Bank Loans Securitization

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Securitization Theoretical Background

Securitization is a process that has developed intensely over the last 10 years, especially over the euro area – due to the introduction of the euro, the increase in financial market integration, the tendency of a more market based financial system - but also world wide.

Securitization represents a structured finance process in which assets such as loans, bonds and other fixed-income receivables are put together and packaged into securities serving as collateral and sold to third party investors.

Figure 1. How securitization works

Source: Monthly Bulletin February 2008” – European Central Bank

Basically the securitization process takes place in two major steps:
FIRST STEP
The originator (lending institution) decides which assets will be included in the reference portfolio as ABS, and then sells them to a third party called SPV – special purpose vehicle.
SECOND STEP
The SPV would finance the purchase price by issuing notes to external investors, which will receive fixed or floating rate payments from the ABS issuer. Usually the credit originator will continue to service the loan – collecting monthly payments from the borrower – and then forwarding those payments less a servicing fee, to the third party (the SPV). Thus the credit risk (and possibly also interest rate and currency risk) is transferred from the issuer to the final investor.
**Parties involved in structuring Asset Backed – Securities:**

Several entities interact during the securitization process, those are: the borrower, the originator, the servicer, the trustee, the rating agency, swap counterparty and the investor.

Some participants are mentioned below:

**The Borrower** is the one requesting the loan from the originator. He is responsible with the monthly payments towards the lender (the bank). In most cases, the borrower is unaware that the lender has sold his loan to another party – this lack of information is allowing the bank to maintain the customer relationship with the borrower.

**Originator**

Originators are the ones that create, sell and often service their financial product to the borrowers, loans that afterwards become part of the ABS. Institutions such as commercial banks, auto makers, and other financial companies can initiate the securitization, thus becoming loan originators to their customers.

**Servicer**

The loan originator plays most of the times the role of the servicer, taking care of the borrower monthly payments, handling the default management and collateral liquidation, and the administrative support for the benefit of the trustee. All those services are compensated with a service fee.

**Trustee**

Is a third party institution, which administer the trust that holds the underlying assets supporting an asset-backed security. The main concern of the trustee is to protect the rights of the investor. Its main role is to safeguard the process through which the originator’s monthly revenues – the borrower’s payments – will follow the securitization flow starting from the servicer, through the SPV and finally to the capital market investor.

**Rating Agencies**

The rating agencies are independent institutions with no interest in the financial transaction, whose primary role is to evaluate the credit quality of the transactions.
Investors

The largest purchasers of securitized assets are typically pension funds, insurance companies, fund managers, and, to a lesser degree, commercial banks. The most compelling reason for investing in asset-backed securities has been their high rate of return relative to other assets of comparable credit risk.

Swap counterparty. Who is involved to hedge the interest rate and currency risks on the pool.

Types of assets that can be securitized

Almost any kind of loans can become backed securities, but the most common are the ones which occur in large pools, are deeply documented, are predictable in the sense of the default rates and cash flows, and have transferable ownership. The mortgage backed securities were the most common backed securities on the market, until the last years.

The new asset-backed securities category which followed includes the auto loans, the commercial mortgages, the credit card receivables and others.

The main distinction between assets to be securitized is shown in the following figure.

All assets can be subdivided into performing or non-performing loans, and existing or future flow assets.

A performing loan is when the obligor pays interest and principal when due as of closing of the ABS transaction, and a non-performing loan is when interest and/or principal payments are overdue.

An existing asset is a loan already existing as of closing of the ABS transaction, in this case the borrower already received the money from the lender, and a future flow asset is an asset to be generated in the future.

The large category of ABS deals is implying performing loans and existing assets.

The CDOs are classified by the type of underlying assets. If the underlying assets are loans, the transaction is known as a collateralized loan obligation (CLOs), but if the underlying assets are corporate bonds or other debt securities, the transaction is known as a collateralized bond obligation (CBOs).

Benefits of Securitizations:
All three actors: the originator, the borrower and the investors can benefit from the securitization process. Here are the most important benefits that the originator can obtain:

- **More Efficient Financing**
  Since the investor credit risk is eliminated, due to the process of structuring the transaction with a bankruptcy remote SPV, a more efficient financing can be obtained due to a better rating. This permits the originator to obtain funding at a reduced cost than accessing directly the capital markets without involving of an SPV.

- **Improvement of the Balance Sheet**
  Securitization can also ameliorate the originator’s balance sheet, and raise the management’s control over the size and structure of the balance sheet. This will lead to an improvement of certain ratios, such as return on equity and return on assets. The decrease of non-performing assets means that the originator can apply the proceeds from the securitization for other uses and invest in more efficient projects.

