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Real Convergence in the European Union: Insightful Evidence from the New Member States

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Abstract

The European Economic Communities have been established in the second half of the last century in order to promote cooperation instead of confrontation, endowing the Western European countries with the appropriate means to perform the values of a modern economic integration process, based on sustainable and long-term development. With the advancement of the integration process, one of the main objectives of the European Union aimed the economic, social and territorial convergence between and within countries and regions. The main purpose of the paper is to study income convergence in the European Union between 1995 and 2018, using β- and σ-convergence indicators. The results of our study confirm the (absolute) β-convergence hypothesis, as poorer European countries experienced a higher catching-up speed comparing to the developed Member States from Western Europe. Furthermore, the catching-up process in the New Member States was accompanied by a reduction in the income gaps between countries (σ-convergence). These trends are encouraging for the European Union and confirm its potential to assure economic convergence between its Members.

Keywords: European Union, real convergence, New Member States.

JEL Classification: O40, O52, O57.

1. Introduction

The establishment of the European Economic Communities has changed the facet of the European continent, transforming war in peace and enemies in friends. Taking into consideration the success of the first initiatives of integration, more and more countries expressed their willingness to become part of the European group. The expansion of the European Union was accompanied not only by

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opportunities, but also by complex challenges. Nowadays, one of the main challenges that threatens the regional stability and prosperity derives from the persisting income gaps between its Members. The main purpose of this paper is to study real convergence in the European Union, by taking into consideration the evolution of GDP per capita between 1995 and 2018, trying to respond to the question if the New Member States are catching-up or lagging behind. In this respect, we have calculated the (absolute) β- and σ-convergence, illustrating that the average catching-up speed was around 2% per year in the European Union and approximately 3% in the New Member States. The paper is structured as follows: the first section illustrates the researchers' perspectives in the field of economic growth and convergence, also comparing the performances of the New and Old Members; the following section presents the methodology used in order to test the hypotheses of the paper, which is based on the neoclassical growth model assumptions. The main findings of the β- and σ-convergence tests are depicted in the fifth part of the paper, while the final section contains the conclusions, together with the limitations and future direction of research.

2. Problem Statement

The topic of real convergence has become increasingly studied with the subsequent waves of expansion of the European Union. Convergence has been examined in relationship with the economic growth theories, researchers being interested in identifying the main determinants of the different growth rates between countries and regions. Moreover, analysts focused on the perspectives of the poorer countries to catch-up with the level of the developed ones, as stated by the neoclassical growth model assumptions. Studies approaching the topic of income convergence with a strong focus on Central and Eastern Europe region or which contain in-depth comparisons between the two group of countries (New versus Old Members) were conducted by Kaitila (2004), Cuñado & Perez de Gracia (2006), Matkowski & Próchniak (2007), Reza & Zahra (2008), Rapacki & Próchniak (2008), Dobrinsky & Havlik (2014), Kaitila (2014), Matkowski et al. (2016), Grela, et al. (2017), Alcidi et al. (2018). Kaitila (2004) analysed the process of income convergence calculating the β- and σ- coefficients between 1960 and 2001. Referring to the Old Member States (15), the analyst identified two periods of convergence, between 1960-1973 and 1986-1991, divided by a period of stagnation (1973-1976). Kaitila also examined the evolutions that occurred in the Central and Eastern European countries that joined the European Union in 2004, identifying a catching-up process between 1993 and 2001 and higher growth rates compared to the Old Member States. Similar conclusions were reached by Matkowski & Próchniak (2007), who examined income and cyclical convergence in the European Union. The results of the study carried out by Matkowski & Próchniak confirmed a process of income convergence in the Central and Eastern European countries between 1993 and 2004. The analysis performed by Bâzgan (2019) revealed that large fiscal improvements in the EU countries had a less

positive effect on the development of economic growth than fiscal adjustments based on medium-sized consolidation.

In another paper, Matkowski, et al. (2016) studied absolute convergence in the New Member States compared to Old Member States group (15) between 1993 and 2005 using β- and σ-convergence. The analysts concluded that the group of ex-communist states registered annual growth rates reaching on average 3.2%, while the EU (15) only 1.5%. In order to capture in detail, the growth trends, Matkowski et al. divided the temporary horizon into 3 subsections. In the 1993-2000 sub-period, which marked the transition from the centralized economy to the market economy, the average growth rate in the Central and Eastern European group was around 3.3%, while in the West of the continent it was 2.8%. The period 2000-2007 was characterized by an intensive economic advance of the New Member States with average annual rates of 6%. In contrast, in the period 2007-2015, the financial and economic crisis hampered the economic growth in both groups, so that the catching-up speed was below 1% for the both groups of countries.

