THE EFFECTS OF EXCHANGE RATE ON ECONOMIC GROWTH IN THE REPUBLIC OF MACEDONIA

Nasir SELIMI
Faculty of Business and Economics,South-East European University,
Ilindenska 335, 1200 Tetovo, Macedonia
n.selimi@seeu.edu.mk
Valdrina SELIMI
Faculty of Business and Economics,South-East European University,
Ilindenska 335, 1200 Tetovo, Macedonia

Abstract

The purpose of this paper is to analyse empirically the effects of exchange rate on economic growth in the FYROM. We apply the OLS approach to estimate the regression equation and present the model that analyzes the impacts of exchange rate on economic growth. As the dependent variable is considered real GDP as representatives of economic growth, and as independent variables besides the variable of real exchange rate, are reviewed a range of other macroeconomic variables like consumer price index, trade openness, the monetary aggregate (M2), current account balance and real interest rate. Also in the model is incorporated an artificial variable (dummy) to explore the effects of the global financial crises. Further, it is made a long-term analysis of the linkage between real exchange rate and economic growth, using dynamic VAR model and Granger causality test.

The empirical results indicate that real exchange rate positively affects the economic growth. Thus, we found out relevant argument that support the current regime i.e. fix regime of the exchange rate which ensures macroeconomic stability of the country. Taking into consideration the euroization, exchange rate pass through effect and credibility, introducing a float exchange regime is likely to induce more costs than benefits for the economy, as the global financial crisis of 2008 proved that still country face the lack of complete credibility of the national currency, monetary and fiscal policies.

This is one of a rare attempt of estimating the effects of exchange rate on economic growth in FYROM using the VAR model and Granger causality test. Although the VAR model and Granger causality test performs well, the results should be interpreted with caution.

Keywords: *Exchange rate, economic growth, OLS, Granger causality test*

Classification JEL: *B23, B27,O24,O40*

I. INTRODUCTION

An exchange rate is one of the most important determinants of country`s economic health. This factor is crucial in the country`s foreign trade. If exchange rate of country`s currency is higher, it makes its export expensive, so its export is not attractive in global market, but in the same time the import of country is cheaper and makes the consumer to buy more from abroad. Otherwise if currency is lower it makes the export cheaper and attractive for foreign consumers, but also it makes import expensive for domestic consumers. Both the exports and imports have impact on country`s lower or higher balance of trade. This is why exchange rate is very important subject for analyze and research by economist and others.

Most currencies can be traded for another currency in the money market. When this trade is not restricted, it is considered fully convertible. Some currencies are partially convertible which means that their Central Bank has control. There are also non-convertible currencies. These currencies are not convertible with another currency and they are not participating in the foreign exchange market.

An exchange rate is the rate at which one currency is converted into another currency. Currencies can be converted in the foreign exchange market. Without function of foreign exchange market today`s international trade is impossible. These rates in general can be: floating and fixed regime. Floating exchange rate is determined by the free market forces. The government doesn`t intervene. The fixed exchange rate occurs when the value of the currency is fixed. The government of country intervene to keep the value of currency at a certain level against other currencies. Most of country fixed their currency with euro or US dollar (Kurtishi-Kastrati et al., 2016).

There are many determinants of exchange rate. The main factors are: differentials on inflation, differentials on interest rate, current account deficits, public debt, political stability and economic performance. According to the monetary approach the determination of exchange rate are: the relative money supplies, the relative velocities of money and the relative national outputs.

II. LITERATURE REVIEW

THEORETICAL ISSUES

Macedonian`s economy today is characterized as a small and open economy with ambition to integrate to the European Union. The process of integration support the single currency with argument that it is in favor of international trade and stability of exchange rate.

The forces that determined the exchange rate are complex and many authors don`t have consensus about them. On the other side the impact of determinants to exchange rate in the export and import is most important for a country.

