reference Entity. These are called Obligations and may be a specific Reference Obligation or some or all of a particular class of the debt obligations of the Reference Entity.

Often the credit default swap will be referenced to "borrowed money" Obligations (debt ranking at least *pari passu* with other senior unsecured obligations of the Reference Entity).

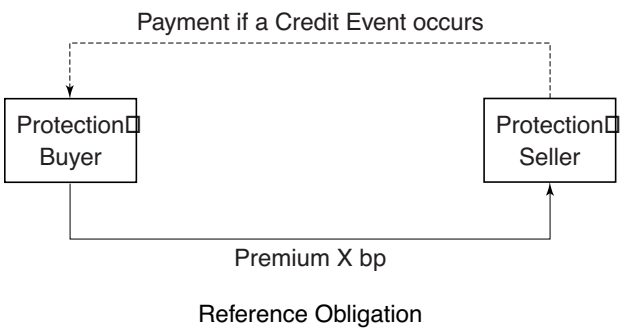
If the Reference Entity defaults, the Seller compensates the Buyer for its loss on the asset's par value in accordance with the Settlement Method (Physical or Cash) agreed between them. The Seller will either take delivery of the agreed credit impaired securities at a pre-agreed price in Physical Settlement or pay the difference between that price and their current market value in Cash Settlement.

The Credit Events that can trigger the credit default protection are agreed at the time of trading, together with the notional amount, the Fixed Rate for the premium (usually expressed in basis points per annum) and the maturity date of the credit default swap. Like an interest rate swap, a credit default swap has a fixed leg and a floating leg. The fixed leg is the premium paid for the credit protection and the floating leg is the payout if the protection is triggered. The Settlement Method is also agreed at the time of trading.

A credit default swap may be shown diagrammatically (see Exhibit 1.1).

Exhibit 1.1

A credit default swap



Source: PricewaterhouseCoopers: *The Financial Jungle: A Guide to Credit Derivatives,* 2001.

The ISDA's stable of most commonly traded Credit Events in respect of investment grade corporates in Europe and North America now are:

- Failure to Pay;
- Bankruptcy; and
- Restructuring.

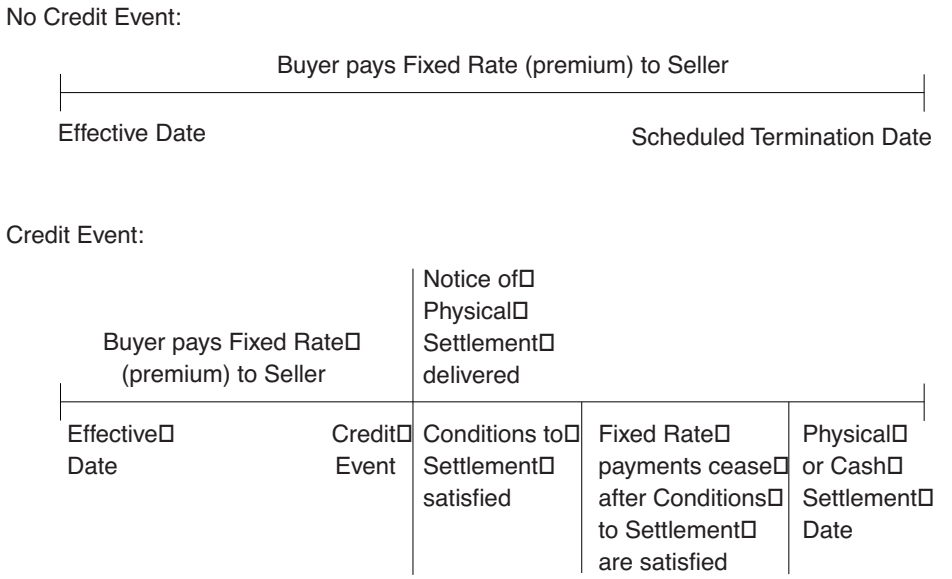
As Exhibit 1.2 shows, if there is no Credit Event during the life of the credit default swap, at maturity the Buyer ceases to pay the premium and the protection expires without having been needed. The Buyer, of course, loses the whole premium.

The premium level is based on, *inter alia*, the maturity of the credit derivative transaction; the number of Credit Events in the contract; and the expected volatility of the Reference Entity's credit quality during the contract's life. The premium increases with, among other things, the number of Credit Events covered.

