ABSTRACT

Credit risk is the likelihood that a bank creditor will be unable to collect its receivables from the debtor in terms of the principal and the interest earned. Although it is inextricably linked to banking business, banks are trying to correct assessment of creditworthiness and credit monitoring performance of the debtor minimize the likelihood of credit risk. Along with the development of financial markets have developed sophisticated management systems and banking techniques to minimize credit risk. It is a prudential mechanism of credit risk management that aims to preserve the quality of loan portfolio in purpose of achieving the projected profitability of the bank. The first part of paper is devoted to analysis of the main determinants of credit risk, credit risk modeling process and the process of managing credit risk. The second part analyzes the performance of credit derivatives as well as modern instruments for managing credit risk. In this section attention will be focused on credit default swap, basket default swap, total rate of return swap as a mechanism of transfer credit risk from one to the other counterparty. The conclusion is reserved for research results.

Key words: credit risk, credit derivatives, credit default swap, basket default swap, total rate of return swap

INTRODUCTION

Credit risk is the essential bank risk that is still one of the key factors of bank insolvency. Because of that credit risk management is set as an imperative. Banking theory and practice are developed different technologies of credit risk management: from kvantnitativnih models for assessing and monitoring to sophisticated technology of transfer credit risk. One of the innovative techniques are credit derivatives - bilateral contracts between buyers and sellers of insurance, which, in exchange for periodic payments of commissions, transfer default risk to the seller of insurance. Credit derivatives are improved instruments for credit risk management, thereby contributing to the stability of financial markets. Also, these instruments are increased the liquidity of financial markets, financial markets have become "deeper", the information efficiently, and therefore more effective in performing its function - the financial resources allocation . The paper is primarily devoted to the theoretical and methodological concepts of credit risk management. Also, the focus of analysis will be credit default swaps, basket default swaps and total rate of return swap as a hedging tool of protection against credit risk.

THEORY

Uncertain fact whose realization may have direct or indirect impact on financial risk and the bank's position is called risk in the financial business. Financial risk in banks can be defined as the ability to invested funds will not earn an expected rate of return. Manifestation of this risk makes a loss in business. On the other hand, credit risk is the possibility that the borrower will not meet its debt
obligations at maturity, in respect of principal and the interest. The bank measures and evaluates the credit risk in order to effectively manage it in purpose of achieving satisfactory profitability. The risk management process is a „roundabout“. It includes the following stages: risk identification, assessment and risk measurement, monitoring and reporting risk; creating a control procedures in the bank. (Udruženje banaka Srbije, 2004) All banks should have detailed policies and procedures for credit risk. Banks must pay attention to the adequate management infrastructure that is necessary to establish before expanding its operations. This helps ensure adequate control over the growth of business. This refers particularly to the structure of bank loan portfolios. If the control operation failed, it can be concluded that the growth of credit operations grew uncontrolled, which can resulted in catastrophic losses. A typical framework for credit risk management in financial institutions can be broadly categorized by the following main components(State bank of Pakistan, 2003): (a) Credit Committee and the supervision of senior business leader; (b) Department of Credit Risk Management; (c) Systems and procedures for the identification, acceptance, measuring and controlling of risk. In order to get a complete picture about the nature of risk, it is necessary the quantity of risk coupled with information about quality of risk. The quality of risk includes the likelihood of default. This is expressed through a credit rating. Prevalent and traditional assessments of credit risk is the rating system that can be (Djukic, 2007) : a system of external ratings and internal rating system. External ratings are used in assessing credit risk related to the corporate bonds. In order to apply the rating system, it is necessary to define a set of methodologies, processes, controls, data bases that support the classification of borrowers and loan into the risk categories. Internal rating systems are organized in banks in order to systematically determine the rating level of the debtor (obligator rating). This rating is displayed as the interval probability of default. The second objective is to establish the facility rating, which defines the parameters of loss in the event of default, such as loss given default and usage given default.

If we are talking about credit risk modeling, there was a proliferation of sophisticated models for evaluation and default risk management. It is the models that have been classified into appropriate groups based on their specific characteristics. Thus, we distinguish between Heuristic Models, Statistical Models, Causal Models and Hybrid Forms. It is about software tools that are built in order to properly assess credit risks to minimize the probability of default. Through these models the probability of default is under control; it is subject of measuring and evaluating. The objective of this operations is achieving a satisfactory rate of return. The significance of these models is remarkable for the efficiency of banking operations, as it is today over 80% of the causes of insolvency of banks arising from inadequate credit risk management.

