

## **THE INNOVATIONS ON THE FINANCIAL MARKETS. USEING DERIVATIVES FOR BANKING MARKET RISK COVERAGE**

**Mihaela SUDACEVSCHI**  
Nicolae Titulescu University

Ph.D. **Ion NIȚU**  
„Athenaeum” University Bucharest

### **Abstract:**

*Derivatives are used for speculative purposes and to reduce the risks manifested on financial markets. Banking market, due to the high volatility of exchange rate and interest rate derivatives are frequently used to cover the risk associated with lending. Contracts such as options on the exchange rate of national currency, swaps - on interest rate exchange, forward on the interest rate, swaps and options on interest rates, banks enable unbundling credit risk and the funding market and credit risk transfer, and keeping its ownership.*

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**Classification JEL:** G24

### **Introduction**

Derivatives are financial instruments used by investors as speculative, and also for risk reduction on financial markets. There are four classes of derivative contracts:

1. Futures
2. Forwards
3. Swaps
4. Options

### **1.1 Derived Headlines**

Debt stock derivatives are products resulting from contracts concluded between the issuer and the beneficiary who entitles the purchaser to the issuer's assets at some future maturities, as stipulated the contract. The market value of

these securities depends on the assets to which they relate. These tools can be classified according to<sup>1</sup>:

- underlying (Reference Obligation), which can be formed from one type of asset or more (reference entity). Note that the activity of investment banks has emerged a significant shift from the trading of corporate shares by those who express claims<sup>2</sup>, primarily mortgage loans;

- Conditions for the exercise, which may be the variation á la hausse or á la baisse of the title, an increase in the spread, so, a change in macroeconomic conditions.

- The payoff that is calculated on the title, following the provisions of issuing, and / or subsequent fluctuations of the methods of indexing.

Derivative instruments on credit risk are:

- Credit default swaps (CDS)
- Credit default options
- Basket default swap (Credit default swaps for multiple entities);
- Total return swaps;
- Total rate of return swaps;
- Credit spread options
- Credit spread forwards

### **Credit default swaps (CDS).**

CDS are bilateral protection financial contracts between buyers and sellers. Protection buyer shall pay a first ex-ante - expressed in basis points per year, depending on the nominal value of the asset - the protection seller, which undertakes to compensate the losses ex-post for reference assets in case of a credit event . This type of transaction is a non-funded, meaning no funds to hold to guarantee the transaction, the seller of protection cashing periodic premiums and thus raising their income without making any capital investment, if it does not occur until maturity contract, no credit event. Otherwise, the seller is obliged to pay compensation, which may be more or less expensive for him, to provide funds that ex-post. In this case it is an off-balance sheet exposure. This type of instrument is most commonly used credit risk derivative product, a weight of over 50 percent of total transactions with derivatives on credit risk.

Credit default swaps can be used to transfer credit risk exposure to any other part. For example, banks can use this contract for the spread of credit trading for

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<sup>1</sup> Codirleşu Adrian - "Using derivatives for hedging credit risk, monetary financial colloquium organized by the Faculty of Finance, Insurance, Banking and Stock Exchange, Academy of Economic Studies, November 2005

<sup>2</sup> Mărgulescu Serghei, Mărgulescu Elena – „ Overtaking limits”, Proceedings, The 32nd Annual Congress of the American Romanian Academy of Arts and Sciences (ARA), 2008

bonds issued by governments or private entities, without possessing these tools. The maturity of the contract must not be the same as the reference asset and in most cases it is not. Where's default, the contract is deemed concluded and the seller of protection will calculate and pay the buyer payment default.

### **Credit default options**

Credit default options and credit default swaps are option to buy protection (payer option) or sell protection (receiver protection) which takes the form of a credit default swap that involves a specific reference credit with a specific maturity. The option is, in general, European type, which means that it can exercise only once, at a future date at a price defined as the credit default swap coupon.

### **CDO (Collateral Debt Obligation)**

- CDO (Collateral Debt Obligation) is a financial asset securitization structure of various kinds, created by banks for potential investors, rarely traded on the secondary market. CDO securities are based on grouped assets (asset-basket security (ABS) or various bonds, generally with high nominal value. Collateral Debt Obligations are divided into three installments, depending on the degree of risk that will be assumed by the investor:

1. Equity trenches, which are the most risky securities. These funds are generally purchased by a hedge fund and CDO manager;

Private equity<sup>1</sup> is a term that means the holding of shares in private companies (which are not listed on exchanges). Financial institutions are dealing with private equity venture capital funds closed, acquiring shares from private companies. Depending on how to obtain the shares, these funds are divided into three major categories:

a) Venture capital - funds that finance start-up companies or small companies to finance their development; b) Leverage - funds that deal with the direct purchase of shares from private companies by making tempting offers; c) Growth Capital – funds, dealing with large and stable companies funding, to help them to develop, expand or restructure.

