

## **Macroeconomics and Monetary Economics**

### **The Impact of Real Exchange Rate on Economic Growth in Albania**

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**Abstract:** Real exchange rate is one of the most important economic variables, especially in today's conditions of integration processes, the removal of trade barriers and increasing direct competition between countries. Real exchange rate affects economy, through its impact on key economic variables, such as employment, inflation and especially economic growth. Changes in the real exchange rate affect the competitiveness of domestic products, resulting in increased exports or imports, affecting trade balance e growth. Also changes in the real exchange rate affect investment and capital accumulation, which are directly linked with economic growth. The aim of this paper is to study the possible impact of the real exchange rate on economic growth in Albania, to answer the question whether the real exchange rate can be used as an instrument of policy. Johansen cointegration method and Vector Error Correction Model is used in this paper to identify the long-term and short-term impact of real exchange rate on economic growth in Albania. Results of the study indicate that the real exchange rate has no significant impact on the Albanian economy, suggesting that policies to promote economic growth, both in the short and long term should not rely on this variable.

**Keywords:** Johansen cointegration; Vector Error Correction Model; long-term impact; short-term impact

**JEL Classification:** F31; F41; F43

#### **1. Introduction**

The real exchange rate RER is now seen by economists as a policy instrument for promoting economic growth of a country. However, the transmission channels of RER impact on economic growth are still the subject of debate between them. Some economists highlight the effect of real exchange rate on the improvement of trade balance, while others emphasize the effect on investment.

The real exchange rate is considered as a key indicator of the competitiveness of a country's products. If RER is undervaluated, domestic products are relatively less expensive than foreign products, and this can lead to displaced demand, domestic as well as foreign, to relatively free domestic products. This will result in higher

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exports and lower imports, the trade balance will improve and domestic economy will grow.

Likewise, changes in the real exchange rate affect investment decisions by firms. If RER is undervalued, increasing the demand for domestic products will boost investments in responding to increased demand. Domestic firms as well as those involved in international trade will increase their level of investment, especially if the undervaluation of currency continues. Increased investment and capital accumulation are considered as “the engine of economic growth”(Razin dhe Collins, 1997).

The aim of this paper is to study the potential impact of real exchange rate on the Albanian economy. Since the euro area constitutes the main trade partner of Albania, the real exchange rate will be constructed as an index against the euro. The data are obtained from Bank of Albania, Eurostat, Ministry of Finance, Albania. The data have quarterly frequency for the period 2002Q1-2011Q4.

## **2. Literature Review**

Numerous studies have been done to identify the possible impact of the real exchange rate on growth.

Razin and Collins (1997) studied the relationship between economic growth and real exchange rate, considering investments and tradable products sector as channels through which the RER deviation may affect economic growth. They came to the conclusion that only a very high overvaluation seems to be associated with slower economic growth, while moderate to high (but not too high) undervaluation of real exchange rate appears to stimulate economic growth.

Rodrik (2003) focused on the importance of a competitive RER in the development process. He suggested that a successful strategy of growth can be developed based on two factors: first, needed an ignition factor, able to stimulate economic growth in the short term, as a necessary condition. The second factor is the creation of institutions and implements policies able to support sustainable growth in the long run. These policies should be country specific, depending on the situation and the particular context of each country. He suggested continuous undervaluation of RER, as an ignition factor.

MacDonald (2000) suggested that if the RER is sufficiently competitive to encourage entrepreneurs to sell in the international market, then firms will increase investment and hire local labor force and the economy will grow.

Eichengreen (2008) suggested that the real exchange rate can not support the growth by itself, but RER can serve as sourcing circumstances: an appropriate real

exchange rate policy can be mitigating condition for a country seeking to increase the level of capital as opportunity for growth.

In their research Aguirre and Calderon (2005) analyzed the misalignment of RER and growth effect of misalignment for 60 countries over the period 1965-2003. They found that the deviations from equilibrium hinder economic growth, but the effect is non-linear: growth declines are larger, the larger the size of the misalignments. Although large undervaluations hurt growth, small to moderate undervaluations enhance growth. They suggested that growth is hampered by highly volatile RER misalignments.

### 3. Model Specification

In this paper, real income per capita is used as an indicator of economic growth and it is considered as a function of real exchange rate, investments, government spending and trade openness.

- **Real effective exchange rate RER** is calculated as weighted geometric average of the price index of major partner countries in Eurozone (Germany, Italy and Greece) compared to domestic prices;

$$RER = E \frac{P^*}{P} = \prod_{i=1}^I \left[ S_i \frac{P_i^*}{P} \right]^{W_i}$$

where  $S_i$  is the nominal exchange rate between euro and Albanian lek,  $P_i^*$  is the price level of the  $i^{th}$  country and  $W_i$  is the weight corresponding to the  $i^{th}$  trade partner.

- **Investments INV** (as % of GDP): the increase of investments will increase the production capacity and the level of income; hence expected to have a positive impact of investments on economic growth;

- **Government spending GOV** (as % of GDP): is expected to have a positive impact on economic growth;

- **Trade openness OPEN**: the effect of trade openness on economic growth is not so clear. An increase in trade openness is supposed to have a positive impact on economic growth, because it enables countries to build their competitive advantages. But, empirical studies have provided different results from those expected for this variable. Devarajan and Rodrik (1989) showed that higher trade openness can result in increased well-being or its reduction in the presence of imperfect competition. Dollar dhe Kraay(2003) suggested that institutional arrangements (policies and governance), market institutions (bureaucracy and competition) and social norms determine the extent to which trade openness affects higher income and economic growth. Rassekh(2004) suggested that the effect of trade openness on economic growth can be positive or negative.

