

Credit Derivatives and their Applicability to the Turkish Banking Sector

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I. INTRODUCTION

Credit derivatives are designed for transferring credit risk. Credit risk can be defined as the risk of losses caused by the default of borrowers. Default occurs when a borrower can't meet his key financial obligations. Credit risk can alternatively be defined as the risk that a borrower deteriorates in credit quality. Also, this definition includes the default of the borrower as the most extreme deterioration in credit quality.¹ The indications of credit risk are the borrower's credit rating and the premium (or spread) which the borrower pays for funds.

In credit risk management banks use various traditional methods such as credit limits, taking collateral, diversification, loan selling, syndicated loans, credit insurance and securitisation.² But these methods aren't so effective in credit risk management. For example, in the taking collateral method, there are some reasons why the seizure and liquidation of collateral may not be an effective solution for credit risk protection. These reasons can be declining and volatile values of collateral, liquidation costs or consumer relationships. In the loan selling method, there are adverse selection problem and moral hazard problem. Outside of these problems, there can be legal barriers, transaction costs or tax issues. But, credit derivatives can solve these problems through the efficient exchange of credit risk. In other words, credit derivatives are more flexible and efficient way than traditional methods. Therefore, using of credit derivatives has grown rapidly.

2. CREDIT DERIVATIVES

2.1. Definition of Credit Derivatives

Credit derivatives are bilateral financial contracts that offer protection against credit or default risk of bonds or loans. Credit derivatives isolate credit risk from other sources of risk such as market risk and operational risk and they can be used for transferring credit risk from one party to another party.³ Credit derivatives are used for transferring both credit risk of one asset and credit risk of a portfolio.

Credit derivative contracts are over-the-counter (OTC) contracts and therefore they can be tailored to individual requirements. However, in practice these contracts are quite standardised. Credit derivative contracts can be written on treasury debt securities, sovereign debt securities, bank loans, corporate loans and private sector debt securities. According to the British Bankers' Association (BBA), 64% of credit derivatives were written on corporate assets, when 11% of the credit derivatives were written on sovereign assets in 2003

and the majority of credit derivatives which are written on corporate assets are expected to remain stable going forward.⁴

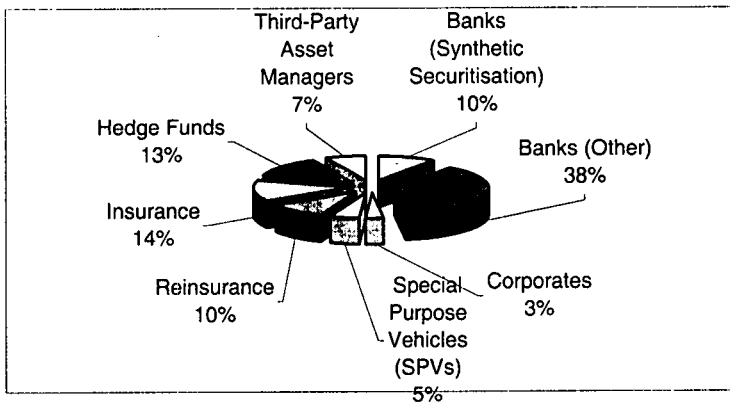
2.2. End Users and Using Reasons of Credit Derivatives

Many financial and non-financial institutions like banks, hedge funds, insurance companies, portfolio management firms, government agencies and corporates can use credit derivatives for some reasons. The reasons of using credit derivatives can be listed like this:⁵

- Hedge and/or mitigate credit exposure,
- Transfer credit risk,
- Generate leverage or yield enhancement,
- Decompose and separate risks embedded in securities,
- Synthetically create loan or bond substitutes for entities that have not issued in those markets at chosen maturities,
- Proactively manage credit risk on a portfolio basis,
- Use as an alternative vehicle to equity derivatives for expressing a directional or volatility view on a company,
- Manage regulatory capital ratios.

