
Credit Derivatives – Possible Implications for Financial Stability

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INTRODUCTION

Taking risks is an integral element of banking operations. The banks typically take several types of risk. The principal type is credit risk, but the banks also face market risk, operational risk and other risks. Management of market risk, comprising e.g. interest-rate and exchange-rate risk, has developed significantly in recent years, and financial instruments for the management and hedging of market risk are a key element of banking operations.

Lending – and thereby assuming credit risk – is a key task for the banks. Credit derivatives are instruments used for credit-risk management. Management and hedging of credit risk is by no means a new phenomenon. Banks have traditionally used guarantees for this purpose. Business enterprises have also been able to take out e.g. credit insurance to hedge the credit risk or losses on their customers/debtors, just as buildings, stocks, etc. can be insured. A credit insurance policy typically covers losses due to default on payment of deliveries of goods and services due to a customer's insolvency (compulsory liquidation, suspension of payments or similar). Credit insurance thereby contributes to reducing the credit risk in the business enterprise's relationship with its bank. Guarantees and credit insurance resemble, but are more individualised than, credit derivatives, and the documentation is different. Credit derivatives are thus more standardised, but in principle all the instruments serve the same purpose, which is to manage and hedge the credit risk.

In recent years, trading of credit derivatives on the international capital markets has expanded significantly, and the banks are key agents in this market.

This article briefly presents the principles behind credit derivative instruments and their typical applications. This is followed by an assessment of the implications for financial stability of extensive use of credit derivatives. All in all, the use of credit derivatives entails advantages as well as drawbacks. One of the advantages is that credit derivatives facili-

tate the banks' management and diversification of the credit risk on their loan portfolios¹. Credit derivatives can thus help to achieve a more appropriate distribution of the credit risk, since transferring risk from one bank to another can improve the position of both banks, thereby enhancing financial stability. Liquid markets for credit risk are also a source of useful price information for the banks, e.g. when determining how their credit products are priced.

On the other hand, the market for credit derivatives is relatively new, and has therefore not yet been "tested" in a cyclical downturn where the credit risk is typically on the increase. This less mature market is still subject to a number of legal and operational risks. In addition, the use of credit derivatives can complicate the monitoring of credit risk in the financial system. Credit derivatives now offer non-banks an opportunity to assume a higher credit risk. It is important that they have the capacity and knowledge to assess the consequences.

This article focuses on international issues, since the market for credit derivatives is still in its infancy in Denmark. Continued expansion of the international market for credit derivatives is expected. This will include greater participation by non-financial agents (business enterprises). Until now, the banks' use of credit derivatives has been motivated by e.g. regulatory aspects (to reduce the solvency burden). However, these considerations are expected to be reduced in view of the Basle Committee's proposed new capital-adequacy rules². On the other hand, the banks' increasing quantification of credit risk in their management of credit portfolios and the capital base is expected to give them a stronger incentive to use credit derivatives.

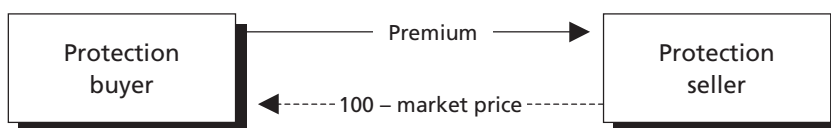
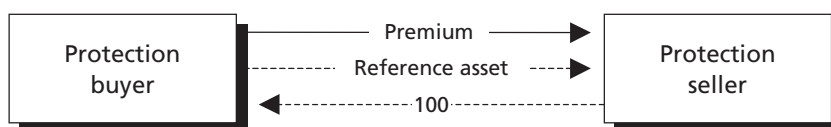
OUTLINE OF CREDIT DERIVATIVES

Credit derivatives are related to traditional bank guarantees or insurance, since one party receives a regular premium for compensating the other party (the protection buyer) for any loss during the contract period. Credit derivatives can contribute to interlinking the loan market, the securities market and the insurance market, making insurance companies active market participants too.

