# Macroeconomics and Monetary Economics

## The Impact of Real Exchange Rate on Employment in Albania

**Edmira Cakrani[1]**

**Abstract:** Unemployment is a big economical and social issue for each country, in particular for Albania, which is a country that comes from a centralized system where the state ensured full employment. In the struggle of applying the transition to market economy, each government had to face the two-digit levels of unemployment. Because of this, the application of the right policies in order to decrease the level of unemployment has been in the centre of the program of each government in Albania. The objective of this paper is to show if the undervaluation or overvaluation of the real exchange rate can affect in a significant way the level of employment in Albania and that to answer the question, if the real exchange rate can be used as a political instrument for the reduction of the level of unemployment. There are relatively few works that study the impact of real exchange rate on the Albanian economy and in my knowledge there is not a previous work on employment and real exchange rate relationship in Albania, so this can be considered as the first study that attempt to assess this relationship. To evaluate the link between the real exchange rate and the level of employment the Johansen procedure and Vector Error Correction Term method is used. The result of the study demonstrates not statistically significant impact of real exchange rate on level of employment, suggesting that the increase of competition of the country through the real exchange rate doesn't improve the condition of the employment in Albania, so the Albanian government should implement other strategies to increase the level of employment in the country.

**Keywords:** undervaluation; overvaluation; Johansen procedure; Vector Error Correction Model

**JEL Classification:** F16; E24

## 1. Introduction

Real exchange rate, RER, affects employment through 3 channels: macroeconomic channel, labour-intensive industry channel and development channel (Frenkel & Ros, 2006).

Macroeconomic channel suggests that real undervaluation expands the demand of tradable goods sector, causing increased production and employment in this sector. This direct impact causes a multiplier effect in the non-tradable goods sector (Frenkel & Ros, 2006). Increased employment causes increased income, increased

consumption demand even for non-tradable goods, whose firms respond increasing supply and employment level.

Frenkel & Ros (2006) suggest that in developing countries, RER determines the relative value of labor to capital, because the capital goods have a large part of imported goods. An undervalued real exchange rate encourages intensive use of labor and the relative value of labor is expected to affect the ratio of employment/production and the long run employment.

Development channel focuses on the influence of real exchange rate on economic growth and consequently the speed of generating new jobs. Leichenko & Silva (2004) highlighted that an undervalued RER increases the exports, causing higher employment and higher income. Frenkel (2004) suggests that the magnitude of the RER effect on employment depends on unused capital and the level of employment.

Koren (2001) evaluates the impact of RER on the employment level in Hungarian exporting firms. He suggests that the undervaluation of RER increases employment through increased competitively exports. On the other hand, an undervalued RER increases costs of intermediate inputs, and this may cancel positive effect of increased competitiveness. The net effect depends by the firms' exposure to exchange rate risk. Koren also (2001) suggests that type of industry does matter. Undervaluation of RER positively affects employment in food industry and tobacco industry, but negatively affects employment in machinery industry.

Filiztekin (2004) studies the impact of RER volatility on manufacturing industry in period 1981-1999 and suggests that undervaluation of RER negatively affects employment level with an even greater negative impact on wage level. Dependency of Turkish manufacturing industry on foreign inputs exceeds the positive effect of undervaluation in competitiveness.

Nucci and Pozzolo (2010) suggest that volatility of RER significantly affects employment level and labor hours in Italy. Undervaluation increases the labor hours in the following year because of increased income, but increased costs reduce the labor hours too.

The objective of this paper is to evaluate if real exchange rate can affect employment level in Albania. The study covers 2005-2012 periods and time series have quarterly frequency.

## 2. An Overview of Albanian Economy

Albania is a small open economy. The major contributor in GDP is the service sector, which represents about 59.3% of GDP in 2005 and 58% of GDP in 2012. Industrial sector is the second greatest contributor in GDP in Albania. In 2005, this sector counts for 22.1% of GDP and in continuous growing, with the highest value 25.4% of GDP in 2008. In 2012, this sector represents 18.1% of GDP. The agricultural sector has been fluctuating, passing from 18.6% of GDP in 2005 to the lowest value of 16.8% in 2008 and 2009 and again to 18.9% of GDP in 2012.

