

# ECONOMIC POTENTIAL RECOVERY – A EUROPEAN CHALLENGE IN THE MEDIUM TERM

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*The waves of the worst global financial and economic crisis since World War II have seriously affected the economy of the Euro Area. The first wave of the global crisis determined the worst recession in decades for the member states of the region. At present, the Monetary Union is confronted with the second wave of the crisis – the public debt problem. Despite the efforts adopted and implemented by the European policymakers over the past quarters, the sovereign debt crisis is far from over. Spain has recently become the “favourite target” of the financial markets.*

*Among the consequences of the waves of the crisis for the Euro Area one can mention the potential output decline and the economic divergence (asymmetric evolution of member countries). In this context, the potential output recovery and the relaunch of the real economic convergence process represent the main challenges for the policymakers in the medium run.*

*This paper analyses the evolution of potential GDP of the member countries of European Monetary Union (12). I employ the Hodrick-Prescott methodology on data from the World Bank Database.*

*According to the results, the economic potential of the member states of the Euro Area (12) decreased to the lowest level of the past decades. At the same time, the analysis presents the differences existing across the member states in terms of potential output. Some countries suffered an important potential output loss over the past quarters (it seems that Greece and Portugal have become asymmetric shocks in the Monetary Union). For these countries, the first wave of the global crisis transformed in a permanent shock. The decline of investments and the depreciation of human capital over the past quarters express a huge probability that potential output is going to maintain at a low level in the Euro Area over the following years.*

*The recovery of potential GDP towards the pre-crisis levels is dependent on a higher participation rate of active population, strong reforms of labour markets and, importantly, the return of investment flows. Other measures in order to attain the objectives of Europe 2020 (smart, sustainable and inclusive growth) would also help the process of potential GDP recovery in Europe.*

*Keywords: potential output, Hodrick-Prescott, Euro Area, public debt crisis*

*JEL: C32, E32*

## **I. Introduction**

The Euro Area is strongly affected by the waves of the worst global financial and economic crisis since the end of the World War II. The first wave of the financial crisis determined a contraction of about 4% y/y of the GDP. At the same time, this wave of the crisis revealed the macroeconomic disequilibria accumulated by some member states during the first decade after the launch of the euro – leading to the second wave of the crisis (the sovereign debt issue).

The public debt crisis launched in Greece in 2010 is far from over, as the measures adopted and implemented by the policymakers over the past quarters are not perceived as credible by the financial markets. Spain has recently become the “favourite target” of the financial markets: the CDS (credit default swap) registered a record level (over 500 basis points).

The waves of the crisis present severe consequences for the economy of the Euro Area, among which one can mention: the decline of potential output, the increase of long-term unemployment, the economic divergence of member countries.

In this context, the Monetary Union in Europe is confronted with unprecedented challenges: potential output recovery, finding a credible solution to the public debt crisis and the relaunch of the economic convergence process.

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The rest of the paper has the following structure: the second chapter reviews the main methods for potential output estimation; the third chapter presents the methodology employed in the current paper; the fourth chapter analyses the results; the main conclusions are mentioned in the last chapter.

## II. Methods for potential output estimation

The literature distinguishes several methods employed in order to determine the potential output. According to Brandner *et al.* (1998) there are three main methods used in determining the potential output: the OECD approach, the IMF approach and the European Union approach.

The OECD distinguishes between the values added by the private sector and by the government sector, with the potential output obtained as the sum of these components. In this approach, the value added of the private sector is estimated from a Cobb-Douglas function, under the following form:

$$Y_t = \alpha N_t + (1 - \alpha) K_t + U_t \quad (2.1)$$

where  $Y_t$  represents the logarithm of the value added of the private sector,  $N_t$  represents the logarithm of the labour input,  $K_t$  represents the logarithm of the capital stock,  $\alpha$  represents the elasticity of output with respect to labour and  $U_t$  represents the error term, seen as the total factor productivity.

