

Trends in dynamics of public debt in EU

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The impressive growth of public debt during last decades and the problem of its sustainability entered in the preoccupation sphere of all governments in EU. The accumulation of public debt is a consequence of how the economic growth is conducted but in the same time it is affecting in long term the growth process itself. Based on the recent studies and using databases published by international organisations we try to estimate the parameters of the convergence/divergence process in matter of public debt at the level of the whole EU and at the level of some groups of countries. First, we are considering two major groups of countries (EU14 – old members of EU, after Brexit, and respectively EU11 – new eastern members adhered to EU after 2000). Moreover, certain behavioural regimes in matter of public debt dynamics are estimated, in which countries in EU are then grouped. Finally, we shall present a unifying model by putting all regimes together. This model could be useful to simulate the long term dynamics of public debt in EU countries and to evaluate the impact of certain policy measures.

Keywords: public debt, economic growth, convergence, behavioural regimes

1. Introduction

Last decades, in the context of extension of globalisation process and an economic crises started in 2007, convergence continued in European Union. Thus, in the period 2000-2015 the GDP per capita increased from 23902 to 37366 international dollars PPP and the variation coefficient decreased from 28.2% to 20.2%, as is presented in Figure 1 (when on the horizontal axe the average level of GDP per capita is in thousand dollars PPP).

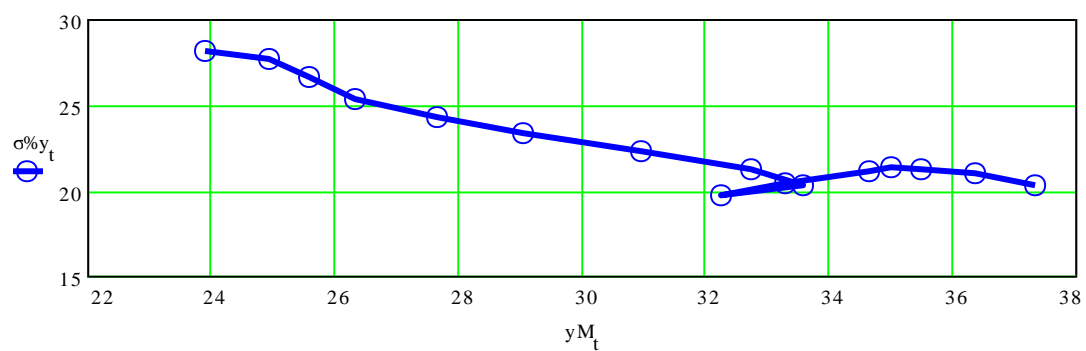


Figure 1.

This favourable dynamics of convergence at the level of EU27 (EU less UK) is a result of an intensive process of convergence inside of EU11 (Eastern countries adhered at EU after 2000), according to data presented graphically in Figure 2. In case of EU11 GDP per capita increased from 11340 to 25461 international dollars PPP, during the period 2000-2015, and the variation coefficient decreased from 19.2% to 11.9%.

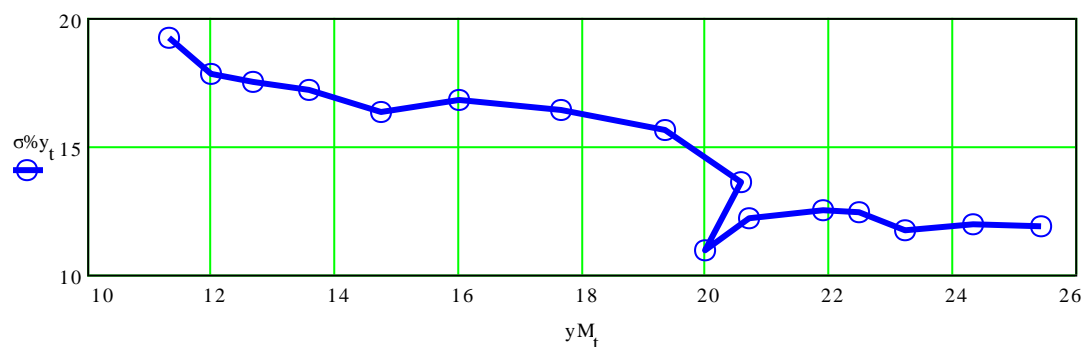


Figure 2.

In the same period, in EU14 (old Western countries of EU, less Cyprus, Malta, and UK) GDP per capita increased from 28198 to 41024 international dollars PPP, but the variation coefficient increased from 7.3% to 13.1% (thus a divergence), as it is presented in Figure 3.