End users of credit derivatives increase as time passes. The principal end users are banks, insurance companies, securities houses and hedge funds. According to the 2003 Risk Magazine Credit Derivative Survey, the banks share of credit derivatives usage was 48% as seen in Figure 1.⁶

Figure 1 : End Users of Credit Derivatives



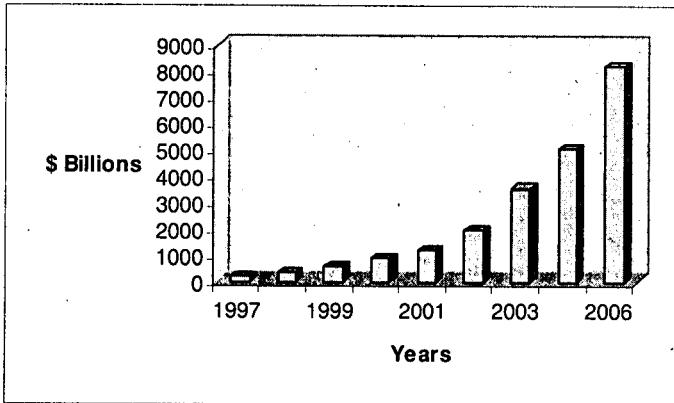
There are two kinds of the end users; buyers of protection and sellers of protection. When the buyers of protection use credit derivatives for transferring and reducing credit risk, the sellers of protection use credit derivatives for taking credit risk and earning premium income. Banks are the largest buyers of protection with over 50% global market share. According to the BBA Credit

Derivatives Report 2003/2004, 51% of banks were protection buyers and 38% of banks were protection sellers in 2003 and BBA expects that 43% of banks will be protection buyers and 34% of banks will be protection sellers in 2006.

2.3. Size of Global Derivatives Market

Trading of credit derivatives started in the mid 1990s. However, the credit derivatives market has grown rapidly and market volume has reached \$5 trillion. According to estimates by BBA, the notional value of outstanding global credit derivatives in the end of 2003 was about \$3.548 billion (excluding asset swaps) and was \$5,021 billion in 2004 and is expected to increase to \$8,206 billion in 2006.⁷ According to the ISDA survey, the size of global credit derivatives market was \$4,799 billion by end of 2004.⁸ The BBA estimates of global credit derivatives market size are shown in Figure 2.

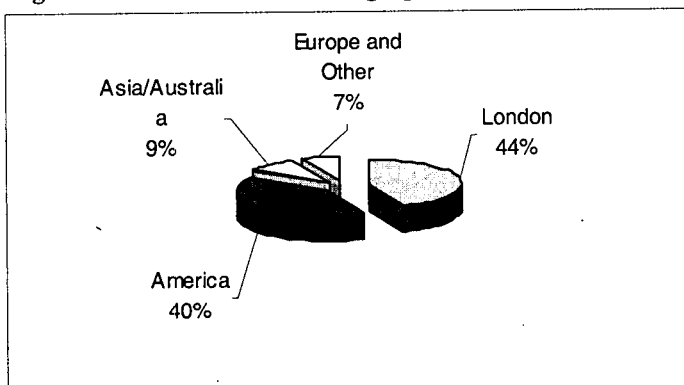
Figure 2 : Global Credit Derivatives Market Size



*Market size for 2006 are forecasted.

London and New York are the centre of credit derivatives market. Particularly London constitutes approximately half of the market. According to the BBA, the size of the London market was \$1,586 billion at the end of 2003 and was \$2,230 billion at the end of 2004 and is expected to increase to \$3,563 billion in 2006. In other words, London market share was 45% of total market in 2003 and 44% in 2004.⁹ In the United States of America (USA), according to the Office of Comptroller of the Currency (OCC), notional amount of credit derivatives in insured commercial bank portfolios was \$1,001 billion at the end of 2003 and rose 134% to \$2,347 billion at the end of 2004.¹⁰ Geographical market share of global market volume according to the BBA are shown in Figure 3.¹¹