However, if a Credit Event has an impact on the Reference Entity at any time during the deal's life, the credit default swap can be triggered. The fixed premium payments from Buyer to Seller cease, and the Buyer and Seller settle the trade on the basis of the Settlement Method agreed in the Confirmation, by either Cash Settlement or Physical Settlement.

Exhibit 1.2

Time frame for a credit default swap



Source: Author's own.

Although the Buyer has covered its direct credit exposure to the Reference Entity, it has taken on contingent exposure to the Seller. This is the risk that the Seller defaults and the Buyer has to replace its credit protection at a higher cost. The most extreme position would be for the Seller and the Reference Entity to default simultaneously.

Where Physical Settlement is chosen in the credit derivatives Confirmation, the Buyer and the Seller agree the nature of the instruments to be delivered by the Buyer to the Seller when payout is triggered. The Deliverable Obligation may be limited to the Reference Obligation itself or may include a variety of bonds or loans with certain characteristics and maturities. Some credit derivatives contracts may include other borrowed money or payment obligations.

Credit default swaps are the basic building blocks for all other credit derivatives products and dominate the market for single-name trading. Nowadays more than 1,000 different credits are traded in the credit default swap market.

Credit default swaptions

Although credit default swaptions (also known as credit spread options) are not yet being traded very widely, they are useful hedging tools for those running a book in asset swaps or credit derivatives, or wishing to have the right to switch portfolios quickly at some time in the future. They are also useful for locking in future funding spreads. As options rather than swaps, they do not need a Credit Event to have taken place for the Buyer to decide to exercise them.

Credit default swaptions enable hedgers to gain protection from unfavourable movements of an asset as measured by a widening in its credit spread (its interest margin) against the yield on very low risk securities (such as US Treasuries) or the current fixed rate in the swap market. A credit default swaption transfers the credit risk from the hedger (Buyer) to an investor (Seller) willing to take the risk.

For example, the current implied spread of a bond held by Bank X is 50 basis points over the swap rate. Bank X believes that the spread on the bond will widen in the short term, due to price movements, but does not wish to sell the bond. Instead, it buys a credit default swaption for a premium from Bank Y, under which it has the right to purchase credit protection at an agreed spread. The agreed spread is called a strike spread. As with interest rate swaptions, there are payer's and receiver's swaptions. Payer's swaptions allow the option holder to purchase credit protection. A receiver's swaption allows the option holder to sell credit default protection at a pre-defined credit spread. The example just given is a payer's swaption.

Credit default swaptions can be physically settled or cash-settled.

Basket products

Credit derivative transactions have also been struck with reference to a basket of credit exposures. These are usually either portfolio credit default swaps or "first to default" swaps.

Payment under first to default swap contracts is typically triggered by a default on the first of several different named obligations of different borrowers or issuers, whereupon the entire contract terminates and the Seller pays out to the Buyer according to the settlement provisions as applied to the first entity to default.

The cost of the protection will be lower if the Reference Obligations in the basket are weakly correlated, because it is less likely that more than one of them will default.

Alternatively, under a portfolio credit default swap the basket can be designed to pay out on any number of defaults up to the total number of the Reference Obligations in the basket. The price will depend upon the number of, and the correlation among, the Reference Obligations, and the likelihood of default and the level of the recovery rate for them.

Substitutions of Reference Obligations or Reference Entities may also be possible subject to compliance with various criteria.

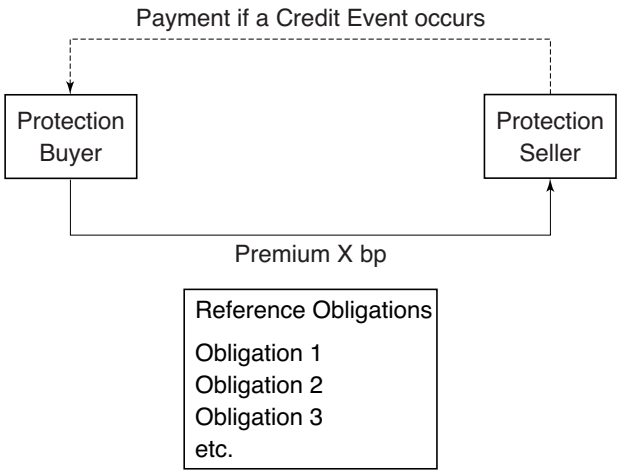
Exhibit 1.3 illustrates a basket structure.

