RELATIVE EFFICIENCY OF MONETARY AND FISCAL POLICIES: THE CASE OF ROMANIA

Mert TOPCU
Faculty of Economics and Administrative Sciences, Department of Economics / Research Assistant
Nevşehir University, Nevşehir-Turkey
Ayhan KULOGLU
Vocational School of Higher Education / Lecturer
Nevşehir University, Nevşehir-Turkey
Oana-Ramona LOBONT
Faculty of Economics and Business Administration, Departament of Finance / Lecturer PhD
West University of Timisoara, Timisoara-Romania

Abstract:
In this paper, it is investigated whether monetary or fiscal policy is more effective on real activity in Romanian economy over the period 2004:IV-2011:II. Empirical findings obtained from OLS and causality estimations support the existence of a strong relationship between fiscal policy instruments and real economic activity. Besides, there exists no correlation between EU membership of Romania and their economic performance. Findings also indicate 2008 financial crisis effects Romanian economy in a highly negative way. Hence, it can be concluded that fiscal policy is more effective rather than monetary policy in both short and relatively long run in Romania.

Key Words: *monetary policy, fiscal policy, real activity, Romania.*

JEL Classification: *E63*

1. INTRODUCTION

The debate over the relative importance of monetary and fiscal policies divided economists into two opposite groups. Monetarist view, the first group, believed that money stock played a key role in determining economic activity. They tried to prove that changes in monetary variables had larger effects rather than fiscal actions. On the other hand, the second group, Keynesian thought believed that fiscal policy instruments such as government expenditures, taxes were entirely essential to stabilize the economy.

Can the changes in real output growth be explained by the changes in money supply or the changes in government expenditures? That is, are Monetarist or Keynesian policies more influential on the changes in reel output? Most economists discussed the relative effectiveness of monetary and fiscal policies both theoretically and empirically. However, no conclusion has been attained yet.

In this paper, the effectiveness of monetary and fiscal policy was examined in Romanian economy over 2004:IV-2011:II periods. Following the introductory part, related literature was overviewed in the second part and the methodology of the study and econometric model were put forth in the third part and finally the findings were interpreted and a general review was made.

2. LITERATURE REVIEW

In the second half of the 20th century, influence of monetary and fiscal actions on GDP became very popular, especially in the United States. Friedman & Meiselman primarily examined this subject in 1963. Ever since this publication, this research area became the subject of great debate. Many papers on it were written by economists.

It is possible to summarize related literature in a table. Following table represents the major empirical studies policies and their policy interferences on the effectiveness of monetary and fiscal policies.

Table 1: Literature Overview

Author	Period	Application Field	Model	Efficient Policy
Belliveau (2011)	1956-2007	U.S.A	OLS	Both
Düzgün (2010)	1987:I-2007:III	Turkey	ARDL	Fiscal
Ali et al. (2009)	1990-2007	West Asian	ARDL	Monetary
Cerda et al. (2006)	1833-2000	Chile	VAR	Monetary
Hsing (2005)	1959-2001	Venezuela	OLS	Fiscal

Ansari (2002)	1969-2000	Malaysia	VECM	Ambiguous
Ansari (1996)	1963-1993	India	Causality	Fiscal
Dönek (1995)	1950-1990	Turkey	OLS	Monetary
Kretzmer (1992)	1950:II-1991:IV	U.S.A	Causality	Monetary
Raj & Silkos (1986)	1947:I-1984:IV	U.S.A	ARDL	Fiscal
Cooper & Fischer (1974)	1955:I-1971:IV	U.S.A	OLS	Monetary
Andersen & Jordan (1968)	1952-1968	U.S.A	OLS	Monetary
Friedman & Meiselman (1963)	1897-1958	U.S.A	OLS	Monetary

3.METHODOLOGY AND MODEL

In this paper, the relative efficiency of monetary and fiscal policy is investigated for Romanian economy. For this purpose, the relationship among money stock, government expenditures and real output is examined to find out this running.

