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Is an Economic Integration a Stimulus for Convergence? Analysis of European Union's Last Enlargement

Ekonomik Entegrasyon Yakınsama için Bir Uyarıcı Etken Midir? Avrupa Birliği'nin Son Genişleme Örneği

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Abstract

This study investigates the issue of the economic integration model's stimulus for convergence between the countries. As an example, the European Union, which is a successful model of economic integration, is taken. With the last enlargement wave of the European Union, the convergence of new members that joined the Union after 2000 was analyzed. Real convergence is estimated by using log regression model and nominal convergence is analyzed with the help of Convergence Reports. The results show that participation in an economic integration and also trade openness contribute to convergence in terms of Gross Domestic Product (GDP) growth among members. Trade openness is a stimulus for convergence in GDP growth in former members and new members, apart from the crisis and recovery years (2008-2013). It can be said that being included in an economic integration has a positive effect on trade openness, GDP growth and GDP per capita. Convergence was seen in 2000-2007 and 2014-2020 periods. In the 2008-2013 period, divergence was observed. The divergence experienced during the crisis years showed that nominal convergence was not sufficient to achieve harmonized growth and to overcome the crisis. In the European Union, a more harmonized growth can be achieved if real convergence is also taken into account.

Keywords: Economic integration, economic union, nominal convergence, real convergence

Paper Type: Research

Öz

Bu çalışma ekonomik entegrasyon modelinin ülkeler arasındaki yakınsama için uyarıcılık konusunu araştırmaktadır. Örnek olarak başarılı bir ekonomik entegrasyon modeli olan Avrupa Birliği ele alınmıştır. Avrupa Birliği'nin son genişleme dalgasıyla birlikte 2000 yılından sonra Birliğe katılan 13 ülkenin yakınsamaları analiz edilmiştir. Log regresyon modelleri kullanılarak reel entegrasyon analiz edilmiş, yakınsama raporları incelenerek de nominal yakınsama araştırılmıştır. Sonuçlara göre, ekonomik entegrasyona katılım ve ticari açıklığın üyeler arasında GSYH büyümesi açısından yakınsamaya katkıda bulunduğunu göstermektedir. Ticari dışa açıklığın, kriz ve toparlanma yılları (2008-2013) dışında eski ve yeni üyelerde de GSYH büyümesinde yakınsama için bir uyarıcı olduğunu özetlemektedir. Birliğe son üye olan ülkelerde 2008 kriz yılı ve sonrasındaki yıllarda (2014 yılına kadar) ekonomik entegrasyona dahil olmanın ticari dışa açıklık, GSYH büyümesi ve kişi başına GSYH üzerinde olumlu etkisi olduğu söylenebilir. 2008-2013 döneminde ise uzaksama gözlenmiştir. Kriz yıllarında yaşanan uzaksama, harmonize büyümeyi sağlamak ve krizlerin üstesinden gelmek için nominal yakınsamanın yeterli olmadığını göstermiştir. Avrupa Birliği'nde, reel yakınsama da dikkate alınırsa, daha harmonize bir büyüme sağlanabilir.

Anahtar Kelimeler: Ekonomik entegrasyon, iktisadi birlik, nominal yakınsama, reel yakınsama

Makale Türü: Araştırma

Introduction

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Economic integration has been concerned with increasing efficiency, welfare, resource allocation and gains from trade in the international economics literature. These gains may arise with the specialization according to the comparative advantages among countries with different economic characteristics (Robson, 1998, p. 5). The European Union (EU) is a successful economic integration model, comprising of 27 countries with different economic characteristics.

The European Union, formerly European Economic Community was established as a free trade area in 1957 with six countries. These six countries had made efforts to integrate Europe after World War II. In this sense, it is also crucial to give attention to the relationship between integration and interdependence, and the maintenance of peace in the continent (Güçyetmez & Şahin, 2020, p. 611).

The European Economic Community later transformed into customs union in 1968 by removing trade barriers between the member states. The Union became a common market in 1992. In 1999, Monetary Union was established with the introduction of Euro. Finally, the European Union became an economic union at the end of 1990s with the harmonization of economic and monetary policies.

From 1957 to 2000s, the European Union experienced successful enlargements during its economic integration process. Enlargement made the Union a safer place, promoting democracy and fundamental freedoms across the member countries. Especially the last enlargement ended the division of Europe after the Second World War (European Commission, n.d.). With this enlargement, the European Union stimulated peace and stability in South East Europe and promoted recovery and reconciliation after the world wars (European Commission, 2014a). The citizens and businesses benefited from the enlargements. The quality of life of citizens has improved as EU environmental, consumer and other standards applied more widely. Trade and investment also increased (European Commission, 2014b).

Economic convergence is crucial for successful integration. Before accession of the new members, the European Union expects the candidates to satisfy certain conditions and become uniform in policy areas. This paper evaluates the integration of last member states with respect to economic convergence criteria. The indicators of the last acceding countries are examined by measuring their convergence The last enlargement is different from other enlargements in the sense that except S.Cyprus and Malta, the other countries were former communist states. Their accession to the European Union had been a driving force for their transition to market economy. In the first part of the study, the term "convergence" is explained; the types of the convergence and the treaties emphasizing convergence are mentioned. In the second part, the related literature review is summarized. The third part of the study evaluates the real convergence of the member states (EU-27) and nominal convergence of the new member states. Findings are summarised by comparing the results of the studies given in the literature review. Finally, conclusions will be presented at the end of this study.