Similarity with market of goods, the determinant of exchange rate is the demand and supply of one currency relative to the demand and supply of another currency. If in the money market the demand for euro is greater than supply the exchange rate of euro will change. Euro in this case will appreciate. The contrary will happen if in the money market the supply for euro is greater than demand. Euro in this case will depreciate. Of course, that there are a lot conditions which impact on changing of demand and supply of a currency, but the prices is the most important in the determination of exchange rate. To understand this relation, we should note the importance of two economic propositions the law of one price and the theory of purchasing power parity (PPP). Inflation is a monetary phenomena. It reduces the value of money. As a general rule is that if the country has low inflation rate its currency value is rising and the opposite if the country has higher inflation rate its currency will depreciate.

Interest rate is also correlated with exchange rate. Central banks can manipulate with interest rate which automatically influences in change the inflation rate and then in changing the exchange rate. In countries where inflation is expected to be high, interest rates also will be high. This is normally because investors want compensation for the decline in the value of their money. This relationship is known as Fisher Effect.

Another important determinant of exchange rate is current-account deficit. It is related with balance of trade of country. The current account deficit is happening when a country is importing more than exporting goods, services, interest and dividends. In those case country is selling with low prices and baying with higher prices which reflect for increasing demand for foreign currency. This situation impact on lowers the value of country currency and change its exchange rates.

Public debt is another determinant on the exchange rate. It happens when the government of a country expend more many in the public-sector projects and government funding. Large debt stimulate inflation and the investors are not interesting to invest in those countries because the risk of default is great.

Foreign investors want to invest in the countries where economy and political situation is stable. They don`t have confidence to invest in the country where political and economy performance are weak. It is known as investor psychology and bandwagon effects (*see*Selimi et al., 2016).

PREVIOUS EMPIRICAL FINDINGS

There are many authors that have different meaning about the effect of exchange rate on the economic growth. Some of them conclude that exchange rate have positive effect on the economic growth and some not.

Besimi (2003) explains connection effects of exchange rate variability in international trade the experience of Republic of Macedonia. He concluded that the effect of exchange rate variability in international trade is endogen that means it depend on the exchange rate regime. So, on the period of higher exchange rate variability the effect on the international trade is negative and very volatile, while in the period of lower exchange rate the effect on the international trade is less volatile, and the sign is moving from negative toward positive.

Fetai (2013) in his finding consider that all econometrics results show that introducing a different strategy of the exchange rate targeting in order to promote rapid economic growth could easy disturb macroeconomic stability without any significant economic benefits. In the long term, the coefficient of exchange rate reveals that a 1% change in the exchange rate will generate an increase in the prices level of 0.52%, indicating that 52% of changes in the exchange rate feed into the prices level. He suggests that introducing a different strategy of the exchange rate regime is likely to incur more cost than benefits.

Coricelli, Jazbec and Masten (2004) in their working paper found that the combination of exchange rate regime and monetary policy contribute to the differences in inflation rates among CEEC-4. The paper finds a strong pass-through from nominal exchange rates to domestic inflation. In such context, the dichotomy between inflation targeting and exchange rate targeting is more apparent than real.

III. METHODOLOGY AND DATA

We apply the OLS approach to estimate the regression equation and present the model that analyzes the impacts of exchange rate on economic growth. As the dependent variable is considered real GDP as representatives of economic growth, and as independent variables besides the variable of real exchange rate (RER), are included a range of other macroeconomic variables, consumer price index (CPI), monetary aggregate (M2), current account balance (CAB), trade openness (OPENES) and real interests rate (RIR). Also in the model is incorporated an artificial variable (dummy) to explore the effects of the global financial crises into the economic development. Besides static models, estimated with the OLS method, it is made a long-term analysis of the linkage between exchange rate and economic growth, using a dynamic VAR model and Granger causality test.

The quarterly data series are used in the empirical analysis, covering the period 1998q1-2015q1. The main sources of data are the National Bank (NBRM) and the State Statistical Office (SSO). All the used series previously are adjusted for the effect of seasonality using ARIMA X12.