Then, the potential output of the private sector is obtained from the following relation:

$$Y_t^* = \alpha N_t^* + (1 - \alpha) K_t + U_t^* \quad (2.2)$$

where  $Y_t^*$  represents the potential output of the private sector,  $N_t^*$  represents the potential labour supply (NAIRU),  $K_t$  represents the capital stock and  $U_t^*$  represents the trend rate of the productivity factor (obtained by applying the Hodrick-Prescott filter). Then, the potential output of the economy is obtained by adding the potential output of the government sector to the business sector potential output.

According to the same source, the IMF approach does not apply a uniform method in computing potential output across the member countries. In some cases the potential output is “... *related to equilibrium in the labour market as given by NAIRU and estimated within the framework of a Cobb-Douglas production function ...*”. One of the differences when compared to the OECD approach consists of the fact that the elasticity of output with respect to labour (as we saw in the above case,  $\alpha$ ) is approximated with the level of wage to GDP ratio. According to Brandner *et al.* (1998), “*in other cases, estimates of the potential output are based on statistical estimates of trend output*”.

The European Union has its own method of determining potential output, different from the approaches of the OECD and IMF. According to Brandner *et al.* (1998), the approach of the

European Union for estimating the output gap consists of directly applying the Hodrick-Prescott filter to real output.

### III. Hodrick – Prescott methodology

One of the methods employed by the literature in order to estimate the potential output is the Hodrick-Prescott (HP) filter. This methodology distinguishes between a cyclical component and a trend component of the GDP ( $Y_t = Y_t^* + Y_{tc}$ ). The cyclical component of the GDP is obtained according to the following mathematical relation:

$$\text{Min} \sum_{t=1}^T (Y_t - Y_t^*)^2 + \lambda \sum_{t=2}^{T-1} ((Y_{t+1}^* - Y_t^*) - (Y_t^* - Y_{t-1}^*))^2 \quad (3.1)$$

where  $Y_t$  represents output,  $Y_t^*$  represents the trend of output,  $\lambda$  is a measure of smoothness, so that the lower the value of this parameter, the closer potential output follows actual output.

In the extreme case when  $\lambda = 0$ , then the trend would equal actual output. Hodrick-Prescott suggests a value of 1600 when working with quarterly data and 100 for annual data. However, some other contributions in the literature suggest the use of other values for  $\lambda$ . Bouthevillain *et al.* (2001) evidence some studies where the value chosen for this parameter is 400 for annual data. On the other hand, they mention other contributions where for a value of 1600 for quarterly data corresponds to a value of 6 to 8 for annual data.

There does not exist any ideal filter for the decomposition of output into trend and cycle. According to Bouthevillain *et al.* (2001), the Hodrick-Prescott filter presents the advantages of simplicity and transparency, which explain the fact that it has been one of the most widely employed filters in the analysis of the macroeconomic series. Two problems they mention are the compression and the leakage effects. The compression effects might appear, as a consequence of the fact that “*the cycles that should belong to the cyclical component*” are not completely included in the cycle, and thus the “*variability of the cyclical component is underestimated*”. These effects have impact in the assessment of the public finances because of the volatility of trends and also might make it difficult to determine the expansionary fiscal policies especially during the boom periods as “*they potentially suggest an overall positive assessment of fiscal policies*”. The leakage effects consist of the fact that “*cycles that should belong to the trend are not in fact included in the latter*” and consequently the “*variability of the trend is underestimated*”. Beyond this, they do not take into account possible “*jumps in productivity growth*”. In the case of the Hodrick-Prescott filter, the magnitude of these effects depends on the choice of  $\lambda$ . According to these authors, the compression effects diminish with the increase of the value of  $\lambda$ . Pointing to the trade-off between the two effects, they conclude that the lower the value of  $\lambda$ , the lower the leakage effects. In fact, choosing the value of  $\lambda$  while applying the Hodrick-Prescott filter, one should take into account the costs of these effects and weight them.

