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## The Impact of National Currency Instability and the World Financial Crisis in the Credit Risk. The Case of Albania

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*My research paper aims at analyzing the relationship which exists between macroeconomic situation and the indicators that measure the quality of the credits in the Albanian bank system for the period 2002-2010. The results of the research work have proved the raised hypothesis that the instability of the national currency, in relation to Euro and the American Dollar, and the world financial crisis have influenced upon the systematic credit risk in Albania. First, we would like to express our evaluation about the credit portfolio characteristics and the tendency of the credit risks in our bank system, evidencing some very important moments which have affected sensibly the tendency of problematic credits. Further, we have investigated the relationship between the credit risk, which is measured by the ratio non-performing loans to total loans and some of the main macroeconomic indicators.*

**Keywords:** macroeconomic factors, financial crisis, credit risks, exchange rate, instability, national currency

**JEL Classification:** G01, G11, G21, F31

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## Introduction

A lot of efforts have been made for the construction of empirical models which assess the influence of the different macroeconomic factors upon the indicators that measure the quality of the banking system. That is the ratio of the credits with problems to total of credits. The problematic credits are caused by the borrowers, who can't pay or can turn back in delay.

These borrowers belong to different economic groups which carry out their microeconomic activity in a certain time and certain space. Their behavior depends and is influenced by the performance of basic indicators which characterizes the macroeconomic development of a certain country. If such indicators display an unfavorable performance for the borrowers, this would influence, in a way or other, upon the level of loan repayment and the latter will influence upon the quality of the bank system, as a whole. Tom Wilson and McKinsey & Company developed "Credit Portfolio View" in 1997, a multiple regression model to measure the credit risk. This model may be useful for evaluation the probability distribution of default and assessment of probability of deterioration of the type of credits in different industrial sectors in certain countries. "Credit Portfolio View" takes into consideration the dependency which exists between the probability of default loans and the deterioration of the credit class to the economic situation.

When the economy doesn't work properly, the possibility of default of companies and the deterioration of the credit class increases, and it happens otherwise, when the economy is developing normally. The quality of the bank system is influenced by certain macroeconomic factors, and every one of them has an important influence upon the credit risks.

This depends on the characteristics of the country, on the economic sector and on the period that we have undertaken the research work. Kern/Reitzig, [2000] pointed out that in seven out of eight important sectors in the German economy, three macroeconomic factors, influenced systematically in deterioration of the credit quality. These factors were: the change of the gross domestic production, the rate of the unemployment and the exchange rate of national currency with the American dollar. Bostjan Aver [2007] defined that the systematic credit risk in the bank portfolio in

Slovenia was greatly influenced from the short term, medium or long term interest rate of the bank institutions at that country, from the rate of unemployment and stock index trading. The quality of the bank system was less influenced by the imports, exports, the exchange rates, the change of the gross domestic production or by the inflation rate.

As the credit portfolio consists of different currency then the exchange rate risk will be present. The credit portfolio according to the currency depends on the available funds and the market demand. Banks manage their funds in different currency through their open positions.

The level of the open positions defines the level of exposure to assessment or devaluation of currencies. The negative changes of the exchange rates damage the structure of the active and the passive of the bank, getting worse their paying ability, the liquidity situation and their profits. Kaminsky, Lizondo and Reinhard [1998], in one of their reviews concerning the bank crisis, concluded that five of seven researches gave evidence to the increase of the credits as basic fact of the bank crisis and its currencies. At the same paper they found out that three out of four credit booms are connected with the bank crisis and seven out of eight of them have to do with the currency crisis. Kaminsky and Reinhard [1990], named it as twin crisis. One currency will worsen the financial bank situation because of its open established positions. Also, the financial situation of the borrower will deteriorate together with the currency crisis which he generates incomes. It is a real fact that many borrowers in Albania have an incompatibility between the credit currency and currency of the entering flux of the money. So, the depreciation of the currency from which they provide incomes put them in difficult liquidity situations and brings them across the way of the increase of problematic credits. If there is a fast lending credit then their effect will be much greater.