The following model represents the linear regression model by which we try to analyze the impacts of real exchange rate on economic growth.

$$\mathbf{lnRGDP}_i = c + \beta_1 lnRER_i + \sum_{m=2}^{M} \beta_m lnX_{im} + \gamma D_s + \varepsilon_i$$

where $RGDP$ is real GDP with constant prices in time *i*; *c* is the constant; *RER* – is the real exchange rate[1]; with X_m– we represent other macroeconomic explanatory variables considered in the model; D – is a dummy variable that is included to capture the effects of the last global financial and economic crisis (2009q1-2011q4). The dummy variable is the divisive period:

- *D=1 if the data belongs to the period of crisis*
- *D=0 if the data belong to the period out of crisis*

with 'ε ' is presented the error term, or stochastic factor that is supposed to be with zero conditional mean and constant variance, ie$E(\varepsilon_i) = \mathbf{0}$ for each period *i*. All the data are transformed into logarithms.

IV. EMPIRICAL RESULTS

Unit root test

Before evaluating regression models, we have done testing of stationary of variables through the Augmented Dickey-Fuller (ADF) test and Philip-Perron(PP). The results are given in the Table1

Table 1. Unit root test statistics of series

Variables	Test	t-statistics	p-value	t-statistics	p-value	
		Level		First difference		**Decision**
Ln RGDP	ADF	-1.726	0.368	-3.370**	0.020	I(1)
	PP	-1.699	0.470	-5.010***	0.000	
Ln RER	ADF	-0.632	0.779	-3.462***	0.000	I(1)
	PP	-0.514	0.645	-4.262***	0.000	
Ln CPI	ADF	-1.899	0.301	-5.066***	0.000	I(1)
	PP	-1.743	0.592	-6.791***	0.000	
Ln OPENES	ADF	-0.993	0.791	-4.025***	0.006	I(1)
	PP	-2.941	0.156	-5.982***	0.000	
Ln M2	ADF	-1.668	0.399	-3.094**	0.039	I(1)
	PP	-1.891	0.129	-4.049**	0.042	

[1] The real exchange rate is: R = EP*/P where E is the nominal domestic-currencyprice of foreign currency, P is the domestic price level, and P* is the foreign price level.

Ln CAB	ADF	-3.323	0.037	-	-	I(0)
	PP	-3.714	0.006	-	-	
Ln RIR	ADF	-1.676	0.134	-3.445**	0.019	I(1)
	PP	-2.577	0.109	-5.6045**	0.000	

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*Note:*** represents the rejection of null hypotheses in the 5% level of significance. The critical value is - 2.926, *** represents the rejection of null hypotheses in the 1% level of significance. The critical value is -3.577.
Source: Authors' calculations

Based on the Dickey- Fuller and Philips-Perron tests, only the current account balance is stationary in its level whereas, all the other variables are non-stationary in their level, but they are transformed to stationary by taking the first difference.

Results of regression models

In this part are given the empirical results of regression models with various specifications. The results show that RER is with positive sign and statistically significant already in all models (see Table 2).

Table 2. Results with various specifications

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
D_lnRER_sa	0.0039 (2.95)**	0.0041 (2.29)**	0.0057 (2.13)**	0.0023 (1.92)*	0.0072 (2.38)**
D_lnM2_sa	0.0141 (3.11)***	0.0227 (3.20)***	0.0255 (2.98)**	0.0401 (2.82)**	0.0149 (3.43)***
D_lnOPENES_sa	0.0669 (1.98)**	0.0692 (1.88)*	0.0518 (2.88)***	0.0505 (2.53)*	0.0801 (2.36)**
D_lnCPI_sa		0.1382 (1.20)			
D_lnRIR_sa			-0.2390 (-0.81)		
D_CAB_sa				-0.225 (-0.34)	
D_Crisis					-0.0123 (-2.06)*
R^2	0.661	0.677	0.672	0.637	0.663

Note: The notifications ***, ** and * denote 1%, 5% and 10% level of significance, respectively. D-means first diference and SA-seasonally adjusted time series.
Source:Authors' calculations

Also, the variables of monetary aggregate M2 and trade openness are with positive sign and statistically significant in all model specifications, whereas consumer price index, current account balance and real interest rates resulted statistically insignificant. Regarding the dummy variable, the coefficient is with negative sign and statistically significant, thus the crisis affected negatively the real GDP.