$$\Delta \ln Y_t = \alpha_0 + \sum_{i=0}^{4} \alpha_1 \Delta \ln M_{t-i} + \sum_{i=0}^{4} \alpha_2 \Delta \ln G_{t-i} + dummy_{CR} + dummy_{EU} + \varepsilon_t \quad (1)$$

In this equation, left-hand-side variable is the change in the log of real GDP. Right-hand-side variables are the change in the log of money stock as measured by M_2 representing monetary policy and the change in the log of government expenditures representing fiscal policy. Since any effect of monetary and fiscal actions may occur with a lag, the contemporaneous and four lagged[1] values are included in equation within a theoretical framework. The regression also includes a constant and two dummy variables respectively representing the effects of 2008 crisis ($dummy_{CR}$) and the difference between being and not being a member of EU ($dummy_{EU}$) for Romania. We appointed dummy variables the value of 1 for the periods whether there exist the influence of crisis and for the periods which covers 2007 and afterward; otherwise 0. Data used in this paper, gathered from the Eurostat Database and Romanian Central Bank. The data are quarterly and the sample period is 2004:IV-2011:II.

It is necessary to test the stability of series before the identification of the relationship between variables. Granger and Newbold stated that the regression analysis among the variables would not be consistent and spurious regression problem would occur if unstable data are used (1974: 111-120).

Dickey-Fuller (DF) (1979), Augmented Dickey-Fuller (ADF) (1981) and Phillips-Peron (PP) (1988) tests are commonly used for stationary in empirical applications. In this paper PP test is employed for unit root investigation.

PP unit root test permits error term to be dependent at a weakly level and distributed heterogeneously (Enders, 2004: 229). Phillips and Peron use nonparametric statistical methods to take care of serial correlation in the error terms without adding lagged difference terms (Gujarati, 2004: 818). PP test has three different regression models just as in ADF test. Asymptotic distribution of PP test is formulized as follows:

$$\Delta y_t = \gamma y_{t-1} + \sum_{i=1}^{m} \beta_i \Delta y_{t-i} + \varepsilon_t \quad (2)$$

$$\Delta y_t = \alpha_0 + \gamma y_{t-1} + \sum_{i=1}^{m} \beta_i \Delta y_{t-i} + \varepsilon_t \quad (3)$$

$$\Delta y_t = \alpha_0 + \gamma y_{t-1} + \alpha_1 t + \sum_{i=1}^{m} \beta_i \Delta y_{t-i} + \varepsilon_t \quad (4)$$

The equations (2), (3) and (4) respectively indicate the models without intercept+trend, with only intercept and intercept+trend. The equations test whether $\gamma = 0$. If the null hypothesis stating that series have unit root was rejected, that would mean series are stationary.

Gujarati claims that the causality relationship could be questioned between these variables if the variables in the equation set were stationary. There is no condition on series to be stationary in levels; it is possible for causality to become stationary in their first difference (2004: 698).

Causality test is used to see whether there is a cause and effect relationship between variables in the model, and to specify the direction of this relationship if there is. In practice, the common method to determine the causality relationship between time series is the Granger causality analysis, developed by Granger (1969). The analysis has been shown through the equations below:

$$\Delta \ln Y_t = \alpha_0 + \sum_{i=1}^{k} \alpha_i \Delta \ln Y_{t-i} + \sum_{i=1}^{l} \beta_i \Delta \ln M_{t-i} + \sum_{i=1}^{m} \delta_i \Delta \ln G_{t-i} + \varepsilon_t \quad (5)$$

$$\Delta \ln M_t = \alpha_0 + \sum_{i=1}^{k} \alpha_i \Delta \ln M_{t-i} + \sum_{i=1}^{l} \beta_i \Delta \ln Y_{t-i} + \sum_{i=1}^{m} \delta_i \Delta \ln G_{t-i} + \varepsilon_t \quad (6)$$

$$\Delta \ln G_t = \alpha_0 + \sum_{i=1}^{k} \alpha_i \Delta \ln G_{t-i} + \sum_{i=1}^{l} \beta_i \Delta \ln Y_{t-i} + \sum_{i=1}^{m} \delta_i \Delta \ln M_{t-i} + \varepsilon_t \quad (7)$$

