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# Current Issues

## Credit derivatives: effects on the stability of financial markets

Credit derivatives are becoming increasingly popular, so the obvious question is whether, and how, they affect the stability of financial markets.

Generally, credit derivatives improve the overall allocation of risks within financial systems. They do so in two ways:

- Credit derivatives make risk management more efficient and flexible especially at banks.
- Credit derivatives allow a more efficient distribution of individual risks and a related reduction of aggregate risk within an economy.

Nevertheless, a number of risk factors must be taken into account:

- Poor market transparency makes it difficult at present to give an adequate assessment of risk distribution. Initiatives to gain additional market information and set appropriate reporting rules which reflect the interests of both the supervisory bodies and the market participants are therefore to be welcomed.
- Risks attributable to poor contract wording (documentation risk) have already been largely overcome thanks to the steadily ongoing development of standardised rules (ISDA).
- A high market concentration currently hinders the economically optimal allocation of risks, although it does not directly endanger the stability of the financial markets. But the high degree of concentration is expected to last only temporarily.
- There is no clear evidence so far that credit derivatives have systematically been wrongly priced. However, this cannot be ruled out entirely at present – especially given the inexperience of some of the participants entering the market. Systematically wrong pricing would result primarily in a misallocation of resources.
- The use of credit derivatives may change traditional incentive structures. This is mainly a theoretical phenomenon. In practice, various mechanisms help to deal with the incentive problems which could potentially increase risk.

Risks associated with the use of credit derivatives will merit special attention until the market has matured. Banks and financial markets will then benefit additionally from their use and become more stable.

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Credit derivatives are becoming increasingly popular. Between 1997 and 2002 there was a tenfold increase in volume, to around USD 2 tr, according to the British Bankers Association (BBA). It is expected that by the end of 2004 the market could reach USD 5 tr.

While credit derivatives are being used more and more in operative financial and risk management, their long-term implications for the credit and financial markets are only beginning to emerge. For the overall economy, one of the most important questions is how their growing use affects the stability of financial markets.

### **Credit derivatives: a means of more efficient risk allocation**

Credit derivatives have potential to improve the allocation of risks both within an individual economy and at the global level, and to increase the stability of banking and financial markets. At the micro-level, credit derivatives are an additional instrument for transferring credit risks. They have properties that conventional means of risk transfer (e.g. sale of credit, credit insurance, etc.) do not always possess.<sup>1</sup> Above all they are tradable and can be used for the synthetic composition and dynamic adjustment of a bank's credit portfolio. Ultimately, credit derivatives help banks to increase or reduce credit risks independently of the underlying transactions, to diversify risk across sectors and countries, and thus to optimise their overall risk profile. With credit derivatives, banks are in a better position to prevent financial difficulties and to alleviate credit problems in specific sectors or regions. The entire banking sector should become more stable as a result.

At the macroeconomic level, the distribution of risk within the economy as a whole improves with the use of credit derivatives. Credit risk connected with conventional bank loans can be borne by sectors for which this was previously impossible. The credit risk – which has been borne primarily by the banks in the past – is distributed more broadly by being passed on to other market participants such as insurance companies, investment trusts or hedge funds. But risks are not only redistributed: aggregate risk also decreases to the extent that the new protection seller is able – because of a differently structured credit portfolio – to assume the exposure at lower costs than the original lender. This results in a more efficient allocation of risks within the economy. Economic shocks such as a slump in growth or, more especially, crises in specific sectors or companies can be better absorbed as the associated costs are lower in total and less concentrated. The use of credit derivatives can therefore improve the overall stability of the financial system.

The fact that the defaults by Enron, WorldCom and Argentina did not lead to more serious financial difficulties at individual banks or to any chain reactions in the banking sector is considered to be largely due to the use of credit derivatives on these debtors. The markets also digested other large credit events (see table) quite successfully by making use of credit derivatives.

Besides having a stabilising effect, credit derivatives can supply important additional information on the borrower's creditworthiness through their pricing – provided the markets are sufficiently liquid. They thus improve the information efficiency of financial markets. In other words, credit derivatives help to make the financial system more efficient and more stable through several channels. However, credit derivatives and their growing use also entail risks. While there

### **Importance of credit derivatives growing steadily**

### **Credit derivatives make risk management more efficient and flexible**

### **Efficiency of macroeconomic risk distribution is improved**

#### **Top 10 credit events in CDS market**

##### Reference entity

- 1.) Worldcom
- 2.) Enron
- 3.) Marconi
- 4.) Railtrack
- 5.) Xerox
- 6.) Argentina
- 7.) Teleglobe
- 8.) Pacific Gas & Electric
- 9.) Swissair
- 10.) AT&T Canada

Source: Fitch, 09/2003

<sup>1</sup> For details see Deutsche Bank Research, Frankfurt Voice, July 10, 2003.