Figure 3 : Market Share of Geographical Regions in 2004



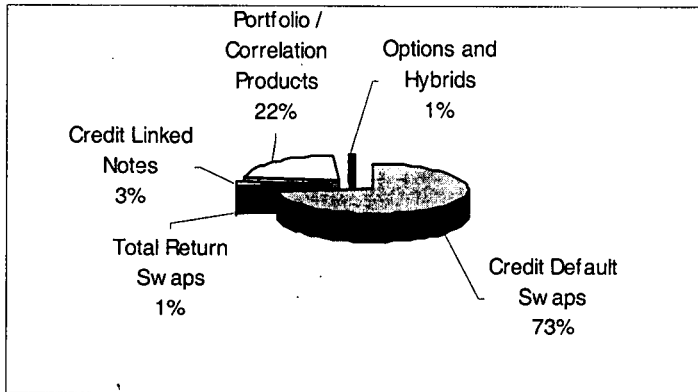
In the emerging markets, credit derivatives market hasn't developed much yet and emerging market issuers comprise a small share of the global credit derivatives market. The emerging credit derivatives market began to start in the second half of 1997 along with the Asian Crisis. However the absence of a standardized documentation slowed down its development until the publication of the 1999 ISDA "Credit Derivatives Definitions". But market players expect that this market grows rapidly in the following years. There is not so much data about emerging markets. According to estimates which made by Deutsche Bank in 2001, the overall size of emerging market was \$200-300 billion in notional amount of contracts which broke down on a regional basis to approximately 50-60% Latin America, 23-30% Eastern Europe and 10-20% other.¹² Emerging Markets Traders Association (EMTA) which is the industry trade association for traders and investors in emerging markets began compiling data about credit derivatives in emerging markets in the first quarter of 2003. According to the EMTA Survey, credit derivatives annual total trading volumes in emerging markets was \$197 billion in the end of 2003.¹³ For example, according to this survey, South Korean credit derivatives market was \$23 billion, Brazilian credit derivatives market was \$23 billion, Venezuelan credit derivatives market was \$21 billion and Mexican credit derivatives market was \$20 billion.

2.4. Types of Credit Derivatives

Credit derivatives can be classed in two main groups. Single-name credit derivatives are contracts that involve protection against default by a single reference asset. Multi-name credit derivatives are contracts that are contingent on default events in a pool of reference assets. As such, multi-name instruments allow investors and issuers to transfer the credit risk associated with a portfolio of risky securities, as opposed to dealing with each security in the portfolio separately.¹⁴

The most common types of credit derivatives are credit default swaps (CDSs), total return swaps (TRSs), credit spread options, credit linked notes (CLNs) and collateralised debt obligations (CDOs). But credit default swap is the basic building block of the credit derivatives market and has an important share in total market volume. According to the Risk Magazine 2003 Credit Derivatives Survey, single name CDSs are the most used instrument in the credit derivatives market with 73% of market outstanding notional as seen in Figure 4.¹⁵

Figure 4 : Credit Derivatives Products



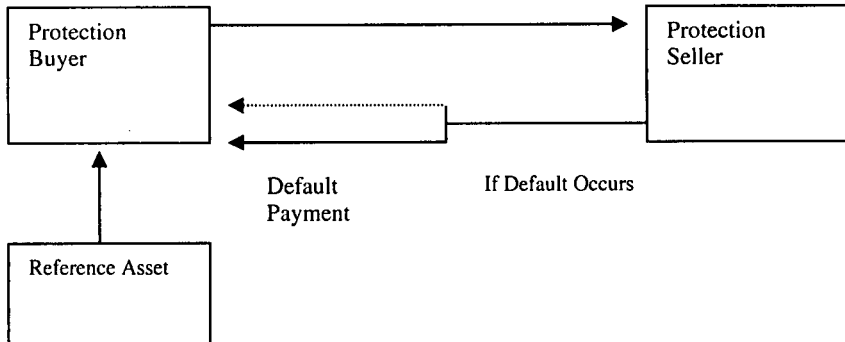
The types of credit derivatives are examined briefly in here.

2.4.1. Credit Default Swaps

A credit default swap (CDS) is a contract which enables one party (the protection buyer) to buy protection against the risk of default of a specified reference asset issued by a specified reference entity from another party (the protection seller). The protection buyer pays a regular fee or premium for the cover until a credit event occurs or until maturity.¹⁶ The credit event is a condition agreed between the contracting parties that will trigger the settlement amount from the protection seller to the protection buyer. The credit events can be bankruptcy, failure to pay or rating downgrade of the reference asset. If a credit event occurs, the protection seller will make a payment to the protection buyer. There are three possible payment alternatives; physical settlement, cash settlement and digital cash payment.¹⁷ In the physical settlement, the protection buyer has the right to sell the defaulted assets to the protection seller for their face value. Many credit default swaps are based on physical delivery. In the cash settlement, a cash payment is made by the protection seller to the protection buyer equal to face value minus post-default market value of reference asset. The digital cash payment is credit event payment which is based on a fixed percentage of the notional principal value.¹⁸ This fixed percentage is

agreed in the beginning of the contract. A credit default swap structure is shown in Figure 5.