1. Concept and Measurement of Convergence

Convergence means that two or more variables become similar or move together. There are two types of convergence related with the economic integration: Legal convergence and economic convergence. Legal convergence is the adjustment of the national legislations of the member countries' central banks so that they are compatible with the European System of Central Bank (ESCB). Legal convergence requires compatibility of national legislation with the treaties and the Statute of the ESCB (European Central Bank [ECB], 2017, p. 12). Economic convergence is defined as the narrowing of international disparities in the development of certain economic variables (Anderton et al., 1992, p. 2). Divergence is the opposite of convergence; it is a process towards dissimilarity and inequality (Bisello et al., 2018, p. 11). Convergence is handled from the economic point of view in this study.

Economic convergence within the member states is a precondition for further moves to economic and monetary integration (Anderton et al., 1992, p. 2). It is the analysis of real and nominal convergence criteria. The nominal convergence criteria are the European Monetary Union convergence criteria determined in the Maastricht Treaty (The Treaty of Maastricht, 1992, p. 41).

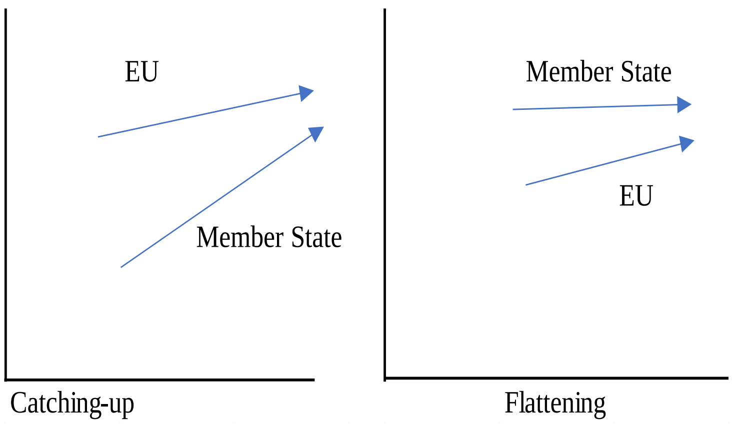
Healey gives importance in achieving nominal convergence before forming the monetary union (Healey, 1995, p. 97-98): First, by prescribing convergence criteria, Maastricht Treaty ensures that member states can consolidate their successes in reducing their inflation rates during the 1980s. Second, criteria are incentive for countries to improve their performance and reform their fiscal systems. Third, the criteria provide the foundations on which the ECB can rapidly establish its credibility. Fourth, they are seen as member states' commitments to the objective of completing the internal market.

Real convergence measures convergence in economic and social performances in terms of real variables like GDP, GDP per capita, productivity, competitiveness, and employment statistics (Marelli & Signorelli, 2010, p. 748-749). Real convergence has four concepts: beta convergence (β-convergence), sigma convergence (σ-convergence), delta convergence and gamma convergence. Beta- and sigma-convergence are the most used measurement way of convergence, and both of them derive from economic growth theory.

Beta-convergence is a catching-up process in which poorer countries grow faster than the rich ones. There are two measurement ways: conditional beta convergence and unconditional (absolute) beta convergence. Economies that have the similar features (technology level, population growth etc.) experience an 'unconditional' (or absolute) beta-convergence and eventually converge to the same level of GDP per capita (Solow, 1956). Sigma-convergence is a decrease in a function of variability over time and measured through the changes in standard deviation or the coefficient of variation. The coefficient of variation is measured for every year by dividing the standard deviation to the mean. A decrease in the coefficient of variation over-time shows a sigma-convergence and an increase indicates that countries are diverging.

The differences of member countries can decrease when countries whose performance was initially lower than the EU average may catch up the others faster (Figure 1). This is an example of positive catch-up. The overall heterogeneity can diminish when member countries who are with better former performance than the EU average may lag behind the rest of the member countries and flatten the EU average. This situation indicates a slower growth of a member country in comparison to the EU average (Bisello et al., 2018, p. 23).

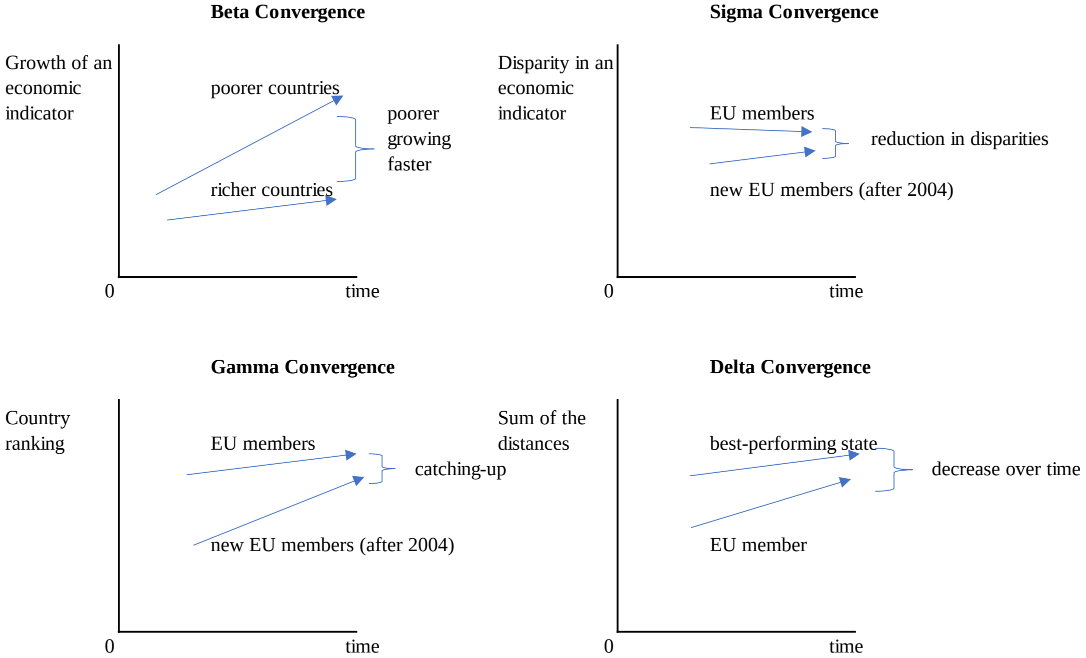
Figure 1. Examples of convergence trends