In the equations (5), (6) and (7), k, l and m indicate lag lengths respectively and ε signifies error term. In order for any model to yield meaningful results, the independent variable coefficients on the right side of equation (β's and δ's) must be statistically significant. The fact that the coefficient of any independent variable is significant means that the variable is the reason of dependent variable. If the null hypothesis that there is no causality relationship is rejected through F test, the existence of a causality relationship for mentioned direction will be proven.

4. FINDINGS

[1] Optimum lag length is determined by information criteria. See appendix for criteria results.

In table-II below, stationary analysis results of series are given for PP test. In the table, it can be seen that Y, M and G series are stationary in their levels for the tests of all models have only intercept, intercept+trend but do not have intercept+trend.

Table II: PP Unit Root Tests

H_0: series have unit root

variables	intercept	trend+intercpt	none	Desicion
ΔlnY	-11,23[0.00]***	-14,06[0.00]***	-8,87[0.00]***	H_0:Reject
ΔlnM	-4,07[0.00]***	-6,62[0.00]***	-4,07[0.00]***	H_0:Reject
ΔlnG	-14,25[0.00]***	-17,68[0.00]***	-8,76[0.00]***	H_0:Reject

Note: Probability values of t-statistics are in brackets.
*** denotes significant at %1.

In order to reveal the relative importance of monetary and fiscal actions on real GDP, as in many empirical studies, the developed model (i.e. model 1) was estimated with OLS regression[2]. According to estimation results, fiscal policy has a significant positive influence on Romanian economy in the short term while monetary policy has insignificant. Besides, again in the short run, becoming an EU member does not effect real activity while 2008 financial crises does. On the other hand, in the long term, cumulative effects[3] of money growth and government expenditure growth on real GDP growth have been calculated as $\sum_{i=0}^{4}\alpha_1$=0,670299 and $\sum_{i=0}^{4}\alpha_2$= 0,411087 respectively. That means a 1 percent increase in money stock is associated with an increase of 0,67 percent in output and 1 percent increase in government expenditure is associated with a increase of 0,41 percent in output over the next year. However, since most of these coefficients have not been statistically significant, it can be generally interpreted that both of policies are ineffective in the long term. Nevertheless, in particular, it can be also seen that the influence of a policy is becoming effective when it gets closer to one year. In addition, the influence of 2008 crisis effects GDP negatively both in short and long run while becoming an EU member does not.

Table III: Granger Causality Test Results

Null Hypothesis	Obs.	F-Stat.	Decision
H_0: ΔlnY does not Granger cause ΔlnM	23	0,053[0.66]	H_0: Accept
H_0: ΔlnY does not Granger cause ΔlnG	23	2,893[0.06]*	H_0: Reject
H_0: ΔlnM does not Granger cause ΔlnY	23	13,391[0.00]***	H_0: Reject
H_0: ΔlnM does not Granger cause ΔlnG	23	3,438[0.04]**	H_0: Reject
H_0: ΔlnG does not Granger cause ΔlnY	23	2,726[0.09]*	H_0: Reject
H_0: ΔlnG does not Granger cause ΔlnM	23	0,778[0.52]	H_0: Accept

Note: Probability values of t-statistics are in brackets.
***, ** and * denote significant at%1 , %5 and %10 respectively.

The results of the Granger causality analysis are summarized in table-III. According to the results, there is a bi-directional causality running between real activity and government expenditures. There also exist a stronger uni-directional causality running from money stock to government expenditures and real activity.

5. CONCLUSIONS

It's very important to know that which policies of a country are more effective. This information will be extremely valuable especially in developing countries to create a road map for growing process. The policies and policy tools which are more effective on economy are given place mostly in the economic programmes that will be applied.