- **Better Risk Management**
  Securitization also improves the risk management function in several ways. It reduces financing risk for the originator by diversification of financing sources. The securitization diminishes the originator’s exposure to individual borrowers while keeping the relationship with them. An improved risk management can be attained by raising the diversification of funding sources. Another improvement in risk management for the originator is that it can transfer risk that it does not want to bear or be exposed to.

- **Liquidity**
  The transformation from illiquid and non-tradable assets to liquid and tradable assets is one of the benefits of securitization.

**Benefits for investors:**
By issuing securitized assets the investors have the benefit of getting access to a new set of asset classes and new ways of diversification. This creates more complete markets and increases the possibility of satisfying the needs of both investors and originators.

**Benefits for borrowers:**
Borrowers can benefit of the highly diversified possibilities of credit, in terms that the lenders might not have had the possibility of supplying the loans if they have had maintained the loans on their balance sheets.

For example, due to the fact that a market exists for mortgage-backed securities, lenders can offer fixed rate debt, which numerous consumers choose over variable rate debt, without over exposing themselves to interest rate risk.

**Securitization Developments in 2009**
The global market for securitization has fallen since September 2007 because of turbulence in credit markets, a liquidity deficit and a reduction in investors’ tolerance of risk.
Additionally, balance sheets of many banks were weakened by possessing considerable tranches of mortgage-backed (MBS) and asset-backed securities (ABS).
Gross global securitization issuance illustrated a drop of about a third from $3,817 billions in 2007 to $2,777 billions in 2008. Government measures in the US and Europe have focused on procuring liquidity to the wholesale money markets and on recapitalization of banks.

The EU governments has solicited that banks retain 5% of securitized products they sell to ensure good standards of underwriting.

The US government, admitting the importance of the securitization market to the accessibility of credit, is allowing the Federal Reserve to lend at least $200 billions at advantageous terms to investors to permit buying of asset-backed securities.

**Securitization in Europe**

The securitization market in the euro area is characterized by a number of representative features: first one is referring to the special role played by synthetic securitization, second one presents the considerable variation in the level of securitization across the euro area; and the third one relating the persistence of the residential mortgage-backed securities (RMBS) segment (and in recent times the commercial mortgage-backed securities (CMBS and CDO segments) and the relatively reduced level of securitization of loans to small and medium-sized enterprises (SMEs).

Repurchase agreements have been signed with the European Central Bank, which describe the special nature of some recently structured Asset Backed Securities that are subjected to special reduction, agreed by the parts at discounted prices. However, those CDOs should adhere to special eligibility criteria and additional rules in order to be accepted due to what seems to be the general intent of the European Central Bank to act as “lender of last resort” against repos with quality assets only, rather than to become “purchaser of last resort” of troubled or toxic assets.

The largest issuer in 2008 in European market was UK, due to considerable funding needs and its quota of the European market was steady at 38%. Other important issuers in Europe in the last year were Italy, Spain and the Netherlands.

Numerous European securitization issues have been downgraded in the last year. The situation changed a lot in 2008 in comparison with 2007. In 2007 were 481 upgrades toward the 214 downgrades, while in 2008 were 1174 issues downgraded compared with 184 upgrades (Chart 4). Approximately two thirds of these downgrades (728) were generated in the fourth quarter, indicating the deepening crisis in the securitization market.

*Chart 1. Rating changes to European securitization*
Collateralized Debt Obligations as a Reason for the Current Market Crisis

The world financial crisis initially started in July 2007 when investors lost confidence in the value of CDOs consisting of securitized, mostly sub-prime mortgages. The epicenter of the crisis is well known to lie in the so-called sub-prime segment of the US housing market, where loan-to-value ratios had been raised over time, often exceeding 1.

When housing prices in the United States started to fall in 2006 connected with a growth in the interest of floating-rate mortgages, the number of delinquencies and foreclosures soon raised. The major problem was that by that time ABS and CDOs against those mortgages were already massively issued and held by numerous American and European financial institutions and the abrupt decline in the quality of the collateral along with the already superior leverage ratios of the biggest U.S. banks activated deep declines in own capital ratios that led in bank bankruptcies and global shortfall of credit, equity markets collapses and even currency crisis in some areas.

The FED, the Bank of England, the ECB and other Central Banks were determined by the interbank market collapsing to supply liquidity for commercial banks. This measure helped numerous banks not to become illiquid. Even if providing saving funding for commercial banks was an extreme measure destined only for a short time period, this solution has been adopted over one year and even more. Providing this kind of liquidity caused Central Banks to make great stocks of low quality collateral on their books.