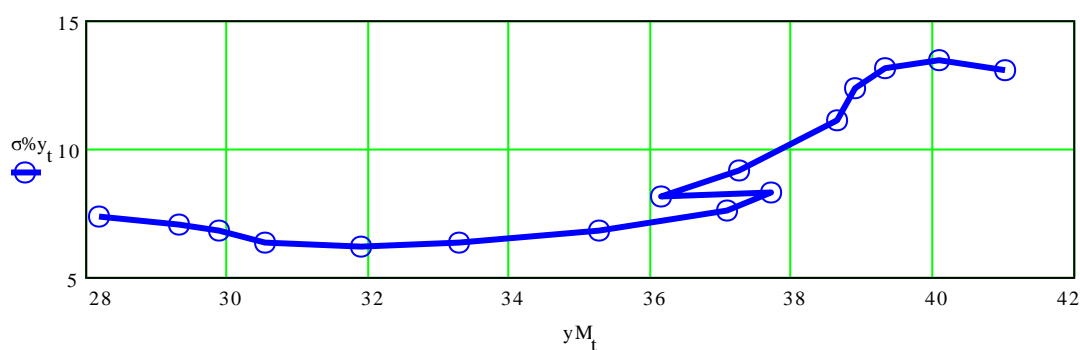


Figure 3.

A more detailed analyses shows that the economic growth in EU countries could be attributed to an increased accumulation of public debt. Until a point this could be a favourable trend, but when it is demonstrated to become an irreversible process many problems could emerge affecting the future growth process itself.

2. Distribution of the intensity of public debt in EU

In EU27, during the period 2000-2015, the public debt, as percent of GDP, $D\%$, increased from 64.3 to 85.8. Changes in spatial distribution of the intensity of public debt in EU between 2000 and 2015 are presented, as stylised maps of EU, in Figure 4 (EU27 less Cyprus and Malta), where LO is longitude, LA is latitude, blue colours mean low levels and red colours high levels.

In 2000, the highest intensity was registered in Belgium – 108.8%, Italy – 105.1%, Greece – 99.8%, Bulgaria – 73.9%, Austria – 65.9%, Germany – 58.9%, France – 58.4%, Spain – 58.0, Hungary – 55.1%, Denmark – 52.4%, Netherlands – 51.4%, Sweden – 51.3%, and the lowest

intensity in Estonia – 5.1%, Luxembourg 6.1%, Latvia – 12.1%, Czechia – 17.0, Lithuania – 23.5%, Slovenia – 29.0%, and Romania – 29.4%.

In 2015 the highest level registered in Southern countries of EU, Greece – 178.4%, Italy – 132.6%, Portugal – 128.8%, Spain – 99.0%, plus in Belgium – 106.3%, France – 96.8%, Ireland – 95.2%, Croatia – 87.7%, Austria – 86.2%, Slovenia – 83.3%, Germany – 71.0%, and the lowest level in Estonia – 10.1%, Luxembourg 21.8%, Bulgaria – 26.9%, Latvia – 34.8%, Romania – 39.4%, Czechia – 40.9, Lithuania – 42.5%, Sweden – 44.1, and Denmark – 45.6%.

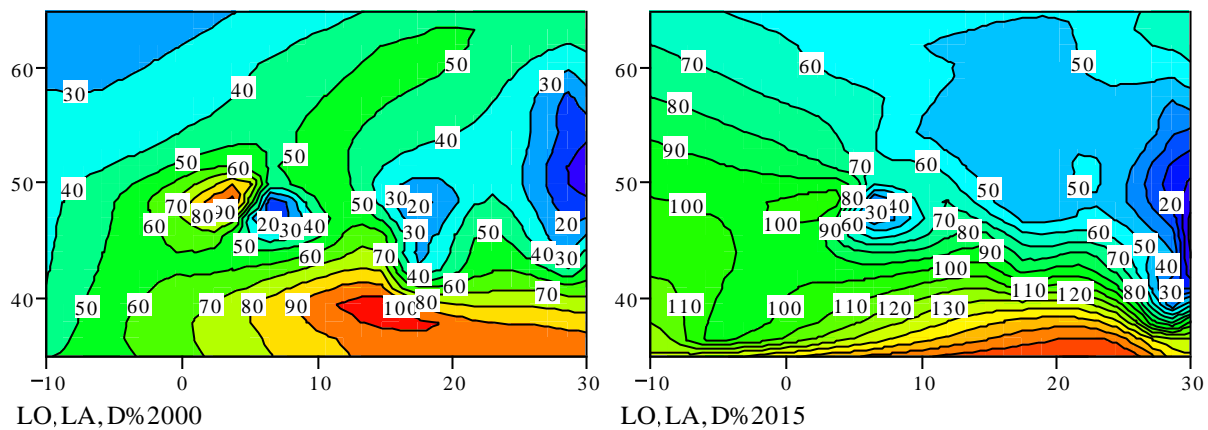


Figure 4.