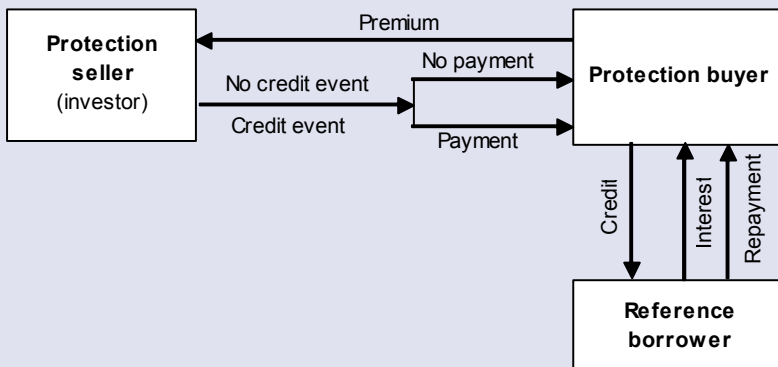
is considerable evidence that the benefits of credit derivatives exceed the costs<sup>2</sup>, it is necessary to weigh up the pros and cons carefully to arrive at a definitive judgement.

### How do credit derivatives work?

Credit derivatives are financial instruments that isolate, and then transfer to investors, the credit risk generated in lending transactions. These investors act as protection sellers, agreeing to cover the cost if a pre-defined credit event occurs. For taking on the credit risk, the seller receives a payment from the protection buyer. While all credit derivatives are based on this principle, they differ as regards the specified credit event (payment default, restructuring, deterioration in creditworthiness etc.), the number and kind of underlying financing transactions (bank credit or bonds) and the form of derivative (option, forward, swap).

Like other types of derivative, credit derivatives isolate a specific aspect of the financial contract from the underlying transaction. They are thus basically similar to interest or currency derivatives. Credit derivatives break the link between lending and the assumption of the credit risk. How they work is illustrated by the example of credit default swaps (CDSs), the most common form of credit derivative at about 44% market share.

#### Credit default swap



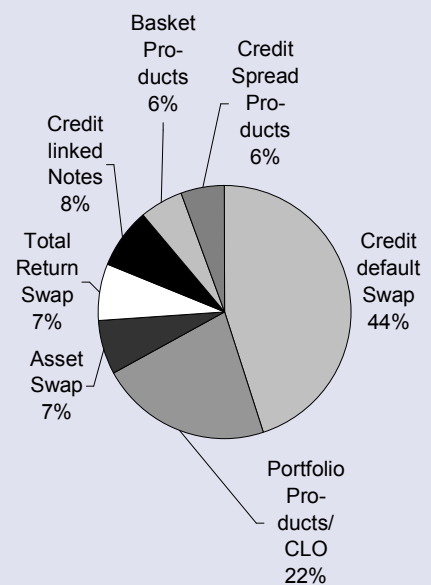
For instance, if a bank (as protection buyer) wishes to hedge the default risk of a credit carried on its books, it concludes a swap agreement with a protection seller. The seller undertakes that, should a credit event occur, either he will pay a net cash amount to the bank (“cash settlement”) or he will accept delivery of the reference asset, or an equivalent, against payment of its face value in cash (“physical settlement”). In return for taking the default risk the protection seller receives periodic premium payments from the bank (the “CDS spread”).

The following section looks at risks that credit derivatives may entail for financial market stability. They are divided into several categories:

- Intransparency of the market
- Documentation risks
- The risk of high market concentration

<sup>2</sup> See A. Greenspan’s address at the Conference on Bank Structure and Competition in May 2003. <http://www.federalreserve.gov/boarddocs/speeches/2003/20030508/default.htm>

#### Credit derivatives products by market share



Source: BBA; Status: end of 2001

- Pricing risks
- Incentive and monitoring problems

### Waiting for greater market transparency

In order to assess the degree of systemic risk in financial markets it is essential to know the size and structure of risk components, the scale and direction of risk transfers, and thus the distribution of the risks within the economy. Such data are needed by national supervisory authorities in particular. To determine the systemic risk in the banking sector, for example, or risk concentrations at individual banks, it must be possible to see who has taken on additional risks – and to what degree – by buying credit derivatives (protection seller), and how these risks are correlated.