Unlike other economies in the region, the Albanian economy has been growing steadily in recent years, passing from 6% in 2005 to 7.5% in 2008, which represent the highest grow rate in the period under study. After this year, the growth rate of GDP decreases to 3.1% in 2011 and to 2% in 2012. Construction and service sector are the greatest contributors of the economic growth, with the service sector to be considered as the sustainable contributor. This sector counts for the 45-50% of real growth in Albania.
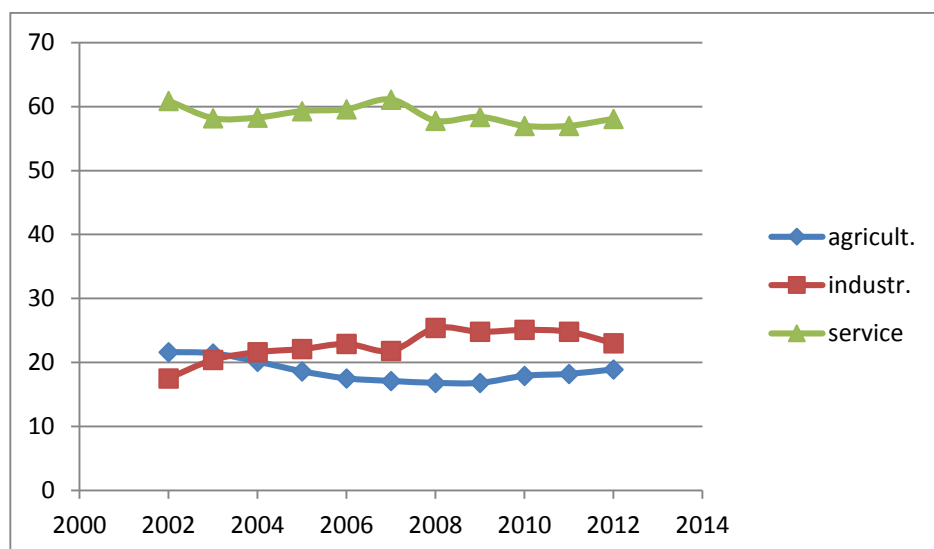


**Figure 1. Composition of Albanian economy**

*Source: INSTAT*

Industrial and agricultural sectors have contributed less in the real growth of Albanian economy. Agricultural sector have seen small growth rate. While the economy has grown on average by 5% during the period 2002-2011, the average growth in the sector is only 0.7%. Industrial sector, although has seen large fluctuation, has contributed on average by 0.7% in growth rate.

**Table 1. Contribution in economic growth by sectors of the economy**

| Year | Agricultural sector | Industrial sector | Service sector |
|------|--------------------|--------------------|----------------|
| 2005 | 0.1 | 1.9 | 3.1 |
| 2006 | 0.6 | 2.5 | 2.1 |
| 2007 | 0.5 | 0.6 | 4.4 |
| 2008 | 1.2 | 2.2 | 3.4 |
| 2009 | 0.3 | 1.0 | 2.0 |
| 2010 | 1.3 | -0.6 | 2.5 |
| 2011 | 0.7 | 0.0 | 1.9 |

*Source: INSTAT*

Even with the good economic performance, Albania has a two-digit level of unemployment. In 2005, around 14% of working force was unemployed. In following years, this level decreased, but remained always above 10%. In 2008, when the economy had the highest growth, the level of unemployment was 12.5%, which is the lowest value of the period. In 2012, the level of unemployment was 13.4%.

In 2005, there were around 932.000 employees working in the economy and in the following years this number has not seen a very significant increase. In 2012, this number was 959.000 employees.

Agricultural sector is not the biggest sector of the economy, but in this sector works the majority of employees. In 2005, 58% of the employees were working in this sector, while in 2011 there were 55%. On the other side, in the service sector works around 14% of the employees, making this sector one of the biggest contributor in the GDP.
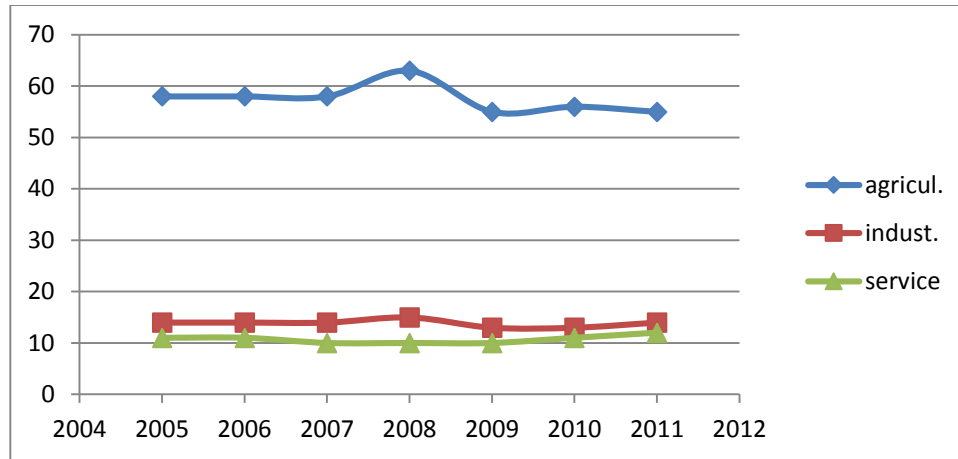
**Figure 2. Employment by sectors of economy**