A hedge fund or an alternative fund is a management organization that operates on the same principles as Collective Placement Bodies Securities (UCITS) or American mutual funds, but investing in an alternative structure. Unlike traditional funds, hedge funds gain performance without having any connection with the general trend of the market shares and bonds. Note that the hedge funds

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<sup>1</sup> [http://ro.wikipedia.org/wiki/Private\\_equity](http://ro.wikipedia.org/wiki/Private_equity)

covers by taking different symmetrical positions. This does not mean that hedge funds practice risk-free strategy, since it would enable them to profit, often substantial.

2. Mezzanine trenches are intermediate trenches. These trenches are the first to bear the risk and are generally purchased by the investors or asset managers acting on their own;

3. Senior trenches are the least risky. They are classified AAA or AA rate by the rating agencies and are purchased by investors with risk aversion, which supports a lower profit.

As paths contain important risk (subprime) CDO are securities most affected by the estate crisis, known under the name of the subprime crisis.

Banks have many advantages if it uses the CDO, such as:

- by issuing a CDO, the banks make a credit transfer, and thus they may fall within the regulations on financial stability, Basel II compliance, and also fits the well-known Cooke rate<sup>1</sup>;

- Issuing a CDO, the bank it seeks a more substantial margin, to maximize the spread between the active rate and passive rate;

- By securitization, the bank offers investors the opportunity to have access to less liquid assets. Depending on the type of assets that comprise the portfolio, are distinguished: - Cash CDO, the investment vehicle (IV or SIV<sup>2</sup>) investing in financial products such as bonds, bank loans or ABS - synthetic CDO, IV face the credit risk, using derivatives like credit default swaps. IV invests the profit of the issues of different trenches in AAA collateral. If the reference portfolio is defined in the transaction and does not change, CDO is considered static.

If not, consider a CDO to be managed and: - is appointed a manager who is able to perform a certain number of transactions on the portfolio of reference - the administrator will reserve a position on one of the trenches of a pool and is paid commission.

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<sup>1</sup> Cooke rate or bank solvent rate is the rate prudential recommended by the Basel Committee. This rate sets a limit on lending assets of a bank to total equity. Thus, we believe that a bank is solid in terms of solvency, if its own funds are at least 8% of total Bank commitments (Cooke ratio).

<sup>2</sup> SIV (Structured Investment Vehicle) or Investment Vehicle (IV) is an entity that performs mismatch risk between securities issued by securitization transaction and the risks involved and investors sold banking institutions sold the underlying assets for securitization transactions.

IV funds through issuance of securitized assets to parties who have the status of securities in different markets, national or international: Debt medium and long term (asset-backed securities) or short-term (asset-backed commercial papers).

If a liquidity crisis, when faced with the request for redemption, VI can be brought into position to sell some assets, shifting thus the crisis in the banking sector in other sectors of the real economy.

Example synthetic CDO:

CDO investment of 100 million Euros, managed by AAA-rated bank:

Mature: the period left until the final maturity of the instrument = 5 years;

Credit portfolio: Europe and North American Credits:

A3/Baal Average Rating

Senior Tranche: (AAA / Aaa, note the rating agencies) :Euribor3M+90 bps

Mezzanine Tranche (AA/Aa2, note the rating agencies);Euribor 3M+ 175 bps

Equity Tranche Euribor3M + 250 bps Subordination:

0% - 4% Equity Tranche

4% - 9% mezzanine tranche

9% - 100% for AAA senior tranche

If there is no loss until maturity, investors will receive quarterly Euribor3M + tranche spread and the main corresponding maturity. If maturity portfolio losses are more than 4 million equity tranche is affected only. If losses are between 4 and 9 million, Equity tranche investors will no longer get back the principal and the mezzanine tranche will be deducted from 9 million deducted from the principal losses. If the loss is more than 9 million mezzanine tranche investors will receive back the principal and the senior tranche will be deducted from the principal difference between 100 million and the losses.

