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Convergence and Transition of the Eastern Partnership Countries towards the European Union

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ABSTRACT

Objective: This article aims to present the convergence analysis results for the Eastern Partnership EaP countries and the twenty-eight members of the European Union (EU).

Research Design & Methods: The relationships between the selected macroeconomic variables and per capita GDP growth rate are econometrically tested to support this research. We analyse the convergence during the period of 2004-2017, but also include two sub-periods: 2004-2008 and 2009-2013.

Findings: The empirical findings support the economic convergence hypothesis. The results show that the recent financial crisis negatively affected the absolute and conditional convergence process, when economic variables are included in the analysis. The negative effects of the crisis on conditional convergence with economic and socio-political variables are not identified.

Implications & Recommendations: Poorer countries in the analysed group should do more to open their economies to attract investment, as gross fixed capital formation and economic openness have a positive impact on per capita growth, while general government debt, unemployment and inflation should be stabilised in the examined sample of countries.

Contribution & Value Added: The contribution of this article is reflected in the fact that it examines a geographic and economic area that has been under examined. The analyses on the Eastern Partnership countries convergence process towards the European Union are almost nonexistent. Economic literature on convergence has focused on the EU Member States, while the analyses on the Eastern Partnership countries convergence process towards the EU are almost nonexistent.

Article type: research article

Keywords: beta convergence; Eastern Partnership; European Union; transition; financial crisis; economic growth

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INTRODUCTION

In this article, we analyse the real economic convergence process among the Eastern Partnership countries (Armenia, Azerbaijan, Belarus, Georgia, Moldova, and Ukraine) and the twenty-eight Member States of the European Union. The focus of the analysis is on absolute (unconditional) and conditional beta convergence during 2004-2017, with two subperiods: 2004-2008 and 2009-2013.

The fall of the Berlin Wall in 1989 led to the collapse of communism and the dissolution of Yugoslavia, the Union of Soviet Socialist Republics (USSR) and Czechoslovakia. During that process more than twenty new countries were created. The countries now called Central and Eastern Europe (CEE) started their transition from centrally planned to market economies in the early 1990s. One of their main goals was the EU membership. In order to join the European Union (EU), the CEE countries had to fulfil various economic, political, and institutional criteria, known as the Copenhagen Criteria (1993). The goal of the criteria fulfilment was to enable the countries to function in the EU market and assimilate with the countries that had already joined the European Union. Eight CEE countries, together with Cyprus and Malta, joined the European Union in 2004, followed by Bulgaria and Romania in 2007, and Croatia in 2013. The criteria fulfilment, as well as the access to the EU funds, enabled the CEE countries to converge towards the EU-15 Member States. Convergence is defined as the tendency of poor countries to grow faster than rich countries (Barro & Sala-i-Martin, 1992). The CEE countries have converged towards the EU-15, as shown by their average per capita GDP, which increased from 41.1% of the EU-15 average in 1995 to 48.3% in 2004, and to 59.1% in 2016. Once new Member States join the European Union, they must eventually join the Europe's Economic and Monetary Union, or adopt the euro as their currency. In this process, they must fulfil the Maastricht criteria (1992), also known as the convergence criteria. During the period of 2007-2015, seven new Member States joined the Eurozone.

The Western Balkan countries are considered to be the next group likely to join the European Union. The six countries (Albania, Bosnia and Herzegovina, FYR Macedonia, Kosovo,[1] Montenegro, and Serbia) signed the Stabilisation and Association Agreement (SAA) with the EU, four of them (excluding Bosnia and Herzegovina and Kosovo) are candidate countries, and only Kosovo has not implemented visa-free regime with the European Union.

Another group of countries going through the transition process is the Eastern Partnership group. The Eastern Partnership countries are former USSR countries; Armenia, Azerbaijan, Belarus, Georgia, Moldova, and Ukraine. The Eastern Partnership, which is a specific dimension of the European Neighbourhood Policy (ENP), was launched in 2009 and focuses on four areas of cooperation; stronger governance, stronger economy, better connectivity, and stronger society (European External Action Service, 2016). The EU's major concern towards the Eastern Partnership includes the establishment of a democratic government, human rights, the rule of law, and socio-economic stability in the region

[1] "This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence" (European Commission, 2015)

(Kharlamova, 2015, p. 30). The Eastern Partnership initiative is not an EU accession process, but it aims to build a common area of shared democracy, prosperity, stability, and increased cooperation (European External Action Service, 2017).

