THE 14TH EDITION OF THE INTERNATIONAL CONFERENCE
EUROPEAN INTEGRATION
REALITIES AND PERSPECTIVES

ROBOR - a "Thumbscrew" of the Romanian Financial System?

Viorica Puşcaciu[1], Rose-Marie Puşcaciu[2]

Motto:
"Inflation decreases when I decide."
(The Savior of the Dune, Frank Herbert)

Abstract: Although present in the banking business for several years, ROBOR has recently become a much discussed and disputed problem in the Romanian economic life. Even if - just recently, after many disputes, it was replaced, we try to clear the situation. What is and what is the use of this banking tool that influences financial activity and influences the lives of many of us? This paper intends to clarify – at least partly – the importance and the main aspects of this banking instruments that lately became a true, "thumbscrew" for the Romanian financial system. Thus, this research is meant to be an essayistic approach of this controversial matter, which has much influenced the economic and social scene in our country. The study refers to the functioning mechanism ROBID-ROBOR, to the reasons of which the interest rates are related to ROBOR, and tries to answer to the question like - what are the factors that influence the evolution of ROBOR, and how this bank index influences bank rates. Our study is addressing both to specialists, and also to the students and researchers which might be interested in this matter. It is a quantitative and qualitative approach of the subject meant to be useful for anyone would read it.

Keywords: interest; loan; average rate; bank institutions; indicator

JEL classification: E43; E44; E52; E58; G12

1. Introduction

For over half a year, ROBOR has become an apple of discord in Romanian society, and there is no day to appear in the media. Everyone talks with concern about ROBOR, making all sorts of scenarios more or less pessimistic about its evolution. A simple search on Google for the word "ROBOR" shows that there are about 1,890,000 results. Why and how did this phenomenon inflame the spirits? The cost of credit in Romania is anyway much higher than any other country in the European Union, or else Romania's financing costs, even as a country, are excessively high. Romania has been paying the highest interest rate for its foreign loans from all the countries of the European Union for several years. But because we cannot compare apples to pears, let compare apples to apples, and see how we face our neighbors of suffering in the former communist East and outside the Euro zone: if we borrow at 4.79% interest, the Hungarians interest rates are 2.68%, the Polishs at 2.69%, the Czechs at 1.76% and the

[1] Professor, PhD, Danubius University of Galati, Department of Economics, Romania, Address: 3 Galati Blvd., Galati 800654, Romania, Tel.: +40372361102, Corresponding author: vioricapuscaciu@univ-danubius.ro.
[2] Senior Lecturer, PhD, Danubius University of Galati, Department of Economics, Galati, Romania, Address: 3 Galati Blvd., Galati 800654, Romania, Tel.: +40372361102, E-mail: rosemarie.puscaciu@univ-danubius.ro.

Bulgarians at 0.68% (all these are interest rates on long-term loans - 10 years). In order to see the causes of this situation, we have to understand some elements even from there beginning of the phenomenon.

2. A Little History of ROBOR - an Abbreviation

In the mid-1990's, the wings had gained for the money market in our country. It was certain that this market would have a future, so we'll reach to have our "LIBOR" too! The model was the London Interbank Offered Rate (LIBOR). The prefix being "L" in London. And the root of the word - an abbreviation of the "Interbank Offered Rate". So they told BUBOR. By abbreviation, like LIBOR. The prefix is "BU" in Bucharest, and the root of the word "BOR" from the Interbank Offered Rate. Why BUBOR and not BUY? For aesthetic reasons. It does not sound good. Finally, as the money market grew and, with the prospect of joining the European Union, began to interfere with foreign markets, neither BUBOR sounded better. Because the Hungarian Monetary Market Index also bears the same name, BUBOR. At our neighbors, the prefix "BU" is a short term in Budapest. And so, BUBOR became ROBOR with "RO" in front. LIBOR stepped up on the London interbank scene in 1984, when bank-to-bank transactions grew and needed a benchmark for interest rates on loans. A time it grew slow; until the first quotations appeared, two years passed. And only three coins were measured: the pound sterling, the US dollar and the Japanese yen. But it took speed, soared as other coins were collected, including the Swiss franc, the Swedish crown, the Australian dollar, and the list could continue. As London were becoming a big financial market, so LIBOR has been enriched with many maturities, a total of 15, four representing short terms and eleven long terms, from one month to one year. In addition to the fact that umbrellas have been opened for about 15 currencies, interest rate developments have been "measured" for a large number of the most sophisticated operations, including financial derivatives. The model, therefore, was redundant. But our ROBOR just started on the road. It needed a lot of school. First and foremost, he had to learn to be an index in all the power of the word. Therefore: 1) act as a factor for analyzing the dynamics of the money market over time; 2) be a variable expressing distinct notes of a present period, comparable to another period, from a closer or distant past; 3) measure changes in a given time, one day, one week, one month, one year in the money market; 4) provide relevant statistical data for a correct interpretation of interest rates and a better understanding of them. A complex analysis, therefore, that cannot be done without performing synthetic indices. And ROBOR has, over time, learned to be such a synthetic index of the money market.

