MONETARY TRANSMISSION MECHANISM OF INTEREST RATES IN ROMANIA

Ailincă Alina Georgeta[1]

Abstract

Still haunted by global economic and financial crisis effects, financial instability represents an element with resonance at the macroeconomic level, including at the level of monetary policy pursuits. Risks, vulnerabilities and tensions concerning the monetary and financial stability can come not only from outside, but rather can come from the improper or poor functioning of the monetary mechanism of transmission. Thus, should be considered that a deficient transmission of the impulse of the monetary policy can generate significant tensions, vulnerabilities and even risks and ultimately, financial and monetary instability. In this context, the article[♦] aims to examine whether and to what extent the evolution of interest rates from the period 2007-2014 can be considered a source of tensions for the financial and monetary stability by a week transmission between the central bank (National Bank of Romania) and monetary market. Thus, the article analyzes the evolution of interest rates of the Romania's money market in relation to the policy rate of the National Bank of Romania, but also in relation to macroeconomic fundamentals which interest rates is supposed to influence.

Keywords: financial instability, monetary transmission, Romania

JEL: E43, E58, E65

1. Introduction

Global financial and economic crisis, in addition to the devastating effects on the economies of the world, it has changed the perspective from which stability problems (or better financial instability problems) are viewed. It is speaking very much about financial instability, but a separate component of financial instability, or even a different aspect of instability, can be considered monetary instability (Milea, 2014), which can catalyze numerous risks, vulnerabilities and tensions existing on international monetary markets. The existence of these imbalances can occur independent or dependent of the functioning of monetary transmission mechanism, but as far as he himself has difficulty in managing arising problems, then it may be considered that he contributes to the amplification of monetary instability. Therefore, a look at the monetary transmission mechanism, the way it works and its speed of action, may be a useful approach in order to understand and manage the imbalances which generate instability. About risks and vulnerabilities there is a whole literature ready to decipher some of our misunderstandings, but very little, and only tangentially, there is mentioned the problem of tensions which generate instability.

Thus, the article tries to clarify the extent to which monetary transmission issues fall under the appearance and manifestation of tensions in the money market.

The definition of the concept of tension captures the state of tension, the stretching, the "struggle", the "nervousness", the inner strength that arises in a body or system due to external forces, the "potential difference", the pressure (generally treated in report of a value or limit considered "normal"), the "excitement", the "feverishness", the unit effort, the accumulation of energies or forces, which in a closed environment tend to escape. Therefore, the tension can

[1] 3rd degree researcher of the Centre for Financial and Monetary Research "Victor Slăvescu" of the "Costin C. Kiriţescu" National Institute for Economic Research, Romanian Academy, Calea 13 Septembrie no.13, Academy House, B Building, 5th Floor, 5 Sector, Bucharest, Postcode 050711, Romania, *E-mail address:* alina.glod@gmail.com.

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be regarded as a characteristic or a feature of something and needs for an adequate description three elements: medium of manifestation, the factor or the phenomenon which is under tension and the force or the group of forces that determines a particular manifestation of the factor or the group of factors in that environment.

If we believe, generally speaking, that the macroeconomic system is a vivid logical system (Dinga, 2009), then the monetary and financial markets, which have a strong component of human behavior, they subscribe also to the characteristics of vivid logical systems. Therefore, if we believe that financial stability is the state of "health" of the system and of the financial and monetary markets and the financial instability describes the state of "disease" or the "severe illness", then the tensions which are manifesting on these markets can be viewed as a state of "pre-disease" or "feverishness" and it warns about the imminent "disease". In this context, the tension can be seen as a signal of the change of the normal physiological status of the financial and monetary system, being a relevant indicator of the imbalance or the "disease" that will come soon.

Also, it should be noted and distinguished the concept of tensions from the concept of risks, which involve the production, with a high probability, of a negative phenomenon, often irreversible. Or, tensions can be considered in many cases reversible, sometimes of the moment and not infrequently positive, describing the normal state or the "tone" of the monetary and financial market in the conditions of a low or moderate volatility. Also, tensions can be considered a latent state, often difficult to identify or an altered state of risks' manifestation, which under the influence of certain factors or forces, in certain specific environmental conditions, it can move to the state of threat or risk.

In this context, the article aims to analyze the evolution of interest rates on the money market from Romania in relation to monetary policy interest rate of the National Bank of Romania (NBR), but also in relation to macroeconomic fundamentals, in order to indicate whether there are adverse developments of interest rates and how they can be considered tensions capable of generating instability.