The main purpose of this research is to present the results of a convergence analysis between the Eastern Partnership countries and the twenty-eight members of the European Union. Its other objectives are to present the results of the convergence process between different time periods, because this could show if the recent financial crisis slowed down convergence, and to determine what affects per capita growth in the group. There are two research hypotheses of this analysis.

H1: There is absolute convergence between the Eastern Partnership and the EU-28 countries in at least one analysed period.

H2: There is conditional convergence between the groups of countries in at least one analysed period.

We use simple and multiple linear-log regression in order to investigate if the Eastern Partnership countries converge towards the EU-28 member states in the period 2004-2017.

The article is organised as follows. The literature review on convergence is presented in Section 2, followed by Materials and Methods in Section 3. Section 4 presents and discusses the empirical findings on absolute and conditional beta convergence. Section 5 concludes the article.

LITERATURE REVIEW

Based on the Solow neoclassical growth model (1956), Barro and Sala-i-Martin (1992) analyse if the U.S. states converged in the period 1840-1988. The results of this analysis show that the states converged at the rate of 2% per year, regardless of the analysed period.

Matkowski and Prochniak (2004) asses the real economic convergence among the eight CEE countries that joined the European Union in 2004. The CEE countries converge between themselves and reveal a good cyclical synchronisation with the EU. El Ouardighi and Somun-Kapetanovic (2007) show that the Western Balkan countries converge towards the EU-27 member states during 1989-2005. However, income inequality increases and convergence in per capita GDP moved at a slow annual rate, confirming the basic rule of 2%. The authors (2009) expand the analysed period to 2008, and conclude that the Western Balkans countries converge during the entire period, but there are differences in the convergence patterns across sub-periods. Borys, Polgár, and Zlate (2008) investigate the convergence process of candidate and potential candidate countries for EU membership against the new Member States between 1993 and 2005. The countries converged, with the main drivers of the convergence process having been total factor productivity growth and capital deepening, whereas labour contributed only marginally to economic growth. Vojinović, Acharya, and Próchniak (2009) present an analysis on the convergence of countries that joined the European Union in 2004. The analysed period is 1992-2006. Their results show that the poorer countries in the group had a tendency to grow faster than richer countries, but the income gap remained substantial. Cavenaile and Dubois (2010) test for the existence of two heterogeneous groups of countries with different convergence rates in the EU-27 between 1990 and 2012. The EU-15 and CEE countries display significantly different rates of convergence,

confirming the heterogeneity in the European Union. Szeles and Marinescu (2010) find both absolute and conditional convergence amongst the ten CEE countries that joined the EU in 2004 and 2007 (Cyprus and Malta are not included in the analysis).

Mikulić, Lovrinčević, and Galić Nagyszombaty (2013) find absolute beta convergence on the national level for the EU countries. Convergence can also be found for NMS regions, but the convergence speed for the regional level is lower in comparison to the national level. Grzelak and Kujaczyńska (2013) confirm convergence within the EU-27 during 2001-2010. Faster growth of the new Member States is associated with improved productivity of production factors, relatively intensive investment activity, and greater homogeneity of the group. Šikić (2013) analyses if there is absolute convergence among countries that joined the EU in 2004 in the period of 1997-2012, with two sub-periods: 1997-2007 and 2007-2012. The results show that the countries formed a homogenous convergence club during the entire period and achieved high convergence rates in the pre-crisis period, but the level of homogeneity decreased after the recent financial crisis started. Tsanana, Katrakilidis, and Pantelidis (2013) find that there are dissimilarities among the Balkan countries in catching-up with the EU-15 during the period of 1989-2009. The income gap relative to the EU-15 remains significant. Dvoroková (2014) investigates the convergence process in the EU-28 between 2001 and 2012. The study shows that higher growth rates were observed in countries with initially lower per capita GDP.

Benczes and Szent-Ivanyi (2015) confirm the convergence of the EU countries (excluding Croatia and Luxembourg) during the period of 2004-2014. The countries were split into two main clusters: the new and the old Member States. Borsi and Metiu (2015) investigate economic convergence in the EU-27 between 1970 and 2010. Their findings suggest no overall real income per capita convergence in the EU, but there are different subgroups that converge at different steady states. Colak (2015) analyses if the CEE and SEE countries converge towards the old Member States of the European Union (EU-15) during the period of 1993-2012. The results a strong tendency on convergence of new Member States, candidate, and potential candidate countries. Bićanić, Deskar-Škrbić, and Zrnc (2016) find that there was no beta convergence or sigma convergence in Yugoslavia, yet both kinds of convergence developed after Yugoslavia dissolved and the countries declared their independence.