### **Portfolio credit characteristics and the analysis of credits with problems in Albanian bank system**

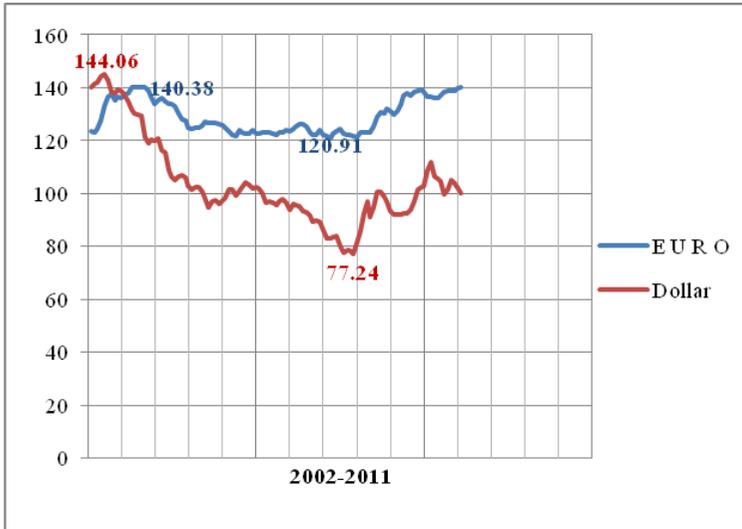
The Albanian bank system activity has increased sensibly. The total weight of the bank system activity to GDP at the end of 2010 was 80.9% %. The development of the credit basis shows evidence as one of the most

impetuous activities and exercises a great influence not only upon the banking activity, but also upon the entire economy of the country. In 2011, the total of the distributed credits by our banking system was 40% of GDP.

In spite of the high rates of growth, Albania is one of the countries with the lowest ratio of the credits in the private sector to GDP, 36.6%. The commercial banks have used a conservative business strategy. The funds collected by the people, in the form of deposits have mainly been invested in Treasure Bonds or in similar instruments of them, with low possible risk and low rate of return. The credit for the economy, not only for the businesses but also for the individuals has been limited; the interest's rates have been very high and the procedures too extended and very careful. The demand has been sustainable, high and constant by the borrowers, with an increasing tendency.

Most of the credit portfolio is the credit which is granted to the businesses, 67.3 % to the businesses and 30.1% to the individuals. In the Albanian economy, the use of the foreign currency, especially the use of Euros and of American dollars, is widely spread and effective. Until 2001, the American dollar was considered as one of the most important currency and has been used in most of the commercial activities as a tool for the protection against the risks of the depreciation of the National currency on one hand, and for facilitating the transactions with foreign companies on the other. The American dollar, gradually, began to lose its domination, after entering the Euro in the Euro zone in the year 2001.

This changing tendency is reflected in the deposit structure, which before that year they were mostly in American currency. The banks have considered it as quite reasonable the use of these two currencies in their credit activity, in order to avoid the exchange rate risk and the interest's norm. The business and the individuals have preferred their credits in Euro because of the low interest's norm of credit in Euro, the long term stability tendency of the Euro, compared with the national currency, but at the same time, because of the fact that the incomes from the business and individuals has been in Euro. The reduction of the interests' norms of the credit in ALL caused the increase of the interest of the credit in ALL and that credit represents a considerable part of the total credits offered by our bank system.