*Source: INSTAT*

## 3. Empirical Analysis

Employment level in an economy is affected by many economical, social and political factors, but the objective of this paper is to evaluate a possible impact of real exchange rate on the employment level.

### 3.1. Model Specification

Real exchange rate is the purchasing power of two currencies, relative to one another and is calculated as the weighted geometric average of trade partners price index compared to domestic price index:

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

Where *E* is nominal exchange rate between foreign and domestic currency, $P^*$ is the foreign price index, *P* is the domestic price index and $w^i$ is corresponding weighted of *i-th* trade partner. In this paper, the real exchange rate is calculated against the Euro, because European countries constitute around 70% of trade exchange in Albania. According to this definition, a fall in the index will show a real overvaluation, meaning that the Albanian economy is not competitive and an increase will show a real depreciation of the domestic currency. This would mean that the Albanian products are more competitive than the others.

According to empirical studies, RER is expected to affect the employment level positively as well as negatively and to assess if there is a significant impact of it on the employment level in Albania. A modified variant of Frenkel & Ros (2006) model

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is used, where employment level is considered to be determined by:

-% of industrial export to total export, INDEX: tradable products are considered labor-intensive. If RER is undervalued, then the use of labor will be increased and industrial exports can indicate this effect. Thus, an increase in industrial exports is expected to positively affect the employment level in Albania.

- real GDP: this variable is expected to indicate the macroeconomic channel effect on employment. An undervalued RER increases exports, therefore product and employment level increases. Thus, a positive relationship between GDP and employment is expected.

The relationship function is:

$$+ \qquad + \qquad +/-$$

**lnEMPL = f( lnINDEX, lnGDP, lnRER)**

### 3.2. Model Analysis

All the variables are tested for unit root through ADF test. The results are presented in the following table.

**Table 2. ADF test results**

| Variable | ADF test | p-value | Results |
|----------|----------|---------|---------|
| lnEMPL | -3.120759 | 0.0369 | I(0) |
| D(lnINDEX) | -7.626789 | 0.0000 | I(I) |
| D(lnGDP) | -25.20153 | 0.0000 | I(I) |
| lnRER | -5.028596 | 0.0004 | I(0) |

*Source: Own calculation*

Test results show that with these variables the Johansen test of cointegration can be used, because all the non-stationary variables become stationary in first difference. Johansen test shows one vector of cointegration in the all system.

**Table 3. Johansen test results**

| Unrestricted Cointegration Rank Test (Trace) | | | | |
|---|---|---|---|---|
| Hypothesized No. of CE(s) | Eigenvalue | Trace statistic | 0.05 Critical value | Prob.** |
| None * | 0.949129 | 110.2805 | 55.24578 | 0.0000 |
| At most 1 | 0.491121 | 29.86180 | 35.01090 | 0.1601 |
| At most 2 | 0.263628 | 11.62207 | 18.39771 | 0.3379 |
| At most 3 | 0.116998 | 3.35955 | 3.841466 | 0.0668 |
| | | | | |
| 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 Statistics | 0.05 Critical value | Prob.** |
| None * | 0.949129 | 80.41869 | 30.81507 | 0.0000 |
| At most 1 | 0.491121 | 18.23973 | 24.25202 | 0.2552 |
| At most 2 | 0.263628 | 8.262522 | 17.14769 | 0.5741 |
| At most 3 | 0.116998 | 3.35955 | 3.841466 | 0.0668 |
| | | | | |
| 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 | | | | |

*Source: Own calculation*

VECM analysis (table 4) is done to verify if there exists a relationship between explanatory variables and real exchange rate. The error correction term $\alpha = -0.18$ (p-value = 0.1921) shows that the coefficient has the right sign, but is not statistically important. This implies that there is not a causality of explanatory variables on employment, meaning that the cointegration vector identified by Johansen test is not the long-run relationship tested in this paper.

Our model is modified, based on the Faria & Ledesma (2005) model and besides REER and INDEX, in the model is introduced trade openness as explanatory variable. Trade openness represents the ratio of all trade volume to GDP:

OPEN = (EX+IMP)/GDP

Where EX and IMP shows respectively the exports and imports of Albanian economy to and from European countries.