#### **Basket default swaps (Credit default swaps for multiple entities).**

Unlike credit default swap contracts, the protection buyer receives a payment if a particular entity enters into default, basket default swap contracts are usually for 3 to 5 reference entities. Your payoff of these options is based on credit events associated with these entities. The maximum amount that can be paid is to be found implicitly or explicitly in the contract.

The most common types of contracts are:

- Senior basket default swaps. The contract specified a maximum payment for each reference entity and the seller of the contract begins to pay after a certain level (threshold) is reached. The maximum amount that can be paid is the total payment minus the maximum threshold for each entity.

- Subordinated basket default swap. The contract specified a maximum payment for each entity and is also specified maximum aggregate payment. There is no threshold and payments starting at the first credit event.

- N-to-default swaps. Payment of compensation is triggered by the n-th credit event. For the first N - 1 credit events payments are not made. After this payment the contract is finished. Usually the contract specified the maximum payment that can be received by the buyer of protection.

### **Total return swap**

Total return swaps or total rate of return swaps are contracts between two parties, whereby they undertake to exchange among themselves the total return of a debt instrument (cash flow and changes in prices ) for periodic payments.

### **Credit spread options**

Put options on credit spread (credit spread put options) allow the buyer to sell debt instruments to the option seller to a certain amount if the spread increases. Among the conditions that can lead to increase the spread may be worsening credit rating into the issuer's default.

The payoff ensured by a credit spread put is:

$$OV_t = NV + \frac{\max[(X_t - P_{t,0})]}{100}$$

if  $(BY_t - RY_t) > SS$

Were,

**OV<sub>t</sub>** , represents the payoff option,

**NV** – nominal value of debt instrument (bond),

**P<sub>t</sub>**- credit instrument price at time t,

**X<sub>t</sub>** – exercise price at time t, which is the price of the bond's yield ( $RY_t + SS$ ),

**RY<sub>t</sub>** – the reference yield at time t, usually LIBOR or the yield on

government securities,

**BY<sub>t</sub>** – The benchmark bond yield at time t,

**SS** – spread option exercise.

Credit spread call options gives the buyer additional coupons. Their value is determined by the difference between the market spread and reference spread, and your payoff is an increasing function of the spread of credit.

The payoff of a call credit spread is:

$$OV_t = \max\{[(BY_t - RY_t - SS) * MN * RF], 0\},$$

Were:

**OV<sub>t</sub>**-represents the payoff option,

**MN** - main notional,

**RY<sub>t</sub>** - the reference yield at time t, usually LIBOR or the yield on government securities

**BY<sub>t</sub>** - The benchmark bond yield at time t,

**SS** - spread of exercise,

**RF** - the percentage change in price due to a change of 100 bp in the spread - the adjustment factor for the interest rate sensitivity.

### **Credit forward**

What distinguishes your credit forward for an option credit spread is the possibility of a negative payoff if the forward contract. The payoff of this contract it is :

$$FV_t = (BY_t - RY_t - SS) * NP * RF,$$

Were, FV - represents contract payoff forward

### **Credit linked notes/CDO**

Credit linked notes are a combination of a fixed income instrument and a credit risk derivative contract. These contracts allow investors of the exposure to a particular fixed-income instrument without taking a direct investment in that instrument. Also, these instruments allow investors to add value to the portfolio from changes in bond prices, the spread of credit risk input or default of the issuer.

### **Advantages of derivative contracts**

For Romania, the derivatives have utility in terms of market development, but can not be neglected the Romanian financial market limits.

Credit derivatives have enabled banks to increase funding to finance the real system by redistributing risk to more entities from the financial sector.

The main benefits of using instruments to transfer credit risk are:

- allows separation of credit risk and the market risk;
- allows the isolation of temporal characteristics of credit risk;
- allows the meeting between the level of assumed risk by the economic agents with their appetite for risk;
- allow banks to transfer credit risk, but to retain its ownership.

## **1.2. Securitization Facility**

Securitization is a financial transaction recovery of claims by an investment vehicle, which acquires, gathers and uses them to guarantee securities issues. The balance sheet of the banking institutions include in the active side the decrease of bank loans to all its customers, individuals and legal entities and liabilities, and in the passive side are included the deposits and customers current accounts and also, the loans contracted from other banks or financial institutions, plus the bonds issued by the bank, which, in fact means debts, too. In the context of balance sheet of the banking institutions, securitization means a kind of funding by securities issue. The operation has its origin in the United States and has taken an increased in the last 30 years.