This paper investigates the effectiveness of monetary and fiscal policies on Romanian economy over the period 2004:4 to 2011:2. In the light of the findings obtained from the analyses, it is seen that in the short term, fiscal policy is effective rather than monetary policy. That means an expansionary fiscal policy increases real activity supporting the equation of nominal GDP. On the other hand, when we focused on long term, both monetary and fiscal policy has insignificant effect. But the influence of these policies is going to be more meaningful when the resulting process gets closer a year. Furthermore, since the fiscal policy reacts more quickly than monetary policy, we can infer that fiscal policy is more effective rather than monetary policy in the long run as well as short run. That is, the findings relatively prove that Keynesian view is more acceptable. In addition, it is very clear that membership of EU does not effect real activity for Romania while 2008 crises does.

Causality analysis shows that there exists a bi-directional causality running between real activity and government expenditures. There is also a uni-directional causality running from money stock to government expenditures and real activity.

[2] See appendix for short and long term regression results.
[3] The sum of the coefficients on the current and four lagged values of each variable.

As a result, it is determined that regression and causality results support the existence of a strong relationship between fiscal policy instruments and real activity. But then, monetary policy can be only regarded as a tool that could effect fiscal policy instruments and indirectly economic performance.

6. ACKNOWLEDGEMENT

This work was supported by the project "Post-Doctoral Studies in Economics: training program for elite researchers - SPODE" co-funded from the European Social Fund through the Development of Human Resources Operațional Programme 2007-2013, contract no. POSDRU/89/1.5/S/61755

7.REFERENCES

1.Ali S., Irum, S. and Ali, A. (2009), "Whether Fiscal Stance or Monetary Policy is Effective for Economic Growth in case of South Asian Countries?", *24th AGM, Pakistan Institute of Development Ecenomics.*

2. Andersen, C. L. and Jordan, J. (1968), "Monetary and Fiscal Action: A Test of Their Importance in Income Stabilization." Federal Reserve Bank of St. Louis Review (November), pp: 11-24.

3.Ansari, M. I., (1996), "Monetary vs. Fiscal Policy: Some Evidence From Vector Autoregression for India", *Journal of Asian Economics*, Volume 7, 4, pp: 677-698.

4.Ansari, M. I., (2002), "Impact of Financial Development, Money and Public Spending on Malaysian National Income: An Econometric Study", *Journal of Asian Economics*, 13, pp: 72-93.

5.Belliveau, S. (2011), "A St.-Louis Equation to Reassess The Influence of Macroeconomic-Policy Instrument", Munich Personal RePEc Archiv, Paper No. 28771.

6.Cerda, R. A., Gonzales, H. and Lagos, L. F. (2006), "Is Fiscal Policy Effective? Evidence for an Emerging Economy: Chile 1833-2000", *Applied Economics Letters*, 13, pp: 575-580.

7.Cooper P. J. and Fischer S. (1974), "Monetary and Fiscal Policy in the Fully Stochastic St Louis Econometric Model", Journal of Money, Credit and Banking, 6 (1), pp: 1-22.

8.Dickey, D. and Fuller, W. A. (1979), "Distrubition of the Estimators for Autoregressive Time Series with a Unit Root", Journal of American Statistical Association, 74, pp: 427-431.

9.Dickey, D. and Fuller, W. A. (1981), "Likelihood Ratio Statistics for Autoregressive Time Serise with a Unit Root", Econometrica, 49 (4), pp: 1057-1072.

10.Dönek, E. (1995), "Relative Effectiveness of Monetary and Fiscal Policies on GNP in the Turkish Economy", *Erciyes University Journal of Social Sciences*, 6, pp: 409-415.

11.Düzgün R. (2010), "Effectiveness of Monetary and Fiscal Policies in Turkish Economy", *The Journal of International Social Research*, 3 / 11 Spring 2010 pp: 230-237.

12.Enders, W. (2004), "Applied Econometrics Time Series", New York: John Willey&Sons.