Dobrinsky & Havlik (2014) were interested in studying real convergence in the New Member States before and after the accession to the European Union. In this respect, the analysis studied σ- and β- (absolute and conditional) convergence between 1995 and 2011. Analysts have found evidence in favour of the absolute β-convergence assumption, the convergence rate of the Member States being around 2% per year. By calculating the values of σ-convergence, the analysts identified a general trend of reduction in the income gaps in the European Union (27). At the same time, Dobrinsky & Havlik studied conditional convergence, including as explanatory variables the labour cost, the internal and external savings (% GDP), and the share in international trade. The results of the conditional convergence model also suggest a catching-up speed around 2% per year.

In line with the previous studies, Grela et al. (2017) identified an average catching-up speed around 2% per year in the European Union between 1997 and 2004. In order to estimate the conditional convergence, Grela expanded the absolute convergence model by including the investment rate, the labour supply and the population growth rate. In this respect, the analysts pointed out that the first two indicators had a positive and significant influence on the GDP per capita growth rate, while the population growth rate had a negative impact. As in the case of the absolute model, the catching-up speed was around 2% in the conditional framework. On the other hand, Nicolescu & Dragan (2020) explored the influence of age, level of education and investments on the employment rate of non-EU immigrants. The results showed that the highest impact on the employment rate is found in the case of non-EU immigrants with age between 18-34 and 35-64 years and with a tertiary level of education. However, the analysts illustrated that income convergence in the New Member States was hampered by the economic and financial crisis, which resulted mainly in a decrease of FDI inflows in this group of countries.

3. Aims of the Research

The purpose of this paper is to examine real convergence in the European Union, by taking into consideration the evolution of the income per capita between 1995 and 2018. In this respect, we have tried to perform a comparative analysis between the New and Old Member States with the purpose of identifying if the former group is catching-up or lagging behind. Consequently, one of the main objectives of our research was to test the assumption that the countries that joined the European Union in the 2000s experienced a higher speed of convergence as reflected by the β-coefficient, compared to the Old Member States. Another purpose of this paper was to examine if the income disparities, as reflected by the σ-convergence, diminished between and within the two sub-groups. Overall, we have tried to respond to the question whether the objective of real convergence can be reached in an enlarged European Union.

4. Research Methods

Convergence is a complex process that can be analysed from multiple perspectives. In this paper, we have tried to study the evolution that occurred in the European Union between 1995 and 2018, using cross-sectional data approaching the values of GDP per capita (as % of EU average) for 27 Member States, which was obtained from Eurostat database. First of all, we have examined the aggregate evolution of income between 1995 and 2018 by comparing the performances of two sub-groups of countries: the Old Member States (14) – which comprises the founding Members (with the exception of Luxembourg) and the countries that joined the European Union in the last century – and the New Member States (13) – which includes the Central and Eastern European countries, Cyprus and Malta.

In the second section of the paper, we have tried to study the (absolute) β-convergence and σ-convergence for all 27 Member States, by focusing on the evolutions which occurred in the New Member States group. In this respect, our quantitative study is based on the neoclassical growth model assumptions, which were initially stated by Solow (1956). From Solow's perspective, the differentials in growth rates between countries are determined by the volume of physical capital, the economies being in different stages of economic growth. The neoclassical growth model suggests that countries will reach the same level of development in the long run.

In close relationship with the neoclassical growth model assumptions, there are the concepts of β- and σ-convergence applied by Barro & Sala-i-Martin. The former approaches a potentially negative relationship between the initial level of GDP per capita (in our case 1995) and the subsequent growth rates, while σ-convergence studies if the income gaps are diminishing in time.

