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## Financial-monetary instability factors within the framework of the recent crisis in Romania

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**THE ROMANIAN ACADEMY  
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**Financial-Monetary Instability Factors within the  
Framework of the Recent Crisis in Romania**

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# Financial-Monetary Instability Factors within the Framework of the Recent Crisis in Romania

BOGDAN FLORIN FILIP\*

**Abstract:** *The paper starts from the premise of the organic integration of the financial-monetary components, with their corresponding interrelations, within the macroeconomic system and from their role in ensuring the normal operation of the entire system. In this respect, it is invoked the impact of some financial-monetary components' functioning, with possible malfunctions reflected on the economic stability, and specific factors that determine financial-monetary instability. The development of research focuses on the analysis of some relevant manifestations of financial-monetary instability, marked by major imbalances expressed themselves, synthetically, through high variations of some specific indicators: inflation rate, bank loans interest rate, foreign exchange rate, etc. In this framework, most of the paper consists in econometric analysis, made through the prism of relations of determining that involve main factors generating financial-monetary instability, on the background of the conditions in Romania, in 2008-2013. There are taken so into calculations data for the previously mentioned indicators, considered as dependent variables, on the one hand, respectively those representing GDP, the NPLs volume, M2 monetary aggregate etc., considered as determinant factors and variables, on the other hand. On this basis, there are outlined conclusions and suggested some possibilities to counteract the financial-monetary instability.*

**Keywords:** *Financial Monetary Imbalances; Inflation Rate; Exchange Rate, Interest Rate On Bank Loans; Non-Performing Loans*

**JEL:** *C23, E63, G01*

## 1. Introduction

Typically, and especially in the context of the of the manifestation of recent global financial crisis and of its negative effects spread on the economies of various countries, including Romania, continuously providing financial-monetary stability represents one of the main objectives of the policies pursued on macro level. It assumes, objectively, permanent concerns to prevent the reverse situations or states, those of financial-

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monetary instability, respectively to eliminate or mitigate the specific imbalances that may occur in this area.

In addressing such issues we consider to be of interest some considerations on the notions of financial-monetary stability and, especially, instability, given the functioning mode with possible failures of the financial-monetary system, which have major impact on the financial-monetary stability / instability. From this perspective, we admit that, in a generalizing interpretation, the states of financial-monetary stability or instability can be viewed as resultants of the correct or flawed functioning of the financial-monetary system components which is conducted under the incidence of specific influence factors. Therefore, to counteract the financial-monetary instability and, implicitly, to ensure stability in this plan, it becomes necessary to analyze the factors involved and the determining relations associated with the operation of the financial-monetary system, in order to prevent or correct its eventual malfunctions, liable to impair the financial-monetary stability. In this context, we appreciate that are useful, first, some conceptual distinctions, starting from the diversity of approaches and interpretations given in financial-monetary theory and practice.

## 2. Theoretical approaches

Most of the literature associates the notion of monetary stability with the price stability (Issing, 2003; Borio, 2014) or with the absence of inflation or deflation (Duisenberg, 2001), admitting, however, the existence of some interrelations between this concept and the financial stability (Foot, 2003; Borio, 2014). Simultaneously, it is admitted that it is more difficult to define the latter, this being differently interpreted in various sources (Gadanecz & Jayaram, 2009; Issing, 2003). Thus, according to ECB, "*financial stability can be defined as a condition in which the financial system – comprising of financial intermediaries, markets and market infrastructures – is capable of withstanding shocks and the unravelling of financial imbalances, thereby mitigating the likelihood of disruptions in the financial intermediation process which are severe enough to significantly impair the allocation of savings to profitable investment opportunities*" (ECB, 2007). Similar opinions on the interpretation of financial stability and instability were found, in time, in papers of other authors (Crocket, 1997; Padoa-Schioppa, 2002; Schinasi, 2004; Gadanecz & Jayaram, 2009). We note also that, while some authors consider that there is an antagonistic relationship between monetary and financial stability (Borio, 2014), others support the idea that

they are mutually reinforcing on long-term (Issing, 2003) or that they presume one another. In this respect, Schwartz (1995) pleads for the idea that price stability (monetary) is a sufficient condition for financial stability, although it may be viable and reverse conditioning between the two variables. In turn, Foot (2003) believes that "...we have financial stability where there is: (a) monetary stability; (b) employment levels close to the economy's natural rate; (c) confidence in the operation of the generality of key financial institutions and markets in the economy; and (d) where there are no relative price movements of either real or financial assets within the economy that will undermine (a) or (b)".