What has happened?

It was proved that five frictions that explain the breakdown in the subprime mortgage market exist.

The problem starts with frictions **between the mortgagor and originator**. The process begins with the borrower, who applies for a mortgage for the acquisition of a property or to refinance existing mortgage. Many products offered to sub-prime borrowers are very complex and subject to misunderstanding and/or misrepresentation. This opened the possibility of both excessive borrowing (predatory borrowing) and excessive lending (predatory lending).

At the other end of the process the problem between **the investor and asset manager** exists. Investment mandates do not sufficiently identify the difference between structured and corporate credit ratings. It follows that asset managers have an incentive to achieve for yield by buying structured debt issues with the identical credit rating but higher coupons as corporate debt issues.

Frictions between **the arranger and third-parties**: An essential information asymmetry exists between the arranger and third-parties relating the quality of mortgage loans. The arranger possesses more details about the quality of the mortgage loans which creates an adverse selection problem: the arranger can securitize bad loans (the lemons) and retain the good ones (or securitize them elsewhere).

Frictions between **the originator and the arranger**: Predatory lending and Borrowing
The portfolio of mortgage loans is usually bought from the originator by an institution named the arranger or issuer. The first duty of the arranger is carrying on due diligence on the originator.

This conflict implies an information problem in the securitization process between the originator and arranger. The originators possess an information advantage over the arranger regarding the quality of the borrower. An originator can have the temptation to cooperate with a borrower in order to make significant misrepresentations on the loan application, which, depending on the circumstances, could be either construed as predatory lending (the lender convinces the borrower to borrow “too much”) or predatory borrowing (the borrower convinces the lender to lend “too much”).

The friction between investors and the rating agencies is the last one in the securitization process. For the rating provided for securities, the rating agencies are paid by the arranger, and not by the investors, how we expected. This can produce a possible conflict of interest.

**Securitization in Romania. What determined Romanian banks to securitize their loans?**

In actual subprime credit crisis few developing countries were directly impacted by the securitization meltdown, this is because securitization is a less common process in developing countries, and only small numbers of institutions in these countries can rely on full financing. Romania can be included in “new securitization market” type due to its late evolution of financial environment.

The crisis outcome in the international financial markets (Lehman Brothers, US 4th top investment bank filed for bankruptcy protection; AIG’s request the US government for a short term $ 40 billions financing), has reflected immediately also in Romania, where the stock exchange has dropped and the RON has depreciated its value, this happened as investors became more cautious to risk exposure.

On the long run though, the crisis effects on the Romanian bank sector and the overall economy might be generated by the international banks investments in the US market. The National Bank of Romania has shown in one of its reports, that even if some of the international banks were affected by investments in the US market, these losses have not reflected in their Romanian offices operations. Romania’s financial institutions did not report any major losses due to investments in the US sub-prime sector, nor caused by any major US bank bankruptcy.

One of the issues concerning the emergent markets economy, such as Romania’s, is the high cost of the foreign capital, due to the low ratings of those economies. Securitization is a technique that could help on this issue; it can support the financial, real estate, system and the overall economy development.

In order to enhance the securitization mechanisms in an emergent economy, some initial conditions must be met.

- First, a secondary state bond market must exist, in order for the investors to familiarize with the fix income financial instruments. After this stage, municipal bonds, corporate bonds and other more complex financial instruments such as securitized bonds might follow.
- Secondly – the securitization principles, benefits and risks must be explained.
- The third condition is to have a legal frame suited to develop a financial securitized instruments market.
Related to the rules that govern the mortgage market and the debt securitization an almost complete lack of transparency can be observed.

Romania’s banking institutions were determined to access funds through the securitization process, as a result of the maturity difference between assets and liabilities given by the loans of foreign currency.

Below a graph shows the sharp growing tendency of foreign currency long period loans during the year of 2007 (an increase of 48% in the month of December 2007 compared to the same period of 2006). The long period loans are offered over a more than 5 years reimbursement period.

Figure 4. The evolution of non-governmental credit in foreign currency, on due date

![Graph showing the evolution of non-governmental credit in foreign currency](image)


The best suited securitization instruments for the Romanian market are those guaranteed with housing mortgages or those guaranteed with consumer or auto vehicle credits. Usually the financial products emitters are banking institutions, but can also be leasing companies, utilities or construction works companies.

**Example of securitization process in Romania**

The analyzed bank represents one of the largest from our banking system and also an important player on the Romanian financial market. The bank is the Romanian subsidiary of an international Group, a leader in Central and Eastern Europe.