Source: Bisello et al., 2018, p. 23

Delta convergence is the analysis of countries' distance from an example model, such as the best-performing country (Heichel et al., 2005). Delta-convergence is measured through the sum of the distances from the top performers. Gamma-convergence examines the changes in country rankings with respect to a particular factor. If countries in the first ranks fall behind or catch up over time, then convergence occurs.

Figure 2. Possible trends of convergence types



Source: Author (Convergence trends in Eurofound Research Report (Bisello et al., 2018) are used as a base)

Convergence can be mixed up with cohesion. Cohesion policy aims to reduce the disparities and inequalities between the member states. Cohesion is a status, but convergence is a process towards something (Bisello et al., 2018, p. 11). The legal Treaties of the European Union gave special importance to reduce the disparities between members, and to convergence and cohesion.

The Treaty of Rome (1957) addressed convergence and aimed to reduce the differences existing between the various regions (The Treaty of Rome, 1957, p. 1). The Single European Act (1987) highlighted the convergence of economic and monetary policies and promoted to develop the European Currency Unit (ECU) and the European Monetary System (The Single European Act, 1987, p. 307). The Single European Act required that each member had to pursue economic policies to ensure the equilibrium of balance of payments and to ensure the stability in the level of prices (The Single European Act, 1987, p. 308).

The Treaty of Maastricht (1992) especially stressed to achieve the convergence and to form an economic and monetary union including a single and stable currency (p. 3). The Maastricht criteria were regarded as convergence criteria that each member state has to fulfil to adopt the single currency. The Commission prepares progress reports that evaluates the achievement of the convergence criteria of each member. Inflation differences had narrowed during 1991-1998, the Maastricht-mandated years; but in the aftermath of the 2000 oil shock, there had been a tendency towards divergence (Baldwin & Wyplosz, 2006, p. 394).

The Treaty of Amsterdam (1997) emphasized establishing an economic and monetary union. The Treaty stressed the Community's task as promoting convergence of economic performances, economic and social cohesion (The Treaty of Amsterdam, 1997, p. 24). The

Treaty of Lisbon (2007) considered the convergence only in common foreign and security policy. The convergence was handled in the Rome Declaration, too (2017). The Declaration called for a sustainable growth that foresees cohesion and convergence. Lastly, Europe 2020 Strategy was proposed in 2010 to overcome the 2008 global economic crisis effects. The Strategy addressed the causes of crisis as competitive differentials between member states and budgetary disequilibrium, and emphasized economic cooperation.

Generally, the Treaties and the decisions taken by the member states featured the importance of convergence and economic cooperation to tackle with economic problems and crisis periods on the way of becoming an economic integration.

2. Literature Review

In the literature, real convergence is measured for various factors like growth rate in GDP, GDP per capita, financial integration, trade openness, employment etc. The articles related with this study from the perspective that examine economic convergence are summarized below. The studies are divided into two categories. The first category refers to the initial studies and the analysis of convergence process in a group of countries, and the second category involves the convergence among the European Union countries.

The Solow model (1956) is the first model that predicts a high expected return on investment in capital-scarce countries, which encourages capital to flow from rich to poor countries. This increased investment will cause the capital-scarce countries to move upwards on the balanced growth path, thereby converging towards the same steady state level of income (unconditional convergence), and inducing the catching-up phenomenon (i.e. β-convergence). An important guiding study in this field is “Convergence” written by Barro, Robert J. and Xavier Sala-i-Martin (1992). They examined convergence in the levels of per capita income and product to find out whether poor countries or regions tend to grow faster than rich ones. In their study that covers 48 contiguous U.S. states, the authors revealed that economies tend to grow faster in per capital terms when they are further below the steady-state position. Ben-David (1996) analysed the relationship between international trade and income convergence of groups of countries. The comparison of the trade-based groups with different country groupings showed that the former was more likely to experience convergence than the latter. Demirbaş and Kabananiye (2011) analysed the convergence in GDP per capita among East African countries. The results of the study revealed a complete convergence in GDP per capita. Jena (2018) examined income convergence among the EU and Association of Southeast Asian Nations (ASEAN) countries in the period 2000-2014 by using beta and sigma convergence and theil index of inequality. According to the analysis, the inter-country inequality in GDP had decreased in the countries. Industrial sector affected the reduction in equality in the EU, while in the ASEAN, industrial and services sectors contributed to the convergence.

