THE EVOLUTION OF ROMANIAN MARKET OF GDP AND INFLATION IN THE PERIOD 2005-2012

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Abstract:

Our approach to the research – the results of which are presented in this paper – is based on the assumption that the relation between the money base and inflation was severely uncorrelated due to the development of technology and the creation of esoteric financial instruments. Since inflation is the key objective of the strategy pursued by the National Bank of Romania, we intend to find out if the monetisation level of the economy still is one of the factors causing inflation. Moreover, we consider the correlation between economic growth and inflation, a question endlessly discussed by academic circles after the crises. By means of an econometric analysis we define some relations of causality among variables to see whether monetary variables influence the evolution of the GDP or vice versa.

Key words: VAR, inflation, monetary base, central bank

1. Introduction

Given the capital account and exchange rate liberalization, National Bank of Romania gave up monetary targeting strategy (monetary base could not be controlled any longer) – a strategy pursued for about two decades and half – and adopted the inflation target strategy in august 2005. Isarescu [2007] said that the development of financial institutions and markets had led to a difficult and, later, impossible control of monetary aggregates due to increasingly unstable velocity of money circulation.

Therefore, the main objective of the monetary policy followed by the National Bank of Romania was the inflation target. The inflation target strategy – which compels the Central Bank to keep a low inflation – played a leading role in maintaining price stability in industrialized countries. Similarly to the developing countries, the former communist countries adopted and implemented this strategy

able to improve the transparency of the monetary policy and to determine the authorities to carry out necessary reforms for a transition from the planned economy to a market economy.

The present crisis showed that the main target of the monetary policy – inflation – was not enough to stabilize prices at a low level and this should have been accompanied by financial stability; more exactly, a combination of monetary policies to obtain a balanced mix of policies. In the 2012 Annual Report, the National Bank of Romania reveals that Romania made progress in macroeconomic stabilization in 2011 by promoting a mix of economic policies for starting economic growth on a sustainable basis. While the monetary policy was countercyclical in 2011, because of the monetary area created in the previous years, the size of the imbalanced caused before the crisis and the need to eliminate the severe deficit by the end of 2012 forced the fiscal policy to be further procyclical.

2. Evolution of the monetary supply in relation with inflation and GDP

In our analysis we used monthly, quarterly and annual data for the GDP, the CPI, and the M1, M2 and M3 monetary aggregates for January 2005 – December 2012 period. The primary data were found at www.bnro.ro and www.insse.ro.

Table 1: The evolution of the monetary indicators during the period under analysis

million lei

Year	2005	2006	2007	2008	2009	2010	2011	2012
M3	86,525	110,821	148,116	174,028	189,630	202,773	216,208	222,017
M2	86,230	110,442	148,044	173,629	188,013	199,572	212,059	221,829
M3 (% of GDP)	30.16	32.44	35.93	34.04	38.75	39.07	37.69	37.80
M1	33,760	48,726	79,914	92,549	79,362	81,592	85,834	89,020
Cash in circulation	11,386	15,130	21,441	25,287	23,968	26,794	30,610	31,477
Demand deposits	22,374	33,596	58,473	67,262	55,394	54,798	55,224	57,543

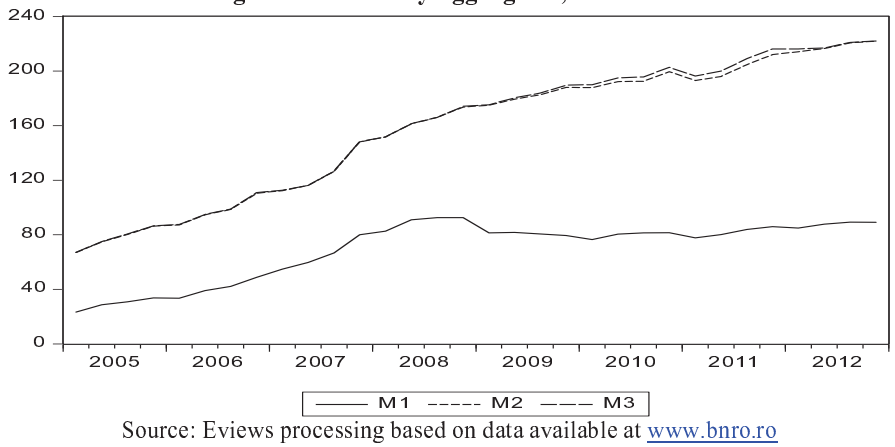
The M1 monetary aggregate (the money supply in a narrow sense) includes sight deposits and cash in circulation. The M2 monetary aggregate (intermediate

money supply) consists of the M1 monetary aggregate and deposits to be reimbursed on notice of the most three months inclusively as well as deposits for an initial period up to two years inclusively. The M3 monetary aggregate (the money supply in a broad sense) includes the M2 monetary aggregate and loans from repo operations, shares/units of monetary market funds (issued) and issued tradable securities with maturity up to two years inclusively.