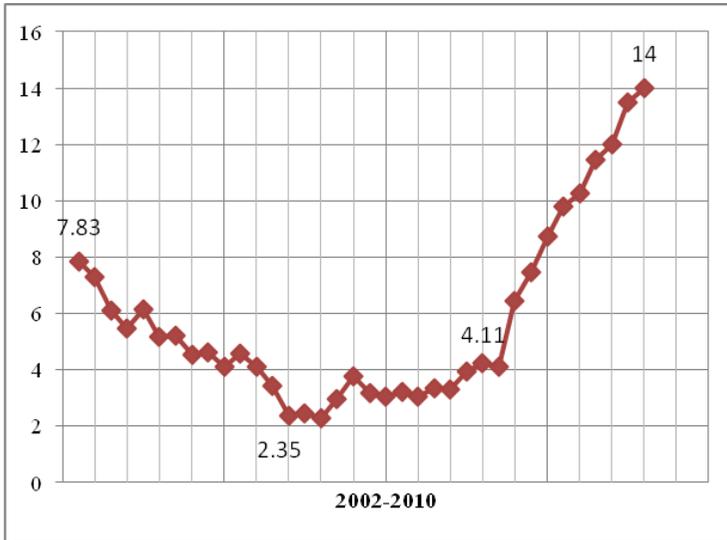


The data to draw the graph from Albanian Bank

**Figure 1:** The tendency of exchange rate ALL/EUR and ALL/\$

Figure 1 show clearly the greater stability of Euro in comparison with the American dollar for the period which is taken into consideration. The exchange rate of ALL with Euro has fluctuated within the terms: ALL 120.91 to 140.38 for one Euro. This exchange rate has varied from time to time with increase or decrease. On the other hand, the exchange rate for the American dollar has fluctuated One ALL for 77.24 to 144.06. But, starting from third quarter of the year 2008 Euro began to assess sensibly towards the ALL. This sort of tendency is present up to March 2011, where the Euro catches the highest quote in ALL, from the time of its existence in Euro zone. For the year 2010, 75% of the Credit Portfolio has been in foreign currency, where 84% has in Euro and 15% in American dollars. After it, it is the credit in ALL and a small part is represented by the American dollar credit. The total amount of the credit in foreign currency, where the incomes of the borrowers are in ALL, represents 35.6% of the total credit and 51% of the credit in foreign currency. The credit in Euro, where the incomes of the borrowers are in ALL, represents 45.3% of the credit in foreign currency. This part of the loan represents a potential channel of

negative impact on the banking sector to adverse changes in exchange rate that can be accompanied with increase in indirect credit risk as a result of the difficulties of borrowers for the payment of the loan obligation.



*The data to draw the graph from Albanian Bank*  
**Figure 2:** The tendency of bad credits

The credits that have to do with real properties have been rising sensibly and rapidly. They represent 14.6% of the GDP. The main features of the credit process concerning real properties that have been evidenced during the last years are: predominance of the credit for real properties granted to individuals and predominance of the credits for real properties granted in foreign currency. Regard the purpose of use the credit for business is focused for the “overdraft”, “purchase of equipment”, “real properties” and less for working capital.

Figure 2 shows the quality of the bank system, respectively credits with problems to total of the credit for the period January 2002 until December 2010. Comparison of key indicators that measures the quality of loans portfolio in the region a test to the quality of loans portfolio in the banking system in Albania, at relatively good, compared to several regional

countries such as Bulgaria, Romania, Lithuania etc. Lithuania presented with the highest ratio of non-performing loans to total loans, with 19.2 % and the lowest level keeps Turkey with 4.9 % Table 1.

**Table 1:** Bank nonperforming loans to total loans for Central and Eastern Europe

	2005	2006	2007	2008	2009	2010
<b>Albania</b>	2.3	3.1	3.4	6.6	10.5	12
<b>Bosnia and Hercegovina</b>	5.3	4	3	3.1	5.9	7.1
<b>Bulgaria</b>	2.2	2.2	2.1	2.5	6.4	7.8
<b>Croatia</b>	6.2	5.2	4.8	4.9	7.8	8.8
<b>Estonia</b>	0.2	0.2	0.4	1.9	5.2	5.6
<b>Hungary</b>	2.3	2.6	2.3	3	6.7	7.8
<b>Lithuania</b>	0.6	1	1	4.6	19.3	19.2
<b>FYR Macedonia</b>	15	11.2	7.5	6.8	8.9	9.9
<b>Montenegro</b>	5.3	2.9	3.2	7.2	13.5	14.9
<b>Romania</b>	2.6	2.8	4	6.5	15.3	17.5
<b>Turkey</b>	5	3.9	3.6	3.8	5.6	4.9