Currently the group searches for ways of obtaining risk weighted Assets (RWA) relief, as a consequence of its rapid expansion during the last couple of years. One possible way to accomplish this objective is by applying the securitization of assets, which will result in a RWA relief and disposing more capital for further expansion. The plan is to offer and sell in different tranches a combination of loans/bonds and/or other assets – a product called Collaterized debt Obligations – to external investors so that the transfer of risk could be accomplished.

The Romanian subsidiary’s securitization process was an action initiated, supported and coordinated by the Group to which the bank belongs to.

Due to the banking regulatory requirements, banks have to retain a certain amount of equity for each originated loan to cover the credit risk. The Group has good access to the equity markets, but the cost of equity is very expensive. Supporting growth solely with conventional equity is a very expensive option.
The following benefits should be attained by the financial group through the securitization process:

- Provide extremely flexible and cost competitive funding solution;
- Enable the group to access funding from the international capital markets at a higher rating than subsidiary’s own foreign currency rating;
- Obtain regulatory capital relief;
- Provide additional funding diversification by accessing a new investor market.

The securitization process was established like a multi-issuance programme. Under a multi-issuance programme, SPV would be able to purchase and finance discreet portfolios, without the need to establish a new SPV.

The originating bank accepted an asset management agreement with the SPV and remained the servicer of the portfolio sold to the SPV.

During the life of the transaction, the loans continued to be serviced, administered and collected by the subsidiary acting as servicer. The subsidiary will be coordinating, among other things, the provision of monthly servicing reports on the performance of the loans.

The collections will continue to be paid into the accounts of Romanian subsidiary, which will hold the money on trust as a Servicer. On a periodic basis, the subsidiary (as Servicer) will transfer the collections to a bank account in the name of the SPV.

The assets implied in a securitized portfolio should accomplish the following assumptions:

- all the assets are to private individuals with the majority having one loan outstanding;
- the portfolio is well diversified in respect of geography, with only expected concentrations in the major cities;
- the loans are payable in EUR;
- the maximum payment remaining term is 5 years;
- all loans amortize over the tenor of the loans;
- the loans are all fixed rate;
- are no legal impediments in the underlying contracts to prevent a true sale being achieved.

The securitized credit portfolio consists of a cross-sectional data, having 4763 samples of Unsecured Consumer loans and Auto Loans. The selected loans have been sold at different times during the past years.

The original idea of this project was to determine the influence of four financial factors as - maturity date, amount, client’s income and score obtained – on the sold loans volume. The credit characteristics are known for all credits included in the selected portfolio.

Considering the multiple regression analysis, the independent variables of the econometric model are:

- maturity date - representing the due date of the credit;
- amount meaning the value of credit obtained by the bank’s client;
- score meaning the total points/the resolution calculated by the bank’s risk criteria;
- the income representing the client’s monthly income.

The dependent variable considered is the volume of the sold loans which represents the credit balance at the securitization date.
The multiple regression analysis allows to explicitly control the enumerated factors which simultaneously affect the volume variable.

Suppose that the volume of sold loans depends on amount, score, maturity and income and other unobservable variables, the regression equation can be expressed in the following form:

\[
\text{Sold credits volume} = \beta_0 + \beta_1 \log(\text{Income}) + \beta_2 \text{Score} + \beta_3 \text{Amount} + \beta_4 \text{Maturity} + u
\]

Where the \( \beta_0 \) coefficient represents the intercept, \( u \) represents the error term containing other factors affecting the dependent variable; \( \beta_1 \) coefficient measures the change in the volume of loan sold in respect to income; \( \beta_2 \) coefficient measures the change in the volume of loan sold in respect to score; \( \beta_3 \) measures the change in sold credits volume in respect to amount; and the last one, \( \beta_4 \) measures the change in sold credits volume in respect to maturity.

The obtained ordinary least squares regression line should predict sold credit volume with respect to score, amount, maturity and log (income):

\[
\text{Sold credits volume} = -210.1386 \log(\text{Income}) - 22.06601 \text{Score} + 0.792825 \text{Amount} + 248.7352 \text{Maturity}.
\]

As we expected, there is a positive partial relationship between sold credits volume and loans amount, holding the others fixed variables. A supplementary unit in amount is associated with a growth of 0.792825 of a point on the sold credits volume, which means that as the amount value increases so will increase the securitized credits volume.