**Credit derivatives as a tool of credit risk management**

Despite the existence of advanced models of credit risk management, banks are developed the techniques of credit risk transfer. One of these techniques are credit derivatives. Credit derivatives are financial contracts that allow the transfer of credit risk from one party to another. In other words, it is a bilateral agreement between the seller and buyer where the seller sells protection against default the reference assets, and counterparty buys that protection. The logic behind credit derivatives is simple. Investors want to have a debt financial instrument that provide attractive yields. Given that those instruments linked to significant credit risk, investors need to ensure against that risks.

This can be achieved through credit derivatives. The logic from the standpoint of the seller of the contract is somewhat sophisticated. Despite the fact that the seller charges a fee, taking a „short position“ in a derivative arrangement, it also takes some kind of „long position“ in relation to basic assets. Thus, the seller creates exposure to a credit instrument, which may be more efficient, compared to assuming the position with cash transactions. This specificity allows some flexibility of the investment strategy. Considering that the credit derivatives are OTC instruments, they can be designed to satisfy the investment needs of different investors.
The basic advantage of credit derivatives is the ability to transfer credit risk, without obligation of buying and selling of debt instruments, primarily bonds and loans. They also provide the following benefits: they allow the set position in relation to credit risk, allowing exposure in relation to reference assets, without having to purchase these securities, and the ability for investors to access the market of bank loans, based on leverage, the possibility of trading the specific segments of credit risk, through credit derivatives investors can also manage interest rate risk, since the interest rate is an important determinant of credit instruments market value.

Credit default swap (CDs) as a tool of credit risk management

Credit default swap (CDs) is a classic representative of the credit derivatives that is similar to the insurance contracts. Its main purpose is to protect the investment portfolio in case of decrease in market value. It is the OTC financial instrument that financial institutions protect their portfolio of government bonds, corporate bonds, municipal bonds, mortgage bonds, the loan portfolio in case of value depreciation. The CDs uses to protect the referent asset, where the buyer insure his assets. The seller charges one-time or periodic fee but compensate the buyer for loss of credit portfolio value. This happens in case of default.

The CDs fee is paid as part of the contract value. The CDs can be based on a financial instrument or basket of financial instruments. CDs based on basket financial instruments is frequent and usually represents the "crude material" for building the complex financial structure: synthetic and structured financial products. The payment arrangement for CDs may be different, depending on the preferences of the parties: it may be related to the price change in the reference assets or other specified assets, may be defined in a fixed amount in relation to the asset price changes, may be defined as a delivered duty of reference assets per specified price.

![Figure 2: Basic structure of the CDs transaction (Source: www.mnje.com)](image)

In this mechanism, the insurance buyer (Bank A) has agreed to pay the guarantor (Bank B) a commission which is usually expressed by the number of basis points of the reference assets nominal value. This payment has a quarterly or annual frequency. The guarantor has agreed to pay to the insurance market-determined post-default amount or a fixed percentage of pre-specified value of reference assets, when an adverse credit event (default) is realized. The methodology for determining the post-default market value of the reference assets is determined by contract. The default shall be publicly verified in order to start the mechanism of CDs. Swap transaction is turned off in case of default before maturity of the reference asset; otherwise the swap is turned off at the moment of maturity without any payment obligations.

Basket default swap

Basket default swap is a credit derivative that is similar to the CDs. The difference stems from the number of credit instruments that are considered the reference entity. Specifically, the BDS
arrangement is concluded between a seller and buyer of insurance against default of reference assets. The assets include five to ten reference entity (for example loans). Mechanism of BDS launches default nth entity that is part of reference basket of assets. This financial arrangement has the appropriate flexibility, which enables adapt to investor’s preferences. The mechanism of protection starts when the first entity defaults in the asset basket. The BDS involves the delivery of non-liquid assets (default asset) in exchange for a nominal value cash payment. The seller of protection receives a commission (as a spread over the nominal value) to the maturity of the contract or to the default. The advantage of this arrangement is that the investor allows achieving much higher yields than the yield that makes any reference entity that is part of the basket. If the investor decides to contract the second-to-default package (n = 2) then the mechanism of protection starts when the two reference entity defaulted. This is less risky arrangement because the lower probability of default of two entities from the basket. Since the financial market risk is always adjusted to yield the investor in case of STDs gets less commission. The commission for protection depends on several factors: the value of n, the maturity of BDS, the number of loans in the basket, the quality of loans etc.