In order to study the absolute β-convergence, we have computed a simple linear regression, where the depended variable is the GDP per capita growth rate between 1995 and 2018 and the independent variable is the logarithm of the initial income:

$$\frac{1}{T}[\frac{y_{it}}{y_{i0}}] = a + \beta_1 ln(y_{io}) + \varepsilon \quad (1)$$

y_i = GDP per capita in economy "i"
y_{i0} = the initial level of GDP per capita

β-coefficient, which reflects the speed of convergence was calculated based on the following formula:

$$\beta = -\frac{1}{T} ln(1 + \beta_1 T) \quad (2)$$

T = period of time

In order to examine if the GDP per capita disparities between the Member States diminished during the 24-year period, we have studied the evolutions of σ-convergence taking into consideration both the standard deviation of the logarithms (equation no. 3) and the coefficient of variation (equation no. 4 and 5).

$$\sigma log_t = \sqrt{(\frac{1}{n}) \sum_{i=1}^{N} [\log (y_{it}) - \log (\mu_t)]^2} \quad (3)$$

y_{it} = GDP per capita of economy "i"
μ_t = arithmetic average of y_{it}

$$\sigma_t^2 = (\frac{1}{n}) \sum_{i=1}^{N} [(y_{it}) - \mu_t]^2 \quad (4)$$

$$\sigma = \sqrt{\sigma^2}, \quad CV = \frac{\sigma}{\mu} \quad (5)$$

5. Findings

Figure 1 compares the values of the GDP per capita in the New Member States in 1995 and 2018, also illustrating the growth rate over the 24 years for each country. Having in 1995 an average GDP per capita around 30% of the European Union's average, the three Baltic States experienced impressive economic growth rates, as follows: Lithuania 145% (GDP per capita in 1995 was 32.7 PPS and in 2018 was 80.2 PPS), Estonia 131% (GDP per capita in 1995 was 35.4 PPS and in 2018 was 81.6 PPS) and Latvia 126% (GDP per capita in 1995 was 30.3 PPS and in 2018 was 68.6 PPS). Other countries that have been catching-up since 1995, being closer to the Community's average are Romania, which more than doubled its GDP per capita, and Poland, with an increase by 65%. In opposition with the general trend of this group of countries, Malta experienced a negative economic growth rate, its GDP per capita decreasing from 94.3 PPS to 89.2 PPS.

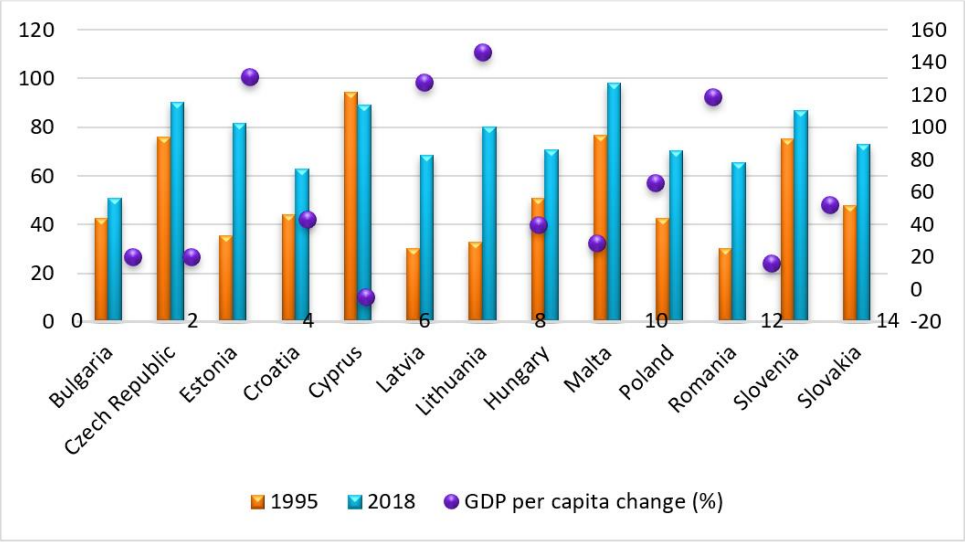

Figure 1. GDP per capita in the New Member States (PPS as % of EU average)
Source: Authors' processing based on data provided by Eurostat)

In contrast with the evolutions that occurred in the New Member States group, the Old Member States experienced a rather negative trend, mainly the Southern European countries. In this respect, Greece recorded a reduction in its GDP per capita relative to the EU average by 25%, while Italy by 29%. The only country in this group that experienced an increase of its GDP per capita during the 24-year period was Ireland.