13. EuroStat Database, http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/.

14.Friedman, M. and Meiselman D. (1963), "The Relative Stability of Monetary Velocity and the Investment Multiplier in the United States", 1887-1958", *In Stabilization Policies*, Englewood Cliffs, Prentice-Hall.

15.Granger, C. W. J. (1969), "Investigating Causal Relations by Econometric Models and Cross-Spectral Methods", Econometrica, 37(3), pp: 424-438.

16.Granger, C. W. J. and Newbold, Paul (1974), "Spurious Regressions in Econometrics", Journal of Econometrics, 2, pp: 111-120.

17.Gujarati, D. N. (2004), "Basic Econometrics", The McGraw-Hill Company, Fourth Edition.

18.Hsing, Y. (2005), "Impact of Monetary Policy, Fiscal Policy and Currency Depreciation on Output: The Case of Venezuela", *Briefing Notes in Economics*, No: 65.

19.Kretzmer, P. E. (1992), "Monetary vs. Fiscal Policy: New Evidence on an Old Debate", *Economic Review, Second Quarter*, pp: 21-30.

20.Phillips, P. C. B. and Peron, P. (1988), "Testing for a Unit Root in Time Series Regression", Biometrika, 75 (2), pp: 336-346.

21.Raj, B. and Siklos, P. L. (1986), "The Role of Fiscal Policy in the St. Louis Model: An Evaluation and Some New Evidence", Journal of Applied Econometrics, 1 (3), (Jul., 1986), pp: 287-294.

22.Romanian Central Bank Database, http://www.bnro.ro.

APPENDIX

Lag Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	193.672	NA	5.95e-12	-17.33386	-17.18508	-17.29881
1	212.633	31.02696	2.44e-12	-18.23940	-17.64428	-18.09921
2	230.807	24.78279	1.12e-12	-19.07340	-18.03195	-18.82807
3	255.056	26.45407	3.24e-13	-20.45973	-18.97194	-20.10925
4	**277.536***	**18.39208***	**1.30e-13***	**-21.68511***	**-19.75099***	**-21.2299***

5	283.354	3.173716	3.31e-13	-21.39588	-19.01542	-20.83511

Short Term OLS Regression Results
Dependent Variable: ΔlnY

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ΔlnM	-0.2923309	0.786541	-0.371666	0.7135
ΔlnG	0.7301363	0.141987	5.1423624	0.0000
C	0.0005457	0.004593	0.1188027	0.9064
$dummy_{CR}$	-0,5042586	0.249823	-2.175203	0.0569
$dummy_{EU}$	-0.259630	0.715987	-0.314630	0.7361
R-squared	0.659689	F-statistic		18.25349
Adjusted R-squared	0.622997	Prob(F-statistic)		0.000013

Long Term OLS Regression Result
Dependent Variable: ΔlnY

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.29E-05	0.003568	-0.012016	0.9906
ΔlnM	1.188892	0.896719	1.325825	0.2096
ΔlnM (-1)	-0.264891	0.708442	-0.373906	0.7150
ΔlnM (-2)	0.292686	0.632184	0.462975	0.6517
ΔlnM (-3)	1.228123	0.796462	1.541972	0.1490
ΔlnM (-4)	-1.774508	0.665006	-2.668410	0.0205
ΔlnG	0.039703	0.246237	0.161239	0.8746
ΔlnG (-1)	-0.043983	0.233182	-0.188621	0.8535
ΔlnG (-2)	0.254922	0.226368	1.126142	0.2821
ΔlnG (-3)	-0.507025	0.238760	-2.123575	0.0552
ΔlnG (-4)	0.667470	0.233490	2.858662	0.0144
$dummy_{CR}$	-1.812630	0.712353	-2.845691	0.0199
$dummy_{EU}$	0.045681	0.278962	0.171569	0.8811
R-squared	0.968044	F-statistic		19.44198
Adjusted R-squared	0.889747	Prob(F-statistic)		0.000011