Source: IBM "Global Financial Stability Report", October 2010

## Establish hypothesis and the research methodology

### 1. Establish hypothesis

Based on the research work done by the scientists and foreign experts, we are trying to find out whether the instability of the national currency comparing with Euro and American dollar and the world financial

crisis have had an important influence upon the systematic credit risk in Albania. Hypothesis set up for this case are:

- H<sub>1</sub>: The exchange rate of the Euro with the National currency has had an important influence upon the systematic credit risk in the Albanian bank system.
- H<sub>2</sub>: The exchange rate of the American dollar with the National currency has had an important influence upon the systematic credit risk in the Albanian bank system
- H<sub>3</sub>: The World financial crisis has had an important influence upon the systematic credit risk of the credit in the Albanian bank system.

The suggested model takes into account a relationship between the variable which expresses the quality of the credit portfolio and the other variables which are thought that they are its determinant. The model forms are expressed as it follows:

$$y = \beta_0 + \beta_1 \times \text{euro} + \beta_2 \times \$ + \beta_3 \times K + \epsilon$$

Variables used are quarterly frequency. More concretely, the equation expresses the relationship between the dependent variable, the systematic credit risk which is measured by the ratio of the credit with problems to total credit and the other independent variables which are:

- The exchange rate of the Euro with the national currency, "euro"
- The exchange rate of the American dollar with the National currency "\$"
- The World economic and financial crisis, "K"

The above described model, on the right hand space, expresses the combination of some of the main macroeconomic indicators which taking into account their instability, have influenced upon the general economic situation where the borrowers have carried out their activity. The left side gives the value of the credit with problems to total credit, the quality of the bank system, or, the probability of not paying off the credit taken which depends to the concrete case of the macroeconomic environment. This means that the value of the macroeconomic indicators in a certain period of time determine this report. Hypothesis that are to be proved are:

- H<sub>0</sub>:  $\beta_1 = \beta_2 = \beta_3 = 0$
- H<sub>1</sub>: At least one of the above-mentioned parameters is different from zero.

## 2. Collecting the data and processing the variables.

The instability of the National currency towards the Euro and the American dollar is measured by the exchange rate of All with Euro and All with American dollars. Besides the exchange rate of Euro and American dollars with the ALL, in this model, we have included the World economic and financial crisis. The crisis had negative effects on the macroeconomic situation in Albania which was reflected in the credits with problems. Three different macroeconomic factors were selected to test the above mentioned hypothesis. The selected factors, with effect on the systematic credit risk, represent the entering variables of the model which is used to define their important influence on the value of credit risk in the Albanian bank system.

Here are the following data of the resources that have been taken under analysis.

- INSTAT, the Statistical Office.
- The database of the Albanian Bank (archives with the financial data picked up from the Albanian Bank Bulletin, statistical time series).
- Different published materials from the Albanian Bank.

The realized analysis of the Albanian bank portfolio is mainly quantitative analysis, as the two independent variables that were used to describe the systematic risk factors of the Albanian bank portfolio credit are quantitative and only one of them that is the crises, is a qualitative variable. The qualitative variable, "Dummy" gets the value of "0" and "1".

More concretely, it gets the value of "0" when our bank system is influenced by the economic and financial crisis and gets "1" when it's vice versa. For the period from the third quarter of the year 2008, a period when our bank system was affected by the crisis effects, until the fourth quarter of the year 2010, qualitative factor "Dummy" gets the value "1" and for the other period of time it gets the value "0". The influence of the macroeconomic special factors in the value of risk of the credit in the Albanian bank system has been tested with the support of the software SPSS and other statistical methods, such as the multiple linear regression. The applied model is based on the different data of the macroeconomic factors of the credit risks, collected on quarterly periods, and the quarterly data of the credit risks from January 2002 until December 31, 2010. The chosen period of the

Albanian bank system after the year 2002 was the best for making a suitable analysis, as the period before 2002 makes the results quite complicated.