3. Defining the Concept of ROBOR

ROBOR (Romanian Interbank Offer Rate) is the average interest rate at which the banks are borrowed between them in Romania in national currency (RON/RON). This indicator is set by the National Bank of Romania based on the information provided by the top 10 most active banks on the market[1].

ROBOR interest is calculated for the same day, the next day, as well as for one week, 1, 3, 6, 9 and 12 months. The most used bank indices for setting the level of variable interest rates on loans are ROBOR 3M (3 months) and ROBOR 6M (6 months), plus the bank's margin.

The question may be asked - how many quotations have ROBOR indices? The most used bank indices for setting interest rates for lei are ROBOR 3M (3 months) and ROBOR 6M (6 months). Another question would be: what type of interest is influenced by ROBOR? The only interest affected by

[1] NBR (National Bank of Romania). ROBID and ROBOR Rules. Accessed on September 5, 2018.

ROBOR is the variable interest rates in lei that have as reference the ROBOR index, i.e. they are made up of ROBOR + a fixed margin of the bank. The smallest value ever recorded by the ROBOR 3M indicator was on September 27, 2016, and on October 14, 2016: 0.68 percent[1]. A small value of the ROBOR index is correlated with a lower rate for loans contracted in lei.

4. Reference Indices

- ROBID;
- EURIBOR;
- LIBOR;
- ROBOR, EURIBOR and LIBOR are benchmark indices and represent the average interest rate for loans in LEI, EURO, USD and CHF;
- ROBOR comes from the Romanian Interbank Offer Rate and represents the average interest rate for RON loans granted on the interbank market and is set by B.N.R.;
- The EURIBOR or the European Interbank Offered Rate is the international rate of interbank interest for the EURO, i.e. the interest rate at which a large number of banks grant each other loans to finance their current operations;
- LIBOR or the London Inter-bank Offered Rate is the index used for loans to banks in the London market. It is mainly used for USD and CHF loans;
- ROBID (Romanian Interbank Bid Rate) is the average interest rate on deposits attracted on the Romanian interbank market.

5. Related Work

Baba and Nishioka (2005) evaluated the role of TIBOR/LIBOR, i.e. the "Japan spread" as an indicator of bank credit risk and investigated the interdependence of bank credit risk in money markets within and across borders since the 1990's. They find that observed risk premia constructed from TIBOR/LIBOR contain global and currency factors, which explain most of the variance of the risk premia. Furthermore, the correlations of the same bank groups' risk premia between the yen 12 ECB Risk measurement and systemic risk April 2007 banks' risk premiums in the same currency market are very high. Finally, they also document that the fundamental prices account for only a small portion of the total variance of risk premia.

Carling, Ronnegard, Roszbach (2006) propose a model that manages to follow both the trend in credit losses and produce industry driven, time-varying, fluctuations in losses around that trend.

Akram, Bårdsen and Lindquist (2007) evaluate two main views on pursuing financial stability within a flexible inflation-targeting regime. It appears that potential gains from an activist or precautionary approach to promoting financial stability are highly shock dependent. They find support for the conventional view that concern for financial stability generally warrants a longer target horizon for inflation.

[1] curs-valutar-bnr.ro. „Grafic si istoric ROBOR din 2005 pana in prezent". Accessed on September 5, 2018.

de Graeve, Kick, Koetter (2008) suggest an integrated micro–macro approach with two core virtues, as evidence on central banks' twin objective, monetary and financial stability, is scarce.

Balakrishnan, Danninger, Elekdag & Tytell (2009) studies how financial stress is transmitted from advanced to emerging economies, using a new financial stress index for emerging economies.