2. Description of the problem

Monetary policy aims at achieving the primary objective of price stability (implicitly through inflation targeting strategy) through three main instruments such as: monetary base (through open market operations), interest rates, and minimum reserves.

Thus, the problem of domestic absorption is managed by monetary policy also through the instrument of interest rates. Movements in interest rates causes an adjustment of the absorption, an increase in interest rates being associated in theory and in practice with the reduction of domestic absorption and with the counteract of the inflationary effects. Real interest rates are derived by adjusting nominal rates with inflation, being formed in the banking and financial markets, the central bank setting only the monetary policy interest rates, which direct the evolution of interest rates in the money market. The evolution of real interest rates modifies the price and the availability of bank loans, the household wealth and the exchange rate evolution, affecting equally the demand for public goods. Increasing interest rates in the money market with a rapid development and / or an important manner it can cause an adverse effect, through which the borrowers are no longer able to honor its obligations to the banks, especially in the conditions of an economy excessively indebted to the banking system.

A downward trend in interest rates contributes to the lowering of the foreign currency value compared to the domestic currency (i.e. an appreciation of the domestic currency and thus a decrease in the exchange rate), which may lead to the increase of imports and of lowering of domestic products prices abroad thus, ultimately, to the reduction of exports. However, over time, the aggregate domestic demand registers increases leading ultimately to the increase of production, of employment, of investments and also of the expenses and incomes. This can lead also to the

increase of wages and prices, if the monetary policy boosts this trajectory. It is possible that only interest rates and/or inflation to rise without being accompanied, at a certain time, by the increase in production and by the reduction of unemployment. Thus, the understanding of the functioning of monetary transmission mechanism is crucial in determining its actual influence on the economy. If the central bank maintains the monetary policy interest rates at a low level, or at least decreasing, this signal should be perpetuated in the interbank market and then in the banking system through a more affordable price offered by bank to customers, stimulating thus both investment and consumption. However, there is a danger that the central banks, which promotes constantly an extremely low interest rates or near zero or they are acting without sufficient credibility among the public, to be unable to achieve a satisfactory liquidity management. In this case, the central banks will send an inappropriate signal, both to the interbank market and also to the banking customers, through which companies and population will be encouraged to hold liquidity rather than to hold bank' receivables with low interest rates (the entrance into liquidity trap).

In fact, mismanagement can occur all the way of monetary transmission, either because the monetary policy interest rate is inconsistent with the macroeconomic framework, either because the interbank interest rates are unrelated to the monetary policy interest rates or either the loans and deposits interest rates are inconsistent with the interbank interest rates or even worse with the monetary policy interest rates, signaling a faulty transmission of monetary policy. Normally, interbank interest rates should report possible money market tensions and the central bank, through its monetary policy should focus on improving the transmission mechanism at this level. Any lack of correlation between these interest rates may be due to the natural factors, intrinsic, structural or cyclical factors or to the possible disruption of the monetary transmission mechanism, due to external factors, which can affect a segment of these interest rates or all the interest rates.

If loans granted by commercial banks are coming mainly from funds raised from the interbank market, then the problem of any possible lack of correlation between loans interest rates and interbank interest rates may indicate problems in the monetary transmission mechanism. If the funds are raised from other market than the monetary market, the lack of correlation between interest rates should not worry the managers of monetary policy, but if the majority of funding comes from the monetary market (as it is the case with almost all European Union countries, including Romania), any significant variation, or possibly even of an opposite sign, can signal problems more or less severe with the monetary transmission mechanism.

Thus, we can say that the extent to which monetary policy interest rate helps to ensure the monetary stability, by providing a satisfactory liquidity, but not excessive so as not to lead to a higher inflation, may be signaled by an effective monetary transmission mechanism.

Note however that the evolution of interest rates are not fully under the control of monetary authorities (implicit of monetary policy), although they made a great efforts in order to obtain a maximum control over the transmission mechanism of monetary policy so as to ensure ultimately the reduction of inflation, the increase of output and the decrease of unemployment. In this respect, there is a certain inconsistency regarding the measures of the monetary authorities in managing the effects of monetary policy impulses, which, in a certain limit can be understood and considered normal.