A credit derivative transfers the credit risk related to a specific loan or portfolio of loans from one party (the lender) to another party. Credit derivatives are bilateral agreements between two parties, and credit derivative agreements concern specific risk elements associated with the

¹ For example, in the 2nd half of 2000, problems in the telecommunications sector contributed to increasing demand for instruments to hedge the credit risk (Bank of England, 2001).

² The New Basel Capital Accord, January 2001.

Example of Cash Settlement**Example of Physical Settlement**

Note: The premium is typically a number of basis points per year on an agreed notional amount.

underlying loan or loan portfolio, without simultaneously affecting the other characteristics of the loan or credit portfolio¹. The general structure of credit derivatives is that compensation is made when a specific credit event occurs. This event may be compulsory liquidation or suspension of payments, but also downgrading of credit ratings, debt restructuring, etc.

Over time, a variety of different techniques have been developed whereby credit derivatives are included in various financial product structures. Credit default swaps are still considered to be the "standard" credit derivatives, however, and are thereby the central element of the market for credit derivatives. This article therefore solely concerns credit default swaps.

Credit default swaps

In a *credit default swap* a counterparty (protection seller) agrees to pay compensation to the protection buyer in the event of breach of contract concerning the reference asset that is subject to transfer of credit risk pursuant to the contract. The reference asset may be for instance a loan or security. As payment for assuming the credit risk, the protection seller receives a fixed premium from the protection buyer during the term of the contract, cf. Chart 1. Should a credit event occur, the protection buyer receives compensation, typically as the difference between the original face value of the reference asset and its market value (recovery value) following the credit event.

¹ Baldvinsson et al. (2000).

There are several settlement methods. Settlement could occur by the protection buyer delivering the defaulted reference asset to the protection seller in return for par value in cash (physical settlement), or as the difference between the par value of the reference asset and its market value following the credit event (cash settlement).

The contract expires when a credit event triggers settlement. If no credit event occurs during the contract period, the protection buyer re-assumes the credit risk on the reference asset on expiry of the contract.

A credit default swap does not entirely eliminate the credit risk for the protection buyer, since there will always be a risk that the protection seller in the default swap is unable to meet its obligations due to e.g. compulsory liquidation. A credit default swap will nevertheless in normal circumstances reduce the credit risk considerably, since it takes two events for the protection buyer to suffer a loss. The greater the correlation between the creditworthiness of the protection seller and the reference asset itself, the greater the probability of the compulsory liquidation of both the reference asset and the protection seller at the same time (breach of the default swap). The higher this correlation, the poorer the protection, which should be reflected in the premium paid by the protection buyer. For example, if the credit derivative is to purchase protection on a business enterprise and the counterparty is a bank situated in the same "high-risk" country as the business enterprise, the premium will normally be lower than if the protection seller of the same reference asset had been domiciled in a "low-risk" country.

A credit default swap offers the protection buyer the opportunity to reduce the credit risk on a wide range of exposures such as loans, bonds, trade credits, etc., and to transfer this credit risk by means of a simple, relatively standardised instrument. In the same way, market participants can buy or sell with a view to hedging, speculation or arbitrage, even though they have no direct exposures in the reference asset.

Documentation

A central problem in the credit default swap market has been the lack of standard documentation with clear, "water-tight" legal definitions. The need for standards for trading in credit derivatives became even more evident during the Russian crisis in 1998, when many documentation problems arose. Until that time, the terms and conditions for each individual credit default swap had been agreed bilaterally¹.

¹ Bank of England (2001).

In 1999, the legal documentation of credit default swaps was standardised under ISDA¹, and most credit default swaps are now traded within the framework of the ISDA Master Agreement. This documentation e.g. contains definitions of a wide range of terms used in the contract. ISDA has thus specified the typical "credit events" that can trigger a credit default swap. This contributes to reducing the legal risk associated with trading of these instruments.

The documentation is subject to continuous development. The credit default swap market cannot yet be described as "mature", and the documentation has not yet been fully tested during a cyclical downturn. For comparison, the market for interest swaps was at an equivalent stage at the end of the 1980s².