Credit-linked notes/credit-linked deposits

Credit-linked notes (CLNs) combine a medium-term note (MTN) with an embedded credit default swap. They offer the holder synthetic (manufactured) credit exposure to a single Reference Entity, or multiple Reference Entities, in a structure resembling a corporate loan or bond.

Exhibit 1.3

A basket credit default swap



Source: PricewaterhouseCoopers, *The Financial Jungle: A Guide to Credit Derivatives,* London, 2001.

They are issued by an issuer equivalent to the Buyer in a credit default swap. The investor receives from the issuer a regular coupon (interest payment), linked to the London Inter-Bank Offered Rate (Libor), at agreed intervals throughout the note's life. The coupon is priced to compensate the investor for having to assume the credit risk of the Reference Entity and the issuer. The investor could face a loss if either of these defaults.

The credit quality of the Reference Entity will usually be lower than that of the issuer. The Reference Entity's credit risk is the rationale for the higher coupon on the CLN.

If no Credit Event occurs, the CLN is redeemed at par. However, if a Credit Event does happen, it pays out the post-default value of the underlying asset or can deliver it. Unlike other credit derivative products, CLNs are funded, which means that the investor has to buy them. Further, if these are the only products traded between the parties, no ISDA Master Agreement is signed. This is useful for investors who are unfamiliar with the ISDA Master Agreement or doubt its enforceability under local law. The CLN issuer receives cash up front and is therefore collateralised.

The coupon on the note is linked both to the credit quality of the issuer itself – which is usually a bank, or a special-purpose vehicle (SPV) that has been rated AAA – and to the underlying Reference Obligation (the subject obligation of the credit protection).

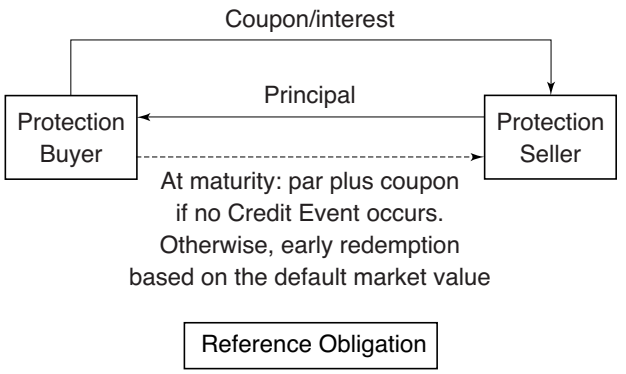
The investor is equivalent to the Seller in a credit default swap. Exhibit 1.4 illustrates this structure.

Using a variety of structures, CLNs can simultaneously meet the needs of hedgers requiring credit protection, and the needs of investors seeking higher yields and/or access to markets and exposure that would otherwise be unavailable to them.

The main difference between CLNs and other bond market products is that payments due under a CLN and its redemption by the issuer are linked in some way to the performance of the underlying Reference Entity and the related Reference Obligation. Because of their highly

Exhibit 1.4

A basic credit-linked note



Source: PricewaterhouseCoopers, *The Financial Jungle: A Guide to Credit Derivatives,* London, 2001.

flexible nature, CLNs can be customised for an investor or a targeted market sector with virtually any desired cashflow structure and payout profile.

CLNs pay a higher yield than non-credit-linked instruments, but are terminated if a designated Credit Event occurs. Then, assuming Physical Settlement, the Buyer delivers a Deliverable Obligation to the issuer of equal notional amount to the CLN. In turn the issuer delivers this Obligation to the investor in lieu of any future coupons or principal redemptions. The collateral (if applicable) is sold to realise the par payment made by the issuer to the buyer under the terms of the credit default swap.

Of course, at that time the market value of the Obligations will have been reduced by the default. The early redemption amount of the CLN would then be linked to the prevailing market price of the Deliverable Obligation(s). This means that, although the investor receives an above-market return on the CLNs as long as there is no Credit Event, the investor is likely to recover only a percentage of his original investment (for example, 50–60 per cent) if such an event occurs. This loss is similar to that experienced by a protection Seller in a credit default swap.