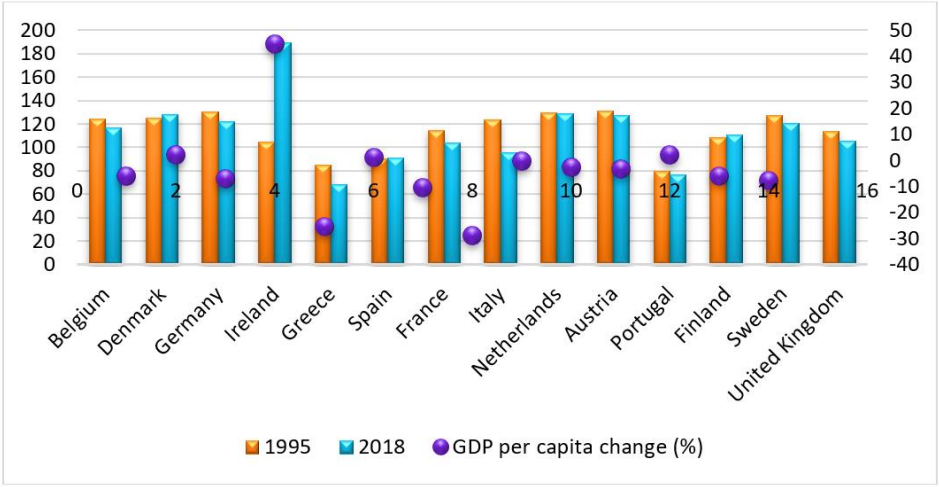

Figure 2. GDP per capita in the Old Member States (PPS as % of EU average)
Source: Authors' processing based on data provided by Eurostat

The analysis of the evolutions which occurred in the two subgroups of countries is continued by the study of the neoclassical growth model assumptions. In this respect, we have calculated the absolute β-coefficient, trying to capture the catching-up speed of the Member States between 1995 and 2018. Figure 3 illustrates the average GDP per capita growth rates between 1995 and 2018 in respect to the initial logged GDP per capita (PPS as % of EU average). As shown in Figure 1, the most impressive GDP per capita growth rates were experienced by the three Baltic States. The average growth rates per year in these states were 3.8% in Lithuania, 3.5% in Estonia and 3.5% in Latvia. Moreover, Romania and Poland experienced a catching-up speed which reached on average 3.3% and respectively, 2.1% per year. In the Old Member States subgroup, as shown above, a significant improvement of the GDP per capita was recorded by Ireland. This country experienced on average a GDP per capita growth rate of 2.4% per year. In contrast, there are also countries, mainly from Western and Southern Europe, which experienced annual reductions in GDP per capita (PPS as percentage of the EU average). For example, France experienced an average GDP growth rate of -0.4% per year, while Greece -0.9& and Italy -1%. These evolutions are posing into question the objective of the European Union to assure a sustainable long term growth for all its Members. Applying the equation no. 2, the average catching-up speed in the European Union was 2.07% between 1995 and 2018.

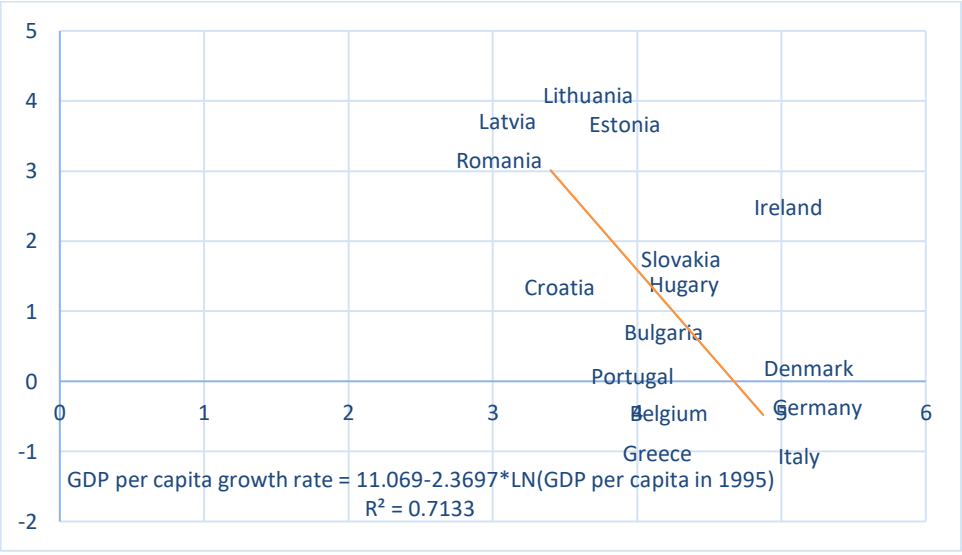

Figure 3. β-convergence in 27 Member States
Source: Authors' computation based on data provided by Eurostat