The advantage of securitization is that, in comparison with traditional financing by bonds issue, it is obtaining liquidity by taking on a debt that is recorded in the balance sheet of the bank and guaranteed by mortgages, securitization gives investors greater protection against credit risk.

Credit risk defines the risk that the bank may not recover a loan from his customers. Using the securitization of mortgage debt, the bank's assets are sold by the originator, which is just the bank. So, these actives are transformed in off actives, thus being fully protected from the originative bank bankruptcy. In addition, the originator bank, make a "cleaning" transaction of the balance sheet, also known as the "window dressing" in this way being better met prudential rules imposed by Basel II.

Securitization involves, in general, creation of derivative securities, mortgage securities, because mortgages are based. Underlying assets may be other receivables, too, in which case, the securities are not named mortgage securities.

Headings are created from a pool of receivables, which are standardized and have common characteristics. Thus, they are put under the control of investors through a specialized intermediary, which is a securitization company or fund established for that purpose (in North American terminology this company is named SPV - *special purpose vehicle*, and in Romanian legislation is named *the investment vehicle* - IV).

A typical securitization operation is performed in minimum two stages. In the first stage are transferred assets, i.e. receivables, to securitization fund and in the second stage the securitization fund issuing derivative securities, i.e. securitized securities. Securitization Fund uses money gained from issuing securities for paying the originator - which acquired the bank debt - the value of the assets



transferred. In this scheme, the fund issues securities on the capital market. The performance of these securities in the market depends directly on the performance of the underlying assets. If case of the mortgage debts, the payoff it is defined by how they are repaid. Who are the investors, namely those who typically buy these derivative contracts issued by securitization? Given that they are based on mortgage loans, which normally are quoted like very low risk to the market, these titles were preferred investments for the entities unwilling to take risks. These are private pension funds, investment funds, specialized entities in issuing and trading of MBS<sup>1</sup>, but also banks, insurance companies etc.

There are two types of securitization, and the advantages and risks involved by these transactions depend on good management and careful control of basic asset quality, which it should be governed by specific provisions, accepted and implemented in the financial area.

### **The Traditional Securitization**

Traditional cash securitization is characterized by the transfer of a portfolio of receivables from the transferor (e.g. an investment bank) to a special purpose vehicle (SPV), which is an independent entity whose business is limited to do that transaction until it maturity.

The transfer is done by assignment of the loan portfolio so that they no longer appear on bank balance sheets. Generally, the transferor bank continues to manage the loans, acting as a servicer - provider of financial services - although no longer the rightful owner thereof, in which case it is established and a backup servicer. For traditional securitization is essential for the legal transfer of credit ownership to the IV, so that in case of bankruptcy of the transferor, its creditors have no rights in that portfolio.

Investment vehicle finance loan portfolio acquisition by issuing bonds to investors. Thus, the IV is the asset portfolio of credit and bonds issued as a liability. Securitized bonds income (IFS) depends only on the loan portfolio, and not of the transferor bank. Transferor bank, which continues to manage the credit, it does the transfer of the interest and the principal to the IV, once it has held receipts from debtors. Coupon payment and redemption of bonds to investors are essentially based on the cash flow, which is generated by the loan portfolio; investors have no

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<sup>1</sup> Les Mortgage-Backed Securities (MBS) are derivative securities that are actively support mortgages grouped in a pool. These mortgages, primarily residential, are used as collateral and considered marketable securities by financial institutions that handle them.

right of appeal for the transferor bank's assets, if the IV doesn't has enough funds. Investors risk comes from non - refundable loans by borrowers and thus from unable to fully and timely pay outstanding bonds. Other risks – currency risk, interest rate risk etc. - are usually covered by swap contracts, so the only risk incurred by investors is the default of borrowers. To pass over temporary unavailable funds, for paying the bonds, the transactions include a liquidity provider, which could be a bank or another financial entity accredited in accordance with the domestic laws and the transaction documentation.

The interests of investors in securitized transactions in financial instruments are represented by an agent (trustee). He oversees the compliance with the legal formalities, contractual terms and payment terms in connection with the portfolio of receivables. Trustee's role is very important in case of borrowers default; also he can perform the role of backup servicer. The manager is responsible in managing the debt portfolio, with responsibilities as a custodian, computing agent, monitoring, collecting and payment. In some transactions, the agent can perform manager duties.

A key role in securitization transactions has the rating agencies. They analyze each transaction in terms of loan portfolio quality, structural and legal, with ratings for the classes of bonds issued. They set the minimum level of support – CE - Credit enhancement - needed to obtain the desired rating for each class. These ratings reflect the risks they are exposed investors, being an essential tool for them. Rating agencies are monitoring transactions along their lifetime, modifying or confirming the ratings.