At the level of the EU11 group, the intensity of public debt related to GDP increased from 36.0% in 2000 to 50.2% in 2015. In the same interval, for EU14 the intensity of public debt grew from 67.0% to 92.5%.

Regarding the convergence in matter of public debt per capita, in the period 2000-2015, it was slower than in case of GDP per capita, as it is presented in Figure 5 (where $g\%$ is the ratio against the EU27 average level of GDP per capita and $g\%d$ is the ratio against the EU27 average level of public debt per capita, in case of EU11 and respectively of EU14; on horizontal axe are denoted the years for the period 2000-2015, as numbers from 0 to 15).

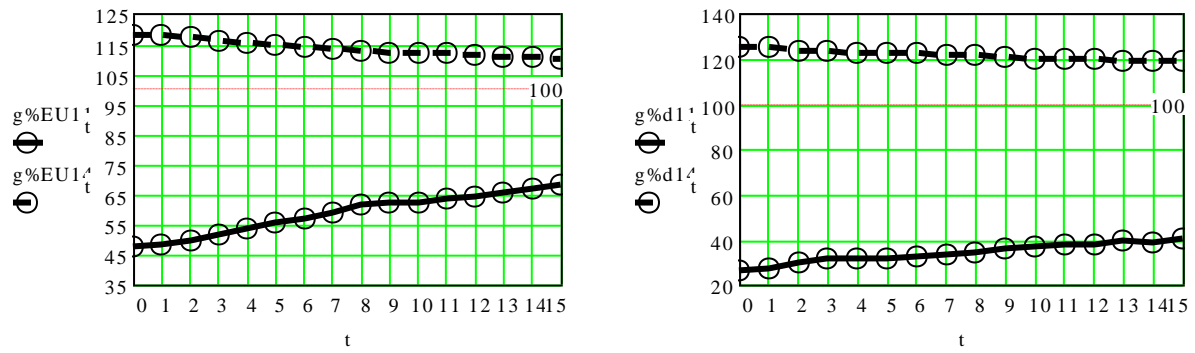


Figure 5.

3. Convergence in dynamics of public debt in EU and behavioural regimes

Analysing the data for the period 2000-2015 demonstrated a general process of convergence in matter of public debt at the level of EU27, as it is presented in Figure 6. Thus, for this period, the value of the variation coefficient, $\sigma\%d27$, decreased from 42.0% to 31.1%.

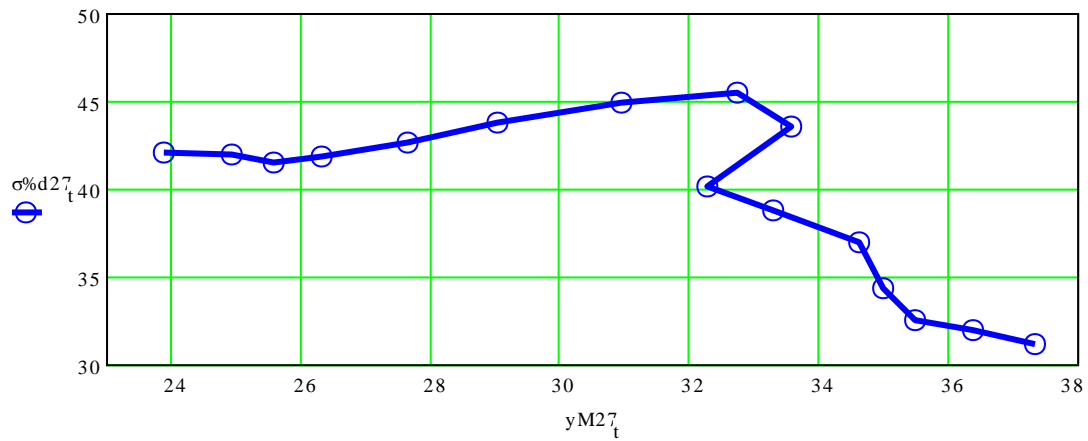


Figure 6.

However, contrary to the dynamics of GDP per capita, in matter of public debt per capita a significant process of convergence registered for the period 2000-2015 in case of EU14, and a very slow convergence in case of EU11. Thus, the value of variation coefficient decreased from

25.1% to 15.3% for the group of EU14 and only from 31.8% to 25.6% for the group EU11, as it is presented in Figure 7.