3. Methodology and data sources

Given previous research, the article aims at achieving a qualitative and quantitative analysis of the phenomenon of monetary transmission, in terms of how the interest rates on outstanding loans and on outstanding deposits (in RON) react to the evolution of monetary policy interest rates and also to the developments of ROBOR 12 months (both are being considered in the model as independent variables). The analysis is based on the NBR data for Romania for the period January 2007 - July 2014, including data from the NBR publications

(monthly bulletins, reports on financial stability, reports on inflation etc.). Processing was conducted using econometric models and ANOVA toolkit. The research methods consist in developing the correlation matrix between the analyzed variables and the formulation and testing of regression equations.

In order to exemplify the connection between the determined variable (interest rate on outstanding term deposits in RON, and respectively the interest rate on outstanding loans in RON) and the independent variables, we used the correlation matrix, shown in Table no.1.

Table no.1 The correlation matrix

	IROTD in RON (% y.p.)	*IROL, in RON (% y.p.)*	*IRNTD, in RON (% y.p.)*	*IRNL, in RON (% y.p.)*	*IROTD, in euro (% y.p.)*	*IROL, in euro (% y.p.)*	*IRNTD, in euro (% y.p.)*	*IRNL, in euro (% y.p.)*	*MPIR (% y.p.)*	*ROBOR 3M (% y.p.)*	*ROBOR 12M (% y.p.)*	*INFLR (%)*
IROTD in RON (% y.p.)	1											
IROL, in RON (% y.p.)	0.95976	1										
IRNTD, in RON (% y.p.)	0.98515	0.93409	1									
IRNL, in RON (% y.p.)	0.97506	0.95031	0.97974	1								
IROTD, in euro (% y.p.)	0.94697	0.85960	0.96519	0.93004	1							
IROL, in euro (% y.p.)	0.64686	0.69756	0.69226	0.63902	0.66519	1						
IRNTD, in euro (% y.p.)	0.90225	0.81620	0.94635	0.89427	0.98002	0.73715	1					
IRNL, in euro (% y.p.)	0.68587	0.70383	0.73467	0.67817	0.71941	0.97303	0.78837	1				
MPIR (% y.p.)	0.8988	0.89824	0.92612	0.89235	0.89215	0.86320	0.90713	0.87214	1			
ROBOR 3M (% y.p.)	0.89071	0.86802	0.94089	0.92335	0.89170	0.75868	0.91656	0.78787	0.92673	1		
ROBOR 12M (% y.p.)	0.89763	0.86826	0.94378	0.92013	0.89747	0.75090	0.92193	0.77972	0.92764	0.99615	1	
INFLR (%)	0.55408	0.57335	0.58213	0.51005	0.55682	0.60606	0.60386	0.59631	0.69239	0.61056	0.63343	1

Source: NBR dataset, ANOVA simulation

The notations used are: IROTD in RON (% y.p.) - Interest rate on outstanding term deposits, in RON (% y.p.); IROL, in RON (% y.p.) - Interest rate on outstanding loans, in RON (% y.p.); IRNTD, in RON (% y.p.) - Interest rate on new term deposits in RON (% y.p.); IRNL, in RON (% y.p.) - Interest rate on new loans, in RON (% y.p.); IROTD, in euro (% y.p.) - Interest rate on outstanding term deposits, in euro (% y.p.); IROL, in euro (% y.p.) - Interest rate on outstanding loans, in euro (% y.p.); IRNTD, in euro (% y.p.) - Interest rate on new term deposits in euro (% y.p.); IRNL, in euro (% y.p.) - Interest rate on new loans, in euro (% y.p.); MPIR (% y.p.) – Monetary policy interest rate (% y.p.); ROBOR 3M (% y.p.) – the ROBOR interst rate on 3 months; ROBOR 12M (% y.p.) - the ROBOR interst rate on 12 months; INFLR (%) – HICP inflation rate.

Analyzing the correlation matrix we see that: - all selected variables are positively correlated, with a relatively strong bond over (0.5); - according to the theory an important role it has the monetary policy rate; - the most significant rates from all the rates we have selected for use in regression equations; - the inflation rate is positively and significantly correlated with the monetary policy rate, but shows also strong correlations with other interest rates, it was subsequently used for the confirmation, in a regression equation, of the connection with developments in interest rates.

4. Results

Regarding the monetary transmission mechanism for the period October 1999 - January 2004, Tieman (2004) stated that "Interest rate pass-through from policy interest rates to market rates and inflation has been hypothesized to play a lesser role in Romania than in other Central European transition economies. This paper tests this hypothesis and concludes that it cannot be supported by the data. Hence pass-through in Romania is concluded to be in line with that in comparable economies in the region. Moreover, the interest rate pass-through has become more pronounced over time.". He also said that dividing the series into two smaller periods (October 1999 - June 2001 and June 2001 - January 2004), in the first period monetary policy rate does not significantly influence the market interest rates, but in the next period monetary policy interest rate significantly influences market interest rates, and the series are cointegrated.