Finally, in a closer approach to the interpretation of the ECB, Schinasi (2004) considers that "*financial stability is a condition in which an economy's mechanisms for pricing, allocating, and managing financial risks (credit, liquidity, counterparty, market, etc.) are functioning well enough to contribute to the performance of the economy*".

The difficulty of shaping a definition to be covering for everything that involves the phrase "financial stability" made that many authors (Mishkin, 1999; Chant, 2003; Schinasi, 2004; Allen & Wood, 2006) to prefer defining the opposite of this concept, namely financial instability. From this point of view, Mishkin (1999) appreciated that "*financial instability occurs when shocks to the financial system interfere with information flow so that the financial system can no longer do its job of channelling funds to those with productive investment opportunities*", emphasizing the role of intermediary of the financial system in financing the real sector and considering information asymmetry as a driver of financial instability.

On the other hand, Chant (2003) defined financial instability through those "...*conditions in financial markets that harm or threaten to harm an economy's performance through their impact on the working of the financial system*", but highlighted also the fact that she can take a variety of forms of imbalances, including banking crises, crashes of capital markets, etc.. Moreover, other authors (Allen & Wood, 2006), viewed the financial instability as "*episodes in which a large number of parties, whether they are households, companies or (individual) governments, experience financial crises which are not warranted by their previous behaviour and where these crises collectively have seriously adverse macroeconomic effects*". They consider, in the same context that also the non-financial sector supports the consequences of financial stress and, therefore, the interpretation of the "financial instability" concept should include also this aspect, while

financial stability is “*a state of affairs in which an episode of financial instability is unlikely to occur*”.

There appear interesting for us also the two characteristic dimensions for the financial instability, formulated by Schinasi (2004), according to whom “*a financial system is entering a range of instability whenever it is threatening to impede the performance of an economy*” or it “*... is in a range of instability when it is impeding performance and threatening to continue to do so*”.

In relation to theoretical approaches that we mentioned previously, we find, first, that many authors highlight the existence of some profound interrelations between monetary stability / instability, on the one hand, and the financial one, on the other hand. Furthermore, in our opinion, the deep connections of economic essence and the organic intertwining of the ways of manifestation of stability or instability in the financial-monetary plan provides a real foundation for their integrated approach also from the financial-monetary global perspective. At the same time it is noteworthy that financial instability, which includes, objectively, the monetary expression, can be interpreted as an inverse condition to stability, in which, after some shocks or amplification of imbalances, the financial-monetary system can no longer meet its functions, including those of financial intermediation, allocation or reallocation of financial resources and financial risk management, significantly affecting the performance of the economy. Under the latter aspect, financial instability can cause major adverse effects on the economic and social life, and their avoidance or mitigation presume, firstly, to identify the destabilizing factors on financial-monetary plan and analyze their actions, based on information provided by relevant indicators regarding the financial-monetary status. Such analysis can be, in general, the basis for some financial and, especially, monetary policies, designed to prevent escalations to more serious events such as crisis.

The recent financial crisis with large scale negative effects on economic and social level, in many countries, reconfirmed the idea that adverse shocks from the financial-banking sector may have significant effects on the real economy and instability in the financial-monetary area causes the manifestation of systemic risks (Kliesen, Owyang and Vermann, 2012). These findings have led to increased concerns of more researchers for analyzing economic and financial-monetary instability and of their determinants (Isarescu, 2009 Palley, 2009 Olteanu, 2013 Iancu, 2014), who have deepened, by reporting themselves to current realities, the previous

theories of some prestigious authors, as Marx (1981), JM Keynes (2009) and, especially, H. Minsky (1992).

One of the important conclusions resulting from analyzes is that *"periods of high inflation were those with severe financial instability and crisis in the banking sector ..."* (Isărescu, 2009). Moreover, recession periods corresponding to financial stress generated by banking activity tend to last more than twice than those not preceded by financial stress (Cardarelli, Elekdag & Lall, 2009), implying the presence of financial-monetary imbalances. From this perspective, some researchers (Kaminski et al., 1998) have tried to anticipate the possibility of the burst of currency and banking crises by analyzing some indicators such as: the exchange rate, the real GDP growth rate, inflation, foreign exchange reserves and external debt. Other authors (Wong et al., 2007; Yiu et al, 2009) have identified economic growth, inflation, the ratio of short-term external debt to foreign exchange reserves as being important factors for financial-banking system distress, while growth of M2 relative to international reserves, the overvaluation of the exchange rate and the ratio of total trade balance to GDP emerged as crucial indicators of monetary tensions, with potential of generating financial-monetary instability.