CLNs can also be structured using SPVs. The SPV is the issuer and is usually structured on a bankruptcy-remote basis approved by the major credit rating agencies. These SPVs are often given AAA ratings, subject to keeping to the credit rating agencies' requirements and distancing themselves from the sponsoring bank.

The SPV issues the CLN to investors and uses the proceeds in one of two ways. First, it may buy a MTN from the bank and sell protection on the Reference Entity to the bank or another counterparty. The premium from the credit default swap and the return on the MTN are used by the SPV to pay a higher coupon on the CLN. The counterparty to the credit default swap is normally the bank issuing the MTN, because the SPV is limited in its choice of counterparty, having no assets to offer as collateral against the risk that it will need to pay out under the credit default swap.

Second, the SPV can use the proceeds to buy G7 government bonds and place these with the bank as collateral for the credit default swap. The coupons on this collateral plus the

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premium on the credit default swap pay the higher coupon on the CLN. The collateral also serves as security for the credit default swap counterparty. This structure is similar to those used in synthetic securitisations.

Total return swaps

Also referred to as a "total rate of return swap", a total return swap (TRS) is a contract under which a total return payer takes a synthetic short position in an underlying asset, such as a bond, by transferring the credit and market risk of that asset to a "total return receiver". This puts the total return receiver in a position equivalent to owning that underlying asset, because it receives returns from it, without having legal ownership of the physical asset. However, the total return receiver does not have to fund the purchase of the asset, nor does it have any direct relationship with the underlying Reference Entity. Instead, the total return receiver makes Libor-related payments to the total return payer to compensate it for the funding costs of buying the asset. It therefore creates a synthetic exposure (a manufactured exposure) in the Reference Obligation, rather than a direct on-balance-sheet exposure.

Total return swaps can also be referenced to indices.

The total return receiver and the total return payer are similar to, respectively, a protection Seller and a protection Buyer in a credit default swap. The total return payer and the protection Buyer are both seeking credit risk protection.

Total return swaps are traded with reference to a Reference Obligation, which can be a bond, a convertible bond, a loan or indeed an equity. The Reference Obligation is likely to be liquid, so that its market price can be easily determined. The parties make periodic payments to each other on the basis that the total return payer pays over to the total return receiver any interest or dividends that are paid under the Reference Obligation. In turn, the receiver pays interest based on a floating rate plus or minus a spread. The asset is also periodically marked to market. Any capital appreciation is paid by the total return payer to the total return receiver, with any capital depreciation being paid by the total return receiver to the total return payer. The notional amount under the transaction is also adjusted in line with the revised market value.

Exhibit 1.5 illustrates all this.

One main difference between a TRS and a credit default swap is that there are two-way payments throughout the life of a TRS, whereas with a credit default swap payments flow in only one direction at any one time.

With a TRS the parties transfer the market and performance risks between each other, rather than just the credit risk. Of course, as with any swap, both parties also incur counterparty credit exposure to each other because of the two-way payment flows.

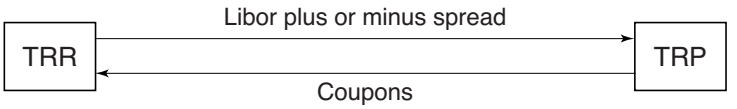
The net effect of these transactions is for the market and credit performances of the Reference Obligation to be reproduced without requiring the total return receiver to purchase it and fund the entire cost. Given that the Reference Obligation can also be a basket, total return swaps are an efficient off-balance-sheet mechanism for the total return receiver to hold a desired portfolio.

Total return swaps have been around since the start of the credit derivatives market. Documentation is fairly standard, although there is no ISDA-sponsored template.

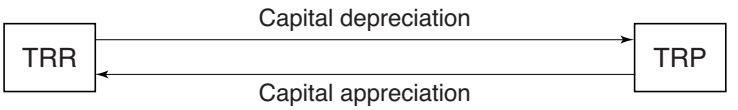
Exhibit 1.5

Payments under a total return swap between the total return receiver (TRR) and the total return payer (TRP)

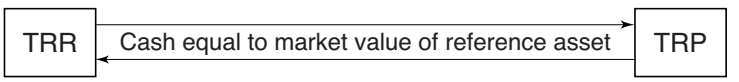
1.5.1 Payments during life of total return swap



1.5.2 Mark-to-market payments during term of swap



1.5.3 Close-out at maturity of total return swap (assuming no default)



Source: Author's own.