In order to capture the economic landscape of the last 24 years in the New Member States, Figure 4 illustrates the evolution of the GDP per capita growth rate between 1995 and 2018 relative to the initial income. Similarly, the negative slope of the trend line suggests that initially poorer Member States experienced higher GDP growth rates. As shown above, in the group of the New Member States, the highest GDP growth rates were experienced by Lithuania (3.8%), while the lowest by Cyprus (-0.2314%). As the value of the β-coefficient suggests, the catching-up speed in this group of countries was higher compared to the European Union, reaching on average 3%. The negative sign of the coefficient confirms the negative relationship between the initial level of the GDP per capita and the subsequent growth rates.

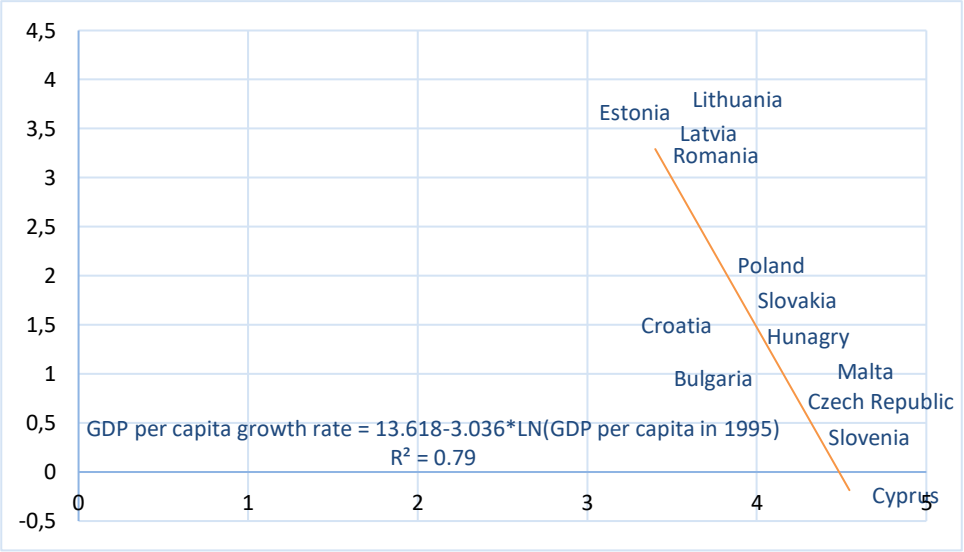

Figure 4. β-convergence in the New Member States (13)
Source: Authors' computation based on data provided by Eurostat

In order to study if the income disparities in the European Union and the two sub-groups of countries diminished between 1995 and 2018, we have tried to calculate the σ-coefficient using 2 measures, the log of standard deviation and the coefficient of variation of the cross-country sample. As suggested by Ram, (2017), these two measures indicate similar trends, but can lead to different amplitude of the annual changes. Figure 5 illustrates the evolution of σ-convergence, which was computed based on the equation no. 3. The income gaps between the 27 member States decreased by 15%. In the New Member States group, the disparities reduced by almost 60%, which suggest that the composing countries became more and more homogenous in terms of income per capita. By contrast, the Old Member States experienced an increase by 45% in the income gaps, as suggested by the values of the standard deviation.