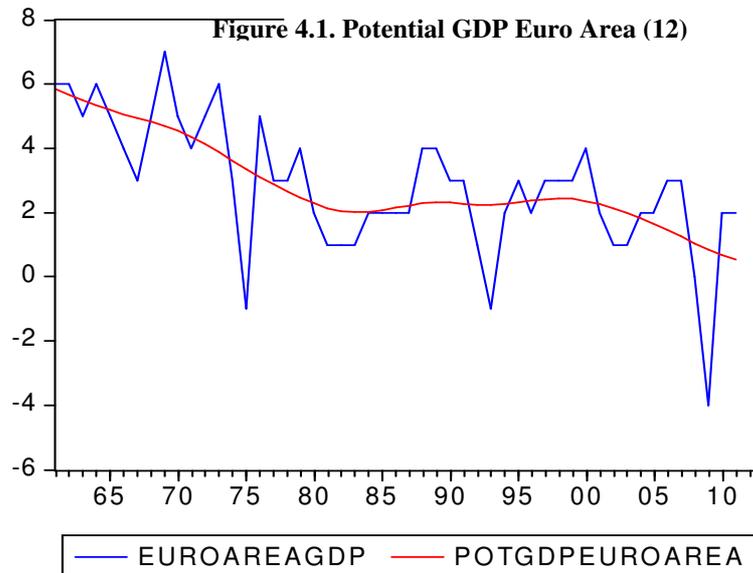
After shortly describing the method, I now compute the potential GDP of the Euro Area (12) and of the member countries, using a value of 100 for  $\lambda$ . I use data (annual observations) of real GDP, expressed in 1995 prices, for the member countries of the Euro Area (12) for the period 1961 – 2011, from the World Bank Database. All computations have been performed with the package Eviews 4.1.

### IV. Interpretation of the results

The following figure presents the evolution of potential GDP of the Euro Area (12) over the past five decades. There is obvious the downward trend during this period. This downward trend of the potential output in the Euro Area (12) was determined by the lack of reforms to the structural shocks that hit the member countries of the region over the past decades: oil shocks, globalization, enlargement of the European Union.

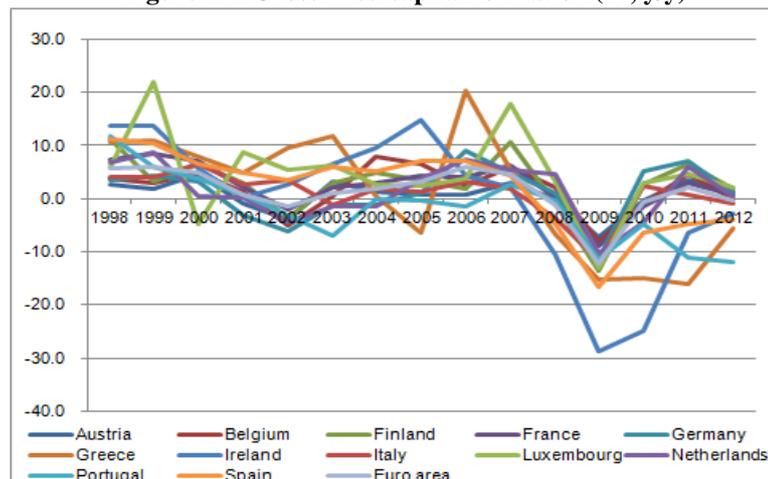
The potential output of the region decreased from around 5.2% y/y during the 1960s to 3.4% y/y during the 1970s. The potential GDP was estimated at around 2.3% y/y during the 1980s and the 1990s. During the 2000s it declined to an average of 1.4% y/y.

As can be noticed on the figure, the rhythm of the decline of potential output intensified during the past years, in the context of the waves of the worst financial and economic crisis since the end of the World War II. At present, according to these estimates, potential output of the Euro Area is below 1% y/y (the lowest level since 1960, at least).