Collateralised debt obligations

A credit default swap protects credit risk on a single name, but this can be extended to multiple names, as we saw with baskets. It is also possible to structure portfolio instruments, such as collateralised debt obligations (CDOs), with customised risk and return features required by protection Buyers and Sellers.

In its simplest form, a CDO is a bond or credit default swap linked to a portfolio of assets where the cumulative losses of the portfolio of assets are sub-divided into different classes to create different tranches of risk. This can be done synthetically or via the issue of securities by SPVs, and backed by a diversified loan or bond portfolio, as can be seen in Exhibit 1.6.

In 2003 a market developed in single isolated CDO tranches where only one tranche, usually the mezzanine, is issued. The remaining parts of the capital structure are retained and risk-managed by the CDO arrangers.

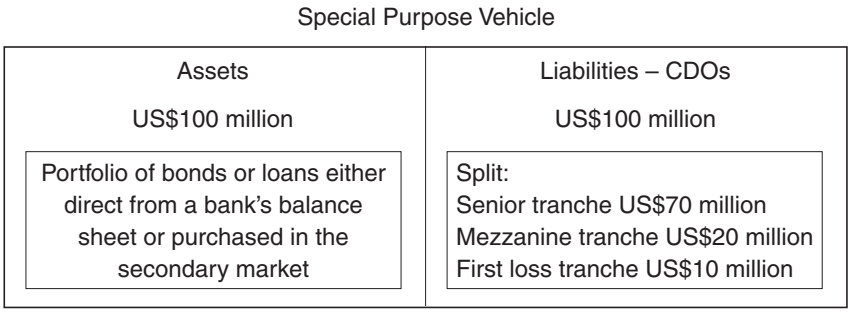
CDOs are used by banks to hedge portfolios of loans on their balance sheet. Other assets, such as aircraft leases, have also been hedged using CDOs. These are known as balance sheet CDOs.

CDOs are also used as pure investment vehicles to create bespoke asset classes for investors. Typically in such cases the underlying assets are corporate or financial bonds, or single-name credit derivatives. These are known as arbitrage CDOs. They exploit mismatches between the yield on the underlying asset and the lower cost of servicing the CDO securities.

The arbitrage market has evolved a stage further to the extent that single tranches for a

Exhibit 1.6

Example of collateralised debt obligations



Source: Financial Stability Review, June, 2001.

particular portfolio can be structured without the need to create the remaining tranches to complete the capital structure. The tranche concerned can then be dynamically hedged by the structuring bank.

Because CDOs are structured transactions, they have not had the standardised features of a single-name credit default swap. This is rapidly changing as single-tranche arbitrage CDO structures become more common and their market becomes more liquid.

CDOs have the following two characteristics:

- the manner in which protection is funded and sold; and
- the risk and return tranching of the portfolio.

Protection can be bought directly from sellers on a variety of credit risks directly through CLNs or portfolio credit default swaps (baskets). Alternatively, it can be achieved through an SPV CDO structure.

The typical CDO structure is funded. This means that the underlying pool of bonds or loans is transferred to the SPV which issues CDOs backed by the cashflow of the portfolio. Increasingly, however, credit default swaps are used to transfer the credit risk to the SPV on an unfunded basis. This is the basis of the so-called synthetic CDO and does not involve a change in the legal ownership of the assets, which is the case with a funded CDO structure. Instead, some or all of the credit risk is transferred by purchasing protection on the portfolio.

Unlike the public bond market, the synthetic CDO market includes transactions that are rated or unrated, public or private.

Because the reference assets are not removed from the sponsoring financial institution's balance sheet, synthetic CDOs are usually easier and cheaper to establish than funded structures. This is especially so where bank loans are the reference assets, where, for instance, borrower notification is necessary if the assets are transferred.

In a typical synthetic structure the SPV issues CDOs to end-sellers of protection and invests the proceeds in G7 government bonds or other high-quality collateral securities. It therefore acts as a portfolio default counterparty and a repository of highly rated collateral.

The end-sellers receive the return on the collateral, often swapped into a floating rate, together, of course, with the credit default swap premium.