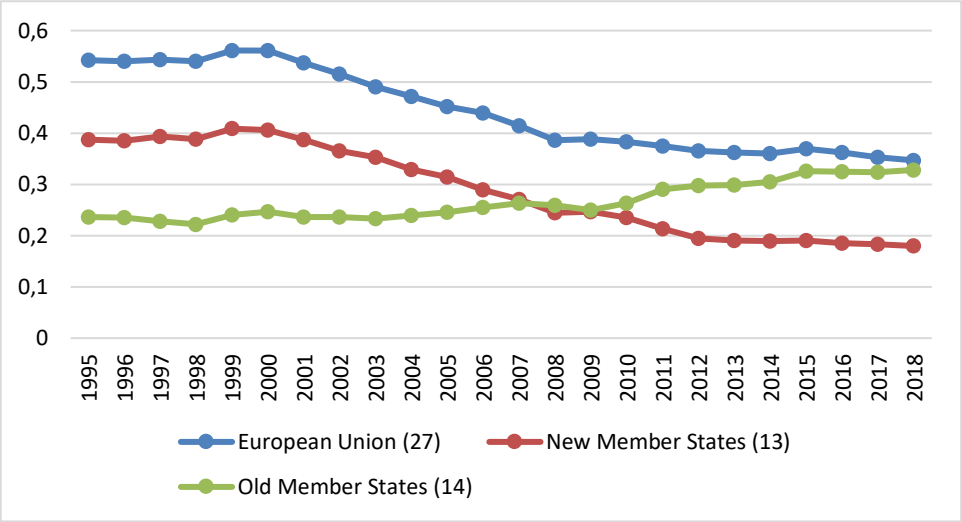

Figure 5. σ-convergence in the European Union based on standard deviation
Source: Authors' computation based on data provided by Eurostat

Figure 6 illustrates the evolution of σ-convergence based on the coefficient of variation. Both methods of calculation lead us to similar findings: the income gaps within the New Member States group decreased between 1995 and 2018, while in the Old Member States increased. As suggested by Ram (2018), the amplitude is different depending on the indicator used for measurement. Consequently, computing σ-convergence as coefficient of variation led us to a reduction in income gaps by 36% in the European Union's group and by 54% for the New Member States cluster. In contrast, the heterogeneity in the Old Member States increased by 39% between 1995 and 2018.

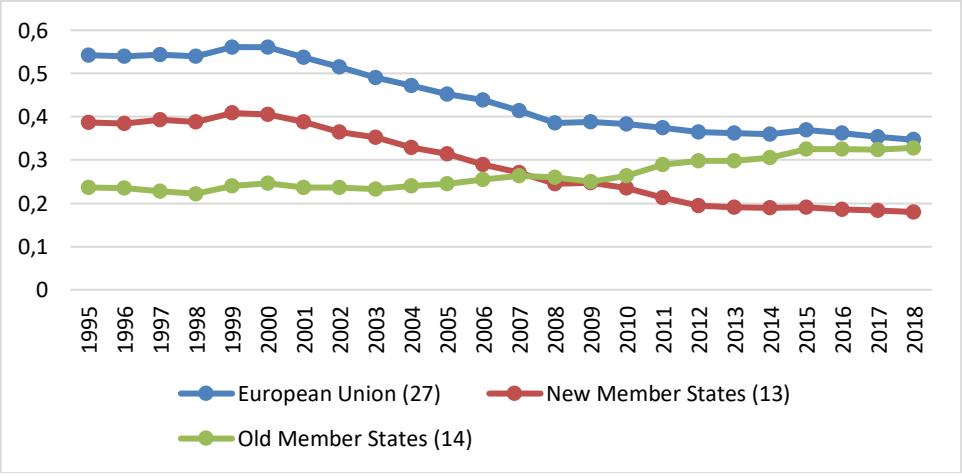

Figure 6. σ-convergence in the European Union based on coefficient of variation
Source: Authors' processing based on data provided by Eurostat

6. Conclusions

The European Union is one of the most powerful economic and political player worldwide, that has gathered under the same common values European countries with different historical backgrounds and heterogeneous economic performances. The accession of the countries from Central and Eastern Europe and of the two Mediterranean islands has remained a key point in the recent history of the European Union and its consequences are still largely discussed. The main purpose of this paper was to study income convergence in the European Union between 1995 and 2018 using β- and σ-convergence. Our findings are in line with the conclusions of the previous studies on this topic, which confirm an average catching-up speed of 2% per year. Similar with other researchers, we have illustrated that the New Member States have experienced a higher catching-up speed, reaching on average 3% between 1995 and 2018. Moreover, we have found evidences in favour of σ-convergence, which measures if the income gaps diminish between and within groups, with the exception of the Old Member States subgroup, where income disparities increased. A limitation of this study derives from the measurement of the GDP per capita: the growth rates obtained by studying convergence based on GDP per capita in PPS as percentage of the EU's average are lower compared with the analysis based on the GDP per capita in euro. Moreover, more Member States experience negative economic growth when taking into consideration the GDP per capita in PPS as percentage of the EU's average, compared with the standard measurement in euro. The analysis could be continued by extending the absolute convergence equation, in order to capture the explanatory variables that might determine the differences in growth rates within the European Union.

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