CREDIT DERIVATIVES AND THEIR USE

In simplified form, the credit derivative market comprises: a) "end-buyers" of credit protection, seeking to hedge a credit risk associated with other elements of their activities; b) "end-sellers" of credit protection, who typically wish to diversify an existing loan or insurance portfolio; and in between them c) intermediaries who provide liquidity, trade on their own account and use credit derivatives to carry out various structured transactions. Table 1 shows the results of a survey whereby the market participants are divided into protection buyers and protection sellers, and are measured in terms of their share of the total market (notional value).

Banks participate in the credit derivative market as intermediaries (contributing to market liquidity), but typically also as net protection buyers. In view of the banks' increased focus on shareholder value, they require higher and higher returns on equity³. Recent years' trends have shown that certain banks can benefit from greater focus on intermediation and structuring of credit risk.

For a number of years the banks have used statistical models to quantify market risk, i.e. the risk of the bank incurring losses due to fluctuations in market prices (interest and exchange rates, and stock prices). Such models are now also increasingly used to quantify credit risk. The purpose is to enhance the management of credit portfolios and capital base. The bank's own estimate of the capital requirement is the economic

¹ The International Swaps and Derivatives Association has prepared the Credit Derivative Definitions from 1999. See also www.isda.org.

² Bank of England (2001).

³ More and more banks allocate capital according to the RAROC (Risk Adjusted Return on Capital) models due to the increasing focus on capital utilisation.

MARKET PARTICIPANTS IN THE CREDIT DERIVATIVE MARKET,
BEGINNING OF 2000

Table 1

Per cent	Protection buyer	Protection seller
Banks	63	47
Securities houses	18	16
Insurance companies	7	23
Business enterprises	6	3
Hedge funds	3	5
Mutual funds	1	2
Pension funds	1	3
Governments/export credit agencies	1	1

Note: There is no comprehensive global data in this area, but the figures are based on a survey conducted by the British Bankers' Association.

Source: Bank of England (2001) and Lehman Brothers International (March 2001).

capital¹. It is the amount of capital required for a bank to be able to cover unexpected losses with a given probability. The greater focus on credit-risk management is expected to augment the incentive to use credit derivatives.

A bank with a large exposure on a customer or a sector may apply various methods to diversify the credit risk, such as reinsurance or syndicated loans, whereby the loan is split up into smaller units and distributed on several banks. Alternatively, the bank may reduce the credit risk by using credit derivatives. Credit derivatives can therefore be perceived as the alternative to divesting assets from the balance sheet, since they can contribute to easing the capital requirements and releasing any credit lines. The effect is the same, i.e. a reduction of the credit risk and thereby of the solvency burden on the bank's assets. Credit derivatives thus enable the bank to diversify its risk exposure, while preserving the relationship with the borrower². A bank can e.g. "grow" with its customer, without the bank exceeding the limit for single exposures (otherwise the bank would have to divest part or whole of the loan portfolio).

Another incentive to use credit derivatives is that the transfer of a particular risk element from one bank to another may improve the positions of both banks. The reason may be that a more diversified risk exposure is achieved for both banks' loan portfolios. For example, the bank may use credit derivatives to achieve a credit exposure, which it would otherwise not be able to obtain (e.g. in a specific sector or a particular geographical area). The bank may be the protection seller via a default swap on a certain sector, while also being the protection buyer on another sector where the bank's credit exposure is particularly high.

¹ The concept of economic capital is described in further detail in Andersen et al. (2001).
² See Clementi (2001).

This management of the credit portfolio enables the bank to achieve the desired relationship between risk and yield without changing its customer base or balance-sheet structure.

Table 1 shows that securities houses constitute the second-largest group in the market. As market makers, they contribute to supplying liquidity in the market. Their position is relatively neutral, since they sell and buy on approximately the same scale.