The studies which examine the convergence in the European Union are summarised as follows: Okko (2003) examined income convergence and regional restructuring in the case of European integration. In the study, eastern enlargement was seen as an opportunity to faster growth in Europe, but the regional restructuring was a crucial condition for this result. Iancu (2009) investigated convergence and cohesion in the European Union. They concluded that there cannot be an alignment of all countries with an absolute advantage, on the other hand EU’s economic policy about harmonisation of market forces based on cohesion is realistic. Iancu (2017) also searched Romania’s economic convergence and transition to the Euro. The author found 70% convergence and suggested that full convergence of Romania requires 22-26 years. Esen and Kıral (2013) examined Turkey’s compliance to European Union membership by using convergence for the period 2008-2010. Turkey was analyzed in different groups. According to the club convergence analysis, the authors concluded that Turkey had similar results with the club members. Glodowska and Pera (2019) investigated the convergence experience of the Central and Eastern European Countries during the years 1995-2016.

According to the results beta and sigma convergence hypothesis was accepted but gamma convergence hypothesis was rejected. Alcidi (2019) discussed how economic integration affects convergence and divergence patterns in the European Union. According to the author, deeper economic integration does not necessarily lead to income convergence, and the full income convergence is not a realistic objective.

Mikulić et al. (2013) examined the regional convergence in the new member states and Crotia with beta-convergence analysis. According to the findings, the regional convergence exists but the speed is found low. Akıncı and Yılmaz (2012) analysed the convergence process among 17 EU member states in the Euro area for the period 1992-2011. The results reveal that there exists convergence among Austria, Belgium, Finland, France, Germany, Italy, Ireland, Luxembourg, Malta, Netherlands and Portugal; but there is a divergence among Estonia, Cyprus, Spain, Slovakia, Slovenia, Greece and the founding sixes. Strielkowski and Höschle (2016) examined the economic convergence among different groups of EU member states. The founding members of the EU and the countries that have been EU members for a long time had likely converged to some extend prior to 1995. Nagy and Šiljak (2022) analysed the relationship between the per capita GDP growth rate and macroeconomic variables in the period of 2004–2018. According to the authors, the European Union can be considered as a convergence machine after the 2008/ 2009 financial crisis. The results also reveal that the poor countries tend to grow faster than the rich countries.

3. Empirical Research about the European Union

3.1. Method of the Research

Economic convergence is analysed from two aspects in this study: real convergence and nominal convergence. For the real convergence, conditional and unconditional beta-convergence regression models are estimated through Least Squares method by using log-log equations. Panel data analysis is made for the years between 2000-2020. There are three sub-periods in this study: 2000-2007; 2008-2013 and 2014-2020. The first period (2000-2007) starts with the first years of the common currency and ends with the 2008 economic crisis (prior to 2008 economic crisis) which caused the convergence trends to slow down. The second period (2008-2013) is the economic crisis period. The third period (2014-2020) is the recovery period after crisis. This period starts in 2014, when upward convergence was restored in most of the indicators (Bisello et al., 2018, p. 2). Data are gathered from ECB convergence reports (ECB, 2016-2018-2020) and the Eurostat (Statistical Office of the European Union). The unconditional beta-convergence is estimated by the following regression:

$$\ln(\Delta Y_{i,t}) = \alpha + \beta \ln(Y_{i,t-1}) + \varepsilon_{i,t} \tag{1}$$

Where $Y_{i,t}$ is the level of indicator Y in country i at time t, $\Delta Y_{i,t}$ is the growth rate of indicator Y in country i at time; t, α and β are the parameters to be estimated, and $\varepsilon_{i,t}$ is the error term. This equation indicates the relationship between the growth of an indicator over a certain period of time and its initial value. Beta-convergence exists if the relationship is statistically significant and negative. The magnitude of parameter β gives an indication of the speed of the convergence process.

The conditional beta-convergence is measured by separating the members in two groups: EU-14 is the group including old member states accessed the EU before 2000 (Belgium, France, Germany, Italy, Luxembourg, the Netherlands, Portugal, Spain, Austria, Greece, Ireland, Denmark, Finland, and Sweden); EU-13 is the group comprised of new member states (S. Cyprus, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia). The conditional beta-convergence is estimated by the following regression:

$$\ln(\Delta Y_{i,t}) = \alpha + \beta \ln(Y_{i,t-1}) + \gamma Z_{i,t} + \varepsilon_{i,t} \tag{2}$$

$Z_{i,t}$ is a vector of potential explanatory factors,

Y_t is GDP per capita at the end of the time period,

Y_0 is GDP per capita at the initial the time period,

t is the number of years.

With conditional beta-convergence, the convergence process is analysed by using explanatory variables such as the rate of technological progress across economies, changes in the labour force, investment-to-GDP ratio or year of EU accession. In this study, trade openness is especially analysed, whether trade openness has an impact on the convergence of GDP growth of the countries. Trade openness is measured by the ratio below:

(Total exports + Total imports) / Gross Domestic Product (3)

The conditional beta-convergence occurs when the estimator β is negative and statistically significant. When $\beta > 0$, there is a divergence, and when $\beta < 0$, there is a convergence process.

