The Estimation of the Time Period Required to Achieve Real Economic Convergence between Romania and the Euro Area

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Abstract: The main objective of this research is to estimate the time needed for Romania to achieve real sustainable economic convergence with the euro area. In this regard, we will try to determine when the absolute level of GDP/capita in Romania will equalize the absolute level of GDP/capita in the euro area. This equalization occurs when the growth rate of GDP/capita (expressed in PPP) of Romania is higher than the growth rate of the same indicator in the euro area. To achieve this objective, there are used simple relationships of growing of the GDP/capita both for Romania and the euro area. The estimated results shows that the GDP/capita (expressed in PPP) in Romania will be able to equalize with GDP/capita in the euro approximately in the year 2030. This uniformity will occur only if the average growth rate of the Romanian economy will remain constant, ie at the same level as the average growth rate for GDP/capita in the analyzed period. If Romania will register higher growth rates, the period of time until the country will achieve real sustainable economic convergence with the euro area average will decrease.

Keywords: speed of convergence; economic growth; euro area

JEL Classification: F15; F63; O47

1. Introduction

Numerous studies have shown that the process of real convergence is influenced by several key factors, represented by population growth, the savings etc., wich leads to the reduction of structural disparities between states and generates a caching up process. A number of recent studies (Mink et al., 2007; Cavallero, 2010) have shown the importance of inter-regional convergence, mainly regarding the new Member States. Angeloni and Ehrmann in 2004, revealed that, during different periods of time, the reduction of the disparities between the developed and emerging countries have not made considerable progress. On the other hand, Aguiar and Soares, in 2009,

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noticed an important development in the process of real convergence, the emerging countries recorded a level of real convergence higher than planned.

From this point of view, in the case of some countries is widening the disparities in relation to developed countries, and other countries, which recorded significant evolutions in the process of real convergence, continue the progress achieved. Barro and Sala-i-Martin, in 1995, discovered the existence of conditional convergence, according to which, when in the case of structural conditions are achieved the same levels of development, the same situation also stands out in terms of GDP per capita. Egger et al. (2006b) show that in a monetary union, shock effects are determined by their degree of symmetry.

A very important aspect of the studies on this topic was to identify the best moment for the euro adoption. Many authors believe that the integration in the EMU must be done when the nominal and real convergence conditions are satisfied, even if the period is longer. On the other hand, other authors believe that fastest integration generates beneficial effects, by reducing the disparities between the developed and emerging countries. Lein-Ruprecht et al. (2007) showed that the process of real convergence produce structural changes leading ultimately to an increased international trade flows, an increased degree of qualification of the workforce and higher productivity. Pecican (2009) remarked a high degree of divergence across the EU, especially regarding the less developed countries. The determination of the GDP/capita over the last decade reflected a weak convergence at EU level.

Most empirical research for validation of the convergence hypotheses show that it can not be achieved the situation for all states to align to a real convergence. What is confirmed by the economic and social reality of the countries or regions is the group convergence in dynamics. Currently, the factors that have a significant role in the dynamics of economies are the intensification of knowledge and human capital development. These two factors determine higher growth rates in the states where they manifest. In these conditions, Romania’s chance to achieve real convergence with the European Union is closely related to the stimulation of those factors and enhancing their contribution to achieve higher economic growth rates.

2. Research Methodology

The most common question regarding the convergence of economic growth is related to the length of time needed to achieve this process. When analyzing Romania's convergence with the euro area, the first issue that needs to be solved is related to the estimation of the time required to achieve the equalization of the absolute level of annual GDP per capita of Romania with the similar indicator in the euro area. In order to establish a realistic deadline for adopting the euro, should be determined the timescale for reducing the difference between the absolute level of annual GDP per capita in Romania and the similar indicator in the euro area. This reduction of the difference can be achieved when the average rate of growth of GDP per capita in Romania is higher compared to the average rate of growth of GDP per capita in the euro area.

To determine the period of convergence between the two entities, we start from the simple relationships of GDP/capita growing, both in Romania and in the euro area, where initial values and annual average growth rates are different:

$Y_{tR} = Y_{0R}(1+\bar{r}_R)^t$ (1)

$Y_{tEZ} = Y_{0EZ}(1+\bar{r}_{EZ})^t$ (2)

Convergence between the two entities is done when the relationships (1) and (2) become equal, according to relationship (3):

$Y_{tR} = Y_{0R}(1+\bar{r}_R)^t = Y_{tEZ} = Y_{0EZ}(1+\bar{r}_{EZ})^t$ (3)

When we logarithm and rearrange the terms in the equation (3), we determine the time period necessary to achieve the convergence of the Romania with the euro area, in the terms of GDP/capita:

$$t = \frac{logY_{0EZ} - logY_{0R}}{\log(1+\bar{r}_R) - \log(1+\bar{r}_{EZ})} \quad (4)$$

Based on the relationship (4), we will calculate the number of years needed for Romania to achieve the convergence with the euro area in the terms of GDP/capita.