However, several papers highlight the existence of some tendencies of creditors and investors to underestimate risk in periods of boom and to overestimate it in the periods of decline that succeed them (Berger & Udell, 2004), both having destabilizing effects. Thus, in periods of economic stability, they tend to ignore the possibility of loss, taking risks that lead to bad loans and investments of poor quality (Hakkio & Keeton, 2009). Once emerged and tending to amplify themselves, these effects lead to the transformation of the euphoria of creditors and investors into pessimism, and their reaction is manifested in the direction of overestimating the risks, leading to a tightening of lending and investment.

On the other hand, from the perspective of the factors that may cause the appearance of imbalances and hence of financial-monetary instability can be noticed, in the foreground, those who have a destabilizing impact to key players such as banks, which are also in the position of main financiers of economy. In this framework, beside macro-level factors (e.g. GDP) it emerges as generator of instability and of banking crisis situations the sharp deterioration in the quality of bank loans. The latter is materialized in the rapid growth of the share of non-performing loans (NPLs) in total bank loan portfolio, in massive withdrawals of bank deposits and in blocking of interbank lending (Von Hagen & Ho, 2004). Thus, the accelerated growth of

bad loans cause a lack of liquidity on the creditor banks level which are forced to borrow, in turn, either on the interbank lending market or from the central bank, which, under certain conditions, can generate a state of instability in the money market.

The recent global financial crisis has highlighted in most of the affected countries, including Romania, all three aforementioned destabilizing phenomena, although in different dimensions. In this sense, it resulted that if deposit withdrawals occurred as a phenomenon reduced in amplitude and duration, the orientation of banks towards assets considered safer, such as treasury bills, as well as the reduction of their lending activity for non-bank or bank customers, was a phenomenon of a longer duration, reaching, in some cases, significant amplitudes. By far, though, the most worrying phenomenon manifested continuously, since the burst of the financial crisis, the rapid growth of the volume and share of NPLs, has become one of the main factors of imbalance in the banking system and of financial-monetary instability.

The destabilizing effects caused by the phenomenon of proliferation of NPLs were and still are the main reason why they are considered by many researchers as a crucial factor. This approach is reflected both in the studies related to the manifestation of tensions in monetary-financial area (Von Hagen & Ho, 2004; Jing et al., 2013) and in those regarding the identification of determinants of financial stability (Gersl & Hermanek, 2007; Gadanez & Jayaram, 2009; Cheang & Choi, 2011), respectively of financial instability (Pouvelle, 2012; Jakubik & Slacik, 2013).

In the same framework, there are worth noting also the implications of commercial banks refinancing by the central bank through direct loans or "open market" transactions, which in addition to the effect of increasing the liquidity of the banking system can generate an alteration of the financial-monetary stability through the possible creation of excess money, especially if amounts representing NPLs are not recovered by commercial banks, this might having a negative impact on inflation, exchange rate and interest rate on bank loans.

In relation to the above mentions, we believe that the conditions of financial-monetary instability or stability could be assessed and analyzed, including in terms of determinants, basing ourselves on representative indicators such as inflation rate, exchange rate and interest rate on bank loans.

### 3. Data and methodology

In order to analyze the states or situations of stability, but especially of financial-monetary instability, including the assessment of the various factors of influence involved within the specific relationships of their determination, our study focuses on econometric approaches for the period after the onset of the recent global financial crisis and its manifestation in the Romania's case. The data used in the analysis refers therefore to the period 2008-2013, and for meeting the criterion of the size of the processed data series, they express quarterly values for the variables, they being published by the National Bank of Romania and National Institute of Statistics of Romania.

Since, frequently, the financial-monetary instability phenomena are associated with higher levels recorded by the inflation rate indicator, we considered to be of interest, first, reporting on the trend of inflation rate and, especially, on factors that may influence this trend and the fluctuations in the level of this indicator.