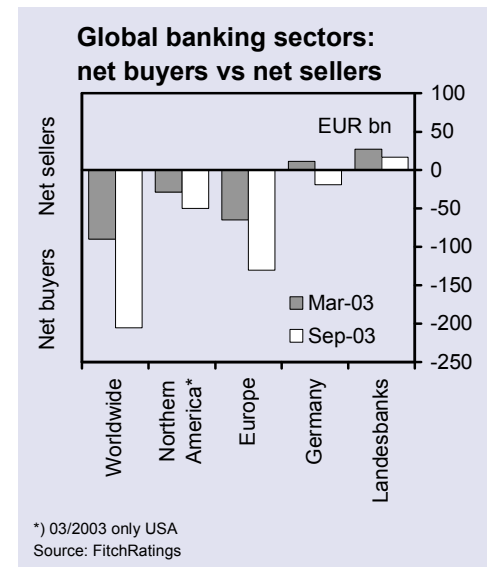
It is particularly important to have company or sector-specific data. Highly aggregated data – which make up the bulk of the data available at present – are of limited value, or may even be misleading. For example, all estimates show the global banking sector to be a net protection buyer. Yet a survey by Fitch Ratings<sup>3</sup> indicates pronounced regional differences. While banks in the USA, Switzerland and the UK do appear to be net protection buyers, the situation at German banks is less clear. Fitch's results also suggest there may be differences between groups of institutions. In Germany, for example, regional banks and Landesbanks tend to act as protection sellers more than big private banks. A risk assessment based solely on the net, aggregated position of all banks may therefore lead to false conclusions.

The global credit derivatives market has indeed been very intransparent. All information on market volume is based on estimates and/or surveys among market participants, not on binding published data. That is also the reason why the estimates differ greatly.

Only in the USA are the commercial banks required to report all derivatives transactions, to the Office of the Comptroller of the Currency (OCC). This means there is much more detailed information available on the structure of the US market than there is for other countries. To what extent banks in Europe may soon be required to report to the national supervisory authorities and/or the Bank for International Settlements (BIS), and to what extend corresponding figures may have to be published is currently the subject of considerable debate. Until uniform reporting standards are agreed, market observers will have to rely on surveys such as those carried out by Fitch, S&P and the BIS for certain national or regional markets.<sup>4</sup> Interestingly, these are based partly on information from brokers and information systems such as Creditex, CreditTrade and GFI – which has been available all along but has been used only for pricing, not for generating structural data. While this does not give a complete picture of the market, it provides useful insights, and systematic analysis of these sources could help to narrow the information gap.

Data provided under accounting rules can potentially also serve as a source of information on credit derivative transactions of individual market participants. It is of little help, though, for assessing systemic

### Transparency essential for assessment of systemic risks



### Potential sources of information on the use of credit derivatives

	Data aggregation	
	low (company level)	high (regional, institutional, group-specific)
Surveys/studies by rating agencies, associations, banks etc.		X
Information and brokerage systems (e.g. Creditex, CreditTrade, GFI)		X
Supervisory authorities/ central banks (e.g. BIS, OCC)	X	X
Market participants themselves under reporting requirements or voluntarily	X	

<sup>3</sup> See Fitch: "Global Credit Derivatives: Risk Management or Risk?", March 2004 and "Global Credit Derivatives: A Qualified Success", September 2004.

<sup>4</sup> A study on the German market has also been produced by the Ruhr-Universität Bochum: Brütting, Ch., N. Weber and M. Heidenreich, "Einsatz von Kreditderivaten durch deutsche Banken – Marktsituation, Problemfelder und Perspektiven", in: Finanz Betrieb, 11/2003, pp. 754-763 and 12/2003, pp. 867-875.



risks. No distinction is made between different types of credit derivative and there is usually a time lag before assumed risks are disclosed. The balance sheet only provides a snapshot of risks at a particular point in time. Risk positions due to credit derivative transactions after balance sheet date are not shown. In addition, there are still no uniform standards that apply in all regions, which would make it possible to compare exposures internationally. Progress has been made in the harmonisation of accounting rules, but considerable differences remain, for example between the reporting requirements under US GAAP and those under IAS/IFRS.<sup>5</sup>

The available information is definitely insufficient for assessing systemic risks. Proposals for deriving timely, accurate details of risk transfers by means of credit derivatives are welcome. Such information is of interest not only to the supervisory authorities, but also to the market participants themselves. For if they are to arrive at an accurate assessment of counterparty risks and their correlations, they must have detailed knowledge of the counterparty's exposure.