**Total Rate of Return Swap**

Total Rate of Return Swap (TRS) is also a bilateral financial contract designed to transfer credit risk between the parties. The main difference compared to CDs arrangement is that it protects the overall economic performance of reference assets through contractual payments, if manifested credit event. Therefore, TRS payments between the contracting parties are based on changes in market values of specified credit instrument, irrespective of whether the default occurred. The typical structure of TRS is given in the Figure 3.

![Figure 3: Mechanism of TRs transaction (Source: www.thefullwiki.org/Total_return_swap)](image)

In the TRS arrangement, the insurance buyer (Bank A) agrees that pay periodic interest and potential gain in market value of the reference active (capital gain) to the seller of insurance (Bank B). Insurance seller (Bank B) is required to pay Libor plus a spread to the Bank A. The spread is defined as the number of basis points compared to the value of reference asset. Also, the insurance seller is obliged to compensate any possible loss in value of the reference asset (capital loss).

**METHODS**

**Problem:** The risk is a combination of threats and opportunities: the threats from default and earn opportunity in case of loan amortization in accordance with the contract. The existing forms of credit risk include: failure to fulfill contractual obligations; worsening credit rating, spread risk, risk of return in the event of liquidation. (Matic, 2010). Credit Risk Management developed specific methods and techniques: from sophisticated quantitative models to credit derivatives that transfer credit risk to third party.
Subject: Credit risk is the cause of huge losses and a source of liquidity problems, which implies that its management should be the focus of risk management. The first part is devoted to analysis of the main determinants of credit risk, credit risk modeling process and the process of managing credit risk. The second part analyzes the performance of credit derivatives as well as modern instruments for managing credit risk. In this section attention will be focused on credit default swap, basket default swap, the total rate of return swap as mechanisms of transfer credit risk from one to the other party. The analysis used standard methods of reference literature critical evaluation and making their own conclusions based on attitudes from leading specialist materials.

Objective: The aim is to point out the importance of credit risk in the nomenclature of bank risks and emphasizes some of the basic methodological procedures of managing this risk. Also, the aim is to emphasize the importance of credit derivatives as an effective instrument in the function of risk transfer and increase the financial market efficiency.

FINDINGS

Credit risk management is the imperative of modern risk management. Banks are developed sophisticated techniques to manage this risk in accordance with the recommendations of regulators and supervisors. Risk management plays a crucial role in achieving banks profitability and stability of banking system. One way to effectively manage of credit risk is the transfer of risk through the credit derivatives. Default swaps market in recent years has become an indicator of financial instruments risk assessment. Specifically, the spread offered by CDs arrangements (spread above the reference rate) has become an indicator of debt financial instruments and loans risk level. What is the spread higher, it is a risky financial instrument, and the insurance offered by CDs is more expensive. In this way, market participants become very clear and accurate information regarding the level of risk and value of debt financial instruments and financial markets become more efficient and transparent.

DISCUSSION

Theoretical and methodological considerations in the context of credit risk management in modern conditions is supported by quantitative analysis and sophisticated risk management techniques. With the credit derivatives one party transfers the default uncertainty of the reference asset to the other party. Also, the other party creates its own exposure to the reference asset without holding that assets on the balance sheet. With the credit derivatives financial institutions are separated functions of origination and submission of credit risk for debt instruments (bonds and loans). Also, the derivatives market are very important „player“ in a process of "price discovery" in the financial market. In this way the derivatives market contributes to efficient allocation of financial resources in the most productive purposes. It increases the efficiency of the economic system.
CONCLUSION AND IMPLICATIONS

Credit risk is the basic banking risk that is a natural satellite of the banking business. Because of its importance the banks have been developed the advanced quantitative and investment techniques to manage this risk. Extremely important to manage credit risk belongs to the various credit scoring models, regression models, simulation models etc. However, an important analytical tool for credit risk management are certainly the credit derivatives. Credit derivatives allow financial institutions, separation of functions of origination (creation) and submitting the credit risk. They are a natural extension of debt financial instruments market, with an important role in separating and repackaging of credit risk. Their role in managing of interest rate risk is indirect, but certainly very significant. Financial institutions without regard to capital constraints can be via credit derivatives exposed to credit risk in relation to the basic assets, without requiring their direct ownership. Also, given that the movement of interest rates is an important determinant value of credit instruments, it can be concluded that through more efficient management of credit derivatives and interest rate risk. Regardless of the capital restrictions, financial institutions through credit derivatives can be exposed to credit risk in relation to the basic assets. Also, given that the changes of interest rates are an important determinant of credit instruments value, it can be concluded that financial institutions through credit derivatives more efficient manage the interest rate risk.

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