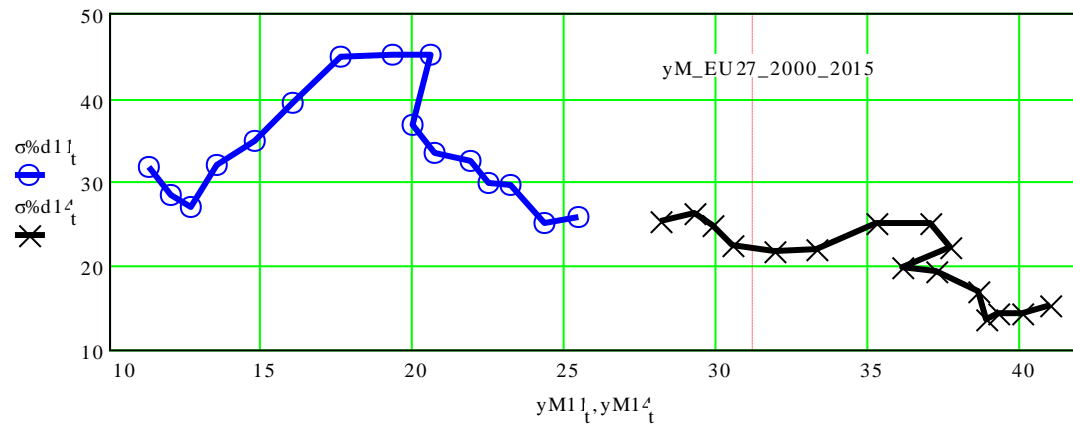


Figure 7.

The last graphical representation could suggest few behavioural regimes in matter of public dept: a general divergence for a level of GDP per capita smaller than 20000 dollars PPP, followed by a rapid convergence until around 25000 dollars PPP, that seems to continue for higher levels of GDP per capita (more than 28000 dollars PPP, as it is the case of the trajectory for the group EU14, represented by black line on the right side of the graph in Figure 7).

One worrying fact is that, together with an increasing convergence as the GDP per capita is growing, it is demonstrated an accentuate process of accumulating public debt. Thus, representing together on the same graph the dynamics of public debt intensity in case of EU11 and in that of EU14, along with the GDP per capita growth, we can see a jump in the level of public debt intensity after a value of around 25.5 thousand dollars PPP. This type of dynamics is presented graphically in Figure 8, where the estimated trend is represented by the dashed line.

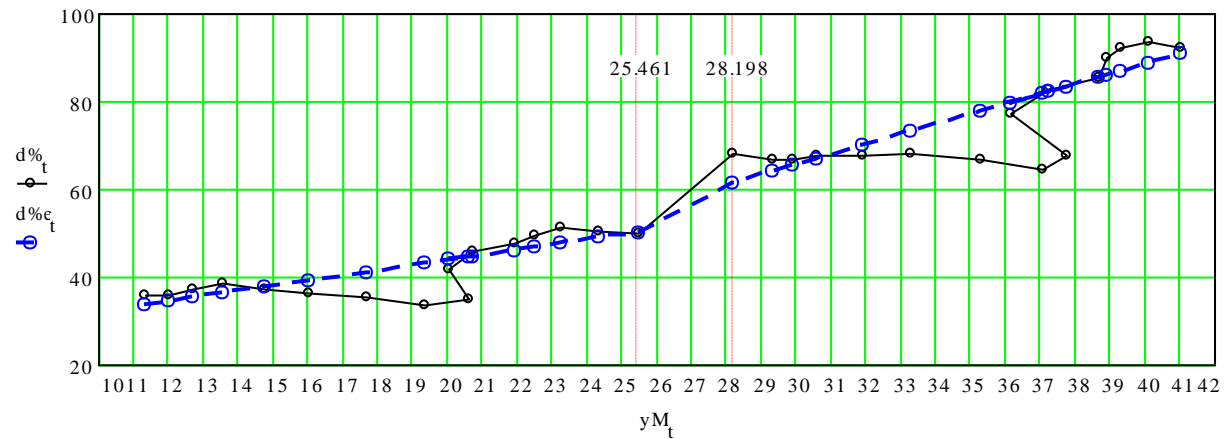


Figure 8.

Based on this Figure, it could be separated two distinct regimes in dynamics of the public debt intensity: first one under the value of 25461 dollars PPP, where public debt is growing slowly, and second one for values over 28198 dollars PPP, when public debt is growing faster.

First regime is corresponding to dynamics registered in EU11 and the second one to that registered in EU14. Moreover, a transitional regime seems to be between the two threshold values.

4. Conclusion

The growth of public debt could be interpreted as a main factor of economic growth in EU, and consequently of convergence. However, its accumulation, after certain threshold, perhaps will result in an increasing instability of economy, entrance in a zone of its non-sustainability, and finally even affecting the growth itself (as it was demonstrated last period by the so-called debt crisis, already manifested in case of some European countries).