The waves of the Great Recession have strongly affected the structural components of the GDP: investments, labour supply and total productivity factor. On the one hand, capital investments declined severely across European countries during the period 2008 – 2010 (see figure 4.2.). This evolution was determined by the increase of the cost of capital, given the risk perception in the context of the crisis.

**Figure 4.2. Gross fixed capital formation (% , y/y)**

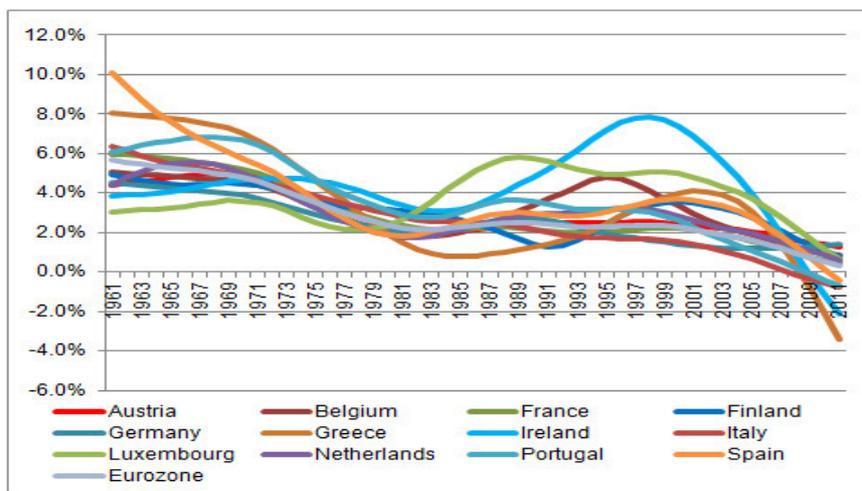


At the same time, the crisis led to a strong increase of unemployment rate (almost to 11%), the youth being the most affected category (over 20%, the highest values being observed in Spain and Greece (over 50%)).

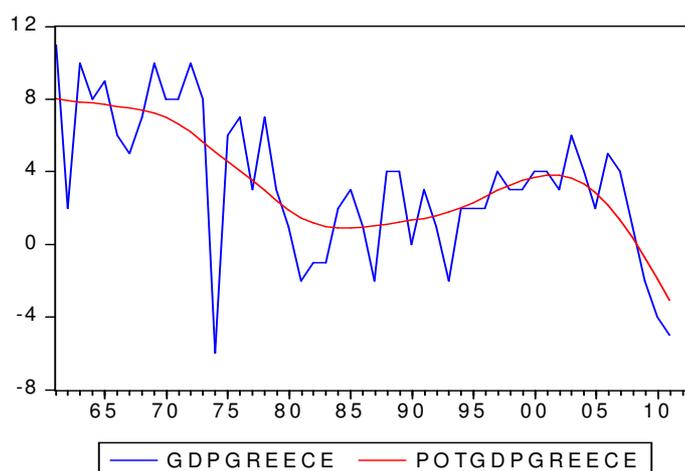
Last, but not least, the total productivity factor was negatively influenced, either by the decline of investments, but also by the depreciation of human capital.

In what regards the cross-country analysis, the following graph presents the evolution of potential GDP for the member states of the Euro Area (12) during the period 1961-2011. As can be noticed, the countries that suffered the most severe declines of potential output after the launch of the Great Recession (period 2008-2011) are: Greece (-3.7 p.p.), Ireland (-2.9 p.p.), Spain (-1.7 p.p.), Luxemburg (-1.6 p.p.), Finland (-0.9 p.p.) and Portugal (-0.9 p.p.). According to the

**Figure 4.3. Potential GDP – member countries of EMU (12)**



**Figure 4.4. Potential GDP Greece**



estimates, potential output of Greece turned negative since 2009 (as can be noticed in the figure 4.4), evolution determined by the flight of capital (in the context of the public debt crisis), with negative impact for investments.