It may be noted in the chart of traditional securitization that the securitized bonds are issued in multiple classes or tranches. Their number varies from one transaction to another, depending on the characteristics of the securitized assets portfolio, on experience and optimization model of structured settlement investment bank and market characteristics. Bond classes have different risk profiles, and different profit levels. It is essential that debt losses which affect portfolio are absorbed first by the junior class (equity) and only after the loss has exceeded its size, mezzanine classes, and then senior suffers. Most transactions are structured so as class / senior classes get rated "AAA" (highest possible), reflecting a lower probability of suffering losses. Junior class, usually called first-loss or equity, is preserved in most cases, the transferring bank and does not receive a rating.

### The Synthetic Securitization

In the case of Synthetic securitization, the originator of the transaction is the buyer of protection, called transferor, and in case of the Traditional securitization, the credit risk transfer - known in banking terms as the default – of a credit portfolio, (but holding the loans in the own balance sheet), to a special purpose vehicle (SPV) and to another entity, generically called “seller of protection” or Senior Partner CDS (Credit Default Swap). The considered case refers to a partially funded synthetic securitization, which is the most used. If the entire risk is transferred to the IV, then the transaction is fully financed, and if the seller of protection takes all the risks, then the transaction is totally unfunded.

Risk transfer is achieved by two Credit Default Swaps: a *junior* one, which means risk transfer to the seller of protection and a *senior* one, which means risk transfer to the IV. A Credit Default Swap can be likened to credit insurance. The buyer of protection – who is insured - pays a regular premium protection to the seller of protection - the insurer - and he is compensated in case of specified events in the CDS contract, by that insurance. In CDS case, the definitions of credit events were standardized by ISDA<sup>1</sup> (International Swaps and Derivatives Association). The actors involved in a CDS decide, by mutual agreement, the credit events that are applicable to the contract, taking the ISDA definitions. The IV take the risk of default or of other event for a certain percentage of the whole portfolio of securitized loans covered. In case of registering loss, protection buyer is compensated by the IV. The losses that exceed the assumed level by the IV are covered by CDS Senior partner. Accordingly, the junior swap is subordinated to the senior swap.

Next, the Investment Vehicle (VI) issued securitized bonds to investors and the funds obtained are invested in low risk securities – like government bonds, mortgage bonds and securitized financial instruments, especially Consumer MBS and ABS type. The securitized bonds yield depends on the financial performance of these investments in securities, and especially on the compensation that it has been paid by the IV, according to junior CDS contract in case of credit events. Sources of income for payment of securitized bonds – the coupon and the principal – derive from the regularly collected premium by the IV from the protection buyer, and the generated coupon and principal investments in securities. In conclusion, through traditional securitization, the bank is transferring the ownership of the loan

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<sup>1</sup> The six credit events in their original English names are: Bankruptcy, Obligation Acceleration, Obligation Default, Failure to Pay, Repudiation / moratorium, Restructuring. In Romanian, as in other languages such as French, etc.. distinction is harder to do, for example between the default risk and bankruptcy and therefore are used as terms of specialized terms originating respectively in English.

portfolio, while through synthetic securitization it is transferred only the default risk assimilated to the respective portfolio. In the first case, banks obtain funds by selling portfolio, and in the second, bank receives compensation only if there are losses due to credit events.

### **The Benefits of Securitization**

From point of view of the initiators, securitization has multiple advantages, the most important being on the protection which it provides in case of insolvency, plus the gains it offers to investors.

Through securitization, banks can balance maturity, i.e. periods of certain classes of assets. Thus, mortgage debts are long term debt, up to 25 years, and need long-term financing that may be offered by securitization. This balance is important, because funding long-term assets with short-term liabilities induces various bank risks. For example, interest rate risk is as follows: a bank lends a credit for a customer for 20 years, while individual deposits, from which these are financed, are for less than one year term. If the lender interest is fixed for 20 years, and interest on deposits grow over time, the bank's profit margin is reduced. Securitization requires less capital than traditional financing - hence offering a better return on bank capital. Securitization is a cheaper form of financing compared with other sources. Securitization reduces bank exposure to a particular class of debtors of a certain risk. Thus, if a certain class of borrowers becomes too large for the rest of the balance sheet through securitization of some of them can be removed from the balance sheet.

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