- First: For the lack of data. The data series for the variable “the exchange rate of ALL/Euro” taken into analysis was rather impossible for the period before the year 2002, as the Euro currency entered in Euro-zone in 2001.
- Second: Methodology changes. Up to the year 1998, the classification according to the categories and sub-categories of the credits with problems was done on some criteria which are quite different from those nowadays. In this way, their value can't be comparable for this respective period of time.
- Third: The change of the credit policy. Before the year 1997 the credits were granted on non-professional, and not competitive basis. This form created a lot of credits with problems for the Albanian state banks. The credits with problems of the privatized Albanian state banks were transferred to the Credit Treatment Agency.

The qualitative indicator of the credit portfolio is measured by the ratio of the credit with problems to total amount of credit offered by the Albanian bank system for the period: January 2002- until December 2010.

### 3. The results of the multiple linear regression

So, we get a multiple linear regression model for three macroeconomic variables, with the coefficient of determination 0,924, and the corrected coefficient of the determination of 0,854. This means that, 85,4% of the credit systematic risk variability in the Albanian bank system is explained by the established model, by the instability of the national currency in comparison with Euro and the American dollar, and by the world economic and financial crisis. The calculated results are presented in the Table 2.

Table 1 presents the results of the test “t”, testing the impact of the independent variable in the credit risk.

- Control the importance of the relationship: The value of Fisher, “F”, is 62.278, which is higher than the critical value. This fact refutes the hypothesis  $H_0: \beta_1 = \beta_2 = \beta_3 = 0$  and automatically accepts as a

true hypothesis  $H_1$ : At least one of the above-mentioned parameters is different from zero. So, according to the test of Fisher, we proved that between the dependent variable, the credit risk, and the independent variables, three macroeconomic variables, there is an important relationship, at least one of the parameters,  $\beta$ , is different from zero.

**Table 2:** Results of multiple linear regression

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.924 <sup>a</sup>	.854	.840	1.292544		
a. Predictors: (Constant), Crisis, Dollar, Euro						
ANOVA <sup>b</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	312.139	3	104.046	62.278	.000 <sup>a</sup>
	Residual	53.461	32	1.671		
	Total	365.600	35			
a. Predictors: (Constant), Crisis, Dollar, Euro						
b. Dependent Variable: Risk						

Coefficients <sup>a</sup>							
Model	Unstandardized Coefficients		Stand. Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-16.168	5.492		-2.944	.006	-27.354	-4.982
Euro	.131	.052	.259	2.519	.017	.025	.237
Dollar	.035	.018	.182	1.925	.063	-.002	.072
Crisis	5.634	.649	.766	8.684	.000	4.313	6.956

a. Dependent Variable: Risk

Criterion “t” for the evaluation of the importance of individual parameters and verification of the three raised hypothesis. The equation that we have taken is:

$$y = -16.168 + 0.131 \times \text{euro} + 0.035 \times \$ + 5.634 \times K + \epsilon$$

The regression coefficient signs are in accord with the economic logic, which in our case means:

- An increase of the exchange rate of ALL/Euro with a unit, influence in the increase of the credit risk with 0.131 per unit, when all the other variables remain constant.
- An increase of the exchange rate of ALL/American dollar with a unit, influence in the increase of the credit risk with 0.035 per unit, when all the other variables remain constant.
- An economic and financial crisis, influence in the increase of the credit risk with 5.634 per unit, when all the other variables remain constant.

In order to determine which of the parameters is more important, it is used as statistical method the criterion “t”. By comparing the values of “t” critical for  $36-2-1=33$  degrees of freedom and  $\alpha=0.05$  shows that the three “beta” coefficients are statistically significant. So the coefficients before the independent variables are different from zero, because there is an important relationship between them and the systematic credit risk. So, the three raised hypotheses are true:

- H1: The exchange rate of the Euro with the National currency has had an important influence upon the systematic credit risk in the Albanian bank system.
- H2: The exchange rate of the American dollar with the National currency has had an important influence upon the systematic credit risk in the Albanian bank system
- H3: The World financial crisis has had an important influence upon the systematic credit risk in the Albanian bank system.

## Conclusions

The results of the analysis of the credit risk of the Albanian bank system for the period: January 2002-December 2010 shows that the instability of the National currency in comparison with Euro and the American dollar and the world economic and financial crisis had an important influence on the credit risks of the Albanian bank portfolio.