### Documentation risks: new rules bring greater clarity

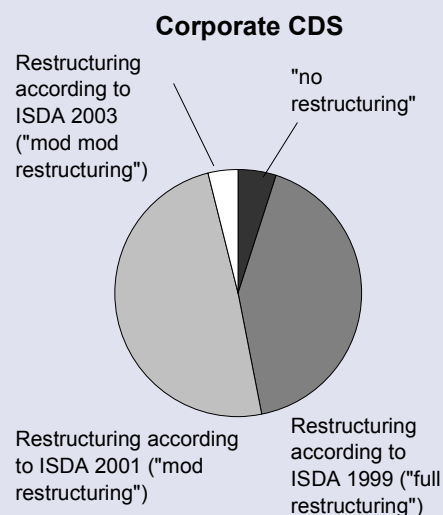
In the past, there were occasional differences of opinion (e.g. Railtrack, Enron) as to whether a credit event, as defined in the contract, had occurred, requiring the protection seller to pay compensation. This not only entailed risks for the protection buyer. It is also important for the stability of the market that the terms of the contract be unambiguous. The conclusion of a contract always involves a documentation risk. In "normal" market phases the potential consequences are only a microeconomic problem. In difficult times when there is a spate of credit events, however, the systemic risk increases. If it turns out that a credit derivative did not cover the real credit event risk, then this risk has to be borne by the original creditor. As a result, he faces risks – and possibly risk clusters – that were initially believed to have been transferred (and perhaps even greater risks if additional credits have been granted following the presumed disposal of the original risk). If large numbers of market participants are affected in this way, the credit risks will not be distributed efficiently within the financial system. The ability of credit derivatives to bolster the economy's resistance to shocks is rendered ineffective. It depends ultimately on the existence of reliable rules. In addition, documentation risks cause uncertainty among market participants and may make them decide not to use credit derivatives at all. Documentation risks are therefore a potential barrier to the development of the market.

For these reasons the International Swaps and Derivatives Association (ISDA) drew up standards for trading in credit default swaps back in 1999. These are now included in most CDS contracts. In mid-2003 a revised version of the ISDA rules came into effect. It integrated earlier amendments and clarified a number of additional points. These new rules take account of regional differences in debt restructuring.<sup>6</sup> They are also more specific as regards guarantees and the conditions which trigger a repudiation or

### Systemic risk due to documentation problems rises in difficult market phases

### ISDA rules create uniform standards

#### Different models of restructuring in CDS contracts (as of June 2003)



<sup>5</sup> The main rules on reporting and accounting for credit derivatives are FAS 133 and 138 under US GAAP, and rules 32 and 39 under IAS/IFRS.

<sup>6</sup> They distinguish mainly between three forms of restructuring: "full restructuring" is preferred in Asia and Japan, "modified restructuring" (mod-R) in the USA, Australia and New Zealand, and "modified modified restructuring" (mod mod-R) in Europe.

moratorium as credit event in the case of emerging markets credit derivatives (e.g. EM sovereign CDS).<sup>7</sup>

Even the reformulated ISDA rules are unlikely to cover all eventualities and prevent legal disputes entirely. All modifications so far have been made in response to cases that were not unequivocally defined as credit events in the existing rules. Nonetheless, the attempt to codify what has worked in practice and to clarify other points represents a major step towards the establishment of a globally accepted, plain vanilla CDS. Recent figures show that the 2003 ISDA rules are already being applied in newly agreed CDSs. Sovereign CDSs, however, use the 1999 definition of a restructuring (“full restructuring”) in 95% of all cases. The modified forms of restructuring were added in 2001 and 2003 in response to the Consec case of 2000, in which a debt restructuring took place without any deterioration in credit quality or credit conditions for the creditors. Since the modified arrangements are rarely used in sovereign CDSs, the market evidently considers it improbable that a debt restructuring will take place here without a deterioration in creditworthiness. Such a case cannot be ruled out, however, so it would not be out of place to use different forms of restructuring in sovereign CDSs, too.

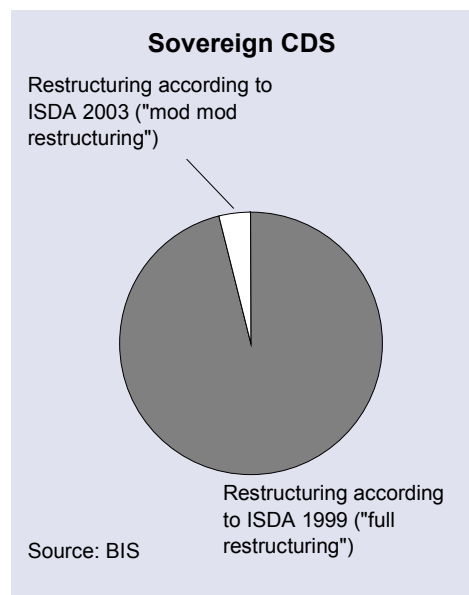
In addition, compared with the corporate segment there are many sovereign CDSs in which the reference entity is of poor credit standing. Almost 40% of the volume of sovereign CDSs relates to non-investment grade debtors; the figure for corporate CDSs is less than 10%. This means that credit events of all kinds are much more probable in the sovereign segment. This makes it particularly important for sovereign CDSs that rules be formulated to reduce documentation risks.