For analysing the nominal economic convergence, the progress reports of the European Central Bank are examined for the countries which did not join the Euro area. The nominal convergence criteria are as follows:

- Budgetary discipline: the ratio of excessive government deficit to GDP is 3%; and the ratio of excessive government debt to GDP is 60%;
- Price stability: Inflation rate must not exceed by more than 1 ½ percentage points that of three best performing Member States in one period. Inflation rate is measured by the Harmonised Index of Consumer Prices (HICP).
- Interest rate convergence: The long-term nominal interest rate must not exceed by more than two percentage points that of the three best performing Member States.
- Currency stability: The fluctuation of the currency must be in normal margins set by the exchange-rate mechanism of the European Monetary System, without devaluations in the last two years.

3.2. Real Convergence Analysis

Table 1 shows the statistics of EU-13 (new member states). GDP growth is the dependent variable. Explanatory factors are gross capital ratio, productivity, trade openness and exports share of the countries. P-values of the coefficients are shown in parentheses. The least-squares estimates of the coefficient β is estimated under the null hypothesis of convergence.

Table 1. Panel estimates for EU-13

Variables	2000-2007	2008-2013	2014-2020
Grosscapital	2,28	2,66	0,78
[prob.]	[0,0000]	[0,0005]	[0,0210]
Openness	-0,87	0,08	-0,49
[prob.]	[-0,0025]	[0,8131]	[0,0005]
Exportsshare	1,24	1,15	1,09
[prob.]	[0,0000]	[0,0000]	[0,0000]
Productivity	-1,91	6,87	4,02
[prob.]	[0,0029]	[0,0750]	[0,0000]
Constant	11,17	-30,91	-11,62
[prob.]	[0,0001]	[0,0897]	[0,0001]
R-squared	0,65	0,60	0,90
Number of countries	13	13	13
Number of observations	94	56	74

*dependent variable: GDP growth

According to the Table 1, the negative relationship between trade openness and the growth rate means that the last accessed countries' trade openness ratio grew at a faster rate in the periods 2000-2007 and 2014-2020. The null hypothesis is accepted. Only in the post Mortgage-crisis period (2008-2013) a positive beta-convergence shows a divergence. The null hypothesis of convergence is rejected for the period 2008-2013. Historical experience in the EU suggests that, cross-country disparities tend to narrow in periods of rapid growth, while in recession divergence gains ground (Robson, 1998: 259).

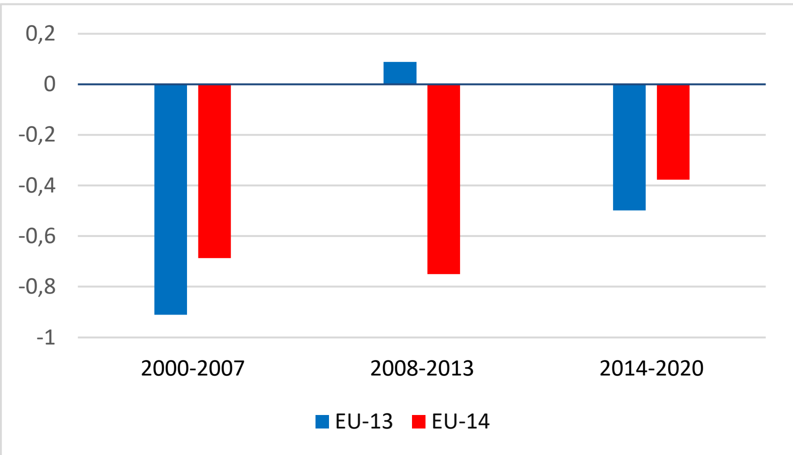
Table 2. Panel estimates for EU-14

Variables	2000-2007	2008-2013	2014-2020
Grosscapital	3,39	2,51	-0,11
[prob.]	[0,0000]	[0,0009]	[0,8117]
Openness	-0,68	-0,74	-0,37
[prob.]	[0,0000]	[0,0003]	[0,0507]
Exportsshare	1,00	1,01	1,03
[prob.]	[0,0000]	[0,0000]	[0,0000]
Productivity	3,57	3,81	0,93
[prob.]	[0,0005]	[0,4233]	[0,4035]
Constant	-18,11	-16,57	5,17
[prob.]	[0,0006]	[0,4614]	[0,2296]
R-squared	0,83	0,75	0,68
Number of countries	14	14	14
Number of observations	96	56	82