Johansen test of cointegration shows that there exist 3 vectors of cointegration in all the system. VECM test shows that the error correction term is negative and statistically important.

$\alpha = -0.37$ (p-value = 0.0002)

**Table 4. VECM test results**

D(LNEMPL) = C(1)*( LNEMPL(-1) - 0.107170311247*LNGDPR(-1) +
0.000162175393737*LNINDEX(-1) - 0.0380788623416*LNRER(-1) -
2.95755477757 ) + C(2)*D(LNEMPL(-1)) + C(3)*D(LNEMPL(-2)) + C(4)
*D(LNGDPR(-1)) + C(5)*D(LNGDPR(-2)) + C(6)*D(LNINDEX(-1)) + C(7)
*D(LNINDEX(-2)) + C(8)*D(LNRER(-1)) + C(9)*D(LNRER(-2)) +  C(10)

| | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C(1) | -0.187710 | 0.138517 | -1.355140 | 0.1921 |
| C(2) | 0.524091 | 0.231277 | 2.266076 | 0.0360 |
| C(3) | 0.353289 | 0.289594 | 1.219946 | 0.2382 |
| C4) | -0.012976 | 0.011012 | -1.178360 | 0.2540 |
| C(5) | -0.004244 | 0.006088 | -0.697079 | 0.4947 |
| C(6) | -0.002196 | 0.004661 | -0.471042 | 0.6433 |
| C(7) | 0.003127 | 0.004359 | 0.717236 | 0.4824 |
| C(8) | -0.001164 | 0.030854 | -0.037737 | 0.9703 |
| C(9) | -0.011658 | 0.031536 | -0.369666 | 0.7159 |
| C(10) | -1.40E-06 | 0.000496 | -0.002811 | 0.9978 |

| | | | |
|---|---|---|---|
| R-squared | 0.446926 | Mean dependent var | 0.000792 |
| Adjusted R-squared | 0.170390 | S.D. dependent var | 0.002278 |
| S.E. of regression | 0.002074 | Akaike info criterion | -9.245798 |
| Sum squared resid | 7.75E-05 | Schwarz criterion | -8.770011 |
| Log likelihood | 139.4412 | Hannan-Quinn criter. | -9.100345 |
| F-statistic | 1.616155 | Durbin-Watson stat | 1.870441 |
| Prob(F-statistic) | 0.184409 | | |

*Source: Own calculation*

The long run relationship equation results

$$\ln EMPL = \quad 3.5 \quad - \quad 0.0645 \ln INDEX - 0.0972 \ln OPEN + 0.318 \ln RER + \varepsilon$$

This equation suggests that the employment level in the long run is affected by real exchange rate: if RER is increased with 1% then the employment level will increase by 0.32%. By construction, an increase in RER means undervaluation of the real exchange rate. This suggests that the undervaluation of RER positively affects employment in Albania. Other variables have negative sign, meaning that an increase in their values will be followed by a decrease in the level of employment in Albania.

The INDEX variable, that is expected to show intensive labor channel effect, has a small negative coefficient. This implies that an increase in industrial exports is not accompanied by an increase, but by a decrease in employment level. This result is contradictory, because parts of industrial exports in Albania are manufactured goods, including *façon* industry goods that are labor-intensive.

Trade openness OPEN has a small negative impact on employment level: 1% increase in trade openness will be accompanied by a 0.1 % decrease in employment level.

## 4. Discussions

Undervaluation of real exchange rate has affected employment level in Albania through macroeconomic channel. Tradable goods sector is expanded by the undervaluation of RER, but this is not followed by an increase in employment level in this sector. However, expansion of tradable sector has increased the domestic income and the multiplier effect has increased the demand in non tradable goods to which firms respond by increasing product and employment level.
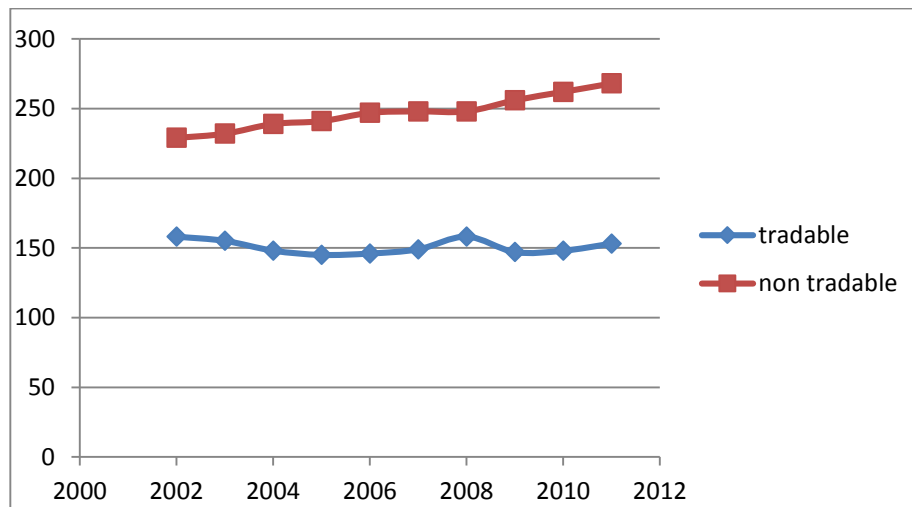