While it is desirable that standards also be established for other forms of credit derivatives, the potential for disputes that exceed those connected with conventional CDSs is limited. For they are either based on a CDS, and hence on its definition of a credit event (e.g. credit linked notes and synthetic CDSs), or the underlying credit event can be quantified and thus objectively identified (e.g. credit options and total return swaps). The buyer of a credit spread put option, for example, will only exercise his right to sell if the yield spread on the reference asset exceeds a certain (quantifiable) level. Unclear definitions of credit events and ensuing disputes are therefore much less of a problem with these products.

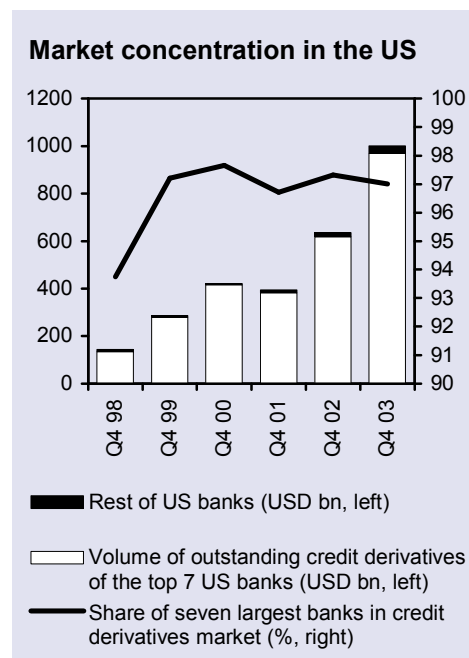
### Market concentrations still high

Up to now, relatively few market participants have traded in credit derivatives. In December 2003, according to the OCC, only 26 out of more than 2,200 US commercial banks participated in the credit derivatives market as protection buyers; 16 acted as protection sellers. The seven most active domestic banks in the US credit derivatives market accounted for 98% of the total volume originated by US banks. This omits participants from other sectors, but it shows that at least in the banking industry there is a high degree of market concentration. There are no comparable data for other countries, but it is suspected that there are only a few major players there, too.

High concentration means that, particularly in the case of less liquid credit derivatives (usually reference debts without investment-grade status), it can be difficult to find a counterparty at any given time. This is especially true when the market is under strain. At such times



### Standards for other credit derivatives would also be desirable



<sup>7</sup> For more information on the new ISDA definitions see Deutsche Bank, Global Markets Research (June 2003): "2003 ISDA Credit Definitions".



there is a danger that trading may be impossible – which also means there can be no reliable pricing. If one of the banks dropped out of the market owing to bankruptcy, this would have considerable implications for the other players. To begin with, the credit risk – which a protection buyer believed he had hedged by passing it on to the participant who has now dropped out – reverts to the protection buyer. And if he cannot find a new protection seller owing to the small number of market participants, he is then unable to reduce his exposure by concluding a CDS.

What are the consequences for the overall economy of a participant's dropping out of a highly concentrated market? It is necessary to distinguish here between highly concentrated trading and highly concentrated position taking. The data available so far indicate that trading in particular is in the hands of just a few banks. The dominance of a small number of participants in the US credit derivatives market, mentioned above, is partly due to the fact that banks often hold credit derivatives in their trading books, and do not intend to take a permanent position as protection buyer or seller. If one of the major traders were to drop out, this would lead to higher transaction costs as the reduced liquidity would make it more difficult for potential protection buyers to find someone to assume the risk. In order to avoid the danger of perhaps not being able to reduce risk at all and thus having his hands tied in risk management, the protection buyer would then be more willing to pay a higher premium (liquidity premium) than before. The "disappearance" of a major position taker (or a number of smaller ones) owing, for example, to the withdrawal of an entire sector from the market, would result in sub-optimal distribution of risks in the world economy. The benefits of credit derivatives, as outlined above, would not come fully into play. This means, in reverse, that the financial markets become more stable when there are more position takers from different sectors and regions.

The problems connected with high market concentration mostly arise when a participant drops out. Why could this happen? The case most often cited is when a participant is forced to withdraw because of bankruptcy. But a look at the US derivatives market, for example, indicates that such a scenario is extremely unlikely. The credit standing of the seven most active banks there is reflected in a rating of at least A. It therefore seems rather improbable that one of the main players will go bankrupt. A second possibility is that a market participant withdraws voluntarily for strategic reasons. This also looks improbable in a market that is growing steadily as more and more banks and other financial services providers join.