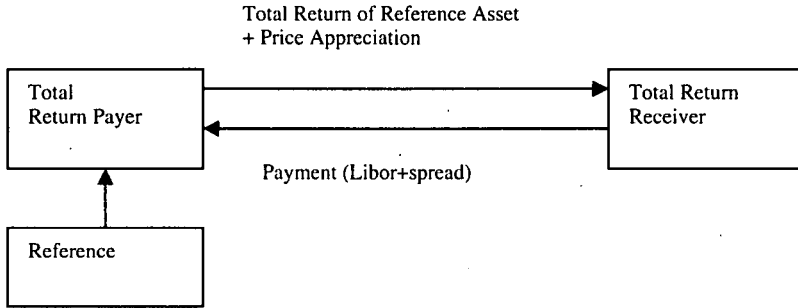
Figure 5 : Credit Default Swap



2.4.2. Total Return Swaps

A total return swap (TRS) is a contract in which the “total return payer” (the protection buyer) pays the total return of reference asset to the “total return receiver” (the protection seller) in return for Libor plus a spread. Also, at maturity, when market price of reference asset declines, the return receiver will pay price depreciation to the return payer and when market price of reference asset increases, the return payer will pay price appreciation to the return receiver. In the total return swap, there isn’t a credit event and contingent payment. At the end of each payment period, payments are automatically exchanged. When a default occurs, the payment due at the end of the next period will be paid at the time of default and the total return payment is determined by the dealer poll of defaulted asset.¹⁹

In contrast to the credit default swap, the total return swap doesn’t only transfer the credit risk, also the market risk of reference asset is transferred too. The total return receiver gains exposure to the performance of the reference asset without having to purchase the asset. Therefore the total return swap effectively creates a synthetic credit-sensitive instrument.²⁰ The total return payer benefits from hedging the market risk and credit risk associated with the reference asset.²¹ A total return swap structure is shown in Figure 6.

Figure 6 : Total Return Swap

2.4.3. Credit Spread Options

A credit spread option is an option contract that allows two parties to leverage off their credit perceptions on a reference security. The reference security can be a bond, a loan or a default swap. After the selection of reference security, the strike spread and option maturity are set. The option payoff is based on whether the actual spot spread at the exercise date is over or under the spread on the reference security. The transaction may be either based on changes in a credit spread relative to a risk-free benchmark (e.g. Libor or treasury security risk-free interest rate) or changes in the relative spread between two credit instruments.²² Settlement of the option contract is the same as with default swaps (cash settlement or physical settlement).

There are two basic types of options according to the obligations; credit spread put options and credit spread call options. A credit spread put option involves the right to sell the reference security at a given strike credit spread over treasury or Libor. A credit spread call option involves the right to buy reference security at a given strike credit spread over treasury or Libor.²³ Also, the options may be structured as an American or European option.

Credit spread options are designed to hedge against on changes in credit spreads. For example, debt holders can hedge credit risk by purchasing a credit spread option to sell the reference bond at a pre-specified spread.²⁴ Also, buying or selling an option on a borrower's credit spread provides an opportunity to gain exposure on the borrower's future credit risk.²⁵ In another words, credit spread options can be used for managing credit risk or earning premium income.