**Figure 3. Employment in tradable and non-tradable sector**
*Source: INSTAT*

Meanwhile, the INDEX that aims to catch the effect of labor- intensive channel has a negative sign. This variable represents the ratio of industrial exports on total exports. The major part of industrial exports is from *façon* industry and this industry has been decreasing continuously from 58% of total exports in 2005 in 29% of total exports in 2012.

Major increase is in minerals and oil industry, followed by construction materials industry. These sectors are not labor-intensive; hence industrial exports index doesn't catch labor-intensive channel effect.
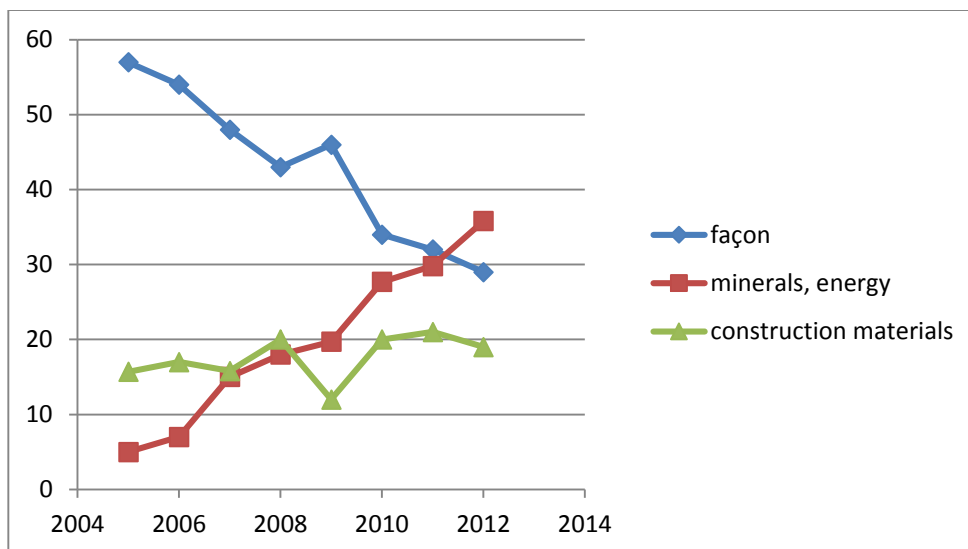
**Figure 4. Industry type exports**

*Source: INSTAT*

## 5. Conclusion

Real exchange rate is an important variable that affects the economy in different ways. The purpose of this paper is to evaluate a possible relationship between real exchange rate and employment level in Albania and to identify the transmission channel of a possible effect. Different variables are introduced in model to evaluate macroeconomic channel, labor-intensive industry channel and development channel of transmission, that are considered as the transmission channels of a possible impact of RER on the employment. The Johansen procedure and Vector Error Correction Model show that there is a positive relationship between real exchange rate and employment in Albania, meaning that undervaluation of RER increases employment in Albania, but this is not a statistically significant impact. Albanian economy has seen a very important growth rate in the period under study, but the growth is caused by the expansion of service sector and this sector is not labor-intensive. Hence, the macroeconomic channel doesn't have a significant effect on the employment, because it was affected only by the multiplier effect. Likewise, the labor-intensive industry channel doesn't affect employment level in Albania, because the increase in industrial exports is in raw materials, oil and minerals and these sectors are capital-intensive. In the same way, the development channel failed to generate new jobs in Albanian economy, even with the good performance of economy and this because the growth is caused by the capital-intensive use sectors instead by the labor-intensive sectors.

As a conclusion, real exchange rate doesn't significantly affect the employment level in Albania and can't be suggested as an instrument to improve it, so the Albanian government should implement other strategies to increase the level of employment.

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