In the considered context, starting from the content of the *inflation rate* indicator himself, which implies the existence of some imbalances between the size of the money supply in circulation (higher) and the required one (lower), having as essential reference the value size of the goods and services marketable on the real market, there appear natural also the links between the level of the inflation rate, on the one hand, and that of other synthetic indicators, which sometimes manifests themselves as factors that generate financial-monetary instability, out of which can be distinguished M2 or money supply variation, the GDP etc., on the other hand. Besides these, on the inflation rate may have influence also other macroeconomic determinants, out of which we have chosen the relative variation of the NPLs, trade balance deficit and the average interest rate of monetary policy. In fact, the latter is viewed also as a tool for direct influencing the inflation rate which is used by the central bank within the monetary policy pursued by it.

In the period under review, we find that in Romania, there have been several cases where quarterly average inflation rate has registered important fluctuations. Thus, in 2008 were recorded inflation rates higher than in each of the four quarters of previous year, the highest value being 8.56%, corresponding to third quarter, compared to an average recorded in the fourth quarter 2007 of only 6.81%, amid the highest relative annual growth of M2 of over 17%, of annual GDP growth of only over 7%, and of the largest trade deficit (over 19 billion RON).

The next period, that of 2009 and the first half of 2010, is marking a downward trend of the inflation rate, which was reduced to 4.36% in Q2 2010, on the background of a substantial decrease of trade deficit (below 7 billion RON in 2009) and a much lower increase of M2 (about 8% in 2009), even if in the same period was registered the most significant decline of GDP (about 7%) and a significant increase in the exchange rate (for at 3.81 RON / EUR in Q4 2008 to 4.18 RON / EUR in Q2 2010). The noted downward trend is reversed, yet, in the second half of 2010 and first half of 2011, inflation rising to 7.5% in the third quarter of 2010 and to 8.23% in the second quarter of 2011. This evolution of inflation occurred in the context of in which GDP fell by about 1%, the exchange rate has increased to an average of 4.23 RON / EUR and the balance of non-performing loans increased from 21 to over 28 billion RON, while the value of M2 increased by 2%. In addition, it should be noted that this period of rising inflation was marked and influenced, however, also by the government's measures to increase taxes, especially VAT from 19% to 24% and to reduce salaries in public sector, but although these measures were maintained further the quarterly average inflation rate decreased in the following period, registering much lower levels, from 4.18% in the third quarter of 2011 to 1.88%, in second quarter 2012, mainly stimulated by the resumption of GDP growth.

The period between third quarter of 2012 and the second quarter of 2013 was once again one with higher quarterly rates of inflation, from 4.07% in the first quarter and up to 5.33% in the last one, while in the last two quarters of 2013 inflation fell to 3.32%, respectively 1.75%. Rising of inflation in the period 2012-2013 was accompanied by a significant increase in exchange rate, exceeding a long time a value of 4.5 RON / EUR, but also by an increase in the M2 aggregate of more than 5%, compared to GDP growth of about 2% and while the ballance of non-performing loans increased about 16%.

The study conducted in the previously exposed framework starts with an analysis of the correlations between inflation and other macroeconomic indicators characterizing the situation in Romania, in 2008-2013, taking into account the variables: the average inflation rate (INFLR), the GDP (GDP); the relative variation of M2 ( $\Delta M2R$ ), the relative variation of non-performing loans ( $\Delta NPL$ ); the trade balance deficit (IMP\_EXP), the variation in the average interest rate of monetary policy ( $\Delta IRMP$ ), and the results are shown in table 1:

Table 1

## . The Correlation matrix

Correlation	INFLR	GDP	IMP_EXP	$\Delta$ NPLR	$\Delta$ M2R	$\Delta$ IRMP
INFLR	1.000000					
GDP	-0.435589**	1.000000				
IMP_EXP	0.484545*	-0.106292	1.000000			
$\Delta$ NPLR	0.145292	-0.184043	0.099728	1.000000		
$\Delta$ M2R	0.012148	0.374461*	0.530746***	-0.006443	1.000000	
$\Delta$ IRMP	0.592518**	0.005572	0.659848***	-0.072773	0.340737	1.000000

\*\*\*, \*\*, \* - denotes significance at 1%, 5% and 10%, respectively

According to the data of Table 1, it results, first, as expected, the existence of a significant negative correlation between the inflation rate and the GDP, expressing that the two indicators have opposite trends. This one corresponds to the results and opinions documented in most of the literature, which usually find a negative relationship between inflation and GDP, to the extent that inflation exceeds a minimum threshold of about 1-2%. The explanation for this correlation may be that, in the absence of other changes, a reduction in GDP growth rate or, especially, a drop of it is materialized in a lower supply of goods and services compared to the demand, given by the amounts of money in circulation, and this imbalance causes an effect of increasing inflation. On the other hand, in terms of inflation, high rates of it are discouraging the consumption and implicitly the production of goods and services, which is reflected in a slowdown in GDP growth or even a decrease of GDP.