At the same 2009, Tovar emphasizes that the major weakness of the financial accelerator mechanism is that it only addresses one of many possible financial frictions.

Jacobson, Linde & Roszbach (2011) empirically study interactions between real activity and the financial stance; using aggregate data the authors examine a number of candidate measures of the financial stance of the economy.

Baxa, J.; Horváth, R. & Vašíček, B. (2012) examine whether and how selected central banks responded to episodes of financial stress over the last three decades. The authors employ a new monetary-policy rule estimation methodology which allows for time-varying response coefficients and corrects for endogeneity.

Giordani, Jacobson, von Schedvin, Villani (2014) demonstrate improvements in predictive power when introducing spline functions to take account of highly nonlinear relationships between firm failure and leverage, earnings, and liquidity in a logistic bankruptcy model.

6. Problem Statement

The matter which this study is intended to clear is why and at to which extend is this indicator – ROBOR -was influencing our financial system and economic life. For this reason we have to analyze the functioning mechanism ROBID-ROBOR. This is as follows: every day at 11:00, the banks that are part of the group of those who show prices for ROBID-ROBOR put their pricing on the page. For 15 minutes these prices cannot be changed. For clarification, the NBR was not involved in ROBID-ROBOR but as an observer, until it gave a law that set a higher limit for ROBOR. Specifically, each bank shows at what price it buys and at what price sells liquidity for each scandet: one day, one week, 6 months, etc. ROBID shows the price at which the bank wants to buy liquidity and ROBOR shows the price at which the bank wants to provide liquidity. The ROBID-ROBOR transactions are made in RON 5 million, the amounts are not very high relative to the market depth. The purpose of this benchmark is to give the real picture of the interbank market situation, and to offer a benchmark for the RON liquidity price at different maturities.

Of course, depending on the sum, the market prices may differ from ROBID-ROBOR. But in a market where liquidity is managed correctly these differences are not significant. Theoretically, an increase in interest rates on the interbank market shows that liquidity is expensive. The reasons why the liquidity in lei becomes expensive are multiple short term, a few days, but in the longer term the only one that influences the liquidity in the market is the central bank. So, if a bank does not want to offer liquidity puts a high price - ROBOR high, and if a bank wants to attract liquidity, then it puts a high ROBID price. In situations of liquidity crisis, we see an increase in ROBID-ROBOR. If a bank does not want to attract liquidity puts a smaller ROBID, and if it wants to give liquidity a dropping ROBOR. The interbank market works like any free market based on demand and supply, buying and selling liquidity. When liquidity is abundant, its price decreases and when it is rare its price rises.

The ROBOR 9-month index, representing the interest rate paid on ROL loans attracted by commercial banks from other commercial banks for a nine-month period, rose to 3.58%, from 3.57% on Friday. The

ROBOR 12-month index, representing the interest rate paid on ROL loans attracted by commercial banks from other commercial banks for a period of 12 months, remained at 3.62% on Friday. ROBOR represents the average interest rate at which Romanian banks borrow between them in RON. The index was set daily as the arithmetic mean of the quoted rates of 10 banks selected by the NBR.

But during ROBID -ROBOR some banks put low prices, but followed by the phrase "level" which means they do not want to trade at these prices. At the same time, the same banks traded before 11:00 and after 11:15 at prices ranging between 30% and 100% (attracting 30% liquidity and offering it at 100%). If all banks would display real prices - it only happened for a few days - we would have had a real and transparent picture of the situation on the interbank market and could have analyzed the role of monetary policy much easier. No scenario appears, and to understand what happened then a lot of inventiveness is needed. Especially since the central bank does not publish the data ever since. As an example, the mistake made by Reinhart and Rogoff was discovered because they provided data with which they worked. This is normal when we talk about empirical analyzes, but especially when the central bank is a public institution. Here is an example, as shown by the recent ROBID-ROBOR statistics: ROBID-ROBOR (11AM).