*dependent variable: GDP growth

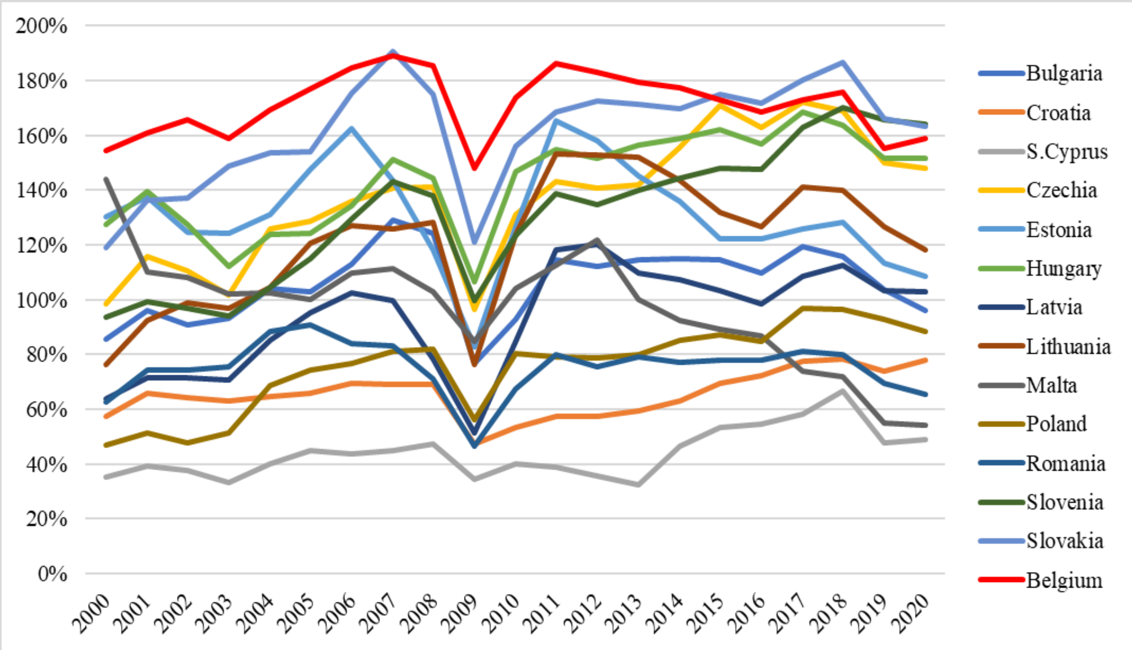
In the second Table, the statistics are summarised for EU-14 (old member countries). The estimated convergence coefficient (β) = -0,68 is significant (0,0000) during 2000-2007. Conditional convergence has occurred at a slower rate of 0,68 percent. Convergence coefficients in the periods 2008-2013 and 2014-2020 are -0,74 and -0,37, respectively. The null hypothesis is accepted for all sub-periods. Graph 1 also shows the β coefficients of trade openness.

Graph 1. Beta coefficients of logarithmic regression of trade openness in the European countries, 2000-2020



The results of estimates indicate that accessing an economic integration and trade openness contribute to the convergence in terms of GDP growth among members. The analysis of trade openness in two groups summarise that also in old members, and in new members, trade openness has a stimulus to convergence in GDP growth except crisis (2008-2013) for the new members.

Graph 2. Trade openness, 2000-2020

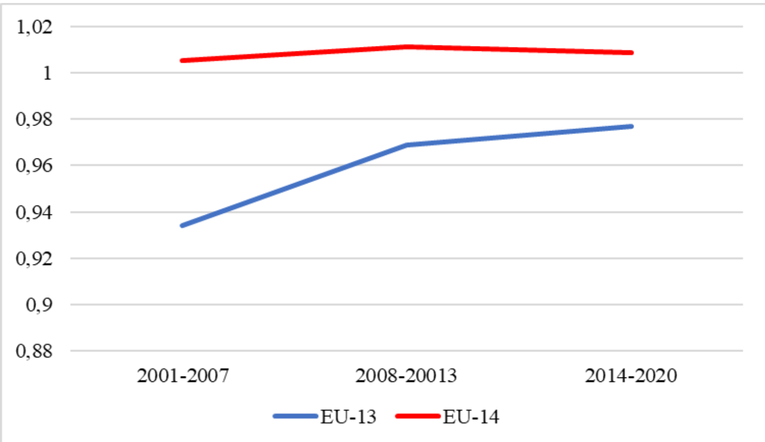


Source: Eurostat, 2021a

The accession of the new member states after 2004 was crucial for these countries for their transition to market economy and integration to the world economy inside the Union. Belgium has the highest percent of trade openness ratio among the old member states. Trade openness ratios of new member states and Belgium are shown in Graph 2. The high level of openness is recorded in Czechia, Hungary, Slovakia and Slovenia after joining the European Union. S.Cyprus has the lowest rate of trade openness, followed by Bulgaria and Crotia. It is also worth to say trade openness ratios of all countries decreased in 2008 crisis and a severe fall was recorded in 2009.

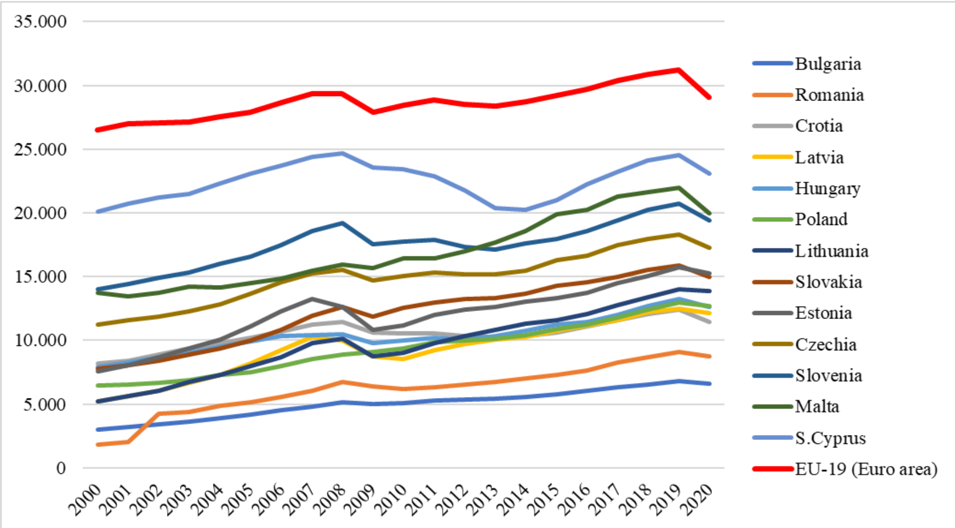
For unconditional beta convergence, converging to the GDP per capita is examined. Graph 3 shows beta coefficients of log of GDP per capita in EU countries. From 2001 to 2008, catching up; but after 2008-2013, a flattening trend is observed.