At the same time, we note the significant positive correlations between the inflation rate and the trade balance deficit, respectively the variation of the interest rate of monetary policy. Thus, the evolution of Romania's trade balance deficit appears to be in line with that of the inflation rate, the reduction of the deficit corresponding to a decrease in inflation rate. In this regard, we note that the trade balance of Romania, which registered deficit constantly in the considered period, creates the background for amplifying the inflation, through the well-known phenomenon of imported inflation, especially given that, in the same period, there was a significant increase in the quarterly average foreign exchange rate (from 3.6892 RON / EUR 4.4514 RON / EUR), leading to significant increases in the prices of imported goods and services, which have a high share in consumption.

In addition, the trend of reducing the monetary policy interest rate corresponds to the similar trend recorded by the inflation rate. This may be an indication that on the conditions in which, under the action of other factors was driven a sharp decline in inflation rate, below target levels, through the policy pursued by the central bank regarding the average interest rate of monetary policy, were obtained positive effects, both to reduce the rhythm of inflation rate decrease and to ensure liquidity and monetary equilibrium.

On the other hand, in Romania's case, the relative variations in the volumes of NPLs and M2, are found to be positively correlated, in terms of their changes, with the inflation rate over the period 2008-2013, although at a very low significance level. This corresponds to the theoretical reasoning, that an excessive money supply and having an upward trend is expected to lead to an increase in inflation. At the same time, the growth of non-performing bank loans involves an increase of the money amounts related to them, which are not returned to the banks, they remaining in circulation without a correspondence in goods and services, and the resulting imbalance determines an upward pressure on inflation.

The results shown in Table 1, provide us the necessary support to set up the relationship between the average inflation rate, considered as the dependent variable and the other indicators mentioned above and considered in the position of determining variables, by building a regression model of the following form:

$$INFLR = \beta_0 + \beta_1 \cdot GDP + \beta_2 \cdot IMP\_EXP + \beta_3 \cdot \Delta NPLR + \beta_4 \cdot \Delta M2R + \beta_5 \cdot \Delta IRMF \quad (1)$$

By applying the equation (1) for the set of quarterly data of the period 2008-2013, in Romania's case, we obtained the results presented in Table 2:

Table 2.

Results of applying the regression equation regarding the inflation rate in Romania's case

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	-0.026467	0.013392	-1.976306	0.0636
IMP_EXP	0.203322	0.413834	0.491313	0.6291
$\Delta NPLR$	0.014452	0.022156	0.652309	0.5224
$\Delta M2R$	-0.111583	0.227890	-0.489633	0.6303
$\Delta IRMP$	2.238786	0.853220	2.623927	0.0172
$\beta_0$	9.106089	2.138607	4.257953	0.0005
R-squared	0.563413		F- statistic	4.645785
Adjusted R- squared	0.442139		Prob(F- statistic)	0.006734

The values in Table 2 certify, first, an acceptable level of viability of the proposed econometric model (R-squared = 0.563; Adjusted R-squared = 0.442), confirming a good dependence of the average inflation rate on the other variables included in the equation.

From the same table, it results also that there is a good probability (Prob. = 0.0636) that the changes in GDP volume lead to a change in the opposite direction of the average rate of inflation, which confirms the links between the two variables shown in Table 1. At the same time, the high probability (Prob. = 0.0172) and the significant coefficient (Coef. = 2.2387), obtained in the case of the monetary policy interest rate variation, points out that this is reflected into a evolution in the same direction of the average inflation rate. We ascertain, therefore, from the data for 2008-2013, that under the impact of the action of other factors it resulted a rapid reduction in the level of inflation rate, which was attenuated by the gradual reduction of the monetary policy interest rate, thus being succeeded also providing the necessary liquidity in the economy.