Insurance and reinsurance companies are primarily protection sellers in the credit derivative market. They sell credit protection with a view to diversification of the traditional insurance portfolio¹ (e.g. casualty and property insurance). Insurance companies may also buy credit protection, however, e.g. by hedging insurance for projects in developing countries by purchasing sovereign credit derivatives (non-perfect hedging). In addition, they perceive certain credit derivative products with a high credit rating as an attractive alternative (i.e. higher yield) to investment in more conventional securities.

Credit derivatives may also be used for hedging or risk management of corporate bonds in investors' portfolios. They can be an attractive alternative in an illiquid corporate bond market, or if the investor does not wish to buy or sell assets in the underlying portfolio².

Financial agents are thus the key players in the credit derivative market, but there is nothing to prevent e.g. business enterprises from using the market. At present, however, they account for only a small proportion of the market³. Business enterprises can use credit derivatives to reduce the credit risk associated with e.g. supplier credit. Credit derivatives can thus function as an alternative to insurance, export guarantees and similar.

THE CREDIT DERIVATIVE MARKET

The global market for credit derivatives has expanded strongly in recent years. There is no comprehensive global data, but it is estimated that the notional amount outstanding in the market totals approximately 1,000 billion dollars⁴, which is double the 1999 figure, and more than six times greater than the figure for 1997. For comparison, the derivatives markets related to interest rates, foreign exchange rates or equities in 2000 were respectively 65, 16 and 2 times larger, measured in terms of notional principals.

¹ Bank of England (2001).
² See Rygaard (2001).

³ See Risk Magazine (2001).

⁴ Bank of England (2001).

Electronic trading platforms for credit derivatives have been established in recent years¹. This has contributed to increasing the transparency and liquidity of the credit derivative market.

The market is concentrated geographically on London and New York. Credit derivatives are subject to ongoing product development, but credit default swaps still account for approximately half of the market².

CREDIT DERIVATIVES AND FINANCIAL STABILITY

Advantages of using credit derivatives

Credit derivatives can enhance the diversification of credit risk. This advantage is achieved if the protection seller can assume a risk at a lower cost than the protection buyer, due to e.g. different portfolio compositions or a different degree of risk aversion.

More widespread use of credit derivatives can contribute to increasing the stability of the financial system. The banks can use credit derivatives to enhance their management and diversification of credit risk, thereby reducing their vulnerability to e.g. sector-specific price shocks. Moreover, the opportunity to transfer credit risk via credit derivatives can help to make the supply of credit to borrowers less dependent on the banks' willingness and ability to assume specific types of credit risk. This will contribute to avoiding "credit crunch", i.e. inappropriate credit tightening.

A liquid credit derivative market can also contribute to enhancing price information concerning credit risk, and thereby improving the banks' pricing of loans and other credit exposures. This is beneficial to financial stability, since the banks' insufficient ability/opportunity for correct price fixing may constitute a risk.

Drawbacks and challenges of using credit derivatives

The use of credit derivatives is also associated with a number of drawbacks and challenges. A fundamental problem is the banks' reduced interest in monitoring the credit risk (i.e. their customers) if the banks that originally extended the loans separate the credit risk³. These banks' incentive to monitor the borrower's creditworthiness is reduced, and any restructuring of the borrowers' debt can be a source of concern if the banks no longer have "interests" in that borrower.

The authorities' oversight of the risk exposure of each bank and of the overall financial sector may also be complicated by a *lack of transparency* in the use of credit derivatives.

¹ E.g. CreditTrade, www.credittrade.com and Credit Ex, www.creditex.com.

² Bank of England (2001).

³ The same problem is associated with e.g. syndicated loans.

Credit derivatives will most likely be used mainly for diversification of the credit risk, but they may also be used to concentrate the credit risk. This emphasises the need for a high degree of transparency for the banks that use credit derivatives. Lack of transparency can make it more difficult for authorities, potential counterparties and shareholders to assess the bank's total risk exposure¹.