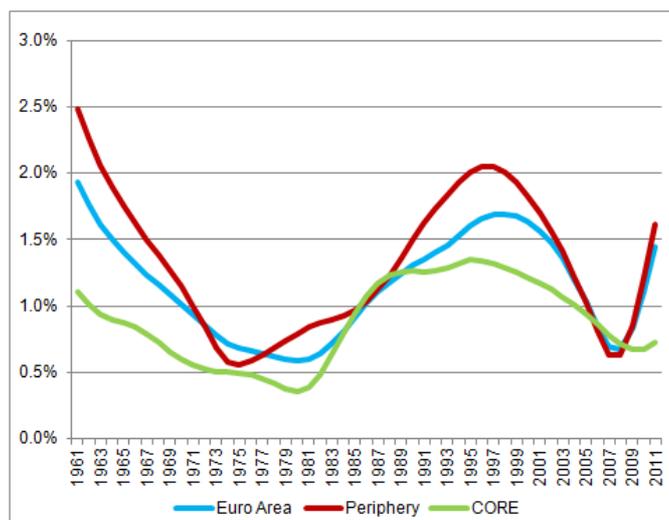
However, there can be noticed a group of countries with lower rhythm of decline (of the potential output) compared to the rate registered at the Euro Area level (-0.6 p.p.): Austria (-0.3 p.p.), Belgium (-0.4 p.p.), France (-0.5 p.p.).

On the other hand, the only one country in the Euro Area (12) that registered an increase of potential GDP during the period 2008-2011 was Germany (0.2 p.p.). This evolution expresses the fact that the first economy in the Euro Area benefited from the waves of the crisis. This result is sustained by the shape of the economy during 2010 (3.6% y/y) and 2011 (3% y/y). The economy has gathered the benefits of the structural reforms implemented before the global crisis hit the European continent (at present the unemployment rate in Germany presents the lowest level since the early 1990s).

These evolutions of the potential output across the member states of the Euro Area (12) confirm the real economic divergence across the region. This divergence increased over the past years, as several countries in the region (the periphery countries) seem to have become persistent asymmetric shocks (the figure 4.5. expresses the real divergence since the first wave of the crisis hit the region).

In fact, the Great Recession revealed the structural disequilibria accumulated by the member countries after 1999. In other words, the nominal convergence established by the Maastricht Treaty was not sufficient, as several economies accumulated severe macroeconomic disequilibria during the last years of the Great Moderation (especially unsustainable level of private debt, with negative consequences for the public finance stances since the launch of the crisis).

**Figure 4.5. Standard deviation (potential GDP)**



## V. Concluding remarks

According to this analysis the potential output presented a downward trend across the Euro Area (12) over the past decades. The waves of the worst global financial and economic crisis since World War II exacerbated the rhythm of decline of the potential output of the EMU member countries, as capital investments contracted severely (mainly in 2009) and human capital depreciated.

At the same time, the analysis presented the differences among member countries of the Euro Area in terms of the amplitude of decline of the potential output. In some countries, the potential output turned negative, as the investments contracted for several years and the unemployment rate surged to record level (especially for young people) (for instance, the youth unemployment rate in Euro Area is over 20%).

In this context, one of the main challenges for the European policymakers on the medium run should be the recovery of potential output. It would be a very difficult process, as, normally, the potential output recovers gradually after a prolonged period of crisis (at present, the Euro Area faces the second recession since 2008).

The recovery of the potential output requires an acceleration of the rhythm of growth, but this seems impossible given the context of fiscal consolidation during the following years. Among the economic policy measures that may support the recovery of the potential output one can mention: the relaunch of capital investments (especially in sectors with a high added value), higher investments in Research&Development and in Education across the member states, the structural reforms (mainly in terms of labour markets). These measures are consistent with the Europe 2020 strategy: smart, inclusive and sustainable growth.

There can be mentioned several reasons that determine me to expect a low potential GDP at the Euro Area level over the next years: the high risk premium (with negative impact for investments), the increase of financial regulation (with immediate impact in a higher selection of investment projects for part of the financial system), a higher tax burden (with negative impact either for investments, or labour force supply).

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