We further investigate for the possible long run relationship between RER and real GDP by performing an unrestricted VAR model. We first find the optimal time lags for these two variables, so basing on Akaike Information Criterion we consider 4 lags in this analysis. Regarding the regression results of VAR model, at least one coefficient of lags of RER was found to be statistically significant, implying that there exists a long run relationship between RER and real GDP.

In the same time we defined the causality between RER and GDP through Granger causality analysis. This analysis investigates whether the RER follow the changes of GDP or vice versa. Base on table number 3 we can concludes also that the null hypothesis that GDP does not Granger causes. RER cannot be rejected, meaning that the GDP does not influence RER and a change in GDP doesn't cause any change in RER. On the opposite the null hypothesis for the causality of RER related to GDP can be rejected, so if the level of RER increases the GDP will follow.

Causality between exchange rate (RER) and M2 estimates the second equation. Here also the null hypothesis cannot be rejeceted, this mean that if RER will change, M2 will not follow and vice-versa. From this we can conclude that these two variables are also statistically independent. So, a devaluation of the Denar/Euro will have on the monetary aggregate M2 approximately zero effect.

The relationship between trade openness and exchange rate respectively.the current account and exchange rate belong to the third and sixth equations. From the causality test is clear that for these equations the null hypothesis cannot be rejected for the both versions. This means that trade openness does not granger cause exchange rate. Also the current account does not Granger cause exchange rate and vice-versa. A devaluation of the Denar/Euro will have zero effect on current account and trade openness.

Table 3. Granger Causality Wald Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause RER		13.40454	0.0252
RER does not Granger Cause GDP	69	0.46655	0.7599
M2 does not Granger Cause RER			0.3191
RER does not Granger Cause M2	69	1.20869 1.59565	0.1904
OPENNESS does not Granger Cause RER			0.3387
RER does not Granger Cause OPENNESS	69	1.16291 1.13364	0.3517
M2 does not Granger Cause GDP			0.0910
GDP does not Granger Cause M2	69	2.13105 2.04451	0.1026
OPENNESS does not Granger Cause GDP			0.1907
GDP does not Granger Cause OPENNESS	69	1.59458 0.51534	0.7248
CAB does not Granger Cause RER			0.4523
RER does not Granger Cause CAB	69	0.93364 1.90706	0.1242

Sample: 1998Q1- 2015Q1 Lags: 4

Source:Authors' calculations

In general our findings from this study are some important arguments that support the actual fix exchange regime: first, the current account deficit and poor performance of open trade do not rely on the exchange rate. Second, export and import and monetary aggregates do not granger cause the exchange rate. Third, with a fix exchange regime the Central Bank of Macedonia can control the degree of euroisation. Forth, the credibility towards national currency is much higher.

The main objective of this study was to examine the effects of exchange rate on economic growth of FYROM. By applying the OLS approach we found that real exchange rate (RER) positively affects the economic growth of the country. The research further attempts to investigate the effect of RER on economic growth using the Vector Auto Regression (VAR) and Granger Causality Test. Based on VAR results at least one coefficient of the lags of RER is statistically significant meaning that there exists a long run relationship between real exchange rate (RER) and GDP. The findings of causality test indicate that GDP does not seem to induce RER but, RER seems to induce GDP. Regarding the current account balance, trade openness and monetary aggregate M2, these variables do not cause the exchange rate and likewise, exchange rate does not cause current account, trade openness and M2, respectively. It is evident that the nature of their relationship is influenced by other factors, such as euroization and structural shocks.

V. CONCLUSIONS

The main objective of this study was to examine the effects of exchange rate on economic growth of FYROM. By applying the OLS approach we found that real exchange rate (RER) positively affects the economic growth of the country. The research further attempts to investigate the effect of RER on economic growth using the Vector Auto Regression (VAR) and Granger Causality Test. Based on VAR results at least one coefficient of the lags of RER is statistically significant meaning that there exists a long run relationship between real exchange rate (RER) and GDP. The findings of causality test indicate that GDP does not seem to induce RER but, RER seems to induce GDP. Regarding the current account balance, trade openness and monetary aggregate M2, these variables do not cause the exchange rate and likewise, exchange rate does not cause current account, trade openness and M2, respectively. It is evident that the nature of their relationship is influenced by other factors, such as euroization and structural shocks.