Also in the conditions to which it relates data processed by us, the other results indicate that, overall, the relative variation of NPLs and trade balance deficit have an impact of change in the same direction of the average inflation rate although this is insignificant. On the other hand, the relative variation of M2 shows to have a significant influence, but reversely, on the average rate of inflation, this result being subject also to the other phenomena that occur, however, contrary to the correlations previously identified in Table 1.

Another indicator that by its dynamics may reflect the appearance of malfunctions or imbalances in the financial-monetary area, is represented by the average *exchange rate* against the euro (EXRE), who's significant oscillations may suggest the existence of abnormal situations that can determine, in their turn, disturbances in the operation of the economy. Naturally, this one should reflect the purchasing power of the domestic currency relative to foreign currencies, based on comparisons of the performance of economies of those countries. However, the average exchange rate levels can be determined, both by the performance of the economy, measured usually by the of real GDP growth rate (RGDPR) and by other factors, including the volume of M2 monetary aggregate, Romania's trade balance, expressed by the relative variation of its deficit ( $\Delta\text{IMP\_EXPR}$ ), and by the volume of NPLs (NPL).

Therefore it appears to us to be revealing also an analysis focused on verifying the existence of correlations between the average exchange rate,

which we consider as dependent variable, and the other indicators, considered as determinant variables, in the case of Romania. Processing this data set for the period 2008-2013 led to the results summarized in Table 3:

Table 3.

The Correlation matrix.

Correlation	EXRE	RGDPR	NPL	M2	$\Delta$ IMP_EXPR
EXRE	1.000000				
RGDPR	-0.490768**	1.000000			
NPL	0.832997***	0.002239	1.000000		
M2	0.880593***	-0.092551	0.972248***	1.000000	
$\Delta$ IMP_EXPR	-0.042012	0.099601	0.116655	0.053981	1.000000

\*\*\*, \*\*, \* - denotes significance at 1%, 5% and 10%, respectively

From the results shown in the table, it appears that between the average exchange rate and the volume of NPLs there is a significant positive correlation, both in terms of the value of the correlation coefficient (0.8302) and of the very high significance. These values express that an increase in NPLs is likely to cause a similar trend for the exchange rate and it may be explained by the fact that in the conditions of the degradation of banking system performance and of creating a financial climate perceived as unstable it appears a natural tendency of orientation of the demand towards safer currencies, leading to an increase in the exchange rate. In this regard, we consider to be particularly relevant that, between the 3rd quarter of 2008 and first quarter of 2009, when the rate of NPLs almost doubled (from 2.18% to 4.03%), it took place also the fastest and highest rise in the average exchange rate (from 3.5771 to 4.2662 RON / EUR).

From the same table, results also a significant positive correlation (Prob. = 0.0000, coef = 0.8806) between the dependent variable and the evolution of M2 monetary aggregate, which can be explained on the account of the fact that the variation of this aggregate's level involves also a change in the supply of available national currency which can be converted into foreign currency, that prints a similar trend also for the exchange rate.

Another significant correlation, but in reverse, highlighted in Table 3, is the one recorded between the average exchange rate and the growth rate of real GDP, which represents a normal situation given the fact that in principle the national currency appreciates or depreciates in correspondence with the upward trend or downward GDP.

However, the results in the same table highlight for the analyzed period the existence of a reverse correlation, but insignificant between the dependent variable and changes in the trade balance deficit, although it was expected a positive correlation.

According to previous findings there are, in our opinion, sufficient premises to outline a regression model that expresses how financial-monetary instability factors, represented by the above determinant variables influence the stability of the exchange rate, considered as the dependent variable, and the corresponding formula may be the following one:

$$EXRE = \beta_0 + \beta_1 \cdot RGDP + \beta_2 \cdot NPL + \beta_3 \cdot M2 + \beta_4 \cdot \Delta IMP\_EXPR \quad (2)$$

By testing the equation (2) processing the data set corresponding to the same period analyzed, for Romania, we obtained the results listed in Table 4:

*Table 4.*

Results of applying the regression equation regarding the exchange rate in Romania's case				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP	-0.027572	0.003276	-8.416530	0.0000
NPL	0.008503	0.004867	1.747133	0.0960
M2	0.005343	0.002753	1.941170	0.0665
$\Delta IMP\_EXPR$	-0.000428	0.030898	-1.383689	0.1817
$\beta_0$	2.963148	0.431471	6.867542	0.0000
R-squared	0.953646		F- statistic	102.8656
Adjusted R-squared	0.944375		Prob(F- statistic)	0.000000

The results of testing the proposed regression model, shown in Table. 4, highlight, first, a high degree of viability of the proposed regression equation (R-squared = 0.9536 Adjusted R-squared = 0.9443), expressing that the exchange rate is highly dependent on the action of the factors represented by the variables included in equation (4).