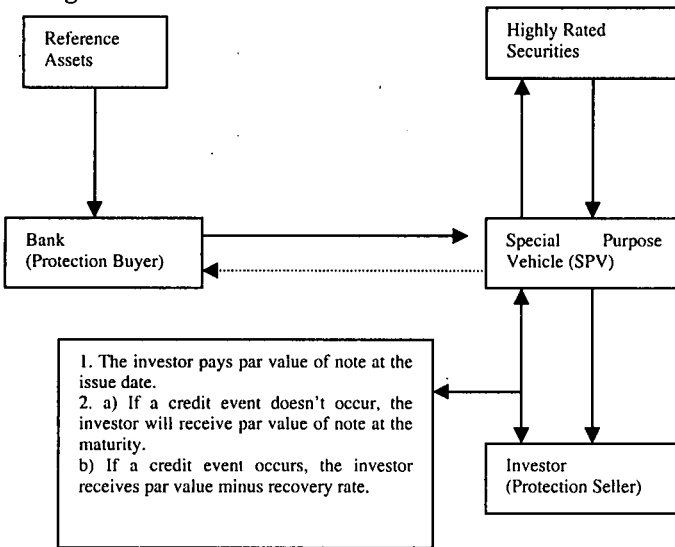
2.4.4. Credit Linked Notes

A credit linked note (CLN) is a bilateral security which contains an embedded credit derivative.²⁶ Credit linked note is normally issued by Special Purpose Vehicles (SPVs) or trusts and the performance of note is linked to reference security. In this structure, a SPV issues the notes to the investors and the investors receive an interest payment during the life of the note. At the

maturity, if a credit event doesn't occur, the investors will receive par value of the note. But, if a credit event occurs, the investors will receive an amount equal to the recovery rate. In here, the investor is "protection seller" or "risk buyer" in exchange for higher yield on the note. The SPV typically hold a pool of highly rated securities. The pool is used for interest and principal payments. The SPV finances the acquisition of the highly rated securities through the issuance of notes to the investors. On the other side, the SPV enters into a credit default swap with a bank (protection buyer) and receives swap fee. When the credit event which is determined in the credit default contract occurs, the SPV will pay the bank par minus the recovery rate. The swap fee is passed on to the investors in the form of a higher yield on the notes.²⁷

Credit linked note offers borrowers a hedge against credit risk and investors a higher yield for buying a credit exposure synthetically rather than buying it in the publicly traded debt. The banks can use credit linked notes to buy credit risk protection. This allows them to remove credit exposure from their balance sheets while retaining ownership of the assets.²⁸ A credit linked note structure is shown in Figure 7.

Figure 7 : Credit Linked Note



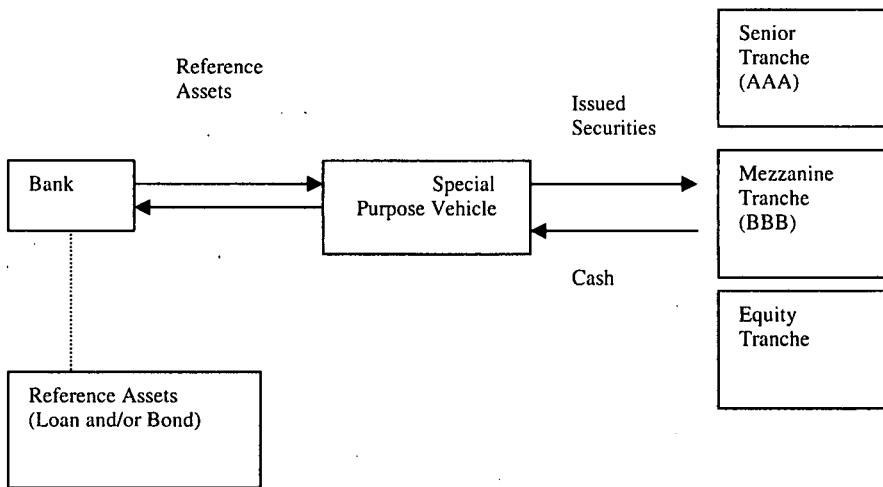
2.4.5. Collateralised Debt Obligations

Collateralised debt obligation (CDO) is a security whose payoff is derived from the credit performance of a portfolio of debt obligations.²⁹ CDO is a variation of an asset-backed security. Collateralised loan obligation (CLO) and collateralised bond obligation (CBO) are two main kinds of collateralised debt obligations. In the CLO, a pool of commercial and industrial loans are formed

and securities are issued against the returns from the loan pool. In the CBO, a pool of high yield bonds are formed and securities are issued against the bond pool.³⁰

In the CDO structure, SPV purchases a pool of debt obligations (bonds or loan) from financial institutions (typically banks) and then issues two or more classes of securities according to the risk-return preference of investors.³¹ Generally, there are three tranches; senior tranche, mezzanine tranche and equity tranche. Senior tranche securities have lower expected returns and higher rating than the overall portfolio.³² This tranche may be rated AAA. Mezzanine tranche securities are more risky than senior tranche securities and this tranche may be rated BBB. Equity tranche securities are the most risky securities and this tranche may be unrated. Unless the interest or principal payments are paid to the senior and mezzanine tranches, any payment isn't paid to the equity tranche.