Alcidi, Núñez Ferrer, Di Salvo, Pilati, and Musmeci (2018) show that the CEE countries led the convergence process in the European Union during the period of 2000-2015. However, the countries had different patterns at the regional level, because capitals accelerated the convergence process while other parts of the country lagged behind. Pipień and Roszkowska (2018) test the heterogeneity of convergence in post-communist countries (CEE and CIS) between 1992 and 2015 concluding that CEE countries have become relatively homogenous. During the same time, the CIS countries lack similar convergence patterns. Siljak and Nagy (2018) confirm the existence of convergence between the Eastern Partnership countries and the EU-13 Member States. Stanišić, Makojević, and Ćurčić (2018) examine stochastic income convergence between the Western Balkan and Central and Eastern European countries (the Czech Republic, Slovakia, Poland, Slovenia, Estonia, Latvia, and Romania) towards the EU-15 during the period of 1993-2015. The results confirm the existence of convergence in the cases of the CEE countries, but convergence is not found in the case of the Western Balkan countries. Žuk, Polgar, Savelin, Diaz del Hovo,

and König (2018) analyse if countries of Central, Eastern and South-Eastern Europe converge towards the EU-15 between 2000 and 2016. The results show that convergence was particularly rapid before the recent financial crisis but slowed down thereafter.

MATERIAL AND METHODS

Convergence occurs when poor countries grow faster than rich countries, and it indicates a negative relationship between per capita GDP growth rate and the initial level of per capita GDP. Convergence can be classified as absolute (unconditional) and conditional.

We follow Sala-i-Martin's (1996) classical approach to convergence analysis and analyse absolute and conditional beta convergence among the Eastern Partnership and the EU-28 countries using ordinary least squares (OLS) regression based on cross-sectional data.

When it is assumed that countries do not differ in their structures, they converge to the same steady state and convergence is absolute. The beta coefficient, or the speed of convergence, captures the rate at which countries converge towards the steady state during a single year. The coefficient is obtained through a simple linear-log regression analysis with one dependent and one independent variable (Equation 1). The dependent variable is the average annual per capita GDP growth rate, while the independent variable is per capita GDP in purchasing power terms (PPP) at the beginning of the analysed period. Because per capita GDP is expressed in PPP, we compute it in natural logarithm. In order to test absolute convergence hypothesis, we estimate the following linear-log model:

$$\Upsilon_{i.0,T} = \alpha_i + \beta \log(Y_{i,0}) + \varepsilon_i \quad (1)$$

where:

β - the convergence coefficient;
$\Upsilon_{i.0,T}$ - the average annual growth rate of per capita GDP for country I;
$Y_{i,0}$ - per capita GDP at PPP for country *i* at the beginning of the analysed period 0;
α_i - a constant;
ε_i - the stochastic error of the equation;
T - the end of the analysed period.

The relationship between the variables must be negative; i.e., the beta coefficient must be negative. The positive coefficient indicates divergence, which means that rich countries grow faster than poor countries, in per capita terms.

When countries have different structures, they converge towards a different steady state and convergence is conditional. The beta coefficient is obtained using a multiple-regression analysis. The absolute convergence model (1) is augmented with various economic, social, or political variables. In this analysis, we include three economic variables: economic openness, gross fixed capital formation, and inflation rate, with three socio-political variables: general government debt, unemployment rate, and population growth rate. Equations (2) and (3) present conditional convergence models:

$$\Upsilon_{i.0,T} = \alpha_i + \beta_1 \log(Y_{i,0}) + \beta_2 EO_{i.0,T} + \beta_3 Inf_{i.0,T} + \beta_4 GFCF_{i.0,T} + \varepsilon_i \quad (2)$$

and

$$\Upsilon_{i.0,T} = \alpha_i + \beta_1 \log(Y_{i,0}) + \beta_2 EO_{i.0,T} + \beta_3 Inf_{i.0,T} + \beta_4 GFCF_{i.0,T} + \beta_5 Debt_{i.0,T} + \beta_6 Pop_{i.0,T} + \beta_7 Unemp_{i.0,T} + \varepsilon_i \quad (3)$$

where:

EO - economic openness;
Inf - inflation rate;
$GFCF$ - gross fixed capital formation;
$Debt\ I$ - general government debt;
$Unemp$ - unemployment rate;
Pop - population growth rate.

It is expected that economic openness and gross fixed capital formation will have a positive impact on per capita growth, i.e., positive estimated coefficients, while inflation, general government debt, unemployment and population growth will have negative estimated coefficients.