Also, regarding on the monetary transmission mechanism in Romania, Antohi, Udrea and Braun (2003) concludes that the monetary transmission mechanism outlined by the central bank is the result of combined effects of general characteristics of the economy (openness and size) and of depth of structural and institutional reforms and the macroeconomic stabilization policies in the transition to a market economy. They noted that the NBR interest rates have a direct impact on the interest rates on term deposits, but have a weaker influence on interest rates on loans (which are influenced more by interest rates on deposits). Credit channel is undermined by the excess liquidity of the system, by the substitution of credit in local currency with the credit in foreign currency and by moral hazard. At the same time, the authors captured the fact that less relevant to the Romanian economy is the real interest rate channel, while the nominal interest rate channel has a strong influence over banking system and over macroeconomic behavior.

Harnessing the previous studies conducted in the field, the results presented in this article are based on the information from the Table. 1, thus considering that you can determine a transmitted influence from monetary policy and from interbank market in Romania on the interest rates on outstanding term deposits in RON, and respectively on outstanding loans in RON, for the period January 2007 to July 2014. According to the method of regression, I used the following regression equation, keeping the above notation:

$$IROTD = \beta_0 + \beta_1 MPIR + \beta_2 ROBOR12M \quad (1)$$

The simulation through the regression method for determining the above regression equation leaded to the results from Table no.2. The result indicates that the interest rates on outstanding term deposits in RON are determined in a high proportion of proposed independent variables, which gives relevance to the applied model. However, the result highlights the dependence of interest rates on outstanding term deposits in RON in the same direction with the monetary policy interest rates and 12 months ROBOR rates, which can be interpreted positively as consistent with economic theory, i.e. with the monetary policy rate movement it should change also the interbank rates and the interest rates on deposits belonging to the banking sector. The model is based on a dataset relatively high (more than 30 observations), for this reason the *t-statistic* must be greater than 2 (or less than -2) thus indicating a significant factor with a confidence of more than 95%. This seems confirmed by two independent variables chosen (MPIR and ROBOR 12M). The very low *P-value* for ROBOR 12 months means that the confidence degree is 99.98%.

Table no.2 Regression for the outstanding term deposit interest rates in RON

Regression Statistics	
Multiple R	0.9149232
R Square	0.8370845
Adjusted R Square	0.8333818
Standard Error	1.1241017
Observations	91

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	571.34796	285.67398	226.0786	2.12007E-35
Residual	88	111.197214	1.26360471		
Total	90	682.545174			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-0.230138	0.5167067	-0.445394	0.6571288	-1.25698403	0.796707899
MPIR (% y.p.)	0.6650519	0.16163034	4.11464737	8.708E-05	0.343845522	0.986258179
ROBOR 12M (% y.p.)	0.3641102	0.09161714	3.97425856	0.0001443	0.182040386	0.546179993

Source: NBR dataset, ANOVA simulation

Referring to outstanding loans interest rates in RON, the following equation (Equation 2) can help us to understand the connection with monetary policy rate and ROBOR 12 M interbank rates.

$$IROL = \beta_0 + \beta_1 MPIR + \beta_2 ROBOR12M \quad (2)$$

The simulation through method of regression of the above determination equation leads to the results from Table no.3

Table no.3 Regression for outstanding loan interest rates in RON

Regression Statistics	
Multiple R	0.9031229
R Square	0.815631
Adjusted R Square	0.8114408
Standard Error	1.0997171
Observations	91

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	470.81505	235.40752	194.65178	4.90086E-33
Residual	88	106.42524	1.2093777		
Total	90	577.24029			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	5.8138294	0.505498	11.501191	3.181E-19	4.809258324	6.8184004
MPIR (% y.p.)	0.858484	0.1581242	5.4291767	4.952E-07	0.544245492	1.1727226
ROBOR 12M (% y.p.)	0.1835518	0.0896297	2.0478896	0.0435516	0.005431537	0.361672

Source: NBR dataset, ANOVA simulation

The result indicates that the interest rates on outstanding loans in RON are determined in a high proportion by the independent variables proposed, which gives relevance to the applied model. At the same time, the result highlights the dependence of interest rates on outstanding loans in RON in the same direction with the monetary policy interest rates and ROBOR rates at 12 months, which can be interpreted positively as consistent with economic theory. The model is based on a data set relatively high (more than 30 observations), the *t-statistic* for this reason must be greater than 2 (or less than -2), thus indicating a coefficient of significance with a confidence of more than 95%. This seems confirmed by the two independent variables chosen (MPIR and ROBOR 12M). The *P-value* at a very low level for ROBOR 12M means that the confidence is 95.64%.