According to the empirical results, we conclude that the current regime i.e. fix regime of the exchange rate ensures macroeconomic stability of the Republic of Macedonia. Having in mean the euroisation characteristics exchange rate pass through effect and credibility. Introducing a float exchange regime is likely to induce more costs than benefits for the economy of the country. Republic of Macedonia has high level of euroisation and with high foreign denominated debt may not be able to afford sharp devaluation because that will increase the burden debt and other negative consequences in the economy.

VI. LIMITATIONS

However**, the study has its limitations and shortcomings.** First, the sample size is relatively small for conducting robust results, since time series regression models require a large sample size. Second, as structural shock is taken only the financial crisis (2008/2009), whereas the ethnic conflict of 2001 and the debt crisis of Eurozone are not considered because of the small-time span of the data.

VII. REFERENCES

1. Besimi, F. (2003), "Variability of exchange rate and intenational trade – the experience of Republic of Macedonia", NBM-Economic Research, pp 3-17.
2. Campa, J.M., and Goldberg, L.S. (2005),"Exchange rate pass-through into import prices. The review of economics and statistics". MIT Press,Vol.87, No.4, pp.679–690
3. Coricelli, F., Jazbec B., andMasten I. (2004),"Exchange rate pass-through in acceding countries: the role of exchange rate regimes". European University Institute, Working Paper, No. 2004/16, pp 1–32.
4. Fetai, B. (2013), "Exchange Rate Pass-Through in Transition Economies: The Case of Republic of Macedonia", Transition Studies Review, Vol.20, No. 3, pp 309-324.
5. Ganev, G., Molnar K., Rybinski, K., and Wozniak, P. (2002),"Transmission mechanisms of monetary policy in central and eastern Europe", Central for social and economic research, Case Reports No. 0052, Warsaw, pp 1–28.
6. Jovanovic, B. (2007), "The Fundamental Equilibrium Exchange Rate of the Denar", Unpublished Master's thesis, Staffordshire University, UK.
7. Jovanovic, B. (2009), "Should the Macedonian Denar be Devaluated? Some Evidence from the Trade Equations", SEER: Journal for Labour and Social Affairs in Eastern Europe, Vol. 12, No. 3, pp.339-368.
8. Kurtishi-Kastrati, S.,Ramadani, V., Dana, L-P. and Ratten, V. (2016),"Do foreign direct investmentsaccelerate economic growth? The case of the Republic of Macedonia", Int. J.Competitiveness, Vol. 1, No. 1, pp.71–98.
9. Nenovski T. and Makrevska E. (2009), "Influence of the Economic Crisis on the Exchange Rates of the Countries from Eastern and Central Europe", American College, Skopje.
10. Selimi, N., Sadiku, M and Sadiku, L. (2016). "The Impact of Foreign Direct Investments on the Economic Growth of Macedonia". 3-rd International Multidisciplinary Scientific Conference on Social Sciences and Arts, SGEM2016, Economics and Tourism, pp. 749-756. STEF92 Technology Ltd, Sofia, Bulgaria.
11. Alguacil, M. and Orts, V. (2002), 'A Multivariate Cointegrated Model Testing for Temporal Causality between Exports and Outward Foreign Investment: the Spanish Case', Applied Economics, 34, 119-132.
12. Clausing, K. A. (2000), 'Does Multinational Activity Displace Trade', Economic Inquiry, 38(2), 190-205.
13. Darvas, Zsolt (2012), "Real effective exchange rates for 178 countries: A new database", Working Paper 2010/06, Bruegel; Discussion paper 2012/10
14. Fontagné, L. and Pajot, M. (1997), 'Relationships between Trade and FDI Flows within two Panels of US and French Industries', Working Paper of the University of Paris 1.
15. Hoekman, B. and Djankov, S. (1997). "Determinants of Export Structure of Countries in Central and Eastern Europe", The World Bank Economic Review, 11(3): 471-487.