It should also be noted that the market for credit derivatives has not yet been "tested" in a recession where credit risk grows. The probability of credit events occurring is greater during a recession or at times of financial crisis, where the protection seller can also be financially vulnerable. Many market participants therefore seek to reduce the risk of correlation between the credit rating of the reference asset and the counterparty (wrong way risk).

Focus should still be on the *legal and operational risks* associated with this relatively new market². As stated above, the documentation for credit default swaps remains to be fully tested during a full economic cycle. New documentation initiatives such as the 1999 ISDA Credit Derivative Definitions reduce the legal risks, but there are still outstanding issues such as a standard definition of credit events. The documentation of credit derivatives is generally a complex issue, and market participants therefore need effective control systems to avoid document errors. Market growth in itself generates risks. Over a relatively short period, the intermediaries have strongly expanded their business areas related to trading and structuring. This generates a risk that internal control procedures, internal risk exposure monitoring and general administration of trading will lag behind front office activities.

As previously stated, greater diversification of the credit risk away from the banks will make the role of insurance companies and other non-banks more important. Diversification of credit risk will have a stabilising effect if financial stability is considered solely on the basis of the banks' situation. If the basis of assessment of financial stability is expanded to include insurance companies and other non-banks, it is important that the necessary knowledge and capacity to evaluate the implications of the risk associated with credit derivatives is available. Non-banks' participation in the market contributes to increasing liquidity, but also raises the question of whether the new participants are fully aware of the related risks.

¹ In The New Basel Capital Accord of January 2001, the Basle Committee proposes a significant amendment of the current rules, i.e. that the banks must provide more detailed information to the market on e.g. the banks' risks (pillar 3 on Market Discipline). See also www.bis.org.

² See Clementi (2001).

CAPITAL REQUIREMENTS OF CREDIT DERIVATIVES

The current capital adequacy rules for banks are stipulated in the Basel Accord of 1988. The 13-year-old rules thus do not take account of the most recent financial innovations, including credit derivatives and the opportunities for e.g. credit risk mitigation¹.

Since credit derivatives are not covered by the rules, individual national authorities were responsible for preparing any guidelines for capital requirements for credit derivatives. The treatment of credit derivatives has thus to some extent varied among countries. The countries that have introduced rules in this area have typically adhered to the practice in the UK and the USA. This is obviously not an appropriate development, but since the credit derivatives are part of the Basle Committee's proposal for new capital adequacy rules², this should help to ensure a level playing field in this area.

The preparation of guidelines for capital requirements for credit derivatives has commenced in Denmark. Since this work is not yet complete, the following is a brief account of the current capital requirements for credit derivatives, based on legislation in the UK³. This is followed by a description of the Basle Committee's proposed new capital adequacy rules for credit derivatives.

The current international rules concerning capital requirements for credit derivatives

The Basel Accord distinguishes between capital requirements for assets in the trading book and the banking book, respectively. The trading book typically consists of negotiable financial assets held for a short period, while the banking book comprises loans granted in connection with the banks' traditional lending activities. Such loans are held for longer periods.

Credit default swaps in the *banking book* are perceived as bank guarantees, provided that the entire credit risk has been transferred to the protection seller. If the reference asset is e.g. a loan to a business enterprise, and the protection seller is an OECD bank, the risk weighting can be reduced from 100 per cent to 20 per cent, and the capital requirement thereby from 8 per cent to 1.6 per cent. A bank acting as a protection buyer can thus apply the risk weighting of the protection seller

¹ The Basel Accord was updated in the mid-1990s, however, with the introduction of capital adequacy rules for market risk. The rules were also amended to allow calculation of the capital requirements for market risks on the basis of value-at-risk models (the internal rating-based approach).

² The New Basel Capital Accord, January 2001. The consultation paper is available on BIS' Web site www.bis.org. See also Hyldahl (2001) for a review of the proposed new capital adequacy rules.

³ Bank of England (2001).

rather than of the reference asset (i.e. substitution). It can be argued that this still imposes a high capital requirement, since, in principle, a credit default swap only exposes the protection buyer to the risk of default of the reference asset as well as of the protection seller ("joint probability of default").