With respect to economic fundamentals (in this case I was choosing the rate of inflation) reaction to the interest rates and especially to the policy rate, I built the following regression equation.

$$INFLR = \beta_0 + \beta_1 IROL_{ron} + \beta_2 IROL_{euro} + \beta_3 MPIR + \beta_4 ROBOR12M \quad (3)$$

The simulation through the regression method for the above equation of determination leads to the results from Table no.4

Table no. 4. Regression for inflation rate

Regression Statistics	
Multiple R	0.7015904
R Square	0.4922291
Adjusted R Square	0.4686119
Standard Error	1.6531642
Observations	91

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	227.839981	56.959995	20.841931	4.89102E-12
Residual	86	235.0338651	2.7329519		
Total	90	462.8738462			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	1.1376547	1.706993789	0.6664668	0.5068968	-2.2557366	4.531046
IROL. in RON (% y.p.)	-0.2418298	0.168688265	-1.4335897	0.1553152	-0.57717093	0.0935114
IROL. in euro (% y.p.)	-0.1022782	0.324292425	-0.3153889	0.7532304	-0.74695023	0.5423938
MPIR (% y.p.)	1.1479633	0.38832489	2.956193	0.0040191	0.37599902	1.9199277
ROBOR 12M (% y.p.)	-0.0094908	0.140968972	-0.0673254	0.9464789	-0.28972783	0.2707462

Source: NBR dataset, ANOVA simulation

The results indicate that the rate of inflation is determined by a ratio of 0.4922 (R Square) of the independent suggested variables, which give some relevance to the model. However, the result highlights the dependence of inflation in the same direction of monetary policy interest rates and in the opposite direction of interest rates on outstanding loans in RON and in euro and of ROBOR 12M. This can be interpreted in the sense of complying with the theory that inflation should rise when interest rates on banks and interbank fall. The model is based on a relatively large dataset (more than 30 observations), for this reason the *t-statistic* must be greater than 2 (or less than -2), indicating a significant coefficient with a confidence of more than 95 %. The value of *P-value* is very low for the monetary policy interest rate which means that the confidence is 99.59%. The interest rates on outstanding loans in RON seem to have a

significant degree of confidence (84.46%), but not the same can be said about ROBOR rates at 12 months and the interest rates on outstanding loans in euro.

In view of the above and confirming the views of other authors (Antohi, D., 2014), I conclude that the interest rate transmission mechanism operates in Romania, lately, an improvement maybe being due to the additional level of supervision in the banking system, to the adjustment of balance sheets of financial and banking institutions, to the considerable reduction of various costs of the banking system, to the better perception of risks in the banking system, but also of the risks of the economy and to the certain maturity of financial-banking market in Romania.

5. Conclusions

The issue of financial and monetary stability (or rather instability) continues to play an important role in the concerns of politicians, the media and experts, as demonstrated by the many papers, both theoretical and applied, that examine and propose solutions in order to improve financial stability. In this framework, along with the risks and vulnerabilities recognized in the literature, the tensions generating instability should be examined more carefully. If we consider the tensions are arising from within the banking system, then a look over the monetary transmission mechanism may signal possible shortcomings of its operation and may provide clues about the extent to which monetary transmission mechanism can generate instability.

In this context, based on a quantitative and qualitative analysis using correlation and regression methods, I tried understanding the monetary transmission mechanism in Romania. Correlations of the money market interest rates in Romania are extremely strong, making it difficult to choose the most significant interest rates, so that it can be used in viable regression equations. Research focused on the extent to which monetary policy interest rates and possibly interbank interest rates (in our case ROBOR 12M) can explain, in a significant manner, the operation of outstanding term deposits interest rates in RON and the outstanding loan interest rates in RON.

The results obtained are consistent with the results of other specialized studies on Romania, confirming a proper functioning of the monetary transmission mechanism, at least in the analyzed segments. The study also shows that the inflation rate responds in a significant manner to the signals of the monetary policy rate, which falls within the theoretical assumptions of the literature. Understanding these issues may allow greater controllability of unfavorable phenomena which manifest on money market, and on Romanian economy.

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