The risk of the credit is influenced by:

- Instability of the exchange rate of ALL/Euro. For the period January 2002 until December 2010 the National currency has been evaluate and underestimated many time compared with euro, within an interval of 120.91 to 140.38. The underestimation of the National currency and the evaluation of euro has negatively influenced on the borrowers who have taken loans in euro. This means much more ALL to liquidate the loan payments. As a result of this, the possibility for paying off the credit is increased and consequently the number of credits with problems is greater. Most of the credit which has been offered by the Albania bank system has been in euro. For the year 2010 the total amount of the credit in foreign

currency, where the incomes of the borrowers are in ALL, represents 35.6% of the total credit and 51% of the credit in foreign currency. 89 % of this loan is in euro. Consequently, the increase of the credits with problems as a result of the increase of the exchange rate ALL/euro is evident. After the crises, the value of the exchange rate of ALL/Euro is sensibly greater than the average of the above mentioned period. The financial and economic crisis influenced on the underestimation of American dollar towards the Euro, in the reduction of the incomes from the remittances and in the reduction of exports. These factors brought up a sensible evaluation of Euro against the ALL.

- Instability of the exchange rate of ALL/American dollar. Having observed the Figure no.1, it is noticed that the exchange rate of ALL/\$ has been much more instable than the exchange rate of ALL/Euro. The values are included within the limits: 77.24 to 144.06 per dollar. But the greatest influence in the systematic credit risk has had the instability of the Euro. This, because of the fact that, the credit in American dollar makes up a small amount of the total credits offered by the Albanian bank system.
- The credits with problems increased greatly because of the negative effect of the world economic and financial crisis. The world economic and financial crisis explains 84.2 % of the variability of the systematic credit risk.

The world economic and financial crisis influenced on the reduction of increasing rhythm of the granted credits, in the existing situation with an continuous uncertainty in the world financial trade markets, trust crisis among the main operators in these markets, lack of liquidity and the dreary prospect for the global economic growth. The reduction of increasing rhythms of the credits brought up an increase of the ratio of credits with problems to total of the credit offered by our bank system.

The crisis influenced on the deterioration of the macroeconomic indicators which affected negatively the microeconomic environment, where the individuals and businesses carried out their activities. The increase of the exchange rate of the ALL/Euro, the increase of the number of

unemployed, the reduction of the remittance incomes brought the deterioration of the financial situation of the individuals and their families, and this situation was reflected in the increase of the probability of default.

On the other side the businesses had marked difficulties which were accompanied by the fall of their profits and sometime by a number of bankruptcies. Many of the businesses had problems for being financed by the bank system, because of the crisis, and many of them coped with a reduction of the foreign demand and consequently because of the fall of exports, the increase of the financial cost and because of the public debt. All this brought about a growth of the non-payment of the received credits. Another element which ought to be stressed is the fact that the economic crisis influenced upon the reduction of the incomes of remittances.

The credits concerning the real properties occupy an important part of the GDP, and that makes up the overwhelming part of the granted credits to individuals. The reduction of the remittances influenced directly on the aggravation of credits with problems.

- The results show that the instability of the national currency in relation to Euro and the American dollar, the world economic and financial crisis had an important influence in the value of the credit risk on the Albanian bank system. But, we can't avoid and not take into consideration the influence of the other factors that do not appear at this analysis. This shows the restriction of the research model. These factors represent those which might have influenced upon the credit risks for the period that is made this analysis.

## **Recommendation**

Having reviewed the correlating coefficient of the multiple regression model, Figure no.1, it shows that the instability of Euro has influenced much more than the instability of the American dollar in the credits with problems in Albania during the period: 2002-2010. The instability of Euro explains 40.7% of the variability of the credit risk, while the instability of American dollar explains 32.25% of the variability of the credit risk. This can be explained by the fact that the greatest part of the granted credits from the bank system are in Euro, and it is evidently that part of the Albanian

borrowers have a discrepancy between the credit currency and the entering flow of the incomes. The Albanian borrowers have preferred this alternative because of the low rate of interest in the credits of euro and their trust in the stability of Euro. This brought up the greater influence of the instability of the Euro in the deterioration of the quality of the Albanian bank system portfolio. That's why we do conclude that the Albanian bank system is rather exposed on the instability of the national currency toward the Euro and the American dollar, which influence straight to the quality of the credit portfolio of our bank. For this reason, the banks must follow more equilibrium policy of credits, aiming at increasing the credit in ALL. The banks may offer even credits in Euro to the individuals that have current incomes in Euro. It is of great importance the management of the net currency position of the banks' balance, which actually is in low levels, restricting the possible loss amounts.