Table 1. Interest rates on the interbank market ROBID/ROBOR are calculated on a daily basis by Reuters

	ROBID								ROBOR							
Period	**O/N**	**T/N**	**1W**	**1M**	**3M**	**6M**	**9M**	**12M**	**O/N**	**T/N**	**1W**	**1M**	**3M**	**6M**	**9M**	**12M**
15/02/2019	3.35	3.36	3.38	2.99	2.84	2.97	3.08	3.13	3.66	3.67	3.68	3.30	3.17	3.35	3.47	3.52
14/02/2019	3.37	3.37	3.36	3.00	2.84	2.96	3.07	3.13	3.68	3.67	3.67	3.31	3.17	3.34	3.46	3.52
13/02/2019	3.32	3.33	3.35	3.01	2.84	2.96	3.07	3.13	3.63	3.64	3.66	3.31	3.15	3.34	3.46	3.51
12/02/2019	3.23	3.24	3.26	2.95	2.78	2.92	3.05	3.12	3.55	3.55	3.58	3.26	3.09	3.30	3.43	3.50
11/02/2019	3.22	3.23	3.26	2.95	2.77	2.92	3.05	3.12	3.54	3.55	3.58	3.25	3.10	3.29	3.43	3.50
08/02/2019	3.23	3.25	3.27	2.96	2.78	2.92	3.06	3.13	3.55	3.56	3.58	3.26	3.10	3.30	3.44	3.51
07/02/2019	3.25	3.25	3.30	2.96	2.79	2.92	3.05	3.12	3.56	3.57	3.62	3.27	3.10	3.30	3.43	3.51
06/02/2019	3.24	3.27	3.31	2.95	2.78	2.93	3.04	3.11	3.55	3.59	3.63	3.27	3.11	3.31	3.43	3.50
05/02/2019	3.20	3.23	3.23	2.95	2.77	2.92	3.05	3.11	3.53	3.55	3.56	3.26	3.09	3.30	3.44	3.48
04/02/2019	3.20	3.22	3.23	2.94	2.75	2.92	3.04	3.11	3.52	3.54	3.55	3.25	3.07	3.30	3.43	3.49

Source: NBR

7. ROBOR versus "greed"

This money market index measures with a maturity - of eight weeks from one week to one year the cost of money market placements, of course, between banks. A good family index: LIBOR for the US dollar or for the pound sterling; TIBOR for the Japanese yen; WIBOR for the Polish zloty, PRIBOR for the Czech crown; BUBOR for the Hungarian forint; and of course, many more, for other and other money markets in the world.

Nowhere, however, on Terra, nobody had the idea of taxing banks' assets from the level reached by this index. The exception, unique on the planet, is with us. Emergency Ordinance 114/2018 (issued by the Romanian Government) instituted a charge on bank assets if the ROBOR index exceeds 2 percent.

Therefore, in these early days, when ROBOR is listed as 3.50 percent, it is quite clear that all 35 banks in our banking system are subject to the extravagant charge called "greed". Among bank assets for which taxes would be paid this year if there is no change, including: 1) money in banks' cash desks; 2) the funds held in the accounts of the National Bank of Romania; 3) derivative financial instruments; 4) the volume of assets, with a huge balance in the balance sheets of 81.58 percent, amounting to the debts representing the money borrowed by state banks, companies and the population. Recalling, therefore, that banks would pay taxes on loans to the Ministry of Finance, businesses and the population.

8. Two Curves in Tandem

What is ROBOR looking for in this combination? This is the problem. Because ROBOR, if it would continue to remain the benchmark for taxing banks, would push the banking system to pay for shocks and risks in the economy. Since mid-September 2017, when inflation has begun to show its tides, after nearly three years of profound calm, ROBOR has also entered an acute growth process. And here's how a certain economic indicator, by nothing more than other indicators, has not only become a character of the public scene, but it has gained notoriety as well. But the truth is that since September 2017 and so far, ROBOR has, in particular, been following the footsteps of inflation. And inflation has reached the hill, being pushed at shocks by the regulated tariffs on heat or electricity, when the international price of oil that fuel has risen, when the price of some fruit of the earth in which we find the influences of the price transport, electricity and solar heat. The Central Bank, after each of the three inflationary shocks, in October 2017, January and April 2018, raised bottlenecks and dramatically reduced the force of inflation. Further, it has calmed the rise of ROBOR! Two curves go in tandem and are continuously compared: the interest rate curve and the inflation curve. And if at the turn of 2017-2018 inflation faded, it is certain that we could not have declining interest rates; so, he climbed the ROBOR. But here, while the 12-month rally rose up to 5.40 percent in May, the NBR halted the monetary policy rate to less than half: to 2.50 percent. Although, with an interest rate of more than 5.40 percent, life would have been easier. But would it have made life easier for the country? Of course not. Two examples are edifying. Because an interest rate of 5.40 percent or more, to cover inflation, would have hit economic growth. At the same time, a lombard interest rate of 6.40 percent, which would have corresponded to the NBR interest rate of 5.40 percent, would have widened the ROBOR movement corridor to the same level, and would have hit it all those who have to repay loans with flexible interest rates to banks.