Graph 3. Beta coefficients of logarithmic regression of GDP per capita in the European countries, 2000-2020



GDP per capita of the new member states had started to increase in the first years of 2000 (Graph 4). However, in 2008 crisis and in the following years, GDP per capita recorded decreasing values. Although GDP per capita had recovered after crisis years, Covid-19 pandemic in 2020 led to decline in GDP per capita in all countries. Graph 4 shows GDP per capita values of new member states in comparison with the GDP per capita of Euro-area (19). All the new countries' per capita values remain below Euro area GDP per capita. S.Cyprus, Malta and Slovenia are the best performing countries in converging to Euro-Area's GDP per capita average. The performances of Bulgaria and Romania diverge in this indicator.

Graph 4. GDP per capita



Source: Eurostat, 2021b

Real convergence is one of the main objectives of a fully-integrated Europe, but it is a long-term process and it is not a necessary condition for a successful transition to an economic and monetary union (Anderton et al., 1992, p. 2). On the other hand, real convergence ensures the consistence and sustainability of the nominal criteria on medium and long terms (Iancu, 2017, p. 9).

3.3. Nominal Convergence Analysis

The Maastricht criteria can be regarded as supportive factors for convergence. The most important criterion is the price stability. In a monetary union, inflation rates must be similar; because inflation rate is the leading factor that countries demonstrate that they are willing and able to converge in this respect before the union is finalised. The transition from high to low inflation also involves reducing nominal interest rates and (in some cases) reducing fiscal deficits (Anderton et al., 1992, p. 2-3).

The euro area currently consists of the following countries with entry years in the parenthesis: Austria (1999), Belgium (1999), Finland (1999), France (1999), Germany (1999), Ireland (1999), Italy (1999), Luxembourg (1999), Netherlands (1999), Portugal (1999), Spain (1999), Greece (2001), Slovakia (2007), S.Cyprus (2008), Malta (2008), Slovenia (2009), Estonia (2011), Latvia (2014), and Lithuania (2015).

Denmark and the United Kingdom gave notification that they would not participate in stage three of European Monetary System. As a consequence, Convergence Reports only have to be provided for these two countries if they so request. The convergence reports examine seven countries: Bulgaria, Czechia, Croatia, Hungary, Poland, Romania and Sweden. Sweden is not also a member of the monetary system. Nominal convergence criteria are examined for the six new countries in this study. Table 3 summarises the convergence of the countries to the Maastricht criteria for the last years.

Table 3. Analysis of nominal convergence indicators

Countries	Years	Price stability (HCIP inflation)	Price stability reference rate value	Long-term interest rate	interest rate reference value	Exchange rate vis-a-vis the Euro (±15% band)	General Government deficit (-), max (-3%)	General Government gross debt (max 60%)
Bulgaria	2015	-1.1	0.7	2.5	4.0	0	-2.1	26.7
	2016	-1.3	0.7	2.3	4.0	0	0.2	29.0
	2017	1.2	1.9	1.6	3.2	0	0.9	25.4
	2018	2.6	1.9	0.9	3.2	0	2.0	22.3
	2019	2.5	1.8	0.4	2.9	0	2.1	20.4
	2020	2.6	1.8	0.3	2.9	0	-2.8	25.5
Czechia	2015	0.3	0.7	0.6	4.0	0.9	-0.4	41.1
	2016	0.6	0.7	1.0	4.0	0.9	0.7	36.8
	2017	2.4	1.9	1.3	3.2	2.6	1.6	34.6
	2018	2.0	1.9	2.0	3.2	2.6	0.9	32.6
	2019	2.6	1.8	1.5	2.9	-0.1	0.3	30.8
	2020	2.9	1.8	1.5	2.9	0.2	-6.7	38.7
Croatia	2015	-0.3	0.7	3.6	4.0	0.3	-3.5	86.7
	2016	-0.6	0.7	3.5	4.0	1.1	-0.9	80.6
	2017	1.3	1.9	2.8	3.2	0.9	0.8	78.0
	2018	1.6	1.9	2.2	3.2	0.6	0.2	74.7
	2019	0.8	1.8	1.3	2.9	0	0.4	73.2
	2020	0.9	1.8	0.9	2.9	-1	-7.1	88.6
Hungary	2015	0.1	0.7	3.4	4.0	-0.4	-2.0	75.3
	2016	0.4	0.7	3.1	4.0	-0.5	-1.7	76.0
	2017	2.4	1.9	3.0	3.2	0.7	-2.0	73.6
	2018	2.9	1.9	3.1	3.2	-3.1	-2.1	70.2
	2019	3.4	1.8	2.5	2.9	-2	-2.0	66.3
	2020	3.7	1.8	2.3	2.9	-4.3	-5.2	75.0
Poland	2015	-0.7	0.7	2.7	4.0	0	-2.6	51.3
	2016	-0.2	0.7	3.0	4.0	-4.3	-2.3	54.2
	2017	1.6	1.9	3.4	3.2	2.4	-1.7	50.6
	2018	1.2	1.9	3.2	3.2	-0.1	-0.2	48.8
	2019	2.1	1.8	2.3	2.9	-0.8	-0.7	46.0
	2020	2.8	1.8	2.2	2.9	-0.6	-9.5	58.5
Romania	2015	-0.4	0.7	3.5	4.0	0	-0.7	38.4
	2016	-1.1	0.7	3.3	4.0	-1	-3.0	37.4
	2017	1.1	1.9	4.0	3.2	-1.7	-2.9	35.0
	2018	4.1	1.9	4.7	3.2	-1.9	-2.9	34.7
	2019	3.9	1.8	4.5	2.9	-2	-4.3	35.2
	2020	3.7	1.8	4.4	2.9	-1.1	-9.2	46.2