All the variables will be introduced in the model in logarithmic form. Given the expected impact of each variable on the level of real income per capita, the relationship equation is:

$$+ \quad + \quad +/\!-\quad +/\!-$$

$$\ln \text{GDP}/c = f(\ln \text{INV}, \ln \text{GOV}, \ln \text{RER}, \ln \text{OPEN})$$

#### 4. Econometric Estimation

Cointegration method is used to explain the possibility of long-term relationship between real income per capita and explanatory variables. Time series data are tested to see if they are covariance stationary (i.e. no trend) or are trend stationary. This is done through Augmented Dickey-Fuller test (ADF). The results of test are summarized in the following table.

**Table 1. ADF Test Results**

Variables	ADF Test	p-value	Result
D(lnGDP/c)	-32.98035	0.0001	I(I)
D(lnINV,2)	-7.235119	0.0000	I(II)
D(lnGOV)	-15.77075	0.0000	I(I)
D(lnOPEN)	-9.615325	0.0000	I(I)
lnRER	-6.059682	0.0000	I(0)

ADF test results show that real income per capita GDP/c, government spending GOV and trade openness OPEN become stationary after the first differentiation, while real exchange rate is level stationary. Investments become stationary after the second differentiation. For this reason, this variable cannot be included in further analysis.

Johansen method is applied on the data to verify the long-term relationship between economic growth and the explanatory variables. The analysis resulted in one cointegration vector in the trace test and the maximum eigenvalue test. This suggested that the variables included in the model move together in the long run, or have a long-term relationship between them. The results of Johansen method are presented in the following table.

**Table 2. The Johansen Cointegration Test Results**

Series: LN\_GDPR\_CAP LNGOV LNOPEN LNREER  
 Lags interval (in first differences): 1 to 1

## Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.583017	61.45707	47.85613	0.0016
At most 1	0.365568	28.21813	29.79707	0.0752
At most 2	0.235150	10.92715	15.49471	0.2160
At most 3	0.019292	0.740254	3.841466	0.3896

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

## Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.583017	33.23894	27.58434	0.0084
At most 1	0.365568	17.29098	21.13162	0.1587
At most 2	0.235150	10.18689	14.26460	0.1999
At most 3	0.019292	0.740254	3.841466	0.3896

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Since in the long run variables move together, then VEC model is applied to identify whether there is causality of explanatory variables on real income per capita. The long-run relationship equation resulted:

$$\text{Ln GDP/c} = 3.99 - 0.08 \text{ lnGov} - 0.79 \text{ lnOPEN} + 0.52 \text{ lnREER}$$

The error correction term  $\alpha = -0.08$ , so is negative and statistically important (p-value = 0.047). This indicates that the equation of relationship is statistically important. The high value of adjustment  $R^2 = 0.76$ , (p-value F statistic = 0.0000) suggest that only 24% of the variation in real income per capita is not explained by the variables included in the model.

Diagnostic checks show that residuals are normally distributed, not serially correlated and homoscedastic. The results of the tests are summarized on the following table.

**Table 3. Diagnostic Checks Results**

Test	Test result	p-value
Jarque-Bera	2.8626470	0.238992
Breusch-Godfrey LM Test	0.178652	0.6810
Breusch-Pagan-Godfrey	10.28374	0.7514

The relationship equation suggest that only trade openness has relatively significant impact on the level of real income per capita in Albania: 1% increase in trade openness reduces the level of income per capita with 0.79%. The variable of government spending has wrong sign and very low coefficient, so the impact of this variable on economic growth would be considered insignificant.

Regarding the impact of real exchange rate on economic growth in Albania, the results show that variable RER has a sign in accordance with empirical studies. Positive sign indicates that an increase in the value of the RER will be accompanied by an increase in the level of income per capita. However, the RER coefficient value of 0.52 indicates that the impact is very small: 1% real undervaluation will be accompanied by an increase in the level of real income per capita in Albania with 0.52%.

Wald test analysis the short term coefficients of VECM. The results are summarized in the following table:

**Table 4. Short-run Coefficients**

Variables	Coefficients	Standard deviation	p-value
D(lnREER(-1))	-0.015687	0.022965	0.5014
D(lnREER(-2))	0.014205	0.019362	0.4706
D(lnREER(-3))	0.000254	0.016817	0.9881

From the Wald test is noticed that in all the cases the p-value > 5%. This suggests that short term coefficients are not statistically significant: real exchange rate has no effect on the level of real income per capita in Albania in short term.

## 5. Conclusions

In this paper, the potential impact of the real exchange rate of economic growth in Albania was studied. Because Albania's main trade partner is the Eurozone, then the real exchange rate index was constructed against the euro. Trade openness, government spending and investments were included in the model as other explanatory variables. First, all the variables were tested for stationary through ADF test. The results of ADF test showed that investments became stationary after second differentiation and for this reason this variable was excluded from the model. The Johansen test of cointegration showed that there is one vector of

cointegration in trace test and maximum eigenvalue test. VEC model enabled simultaneous identification of long-term and short-term coefficients. In the long term only trade openness seems to significantly affect economic growth in Albania, while the real exchange rate has a very small coefficient, suggesting an insignificant impact of real exchange rate on economic growth in Albania in long term. Also, short-term coefficients resulted statistically insignificant.

In conclusion it can be suggested that the real exchange rate has no significant impact on economic growth in Albania. This means that real exchange rates should not be used as a policy instrument for promoting economic growth in Albania.

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