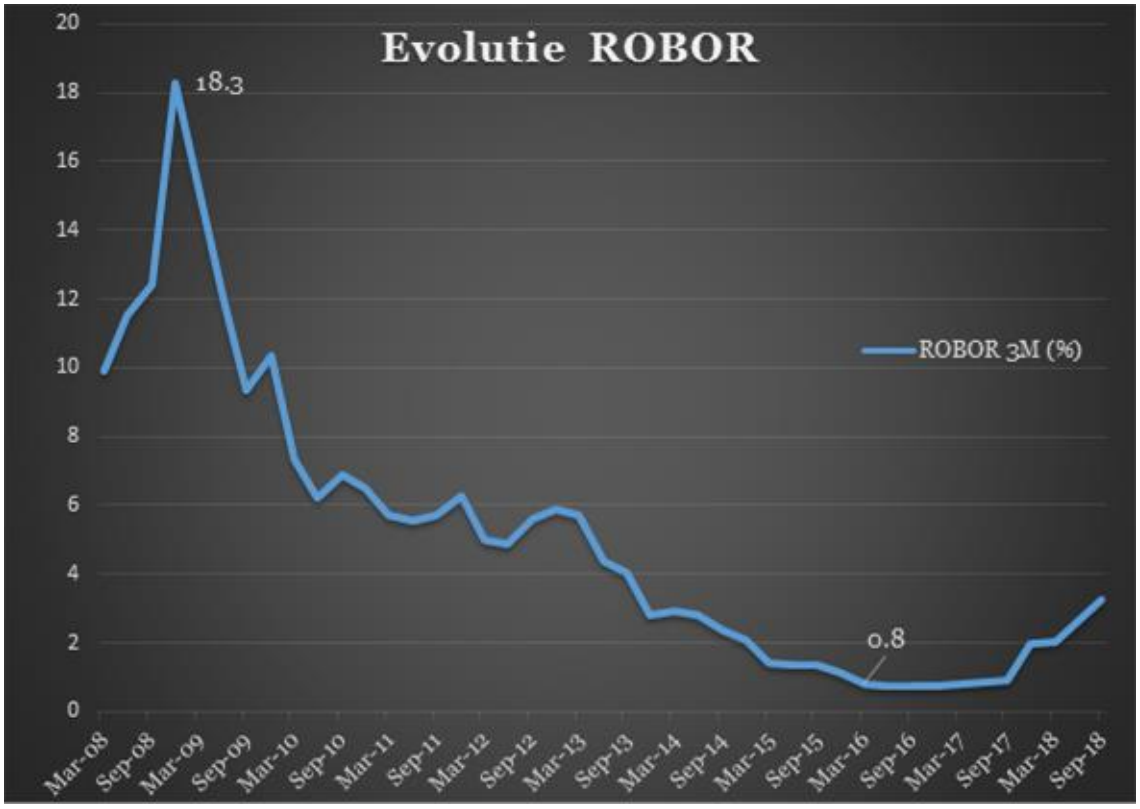
9. Why are Interest Rates Related to ROBOR?

It's simple - it was the decision of the Romanian State, which in 2010 enacted the conditions under which the credits can be granted by the Emergency Ordinance 50 (OUG 50). Thus, the State (following a European Directive) decided that loans could be granted either with fixed interest, or with the interest rate correlated to a reference index - ROBOR. This benchmark has been chosen because it is an internationally used practice, and its establishment is transparent. By this Ordinance, the State decided to protect the population from possible interest rate increases on loans resulting from unilateral decisions of banks. Thus, now (on the basis of the law's obligation), credit agreements, in lei, with variable interest, mention an interest composed of ROBOR + a fixed margin of the bank. In this way, for a bank, ROBOR is the cost of the raw material, and the margin is the gain from which the costs are covered (rents, consumables, ATMs, software, salaries, etc.) and eventually profit. Thus, ROBOR does not influence the profit of a bank.