Another very important factor which may influence upon the quality of the bank credit portfolio is the instability of the immovable properties prices. A reduction of the price of the real properties influences on the reduction of the value of the credit collateral for immovable properties, exposing the banks to great losses. The credit crisis in the USA must serve as a good lesson for our bankers. They must pay attention to the qualitative analysis of the borrowers, estimating the future flows of the money and they must not be based only to the physical collateral. The increase of the credit for the real properties and their domination towards the total of the credit expose the banks on the risk of devaluation of the real properties.

Based on the macroeconomic forecasting indicators, it is predicted the deterioration of the bank qualitative portfolio. Therefore, the bank ought to create enough reserves for the possible losses from credit risk. Based on the portfolio of loans, as well, the bank must identify their clients who have temporary problems, establishing supporting policies for them and increasing their possibility for payment. As for clients who are assessed with low chance of repayment of the loan, banks must follow legal procedures for the execution of guarantees and collateral to recover a greater amount of the loan. As for the new credits, based on the experience gained by the banks with problems, it is necessary to plan a better

distribution and to have a reasonable equilibrium between the public and private projects; between the business entrepreneurs and the families; between the ways of granting credits in ALL and foreign currency, etc., managing lending activity in such a way as to minimize the exposure of the banks toward the problematic forms and to reduce centralization, as a whole.

The results of our analysis may be applicable in other financial institutions such as: insurance company, pension funds, etc., when taking into consideration the management of the risk of their financial investments. They may be applicable in special economic sectors, e.g. may be realized empiric analysis of the influence of macro-economic factors in the credits with problems at the trade sector or at the construction sector, etc. The results of our analysis may be applicable in the credit portfolio according to the purpose of use, e.g., may organize empiric analysis of the influence of the macroeconomic factors in the credit with problems for the immovable properties and finally, the results of our analysis, may be applicable in the credit portfolio by the subject, business or individual, according to the schedule, etc.

As the Albanian bank system, displays positive reactions toward the macroeconomic situation of the country, the banks must organize the stress-test analysis. This analysis estimates the different scenario of the main macroeconomic indicators and based on the probability of occurrence of these scenarios must take immediate reaction and response, in order to avoid the different losses of the bank portfolio. Banks should strive to be the analysis more accurate, more frequent and performed on more advanced forecasting programs.

## References

- [1] Albanian Bank, *Semiannual Report*, 2010;
- [2] Albanian Bank, "Articles published on Albanian Economic Bulletin over one decade", period 2005-2007, December 2007;
- [3] Bostjan Aver, "An empirical of credit risk analysis of Slovenian banking System", 2007;

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- [4] European Bank for Reconstruction and Development, "*Recovery and reform*", *Transition Report*, 2010;
  - [5] Glantz, Morton, "*Managing Bank Risk An introduction to Broad-Base Credit Engineering*", 2003;
  - [6] IBM, "*Global Financial Stability Report*", October 2010;
  - [7] Kaminsky, Lizondo dhe Reinhard, "*The twin crises: The causes of banking and balance of payments problems*", International Finance Discussion Paper. 1998;
  - [8] Kaminsky dhe Reinhard, "*The twin crises: The causes of banking and balance of payments problems*", American Economic Review. 1999;
  - [9] Kern / Reitzig, "*Comparative analysis of credit risk model*", 2000;
  - [10] Rajan, "*Why bank credit policies fluctuate*", 1994;
  - [11] Tom Wilson and McKinsey, "*Credit Portfolio View*", 1997