Source: European Central Bank Convergence Reports (2015-2020).

In Table 3, the values that exceed reference values are coloured. When the indicators are compared with the reference values, it is clear that none of the countries has satisfied the criteria. Bulgaria is close to meet the criteria, only price stability seems to be an obstacle for the adoption of Euro. All the countries could not meet the price stability criteria except Crotia. Crotia has excess gross government debt and government deficit. Hungary and Poland have inflation and interest rate problems, also excess government deficit. Besides, Hungary's gross government debt has been higher than the reference value in the last years. When compared with the other members, Romania is very far from satisfying the Maastricht criteria.

4. Findings

Economic convergence is examined from different perspectives in the studies given in the literature review which analyse the convergence among European Union countries. For example, Akıncı and Yılmaz (2012) investigated convergence only in the Euro-zone. Strielkowski and Höschle (2016) examined the convergence by grouping the countries according to the member states that joined the EU in course of the same enlargements. Esen and Kıral (2013) analysed the convergence by also considering the candidate countries.

In this study the economic convergence of the last acceded countries is examined. According to the findings, in terms of real convergence, GDP per capita had a converging trend in the first years of 2000 since 2008. The 2008 economic crisis affected negatively the converging process. The performances of S.Cyprus, Malta and Slovenia converge to the Euro-Area average, but Bulgaria and Romania had diverging trends. These findings were line with Glodowska and Pera (2019) who analysed the convergence process of the Central and Eastern Europe (CEE) countries towards Western European countries (EU15) in years 1995–2016. The author found that that the most distant countries were Romania and Bulgaria. Similar results were obtained by Alcidi (2019), while in this study, the convergence was examined among EU-28 between 2000-2015. In the case of Southeastern Member States, the author found a very strong internal income divergence. From the nominal convergence perspective Romania did not satisfy the Maastricht criteria. This result is consistent with the studies of Iancu (2009) and Iancu (2017) who consider that Romania needs years for the convergence.

Trade openness was not examined in the former studies. Considering the trade openness rates calculated in this study, Czechia, Hungary, Slovakia and Slovenia had highest levels after joining the European Union. However, S.Cyprus, Bulgaria and Crotia had lower rate of trade openness.

Conclusion

Forming an economic integration, and expectations of increasing gains from an integration are a long-run process. European Union has been a successful economic integration model by realising the aim of ever-growing union since its establishment. Turning from a free trade area into an economic union lasted for long years. With the formation of economic and monetary union, the EU realised the deepest form of economic integration thanks to the Maastricht Treaty. In this study, real convergence and nominal convergence are examined in the European Union to find out whether economic integration has an impact on convergence. The limitation of the study is that, only last acceded countries were considered. This research can also be extended to all member states and also to candidate countries.

The nominal convergence criteria set out in the Maastricht Treaty can be regarded as a stimulus of converging economies which aimed to joined the European Union. Hence, these criteria ensure the stability in price levels, interest rate, exchange rates fluctuations, and government debts; fulfilling these criteria will provide harmonious development inside the Union. Although real convergence is not a necessary condition for nominal convergence, real convergence also stimulates convergence in the macro indicators.

In real convergence measurement, trade openness, GDP growth, and GDP per capita of the countries were examined. Based on the findings, it can be stated that, accessing of the last members in the union caused a positive impact on trade openness, GDP growth and GDP per capita except 2008 crisis year and the following years until 2014. The period of 2008-2013 shows a divergence among the members. The best performing country was found as Slovenia. Romania is the last country in the convergence performance.

The results demonstrate that economic integration stimulates convergence among the member countries. With the membership of the European Union, the increase in the trade openness, and the efforts to meet the Maastricht criteria have enabled these countries to develop their macro indicators within the economic integration, and also to adapt to the market economy. By joining the Union, they have been converging to the European Union average. Divergence occurred only in the crisis years. In fact, real convergence is not a necessary condition for the nominal convergence; the divergence during crisis years showed that nominal convergence is not sufficient enough for the harmonised development and to overcome the crisis. The European Union has better consider also the real convergence.

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ETİK ve BİLİMSEL İLKELER SORUMLULUK BEYANI

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