The money supply in a narrow sense (M1) began to decrease with the start of the global financial crisis, from 92,549 million lei in 2008 (the reference level of the best economic year as regards the GDP level) to 79,362 million lei in 2009, and then slightly increased, but not reaching the level of economic growth in the reference year.

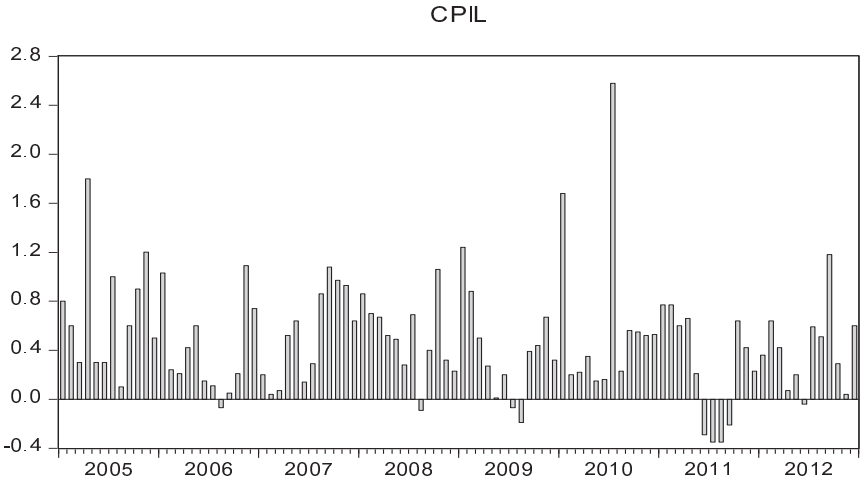
The evolution of the monetary indicators during the period under analysis:

Figure 1. Monetary aggregates, 2005-2012



Source: Eviews processing based on data available at www.bnro.ro

Figure 2: Evoluţia inflaţiei în perioada 2005-2012



Source: Eviews processing based on data available at www.bnro.ro

In our study, the assessing of the intensity of shocks to system variables is based on the VAR determination, which is a model enabling us to analyse the effects of economic policy measures. VAR analysis has been used in macroeconomic studies since the 1970s, with Cristopher Sims as a leading promoter, as VAR is , in fact, a system-type analysis with all included variables endogenous and, there before, modelled together. The VAR method is very common for analysing time series, especially due to its flexibility and easy utilisation. It may be considered a generalisation of both the univariate autoregressive (AR) model, because the dependent variables are lags of explanatory variables and also of simultaneous equations. All variables in the VAR model are treated symmetrically, as each variable has an equation that explains the evolution on the basis of own lags and the lags of other variables of the model.

We used the Phillips – Perron test for stationarity.

Table 3: The stationarity of the series

	Null hypothesis likelihood (unit root)			**Nature of the series**
	Level + ct	**Level+ct+trend**	**First difference**	
Series	**Prob.**	**Prob.**	**Prob.**	
GDP	0.2721	0.9691	0.0147	I(1)
M1	0.0015	0.0381	0.0000	I(0)
M2	0.0586	0.1516	0.0000	I(0)
M3	0.0598	0.1678	0.0000	I(0)
CPI	0.0002	0.0006	0.0000	I(0)

First, we tested for the existence of a VAR representation between the GDP and the M1 and M2 monetary aggregates, and the CPI and the M1 and M3 monetary aggregates. For the GDP we considered the difference series according to the above table (series I (1)), and for the other ones we used the level series. The results of the VAR model tests are not conclusive for the 2005 – 2012 period, i.e. the regression coefficients related to the explanatory variables are mostly statistically insignificant, which – if correlated with high coefficients of determination – leads to the conclusion that the space of entered elements would be strongly correlated. Under these circumstances we checked up the existence of some causality relation among those variables using Granger Causality Tests to see exactly if monetary variables influenced the GDP evolution or vice versa. Since not all variables are stationary, we used Toda–Yamamoto version of Granger Test. Toda-Yamamoto version is applied when series are not stationary [Jula 2013].

Testing a causality relation between inflation and monetary aggregates.

We tested the causality relation between CPI and M3 for quarterly data. The results do not show causality between those variables.