A third possibility remains: one player disappears from the market as a result of merging with another market participant. This scenario does indeed appear to be more important. Four of the largest participants in December 2003, as shown in the table on the right, have already merged into two banks (JPMorgan Chase with Bank One, and Bank of America with Fleet National). With consolidation in the banking sector expected to continue, this trend will probably grow stronger. A merger of two participants has the immediate effect of reducing the number of market players. But it is unlikely to bring a sudden drop in the combined business activities. A gradual reduction is more probable, as existing fields of business are not going to be merged overnight. This applies particularly to credit derivatives transactions that serve in the management of the credit portfolio (e.g. as hedging), not so much to trading activities. Besides, since credit derivatives are a growth market, it can be expected that new participants will penetrate the market during the reorganisation

### High market concentration gives rise to transaction costs ...

### ... or prevents the optimal distribution of risks

**Top 7 US banks in the US credit derivative market**

Bank	Rating		Transaction volume <sup>1</sup> USD bn
	S&P <sup>2</sup>	Moody's <sup>3</sup>	
JPMorgan Chase	A+	A1	577.7
Citibank	AA	Aa1	166.1
Bank of America	A+	Aa2	138.6
Wachovia Bank	A	Aa3	35.6
HSBC	A+	Aa3	31.3
Bank One National	A	Aa3	20.4
Fleet National	A	A1	15.9

1) Source: OCC; Status: Dec 31, 2003

2) If/foreign issuer rating

3) senior unsecured rating

phase, thereby closing the gap. A merger between participants should hence not strain the market to any noticeable degree.

All in all, it seems likely that increasing numbers of participants will want to benefit from using credit derivatives, and join the market. Recent surveys show that small regional banks are already starting to become more active, which suggests that the concentration at present is due to first-mover effects rather than efforts to achieve economies of scale (which would also result in just a small number of participants in the long run). This applies particularly to the position takers. Over time, the entrance of new participants will greatly reduce the existing concentrations in this market. In trading, though, a certain degree of concentration will remain, as high sunk costs are a barrier to the market entry of new participants. However, a similar tendency can be seen in trading in conventional derivatives – on interest rates, for example – and the stability of those markets has not suffered.

### **Price distortions: how great are the risks?**

Before concluding a CDS contract, the parties have to agree the premium – the CDS spread – which the protection buyer will periodically pay to the seller. Since a CDS separates the credit risk from other risks of the underlying transaction (e.g. interest rate and currency risks), the premium should closely reflect the risk of a credit event, in other words the credit quality of the reference entity. Pricing models for credit derivatives are still at an early stage of development, however. The Bank for International Settlements (BIS) mainly criticises three points regarding current pricing practice.<sup>8</sup> First, there is no generally accepted pricing model. Second, models are used too early, before they have been tested sufficiently. Third, pricing models for more complex portfolio products, especially synthetic collateralised debt obligations, are inadequate. These latter models have to capture, above all, the correlation of default probabilities for the underlying assets in the portfolio. But these correlations are difficult to quantify. In practice, this has resulted in over-simplistic methods of getting round the problem, according to the BIS: it is assumed, for example, that the correlation between the default risks of debts is automatically lower if they are from different sectors or regions.

### **Inaccurate pricing harms the economy**

The BIS sees a central problem here: a danger that market participants may underestimate the real risks and take on more risk than would be desirable for the overall economy. If credit risks were systematically wrongly priced this would be dangerous for other reasons, too. It would lead to a misallocation of resources as capital would not be channelled into the most efficient uses. Price distortions would also have microeconomic implications. If prices were too high, the protection buyer would be at a disadvantage compared with the seller as he would have to pay an excessive premium. If prices were too low, the opposite would be the case.

So are credit derivatives systematically wrongly priced? And, if so, does it entail worrying risks?

### **Accuracy of pricing is unclear**

In practice it is difficult to check whether the premiums on credit derivatives are appropriate since it is not possible to observe the “true” credit risk and thus the size of the “correct” premium (fair

**Over time, concentration in position-taker market will ease**

**Premium should reflect creditworthiness of reference entity**

**Criticism of pricing practices**

**Inaccurate pricing is problematic for the economy**

**Fair value is a non-observable variable**

<sup>8</sup> Committee on the Global Financial System: Credit Risk Transfer; Basel, January 2003.





value). But the development of premiums prior to actual credit events provides some clues. Before Argentina's default in December 2001, for instance, CDS premiums rose rapidly: a clear indication of the increased credit risk of Argentinean bonds. CDS spreads showed a similar pattern before the Enron crisis. Other studies confirm that CDS premiums anticipate credit events more strongly than comparable market indicators such as bond spreads, i.e. the yield gaps between bonds and a safe investment.<sup>9</sup>