Figure 8 : Collateralised Debt Obligation Structure



CDOs are used to transfer the credit risk of bonds and/or loans or to earn profits from managing and trading in a portfolio of credit-risky assets by banks. CDOs are usually classified as either arbitrage or balance sheet transactions according to the motive of the transaction. Arbitrage CDOs are typically managed by an asset manager motivated by an arbitrage opportunity. Balance sheet CDOs are a tool for commercial banks to manage regulatory capital through the transfer of existing portfolios of loans or bonds off balance sheet.³³ Some balance sheet transactions use credit derivatives to transfer the credit risk of assets from balance sheets to CDOs without the sale or transfer of the assets themselves. These structures which is be non-funded or partially funded are

called synthetic CDOs.³⁴ Figure 8 shows a basic collateralised debt obligation structure.³⁵

3. APPLICABLE OF CREDIT DERIVATIVES IN THE TURKISH BANKING SECTOR

Although credit derivatives started trading in the mid 1990s, the credit derivatives market has grown rapidly. But the credit derivatives market is quite new financial instruments for emerging countries while London and New York are dominant markets in the world.

In Turkey, a credit derivatives market hasn't developed yet. The most important reason of non using credit derivatives is that there is not a credit derivatives market in Turkey. The problems and shortcomings in front of the developing a credit derivatives market and some suggestions for developing a credit derivatives market in Turkey can be listed as below:

- The banks haven't got adequate knowledge about credit derivatives. Therefore, some education and training activities may be done for the bank personnels, especially for risk managers. The banks should have expert and experienced personnels about credit derivatives.

- The derivatives markets haven't developed enough. Until February 2005, there wasn't a derivatives exchange in Turkey. Although a derivative exchange which only USD currency futures contracts were traded was opened under Istanbul Stock Exchange (ISE) but trading volume was quite low. Also, there is a derivative exchange under Istanbul Gold Exchange which only gold futures contracts is traded. The first real derivative exchange, Turkish Derivatives Exchange (TURDEX) was opened in February 2005. Currency futures contracts which listed under ISE was transferred to TURDEX. In TURDEX both financial futures contracts (interest rate futures, equity index futures and currency futures) and commodity futures contracts (wheat futures and cotton futures) are traded and option contracts will be traded in near future. The credit derivatives market can develop more easily in a country which basic derivatives markets have developed and used.

- The risk management culture has started to form recently in the Turkish banking sector. Particularly, the banks have considered risk management more important after 2001 crisis. Also, Banking Regulation and Supervision Agency (BRSA) made some regulations about risk management. The banks are experienced in market risk management, but credit risk management and operational risk management are not to be in desired level. When risk management culture develops, the markets and tools which are used by the banks in the risk management will develop.

- A secondary credit market or loan selling didn't develop in Turkey. The credit derivatives market can be the next stage after the secondary credit market.

- Private sector bond market didn't develop in Turkey. When the corporates want to borrow money, they use bank loans, because debt securities markets haven't developed enough. Credit derivatives are written on the private debt securities too, so the banks and the investors who hold bonds in their portfolios can be used credit derivatives when the credit derivatives market develops.

- Although there isn't a legal barrier in front of the using credit derivatives, there aren't any legal legislation about credit derivatives, so legal infrastructure should be constituted. If these laws and regulations are made by the regulatory institutions, the banks and other investors will be more courageous for using credit derivatives. Because credit derivatives are over the counter contracts, therefore some problems may arise.

- The credit rating system hasn't develop enough. Most of the corporates haven't got a credit rating, therefore the banks use internal credit rating systems and/or scoring models for evaluating these corporates. There may be some difficulties relevant to the credit derivatives that are written on the loans and the bonds of the corporates which haven't got a credit rating because determining of spreads and using of these spreads are more harder than the corporates which have got a credit rating.