10. What are the Factors that Influence the Evolution of ROBOR?

ROBOR fluctuates depending on the economic conditions, the inflation rate and the money available in the banking market. Banks have no interest in influencing ROBOR precisely because it reflects a cost for both loans and deposits. So, if ROBOR grows, it raises the income of a bank, but it also raises the costs for banks, because then banks will be more expensive to finance in the financial markets, or through deposits attracted from its clients. No one can predict exactly which level will have an average interest rate (ROBOR or EURIBOR) at a time, because it depends on a lot of factors that are hard to predict/measured or influenced. Including State interventions in the economy or economic and fiscal policy decisions radically influence the evolution of ROBOR, alongside inflation or external developments. What was the evolution of ROBOR? Over time, there have been times when ROBOR has also declined and ROBOR has grown. Here you can find out more about the ROBOR evolution in recent years.

Table 2. The evolution of ROBOR



Source: NBR statistics

For example, in the last 10 years, the highest ROBOR at 3 months was in March 2009 when a rate of 18.3% was recorded. The minimum was in March 2016 at a rate of 0.8%. It is just an example, but it shows quite clearly that ROBOR is a living interest rate that is constantly moving.

11. How was ROBOR Calculated?

ROBOR was an index calculated by a very complicated, clearly established formula under the supervision of the National Bank of Romania (NBR), and calculated by the help of the Thomson Reuters

financial company (a company that existed since 1851 and which also calculates interest reference EURIBOR used worldwide). More precisely, ROBOR was calculated daily as the arithmetic average of the interest rate quotations for lei used by ten major banks in Romania, being the interest rate at which a bank borrows liquidity from other banks. Calculations excluded extremes (highest and lowest interest rate) to be relevant to this index. Thus, we can say about ROBOR that it was a price of money in interest - a kind of reference - that is, a reference to the cost of money for a local currency. ROBOR was very transparent, it being a price tag and a benchmark for the evolution of interest rates on the banking market, calculated and published both on the Thomson Reuters platform and on the NBR website, in a clearly defined way and pursued by local/international financial institutions, by the authorities. ROBOR was announced daily by the National Bank of Romania on the website: https://www.curs-valutar-bnr.ro/robor.

12. ROBOR "handled" by Inflation

Robor grows as inflation rises. There are two categories of factors that explain this growth: some are the so-called "fundamental factors, which are related to inflation, which is increasing. The idea is that at an inflation of over 3% in the first part of the year, we could not expect Robor to be below 1%."

Conjecture makes the Robor Index to precipitate. The second category of factors, the conjunctural ones, which precipitated the growth tendency of Robor. This growth has been accelerated and precipitated by the fact that in recent times the excess liquidity we had in the money market has fallen sharply, because state companies have paid very large amounts of money to the state budget, in the money market, in bank deposits, and now they are no longer, are in the accounts of the Ministry of Finance, which has diminished the liquidity we had in the banking system.

What are the Effects?

They are that the ROL loans will be expensive because of the bad faith, the stupidity and the incompetence of the political factor. Loans in lei will rise because interest rates on ROL loans are rising. These are established by banks according to the Robor index. Many customers in lei, individuals, are on a margin of several percent, which will now be consumed. The effect will be that bad credit portfolios will appear in banks. Is it the problem of the banks? What is the significance of the fact that the Robor index has continued to increase in the last few months, after spending several days on a percentage basis. Behind this rise, symptomatic, there is a new REPO operation of the National Bank. There were times when the ROBOR index actually jumped into the air. The result was that the credits were up again.

The REPO index is a barometer of the state of the economy. There is, at the moment, a trend of Western ideas, according to which it is good for the economy to have a 2% inflation. The problem is that in us this growth does not indicate a well-being of the economy. On the one hand, an increase of several basis points on the Robor index is irrelevant. On the other hand, the overheating of the economy, due to political attacks on the prosperity of the economy, leads to inflation. Let us recall - for example - inflation in September 2018 was 1.8%. Given that the monthly inflation growth was 0.5%, we had an optimistic inflation expectation of 2.4%. The Robor Index and conjunctural factors. There are several factors that influence the Robor index. Some are fundamental, others are conjunctural. When we talk about the latter, we suddenly start making politics. And politics, as we shall see, influences the Romanians' loans, from the size of the interest. The question arises: what were these conjunctural factors this year? Payments to the budget are such a factor. And very important: the government has asked state-owned companies to pay a pretty big dividend. It pulled liquidity out of the market. As the money market is