If Credit Events occur on the reference portfolio, principal and interest payments are reduced, and the bank/sponsor has a claim on the SPV under the credit default swap, backed by the collateral, which is normally cash-settled.

The structure offers buyers and end-sellers of protection the following benefits.

- It reduces counterparty risk for them both. Both have potential claims on the SPV that are, at least partly, backed by collateral securities. The SPV should be bankruptcy-remote.
- Some regulators may apply a lower capital charge on the credit risk of loans hedged in this way where the bank's counterparty is an SPV restricted to holding OECD government bonds as collateral.

Risks and return tranching of the portfolio

The risk on portfolio transactions is usually divided into at least three tranches. For example, a US$100 million portfolio may have the following tranches:

- a US$70 million senior tranche;
- a US$20 million mezzanine tranche; and
- a US$10 million first-loss tranche.

If there is a US$15 million loss on the portfolio following one or more Credit Events, the Seller of protection on the first-loss tranche loses US$10 million and the protection Seller for the mezzanine tranche loses US$5 million.

Typically, at present, the senior tranche would be rated Aaa/AAA and the mezzanine tranche would be rated Baa3/BBB.

Tranching can be achieved in two different ways. If the credit risk on the portfolio is transferred to an SPV, it can issue CDOs with varying levels of seniority. If, on the other hand, protection is purchased direct from sellers, tranching must be specified in the contractual terms of the CLN or the portfolio credit default swap.

Senior CDO tranches are more likely to be unfunded than first-loss or mezzanine tranches, because, first, the amounts are larger and, second, protection Buyers prefer to avoid counterparty risk on first-loss and mezzanine tranches, which are more likely to incur losses.

Tranching leaves an originating institution with the credit risk it most desires.

Insurance companies, pension funds, investment funds and hedge funds are the most important investors in CDO tranches and credit-linked notes.

Risks associated with credit derivatives

The following are the principal risks associated with credit derivatives:

- credit risk;
- market risk;
- operational risk;
- legal risk; and
- basis risk.

Credit risk

Credit risk takes three forms with credit derivatives.

- *Reference Entity credit risk*. This arises where the Reference Entity suffers a Credit Event. This is the risk that a protection Buyer wants covered in a credit default swap by a protection Seller.
- *Counterparty risk*. This is the risk that a credit derivative counterparty defaults and the non-defaulting party has to replace the contract. In relation to the credit derivative transaction, this could arise where the protection Buyer fails to pay its premium to the protection Seller during the life of the credit default swap. It would also arise where the protection Seller is unable to meet its payout obligations to the protection Buyer if a Credit Event occurs to the Reference Entity. Counterparty risk also encompasses the risk that a counterparty defaults on one of its other Obligations or becomes insolvent.
- *Joint default risk*. This risk applies only to the protection Buyer, which needs to gauge the likelihood of the protection Seller and the Reference Entity both defaulting at the same time. The protection Buyer particularly focuses on the correlation of credit risk between the protection Seller and the Reference Entity. Correlation is a measure of the co-dependence of two factors. It could arise if the protection Seller and the Reference Entity are companies in the same group, or where both are heavily exposed to a single market and that market suffers a downturn. If these apply, the probability of joint default is likely to be high. Where there is such a correlation, the risk can be addressed through the Seller providing liquid collateral.

Market risk

Credit derivatives are exposed to the same market risk as all other types of derivatives, namely the volatility of market rates such as interest and currency rates, which can at times be significant. A movement in market rates could cause a temporary or permanent loss in the value of a transaction.

Operational risk

ISDA defines operational risk as "the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems and from external events". This clearly embraces failed deliveries, computer breakdown, human error or fraud and impracticable or prejudicial provisions in documentation.

As far as credit derivatives are concerned operational risk can take the form of either systems or processing risk, or settlement risk, or both.

Systems or processing risk is less of a problem than it was in the market's early days, when the nature of credit derivatives did not fit easily into existing trade recording, reporting and monitoring systems, and new systems had to be designed. Nowadays this is not a problem for plain vanilla credit default swaps, but highly bespoke credit derivative products still have systems or processing implications, as they can make it difficult to capture and record all the relevant features of a transaction. This means that some processes can only be performed manually. While systems have improved significantly since the inception of the market, there remains the possibility of

model risk especially for structured transactions. This is the risk that the model or system used to calculate the value of the credit derivative fails to evaluate the risk correctly.