With regard to *the trading book*, capital requirements for credit derivatives are divided into requirements covering specific risks associated with the reference asset itself, and general risks associated with the entire securities market. This is the "traditional" method of calculating the capital requirement for the market risk in the trading book. Derivatives also entail a capital requirement for the counterparty risk, i.e. the risk of the counterparty defaulting on its obligations¹. The international practice for capital charges to trading book positions hedged by credit default swaps is typically to recognise the transfer of the entire specific risk from the protection buyer to the protection seller if the reference asset, currency and maturity are exactly matched².

The proposed new capital adequacy rules

The objective of the Basle Committee's latest proposal for new capital adequacy rules is to e.g. achieve greater coherence between capital requirements and the actual risk profile of the banks, and thereby the banks' assessment of the required economic capital. This may entail a reduction of the regulatory incentive to use credit derivatives. The reason is that the new rules make a stronger distinction between the credit risks within various counterparty categories, so that different business enterprises are given different risk weightings. On the other hand, especially the banks' increased focus on quantification and dynamic management of credit risk, and their general use of the concept of economic capital, are expected to contribute to continued strong future growth in the market.

With regard to the *banking book*, the following proposal is made concerning treatment of credit default swaps: only credit default swaps offering credit protection comparable to that offered by guarantees are entitled to recognition, and the previously mentioned "substitution" of the risk weighting of the reference asset by the risk weighting of the pro-

¹ For example, if the credit rating of the reference asset has diminished after the credit default swap is established. In this situation the protection buyer has an exposure vis-à-vis the protection seller, since the premium for establishing a new contract will probably now be greater than before the downgrading of the reference asset. The premium will thus have risen in the event of liquidation of the protection seller, where the protection buyer has to establish a credit default with a new protection seller.

² As stated above, this is not subject to joint standard international rules, however, so that the treatment of credit derivatives tends to vary among the national authorities.

tection seller is maintained. The Basle Committee also finds that use of credit derivatives cannot cover all risks, but that a residual risk will always remain. According to the proposal, this will be covered under pillar 2 (the supervisory review process)¹, making it up to the national supervisory authorities to ensure consistency between the banks' capital adequacy and the risk profile. According to the Basle Committee's proposal, protection granted by non-banks with a high credit rating may now also reduce the risk weighting of a bank's credit exposure². This means that in the future banks, as protection buyers, can choose e.g. insurance companies of high creditworthiness (a credit rating of A or above) as counterparties. Previously, protection sellers were exclusively banks.

For the specific risk capital charge applied to *trading book positions that are hedged* by credit default swaps where there is an exact match in terms of reference asset, maturity and currency) an 80 per cent specific risk offset is allowed under the new rules. For some countries, this will entail a tightening of the current rules.

In seeking to avoid any legal or operational risks in connection with credit derivatives, the Basle Committee's proposal for new capital adequacy rules includes a number of requirements concerning the banks' use of credit derivatives. These must be fulfilled before the capital charges can be reduced in any way. The requirements include provisions concerning the banks' risk management, as well as explicit requirements concerning the credit derivative contract itself. It must be emphasised that the new capital adequacy rules are not yet complete, and another consultation round will take place in the spring of 2002.

CONCLUSION

In overall terms, credit derivatives are assessed to enhance financial stability via the benefits of improved management and diversification of credit risk, as well as the opportunity for improved pricing of credit risk. However, focus should still be on a number of issues related to the use of credit derivatives, including that the banks' interest in monitoring credit risk may diminish, that the credit risk can be diversified to non-banks, and finally, that credit derivatives can increase the concentration of credit risk. The use of credit derivatives requires improved transparency on the part of the banks with regard to transfer of credit risk, as well as continued focus on the legal and operational risks of credit derivatives.

¹ The Basle Committee: Update on work on the New Basel Capital Accord, 21 September 2001, see also www.bis.org.

² This is subject to observance of the ISDA definitions of credit events, cf. the above section concerning documentation.

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