quite limited to us, the super-dividend in the absence of money from the budget, contributed to the rise of the leu and the growth of Robor. Third, Finance, during the summer, continued to issue monthly - a relatively constant amount from month to month - of government securities. The Robor Index, influenced by overlapping factors. We will detail this subject and its meanings in the coming days on an essential theme. This issue of titles has been made on the background of relatively low maturity. That is, maturities of relatively small amounts - a billion-two billion lei. Finance has issued titles of 3-4 billion lei a month. And it extracted from the liquidity of the market about two billion lei a month. But the Finance Ministry is constantly in the market to finance its needs. But this is not the problem: there are still fluctuations in liquidity and because, on a monthly basis, some titles can be mature, which may be higher or lower. Obviously, this also influences liquidity on the money market. Now, there was an overlap of several factors (n.n: conjuctuals) besides the fundamental ones. Robor had begun to grow for a while, but not so fast.

13. Conclusion

The Finance Ministry proposes that Robor be replaced by the average interest rate, weighted by the borrowed amount. However, this average interest rate of transactions will fluctuate a lot in the situation where a bank or another will have conjunctural hunger. Under these circumstances, why do individuals or companies depend on the eventual volatility of bank lending rates? It would be right that interest rates on loans rise or fall depending on the general market context driven by macroeconomic developments. All these turbulences in the Romanian financial-banking system after a long period of economic upheaval ended with the replacement of ROBOR, with another indicator. But it seems that this does not solve the underlying problem - the sustained rise of this indicator - and with it credit rates, or, in other words, the increase in credit. The explanation would be that the average interest rate on interbank transactions instead of Robor is simply the replacement of an artificial benchmark with another artificial benchmark in the cost of credit to the population and companies. The fair benchmark is interest on bank deposits. Let's see to what extent and especially in what direction things will evolve in the future.

14. References

Akram, F.; Bardsen. G. & Lindquist, K.G. (2007). Pursuing Financial Stability under an Inflation-targeting Regime. *Annals of Finance 3*, pp. 131–153.

Baba, N.; Nishioka, S.; Oda, N.; Shirakawa, M.; Ueda, K. & Ugai, H. (2005). Japan's Deflation, Problems in the Financial System and Monetary Policy. *BIS*, Working Paper no. 188. Available at SSRN: https://ssrn.com/abstract=861664 or http://dx.doi.org/10.2139/ssrn.861664.

Balakrishnan, R.; Danninger, S.; Elekdag, S. & Tytell, I. (2009). The Transmission of Financial Stress from Advanced to Emerging Economies. *IMF Working Paper*, no. 09/133.

Baxa, J.; Horváth, R. & Vašíček, B. (2012). Time-Varying Monetary-Policy Rules and Financial Stress: Does Financial Instability Matter for Monetary Policy? *Journal of Financial Stability, forthcoming*. Czech National Bank, Working Paper, No. 3.

Carling, K.; Ronnegard, L. & Roszbach, K. (2006). Is firm interdependence within industries important for portfolio credit risk? *Sveriges Riksbank Working Paper*, No. 168, *Riksbank Research Paper*, no. 11.

Giordani, P.; Jacobson, T.; von Schedvin, E. &Villani, M. (2014). Taking the Twists into Account: Predicting Firm Bankruptcy Risk with Splines of Financial Ratios, *Journal of Financial and Quantitative Analysis*, Volume 49, Issue 4/August 2014, pp. 1071-1099.

Jacobson, T.; Linde, J. & Roszbach, K.F. (2011). Firm Default and Aggregate Fluctuations. *Sveriges Riksbank Working Paper Series*, no. 226. Available at SSRN: https://ssrn.com/abstract=1471254 or http://dx.doi.org/10.2139/ssrn.1471254.

de Graeve, J.; Kick, T. & Koetter, M. (2008). Monetary policy and financial (in)stability: An integrated micro–macro approach. *Journal of Financial Stability*, Volume 4, Issue 3, September 2008, pp. 205-231.

Tovar, C.E. (2009). DSGE Models and Central Banks. *Economics: The Open-Access, Open Assessment E-Journal 3*, 200916.