Settlement risk occurs after a Credit Event. It particularly relates to Physical Settlement where a protection Seller receives any of the Obligations of the Reference Entity. The protection Seller needs to ensure that they correspond to the Deliverable Obligation Categories and Characteristics specified in a Confirmation.

Where Restructuring (in one of its various forms) is cited as a Credit Event on the Reference Entity in a Confirmation, then the protection Seller is exposing itself to credit deterioration as well as default. Whether this is desirable depends upon the protection Seller's risk appetite. A successfully completed debt restructuring can trigger a Credit Event even if there has been no default. Where this happens none of the Reference Entity's senior unsecured debt becomes due and payable. Hitherto the protection Buyer would probably have tried to deliver the lowest-priced senior unsecured debt it could find. ISDA has countered this in the various incarnations of its Restructuring Credit Event (see Chapter 3, pages 85–96 for details). Nevertheless, the protection Seller needs to be vigilant.

With credit derivative transactions incorporating the Restructuring Credit Event, the cheapest to deliver risk has essentially been mitigated following the introduction and adoption of "Modified Restructuring", which limits the maturity of Deliverable Obligations and the situations where a Restructuring Credit Event can be triggered.

Settlement risk also arises where legal or regulatory restrictions prevent a protection Buyer from making delivery or a protection Seller from taking delivery.

Legal risk

Legal risk affects all derivatives and not just credit derivatives. It comes in various forms.

- *Capacity*. As the *Hammersmith and Fulham* derivatives litigation of the early 1990s highlighted, it is vital for each contracting party to a derivatives transaction to have the legal capacity to enter into it. The same applies to credit derivatives. Otherwise the transaction can be deemed to be *ultra vires* (outside the party's powers), and be declared null and void. Section 35 of the Companies Act 1985 protects counterparties of companies incorporated in England and Wales against those companies' *ultra vires* acts, but there is no statutory protection in the United Kingdom in respect of other counterparty types and very little statutory protection overseas.
- *Suitability*. A key legal principle in many jurisdictions is that a transaction should be suitable for a party entering into it – it should achieve its intended purpose and the contracting parties should both understand it and the risks associated with it. Where this is not the case, the Buyer may be able to sue the Seller for misrepresentation. To counter this in the derivatives markets, many Confirmations and ISDA Master Agreements include standard non-reliance representation language. Of course, this can only apply where one of the parties is not relying on the other.
- *Enforceability of close-out netting*. Many jurisdictions now have close-out netting legislation and ISDA has commissioned netting opinions from 43 jurisdictions in respect of the 1992 ISDA Master Agreement and from 41 jurisdictions for the 2002 ISDA Master Agreement. However, in some jurisdictions this netting does not apply across the board and may exclude certain products. It is therefore important to check that credit derivative

contracts are covered in each case. If credit derivatives are documented under the same ISDA Master Agreement as other products, their exclusion under a jurisdiction's netting legislation could potentially taint the agreement and nullify the effectiveness of close-out netting for all products.

- *Legal enforcement of documentation*. The only way of knowing under English law if the provisions of a certain document are legally effective is for it to be tested in court.

Some of the terms of the credit derivative contract have been tested in the English courts. These are discussed in Chapter 2.

Basis risk

This risk arises where there is a mismatch between an asset and its hedge in legal or economic terms. Consequently Buyer could suffer a loss that is not fully compensated by his credit protection. The risk can also arise where the terms of the hedging protection do not exactly match those of the protection bought, for example where one credit default swap hedges another with different terms. A trader will want to ensure that the offsetting terms of trades and hedges are identical as far as possible.

It can also happen where there are conflicts and inconsistencies between the terms of the credit derivative transaction Confirmation and the documentation governing the Reference Obligation. If a Credit Event is not in line with its description in the Definitions, particularly if the Confirmation has been amended, it will be deemed not to have occurred and the protection under the credit derivative transaction will be flawed.

Risk taken on today and hedged tomorrow may give rise to basis risk, particularly where the same documentation is not used.

Conclusion

Clearly, in order to have confidence in credit derivative trading, institutions need to put in place a robust risk management system that addresses all these risks thoroughly and continuously. In Chapter 2 we turn our attention more fully to the legal issues in respect of credit derivatives.