From the same table is found also that real GDP growth rate is the most significant determinant (coef. = - 0.0276, Prob. = 0.0000) of the exchange rate, the increase of the size of created product having an effect of currency appreciation and vice versa. It is noted, also, the positive and significant relationship of determining the value of the exchange rate by the evolution of M2 (coef. = 0.0053, Prob. = 0.0665), while the trade balance relative variation appears to influence less significantly the dependent variable.

Moreover, the results highlight the significant impact of NPLs on the exchange rate, in terms of the registered coefficient (0.0085) in the regression equation in the context of a significance level below 10% (Prob. = 0960). In addition, one can notice the significant direct influence of the factor represented by the volume of NPLs on the dependent variable, confirming that an increase in NPLs attracts a depreciation of the domestic currency, especially given that about half of bank loans recorded in Romania, are denominated in foreign currencies.

On the other hand, from the perspective of financial instability, viewed as a state of the financial system that can no longer act as a financial intermediary, after experiencing some shocks or deepening some imbalances, it is accepted that an appropriate indicator for reflecting the financial stability or instability may be the *interest rate on bank loans*, especially in the case of "leveraged economies" (Filip, 2012) whose funding is based mainly on bank credit, as is the case of Romania. Therefore, we consider useful also an analysis of financial-monetary instability in terms of the interest rate on bank loans in Romania, aiming to identify the impact of some factors influencing this indicator, for the same period 2008-2013.

Among the phenomena with impact on the interest rate on bank loans (LIR) in the period under review, it is noted, particularly, the significant expansion of NPLs. But, along with the latter influencing factor, whose impact we will appreciate through the relative variation of NPLs ( $\Delta$ NPLR), on the interest rate on bank loans have exercised influence also other factors, meaning determinant variables, such as: overnight interbank interest rate (ROBOR\_ON), M2 monetary aggregate size, respectively the total volume of bank loans (TL).

In this context, analyzing the relationship between the interest rate on bank loans and other variables, lead by their correlation matrix, to the results shown in Table 5.

Table 5.

The Correlation matrix.

Correlation	LIR	$\Delta$ NPLR	M2	TL	ROBOR_ON
LIR	1.000000				
$\Delta$ NPLR	0.700191***	1.000000			
M2	-0.707974***	-0.326054	1.000000		
TL	-0.402782**	-0.040282	0.795448***	1.000000	
ROBOR_ON	0.817960***	0.575942***	-0.704903***	-0.495631**	1.000000

\*\*\*, \*\*, \* - denotes significance at 1%, 5% and 10%, respectively

Data recorded in table 5 reflect the direction and the intensity of the correlations between the interest rate on bank loans and the other variables and suggests their ability to influence the stability or monetary financial instability in the present case. Thus, according to the coefficients outlined in this matrix there appear significant positive correlations of the interest rate on bank loans with NPLs relative variation and with ROBOR ON interbank interest rate.

These results are viable since the amplification of phenomenon of NPLs causes for banks the occurrence of additional costs related to provisions for the risks associated to these loans, which are required to be compensated by obtaining higher incomes. Moreover, given that banks income come primarily from lending activity, it results, inevitably, a pressure for increasing the interest rates on loans especially when it is difficult to increase the volume of loans, phenomena that have faced banks in Romania, during the financial and economic crisis. At the same time, it is natural the correlation between the cost of credit resources and the price of credits granted by commercial banks and, consequently, in case that such lending resources are attracted from the money market the level of the interest rate on bank loans also depends on the interbank market interest rate that can become potential factor of financial-monetary instability.

The values listed in table 5 also point out the presence of significant negative correlations of interest rate on bank loans with the dimensions of M2 monetary aggregate and the total volume of bank loans. Thus, the growth of financial resources available in the market (M2 having an upward trend), favours banks to obtain cheaper resources and creates for them the opportunity to grant cheaper loans. On the other hand, in the conditions of the financial crisis, when banks are no longer able to increase or maintain the previous volume of bank loans, which in conjunction with the amplification of the costs that must be paid by them, it results their reaction of rising the interest rate on loans.