Analyzing the score coefficient, keeping the income, maturity and amount fixed, another point obtained at the score value is predicted to decrease sold credits volume by 22.06601, which from an economic point of view means that the bank securitized the loans with a low score and retained the ones with a high score, keeping in this way a performant portfolio.

Considering the independent variable, log(Income) and keeping the score, amount, maturity at a fixed value, observe that an additional unit of income is predicted
to decrease the securitized credits volume with 210.1386. The economic interpretation is that the client with a semnificative income, will obtain a high score, and in this way, the bank will want to keep it in its portfolio, thus the sold credits volume will be negatively affected.

The 248.7352 coefficient, means that keeping log(income), score and amount constant, another year of maturity is predicted to increase sold credits volume with 248.7352. This signifies that the bank chooses to securitize especially the credits approved on a long period of time.

The $R^2$ measures the success of the regression in predicting the values of the sold credits volume within the sample. $R^2$ (96.60%) may be interpreted as the fraction of the variance of the sold credits volume explained by the log(income), score, amount and maturity. Taking into consideration the interval in which $R^2$ can take values, we observe that the sold credits volume is highly determined by the independent variables.

Suppose that the decided significance level is 5%, the null hypothesis stated for the log(income) variable is $H_0: \beta_1 = 0$ (doesn’t influence the sold credits volume), while the two-sided alternative hypothesis considered $H_1: \beta_1 \neq 0$ (influence the sold credits volume variable). Considering the p-value, which represents the smallest significance level at which the null hypothesis would be rejected, the p-value determines the $H_0$ rejection, which means that the alternative hypothesis would be accepted (the log(income) variable is statistically significant). When we applied the same methodology for the others variables, we found that all independent variables are statistically significant.

Analyzing the F-statistic represents the test which tells us if the group of all mentioned independent variables has no effect on the dependent variable (sold credits volume).

In terms of the parameters of the model, the null hypothesis is stated as:

$H_0: \beta_1 = 0, \beta_2 = 0, \beta_3 = 0, \beta_4 = 0$ which means that log(income), score, amount, maturity have no effect on sold credits volume.

The appropriate alternative hypothesis is $H_1: H_0$ is not true.

The Prob F-statistic), in our case 0% is less than the established significance level (5%), which means that the null hypothesis that all slope coefficients are equal to 0 is rejected. That means that log(income), score, amount, maturity are jointly significant, and have effect on sold credits volume.

The Durbin Watson stat measures the correlation of the residuals. The basic regression output includes a value for the Durbin Watson statistic. The value from our model is approximately 2, which means that the errors aren’t first order auto correlated.

**Testing the heteroscedasticity**

From the figure below we can observe that the residuals of the regression have systematically changing variability over the sample, that constituting a sign of heteroscedasticity.

*Figure 5. The residuals graph*
The general test used for heteroscedasticity presence is White Test. While the null hypothesis is stated as the existence of homoscedasticity, the alternative hypothesis is the existence of heteroscedasticity. If the result of the White tests - the probability value - is lower than the significance level (5%) we reject the null hypothesis of homoscedasticity at that significance level.

After the heteroscedasticity presence was identified, an alternative estimation method which takes this into account can be used, and if applied it will cause the

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The general test used for heteroscedasticity presence is White Test. While the null hypothesis is stated as the existence of homoscedasticity, the alternative hypothesis is the existence of heteroscedasticity. If the result of the White tests - the probability value - is lower than the significance level (5%) we reject the null hypothesis of homoscedasticity at that significance level.

After the heteroscedasticity presence was identified, an alternative estimation method which takes this into account can be used, and if applied it will cause the
disturbances to be homoscedastic. One possibility to solve the heteroscedasticity is to use the White heteroscedasticity consistent covariances. The effect of using the correction is that the standard errors for the slope are increased relative to the estimated ordinary least squares standard errors, while the coefficients from the initial regression estimation output are the same with those from heteroskedasticity consistent covariance. Anyhow, all the independent variables remain significant at the 5% level.

**Conclusions:**

The process of organizing the securitization is a complex one, which can only be accomplished with solid activity coordination, involving internal and external resources.

In the selection of the credit pool subjected to the securitization process, the issuer must analyze each of the loans with respect to criteria such as amount, date of maturity, interest rate, balance, number of delayed payments, so that the probability of selling high risk credits when considering the monthly payments is diminished.

The securitization dealings in Romania are characterized by a total lack of transparency, the NBR does not offer any useful data about the securitized loans to the public, so that the final investors could take the best decisions. Same lack of transparency is applied also by the issuers who tend to interpret the data availability of their securitized loans as a sign of weakness, which can worsen their image to the public.

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