However, the fact that premiums tend to move in the right direction does not mean that pricing is unproblematic. CDS prices do not always seem to be a useful leading indicator for credit events. Fitch Ratings draws attention to two critical points.<sup>10</sup> First, CDS prices send many "false signals", i.e. they suggest that a credit event is in the offing, but none actually occurs. Such false signals cannot be entirely ruled out and they may give rise to additional costs, particularly for buyers who conclude a contract during a phase when protection is wrongly priced. It must be remembered, though, that if a price is considered to be "false" this may be because it is classified ex post. Price signals may, for instance, induce the reference entity to adopt behaviour that forestalls the credit event. High CDS prices may prompt the Board of the company which is the underlying debtor to take the necessary action to prevent the credit event. The CDS price signal would subsequently be interpreted as "false" even though it might have been justified at the time.

For the economy, though, frequent occurrences of false signals would indeed be problematic. At the microeconomic level they drive the cost of credit protection excessively high. At the macro-level, they give rise to costs resulting from misallocation. Such costs are caused by wrong pricing quite generally, though, i.e. not only by false signals but also by prices that are too low. In the long run, allocative distortions have a destabilising effect on the financial markets if liquid funds flow not to underlying debtors who only appear to be a credit risk, but to debtors who really are a risk but whose CDS premiums may be unduly low. From the point of view of stability alone, though, overly frequent false positives may be quite acceptable in the short term as they warn market participants to be more cautious – as the BIS demands.

The second conclusion drawn by Fitch is that CDS premiums only peak when the credit event is imminent or has even taken place. This, however, is an inherent characteristic of any leading indicator: as the event which the indicator is supposed to predict approaches, the uncertainty as to whether it will take place diminishes and the signals become increasingly clear. The informative value of CDS premiums does not depend on whether they have peaked; the change itself is the important thing.

Any assessment of whether CDS prices are appropriate is bound to be essentially anecdotal, however, at the present stage of the market's development. The track record is too short and the number of credit events is too low to provide a reliable basis.

#### **Quality of pricing improving steadily**

At present, problems with the pricing of CDSs cannot be entirely ruled out. That is certain. But this is mainly due to the fact that the credit derivatives market is still young. Over the medium term these problems should decline. Growing experience with the use of pricing models will help to improve the accuracy of prices and, as the

**Extent to which CDS spreads can serve as leading indicator is unclear**

**Wrong pricing leads to allocative distortions**

**No empirical proof of systematically wrong pricing**

**Greater experience helps to improve accuracy of pricing**

<sup>9</sup> IMF, Working Paper 03/106: "Anticipating Credit Events Using Credit Default Swaps, with an Application to Sovereign Debt Crises".

<sup>10</sup> FitchRatings: "Credit Derivatives: A Case of Mixed Signals?", December 2003.

number of market participants increases, the distortion of prices through liquidity premiums should decrease. This means that grounds for concern about wrong pricing currently exist mainly in connection with credit derivatives traded in relatively illiquid markets (e.g. products on smaller reference entities). Risk pricing is less certain to be timely and efficient here as information on such debtors is generally sparse.

Problems due to unreliable pricing models should not be seen as too important in the medium term. They are a natural problem of young financial market products: similar problems were observed in the early days of interest rate and currency derivatives, yet did not automatically lead to instabilities. Moreover, the absence of a generally accepted pricing model used by all market participants can even be a good thing, as it reduces the danger that all will react in the same way to signals from the model. The use of uniform risk models can lead to herd behaviour, with all participants interpreting market developments in the same way and taking similar action. At times when the market is already under strain, such homogeneous behaviour can accelerate the onset of crises.<sup>11</sup>

### **Lack of pricing know-how**

Attention should, however, be devoted to weaknesses in pricing that are due to inadequate knowledge on the part of some market players. These are mainly participants who have not normally been involved in business with bank loans and therefore have little experience with the related default risks. If risk management is weak or if systems for the management of other types of risk are applied without modification to credit risks, this can lead to an excessive accumulation of risks with individual market participants. While there are no known cases in which wrong pricing was definitely attributable to a lack of know-how, there is a latent risk, particularly with new participants entering the market. But a lack of know-how should be only a temporary problem. As in other areas, risk management systems should become more efficient with growing market experience.