The existence of the correlations outlined before may serve as basis to outline an econometric model, regarding the determination the interest rate on bank loans, as dependent variable, by the action of specific factors represented by some indicators, considered as determinant variables and the regression equation is the following one:

$$LIR = \beta_0 + \beta_1 \cdot \Delta NPLR + \beta_2 \cdot M2 + \beta_3 \cdot TL + \beta_4 \cdot ROBOR\_ON \quad (3)$$

Therefore, in relation to the proposed regression equation (3), processing data for the period 2008-2013, in Romania's case, led to the results in table 6:

Table 6.

Results of applying the regression equation regarding the interest rate on bank loans in Romania's case

Variable	Coefficient	Std. Error	t-Statistic	Prob.
$\Delta$ NPLR	0.055771	0.021518	2.591857	0.0174
M2	-0.045000	0.019744	-2.279183	0.0338
TL	0.022904	0.023850	0.960347	0.3483
ROBOR_ON	0.265877	0.112988	2.353137	0.0290
$\beta_0$	15.29015	3.662233	4.175089	0.0005
R-squared	0.807555		F- statistic	20.98148
Adjusted R-squared	0.769066		Prob(F- statistic)	0.000001

The data shown in table 6 reveals, first, a high viability of the proposed regression equation (R-squared = 0.8076, Adjusted R-squared = 0.7691), which means that the interest rate on bank loans is determined quite surely by the relative variation of NPLs and the other determinant variables included in the equation and considered as potential factors of financial-monetary instability / stability. At the same time, from the same table, it can be noticed that there is a very high probability (Prob. = 0.0174) that the relative variation of the volume of NPLs to influence in the same direction the level of interest rate on bank loans. Also, according to the calculated coefficients, ROBOR ON interbank interest rate causes a similar trend for the interest rates on bank loans, its impact being significant (Prob. = 0.0290). Moreover, we found that changes in the size of M2 monetary aggregate causes changes in the opposite direction of the interest rate on bank loans, which corresponds to the correlation between these two variables, as it was previously identified. However, based on processing the data in the present case, it resulted, yet contrary to previously identified correlation, a positive but insignificant (Prob. = 0.3483) influence of the volume of bank loans on the level of the interest rate charged by banks for loans.

#### 4. Conclusions

Based on the undertaken research, the paper outlines, first, the assessment that there are multiple differences of approach of the concepts of financial (and monetary) stability and instability that go up to defining them by the opposite meanings of each other, the essence of both concepts remaining questionable. In our opinion, the financial-monetary instability designates a state of malfunction of the financial-monetary system, which after the occurrence of some shocks or the amplification of some imbalances does not fulfil satisfactorily its functions, including financial intermediation, reasonable allocation of financial resources and financial risk management. Objectively, counteracting financial-monetary instability requires identifying the factors that determine the results of the operation of the financial-monetary system, respectively the destabilizing ones and their analysis based on data provided by relevant indicators.

The study covered on the first part of the paper led to the conclusion that we can consider to be relevant for the appreciation of the financial-monetary instability mainly indicators such as: inflation rate, foreign exchange rate and interest rate on bank loans. Subsequently, by building econometric models adequate for the analyzes performed on financial-monetary instability and the factors that determine the levels of these indicators, including connections with specific determinants (GDP, NPLs, M2, trade balance deficit, interest rate monetary policy etc.), result both the validity of the models used and the influences, sometimes contradictory, exerted by these factors in Romania's case, in 2008-2013. Thus, the analysis focused on the inflation rate, as an expression of financial-monetary instability / stability reveals that both GDP and interest rate of monetary policy had strong impact on inflation, although it does not show, conclusively, a state of instability.

On its turn, the analysis centred on the exchange rate, revealed that real GDP growth rate has the most significant impact, causing changes in the opposite direction of its level, while the volume of NPLs and M2 did significantly influenced its growth, having a destabilizing effect.

Also, the analysis focused on the interest rate on bank loans shows that the relative variation of NPLs and the interbank interest rate ROBOR ON influenced in the same direction its level, indicating implicitly tendencies of financial- monetary instability.

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