- Share of the long term corporates loans in the banks' loan portfolio are low. The government's financing need should be reduced and the banks should give long term loans to the corporates.

- The banks should calculate and collect the data about borrowers and loans such as probability of default, recovery rate and default correlation. Because these data which are used measuring of credit risk are also used pricing of credit derivatives.

- Macro economic stability and stability of the Turkish banking sector is one of the most important factors. Because, when the economy is stable, the banks give the corporates long term loans with low interest rates. Increasing of long term corporate loan volumes forms a infrastructure for developing of the credit derivatives market.

CONCLUSION

Market risk, credit risk and operational risk are fundamental risks which banks exposure. Credit risk is the oldest and important risk among these risks. There are various traditional methods in credit risk management such as taking collateral, credit limits, diversification, loan selling, credit insurance and securitisation. In recent years a new instrument which is called credit derivatives is being used in credit risk management by banks.

In Turkey, a credit derivatives market hasn't developed yet, but the credit derivatives market may develop and the Turkish banks can use credit derivatives. The most important reason of non using credit derivatives is that there is not a credit derivatives market in Turkey. For developing credit derivatives

market in Turkey, legal infrastructure should be constituted, government's financing need should be reduced and banks should give long term loans to the corporates, private sector bond market should be developed; rating system should be improved and corporates should be encouraged to take a rating from rating institutions, banks should calculate and collect the data related to the borrowers and loans such as default probabilities, exposure at default, recovery rates and correlations between defaults. Also, developing risk management culture, feeling a need for these instruments and economic stability are important components for developing a credit derivatives market. However banks might not wait for developing a credit derivatives market in Turkey, they can use credit derivatives through foreign markets and transfer credit risk of their bond and/or loan portfolios. But, for using of foreign credit derivatives market, stability of the Turkish banking sector, obtainability of data which is related to the borrowers and loans and the experience and knowledge of the Turkish banks are the important factors too.

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Abstract

Credit Derivatives and their Applicability to the Turkish Banking Sector

Credit derivatives are financial contracts that offer protection against credit risk of bonds or loans. The most common forms of credit derivatives are credit default swaps, total return swaps, credit spread options, credit linked notes and collateralised debt obligations. Banks are one of the most important market players in the credit derivatives market. Banks can use credit derivatives for various purposes such as reducing credit risk, reducing regulatory capital, taking advantage of arbitrage opportunities, obtaining premium revenues and diversification of credit portfolios. But, banks generally use credit derivatives for credit risk management. The main purpose of this article is to give information about credit derivatives and to analyze the applicability of credit derivatives in the Turkish banking sector.

Key Words: *Credit derivatives, credit default swap, total return swap, credit spread option, credit linked note, collateralised debt obligation*

Özet

Kredi Türevleri ve Kredi Türevlerinin Türk Bankacılık Sektöründe Uygulanabilirliği

Kredi türevleri, tahvillerin veya kredilerin kredi riskine karşı koruma sunan finansal sözleşmelerdir. Kredi türevlerin başlıca türleri; kredi temerrüt swapları, toplam getiri swapları, kredi spread opsiyonları, krediye bağlı tahviller ve teminatlı borç yükümlülükleridir. Bankalar, kredi türevleri piyasasındaki en önemli piyasa oyuncularından biridir. Bankalar; kredi riskini azaltmak, yasal sermaye gereksinimini azaltmak, arbitraj fırsatlarından yararlanmak, prim geliri elde etmek, kredi portföyünü çeşitlendirmek gibi çeşitli amaçlarla kredi türevlerini kullanabilmektedirler. Fakat bankalar, kredi türevlerini çoğunlukla kredi riski yönetim aracı olarak kullanmaktadır. Bu makalenin temel amacı, kredi türevleri hakkında genel bir bilgi vermek ve kredi türevlerinin Türk bankacılık sektöründe kullanılabilirliğini değerlendirmektir.

Anahtar Kelimeler: *Kredi türevleri, kredi temerrüt swapı, toplam getiri swapı, kredi spread opsiyonu, krediye bağlı tahvil, teminatlı borç yükümlülüğü*

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