3. Empirical Results

Table 1 presents the data used in the calculation formula (4): target level of GDP per capita calculated on the basis of PPP (GDP/capita in the euro area in 2014) which should reach Romania and the annual average growth rates of the two entities, calculated based on the values recorded in the period 2000-2014. Also, Table 1 contains the results obtained, ie the number of years needed to achieve convergence with the euro area and various anticipations of this period of time, depending on different economic growth rates, similar to those recorded by Romania in 2000 - 2014.

Table 1. Input data and the results obtained regarding the number of years needed to achieve convergence between Romania and the euro area, in terms of GDP/capita

Target of GDP/capita (2014)		**The average growth rate of GDP/capita in the period 2000 - 2014 (%)**		**Number of years required to achieve convergence**
Euro area	Romania	Euro area	Romania	
39328.2903	20348.0696	0.78	4.50	18.18
		Anticipations		
		0.78	3.50	24.75
		0.78	6.00	13.05
		0.78	7.00	11.00
		0.78	8.00	9.52

Source: Author's calculations based WorldBank data

According to the results presented in Table 1, maintaining an annual average growth rate of GDP/capita of 4.5%, Romania would need about 18 years to reach the euro area.

Analyzing the results based on anticipated growth rates, there are obtained different possible scenarios. Thus, for a growth rate of GDP/capita of 3.5%, Romania would need about 24 years to reach the euro area. On the other hand, as growth rates are higher, it decreases the number of years needed to achieve the convergence of GDP/capita between the two entities.

Even if in certain periods of time Romania has registered higher growth rates compared to more developed countries, bridging the gap is still an essential problem for the Romanian economy. This decrease of the gap between the Romanian economy and the euro area economy can be achieved through policies of encouraging the investments, stimulating savings, growth in exports etc.

Romania's economy is currently quite tender and can easily act to endogenous and exogenous temporary factors. To keep up the pace of developed economies, in the moment of passing to the single currency, Romania needs to achieve real convergence with the euro area countries, as measured by annual average growth rates higher than those registered in the other states, and then to maintain these growth rates over long periods of time.

In terms of the GDP/capita calculated on the basis of PPP, Latvia is 64% of the EU27 average in 2012, two years before entering the EMU (2014), Estonia is 63% of average EU27 in the year prior to entry into the euro area and Slovakia to 73%.

Analyzing these circumstances, we conclude that Romania, which in 2014 was about 50% of the euro area average, would not currently have a high degree of real convergence to be considered a country with a sustainable economy in the euro area. Analyzing the example of countries like Estonia, Latvia or Slovakia, we conclude that the GDP/capita should be over 65% of the euro area average in the moment of Romania's accession.

The level of heterogeneity between Romania and the euro area can be assessed also, using the Dynamic Stochastic General Equilibrium model.

If Romania would not be part of EMU, increasing levels of consumption will increase the level of production and the number of workers, but the increase of the level of investment is uncertain. With increasing inputs of labor, the marginal cost increase, which will cause an increase in inflation. To mitigate the effects of higher inflation rate, the national bank will increase the interest rate. When Romania give up its own monetary policy, can record adverse effects, it is possible that a positive shock on consumption does not raise national production.

On the other hand, with Romania's entry into EMU will increase capital efficiency which will lead to increased production and investments. One positive effect of increased productivity is a lower level of inflation.

The transaction costs are absent in the case of monetary union, which would cause households to consume goods from abroad, resulting in a decrease in capital input, a decrease of local investment and a decrease of Romanian origin GDP.

A decreased production leads to lower exports but will increase imports to meet household consumption.

The main benefits of joining the EMU appear in the tradables sector. Thus, in case of an impact in the technology sector, Romania's GDP is expected to grow.

Euro adoption by Romania and giving up its own monetary policy could influence decisively the achievement of optimal capacity growth. After giving up the national currency, the only markets left to make various adjustments would be: goods market, labor market and fiscal policy. Armed with just these adjustment mechanisms, Romania would face the risk it can not ensure the price stability and the optimal labor employment.

4. Conclusions

This paper designs a possible route of Romania, in the direction of adopting the single currency.

Using the real GDP indicator, logarithmic calculation shows that it takes approximately 18 years for Romania to equalize the level of GDP/capita in the euro area, if the annual average growth of the same indicator in Romania remains constant to 4.5%.

The possibility for Romania to achieve faster convergence with the euro area average, assumes that Romania to record higher growth rates of GDP/capita in the coming period. Romania was in 2014 about 50% of the euro area average. This shows that this country would not have currently a high degree of real convergence to be considered a country with a sustainable economy in the euro area.

It is very important that before joining the euro area to be studied several possible scenarios in terms of shocks that might generate imbalances or asymmetries, because there is a high degree of heterogeneity between the Romanian economy and the euro zone economy.

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