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 03/21/13 Time: 13:38
Sample: 2005Q1 2012Q4
Included observations: 30

Dependent variable: CPI

Excluded	Chi-sq	df	Prob.
M3	1.197907	1	0.2737
All	1.197907	1	0.2737

Dependent variable: M3

Excluded	Chi-sq	df	Prob.
CPI	0.201928	1	0.6532
All	0.201928	1	0.6532

The null hypothesis: M3 does not Granger-cause CPI (Toda Yamamoto version) and the likelihood of 0.2737 is higher than the standard threshold of 0.05, so we accept this hypothesis.

The null hypothesis: CPI does not Granger-cause CPI (Toda Yamamoto version) and the likelihood of 0.6532 is higher than the standard threshold of 0.05, so we accept this hypothesis, too.

In conclusion, the hypothesis regarding a relation between the quarterly values of CPI and M3 is not econometrically verified. Under these circumstances, we test for the existence of some causality relations among monthly values of those variables.

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 03/21/13 Time: 13:18
Sample: 2005M01 2012M12
Included observations: 94

Dependent variable: CPIL

Excluded	Chi-sq	df	Prob.
M3L	4.895786	1	0.0269
All	4.895786	1	0.0269

Dependent variable: M3L

Excluded	Chi-sq	df	Prob.
CPIL	0.004698	1	0.9454
All	0.004698	1	0.9454

The money supply in a broad sense (M3) does not Granger-cause CPIL (Toda-Yamamoto version) and the likelihood is 0.0269, below the standard threshold of 0.05, so the hypothesis is rejected; therefore we accept the alternative hypothesis that M3 is a cause for CPIL.

CPIL does not Granger-cause M3 (Toda-Yamamoto version) and the likelihood is 0.9454, higher than the standard threshold of 0.05; therefore, we accept the hypothesis that CPIL is not a cause of the M3 dynamics.

We also tested the quarterly relation between the GDP and M1 and between the GDP and M3.

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 03/21/13 Time: 12:51
Sample: 2005Q1 2012Q4
Included observations: 30

Dependent variable: M1			
Excluded	Chi-sq	df	Prob.
PIB	0.722892	1	0.3952
All	0.722892	1	0.3952

Dependent variable: PIB			
Excluded	Chi-sq	df	Prob.
M1	1.383073	1	0.2396
All	1.383073	1	0.2396

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 03/21/13 Time: 12:41
Sample: 2005Q1 2012Q4
Included observations: 30

Dependent variable: PIB			
Excluded	Chi-sq	df	Prob.
M3	0.570287	1	0.4501
All	0.570287	1	0.4501

Dependent variable: M3			
Excluded	Chi-sq	df	Prob.
PIB	1.242044	1	0.2651
All	1.242044	1	0.2651

M3 does not Granger-cause GDP (Toda Yamamoto version) and the likelihood of 0.45 is higher than the standard threshold of 0.05, so the hypothesis is accepted.

GDP does not Granger-cause M3 (Toda Yamamoto version) and the likelihood of 0.265 is higher than the standard threshold of 0.05, so the hypothesis is accepted.

3. Conclusions

After more than five years since the global financial crisis started, is still has a major impact on all domains influencing the GDP. In Romania, the crisis interrupted the economic growth that had lasted for more than one decade. If the National Bank of Romania had not adopted the inflation target strategy Romania might have not grown economically between 2000 and 2008, by giving up the monetary aggregate target; the national economy underwent a strong monetisation, so the maximum level of monetisation expressed as a ratio of the money supply in a broad sense (M3) to the GDP was attained in 2009.

The econometric analysis shows that in the period in view there are no causality relations according to Granger test between the money supply and inflation and between the money supply and the GDP, and the analysis based on the autoregressive vector reveals that the macroeconomic variable variation cannot be explained by means of the past values. The decorrelation of the monetary aggregates and inflation, and the GDP, respectively, was caused by the development financial institutions and markets, and the emergence of esoteric financial instruments, respectively.

Considering the proposal of Milton Friedman, the father of monetarism, who said that the monetary policy had to ensure the equilibrium of the market economy by constantly increasing the money supply in circulation by 5-6% annualy, the question is whether we have to adopt a monetary policy able to ensure the monetary supply expansion by a percentage that constantly stimulates constant growth of the Nominal Gross Domestic Product. There are some economists who support this policy, called the strategy of Nominal Gross Domestic Product target, but for our country this could be a difficult target because of the very low rate of sustainable economic growth. Belonging to the Monetary Union Zone could be another structural constraint of our economy as regards the monetary policy target, called the Nominal Gross Domestic Product Target.

4. References

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