### **Incentive problems are inherent to credit derivatives**

Like all financial products, credit derivatives have their own specific incentive structure. When a credit risk is transferred by means of a credit derivative, the incentive structure of the underlying transaction is eclipsed by that of the derivative. The new incentives may lead to behaviour that could tend to undermine stability. This is illustrated by two examples:

#### **Case 1: Incentive problems relating to company monitoring**

When a bank grants a loan it has an incentive to monitor the debtor's behaviour in order to reduce the risk that its claim will not be honoured. If the creditor hedges the default risk through a credit derivative, though, he has no further incentive to monitor the debtor. The debtor may then tend to behave in a way that threatens repayment of the loan and perhaps even the company's very existence. If this were to happen on a broad scale it would create risks for the overall economy.

In practice, however, a number of mechanisms counter these dangers. They were described in detail in an earlier report and are therefore only mentioned here.<sup>12</sup> Essentially, they consist of various

**Search for appropriate pricing models helps to counter destabilisation**

**New market participants may not know enough about pricing**

**In theory, incentives to monitor the reference entity are reduced, ...**

**... but in practice they are reactivated by various mechanisms**

<sup>11</sup> This argument is also relevant in the current discussion of regulatory rules requiring that standardised value-at-risk models be used for the assessment of market risks.

<sup>12</sup> For details see Deutsche Bank Research, Frankfurt Voice, July 10, 2003.



ways of requiring the protection buyer to bear part of the costs in case of a credit event. This can be achieved by including certain components in credit derivatives (e.g. digital CDSs or second-to-default protection). In addition, the conclusion of several credit derivatives contracts with the same counterparty triggers mechanisms (reputation effects) which ensure that the protection buyer monitors the underlying debtor.

### **Case 2: Incentive problems connected with restructuring**

In many cases payment difficulties do not lead to a full default but only to a restructuring of the reference debt. The terms of the restructuring are worked out jointly by creditor and debtor. If the creditor has CDS protection, he will have less incentive in the event of a restructuring to seek a solution that is also acceptable to the debtor. This means that the creditor may agree to terms knowing that they may lead to a deterioration in the debtor's economic situation.

The incentives that take effect in a specific case depend, however, on the agreed method of settlement. With physical settlement, the reference asset is transferred to the protection seller when a credit event takes place. The seller thus has an interest in ensuring that the company is restored to health. While the problem of the altered incentive structure between the original creditor and the reference debtor is not solved here, a new, functioning creditor-debtor relationship is created in which the protection seller is the new creditor. It may prove difficult, though, to identify the new creditors (protection sellers) and get them together for the rescheduling negotiations.

With cash settlement, the protection buyer receives from the seller the difference between the face value of the debt and its current market value. There are probably far fewer incentives in such cases for the protection buyer to work together with the underlying debtor to agree a way to restructure that is in both their interests. If the protection buyer were to act opportunistically, he might even have an incentive to deliberately provoke a restructuring (e.g. by refusing to grant further loans). Because of the cash settlement he would suffer no loss from the restructuring, but he would have an incentive to negotiate the highest possible repayment later from the reference entity. This is because the cash settlement is based on the market value of the debt at a fixed point in time after the credit event, whereas the amount of the debt to be repaid to the protection buyer may be agreed at a later date.

The danger of opportunistic misconduct by protection buyers has been theoretical so far. There has been no known case of such behaviour. The danger that a party may deliberately trigger a credit event is increasingly being countered by mechanisms as described above. The inclusion of clauses requiring the protection buyer to bear part of the costs and the establishment of longer-term business relations help to prevent misconduct and are therefore to be welcomed.

### **Credit derivatives: residual risks in the short term, stronger financial markets in the long run**

All in all, credit derivatives have the potential to make both the banking and financial markets more stable. They can improve risk management at the micro-level and enhance the diversification of risks within a financial system. Nonetheless, a number of risk aspects need to be taken into consideration, particularly until the credit derivatives market becomes fully mature. Broader application of credit derivatives to a larger number of (especially smaller)

**Incentive problems in case of restructuring depend on settlement method**

**Physical settlement shifts incentives to protection seller**

**Cash settlement seems, theoretically, to give less incentive for restructuring, ...**

**... but, in practice, incentive generally still exists**

**Although individual risks need to be watched in the short term, ...**

reference entities and broader use of credit derivatives by a larger number of market participants would be characteristics of a mature market. In the short term there could still be risks, owing primarily to the lack of transparency, still relatively high level of market concentration, and possible pricing problems. These problems will lose significance over time. Thanks to effective rules (ISDA), documentation risks have already been largely overcome and incentive problems appear to be mainly a theoretical phenomenon.

Credit derivatives are already helping to improve risk management at the micro- and macroeconomic levels. When some shortcomings are eliminated, the financial and banking markets will benefit even more and become more stable.

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**... credit derivatives should help to strengthen the financial markets in the medium term**

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