The analysed period is 2004-2017, with two sub-periods: the pre-crisis period of 2004-2008 and the crisis period of 2009-2013. The sub-periods are included so that we are able to test whether the recent financial crisis negatively affected the absolute and conditional convergence process. When deciding on the appropriate length of sub-periods, Islam (1995) suggests that five-year time intervals should be used. Even though one-year periods are technically feasible, they are too short, this is because short-term disturbances may appear larger in such brief intervals.

In this research, convergence is analysed based on the cross-sectional data, using the average rates for a given period. Cross-sectional data are used because this type of data is free of the distortions caused by business cycles and various demand-side and supply-side random shocks, both internal and external, which could deviate the economy from a path towards the steady state (Vojinović *et al.*, 2009, p. 127). We analyse whether the countries converge or diverge during the analysed period, and do not estimate a model which could predict the future development of the convergence process. Therefore, this model can be applied only ex post (Dvoroková, 2014, p. 91).

In order to investigate relevant model diagnostics, we conducted three tests with all estimated models, the Breusch-Pagan test, which tests the null hypothesis that the variance of the residuals is constant, the multicollinearity test using the variance inflation factor (VIF), and the Ramsey RESET test, which tests the null hypothesis that a model has no omitted variables.

This research is based on annual data. Table 1 presents the descriptive statistics of the variables used in the estimation of absolute and conditional convergence models during 2004-2017. The data set includes thirty-four countries.

The Eurostat, World Bank, and World Economic Outlook (WEO) databases were the main sources of data for this analysis. Data for the per capita GDP growth rate, the initial per capita GDP, economic openness, gross fixed capital formation, inflation, the unemployment rate, and the population growth rate are derived from the World Bank's database. Data for general government debt, as a percentage of GDP, were obtained from Eurostat for the EU Member States, and from the World Economic Outlook database for the non-EU countries. The data for this variable coincide because they are based on the same measure.

Table 1. Descriptive statistics

Variables	Description	Mean	Standard Deviation	Minimum Value	Maximum Value
Per capita GDP growth	Annual percentage growth rate of GDP per capita based on constant local currency	2.45	2.08	-0.87	7.84
Log (initial per capita GDP at PPP)	Natural logarithm of per capita GDP at the beginning of the analysed period	9.76	0.76	7.88	11.07
Economic openness	A sum of exports and imports divided by GDP	116.95	60.84	53.85	344.73
Inflation rate	Measured by the Harmonized Index of Consumer Prices	3.48	3.69	1.06	18.55
Gross fixed capital formation	Measured as a percentage of GDP	22.60	3.31	16.37	31.54
General government debt	The government debt to GDP ratio	54.76	30.10	7.15	144.13
Unemployment rate	As a percentage of total labour force	8.83	3.71	0.73	17.53
Unemployment rate (excluding Belarus)	Aa s percentage of total labour force	9.07	3.48	5.02	17.53
Population growth	The annual growth rate of a population	0.18	0.75	-1.35	2.02

Source: own calculations based on World Bank, IMF, and Eurostat data.

RESULTS AND DISCUSSION

We analyse the absolute and conditional beta convergence of the Eastern Partnership countries towards the Member States of the European Union during the period of 2004-2017, and two sub-periods: 2004-2008 and 2009-2013. We make the subdivision in order to test whether the recent financial crisis had a negative impact on the convergence process in the analysed countries. Four equations are estimated for each period: absolute convergence models (Models 1-3), conditional convergence models, when economic variables are included (Models 4-6), and conditional convergence models, when economic and socio-political variables are included in the analysis (Models 7-12).

The regression results for absolute convergence models in the analysed periods are presented in Table 2.

The regression results show that the beta coefficient during the period of 2004-2017 is -2.16. If we assume that the countries have similar structures, they converge towards the same steady state at the rate of 2.16%, which is slightly higher than the reference value of 2% taken from the Barro and Sala-i-Martin (1992) findings. The convergence rate in the pre-crisis period is 4.24% and decreases to 1.77% during the crisis. The beta coefficients are highly significant in every analysed model (p = 0.0000 in Models 1 and 2 and p = 0.0001 in Model 3). Analysing convergence during the sub-periods, we can conclude that the recent financial crisis had a negative impact on this process. The countries

converge in every period; therefore, we do not have enough evidence to reject the first research hypothesis.

We do not find multicollinearity in the estimated models, which have a proper functional form. However, the issue of heteroskedasticity is detected in Model 2, so we estimate a regression with a heteroskedasticity robust standard error (Model 2'). When the issue is corrected, the beta coefficient remains the same at $p = 0.0000$.

Table 2. Absolute (unconditional) convergence of the Eastern Partnership and the EU-28 countries

Statistic	Model 1 2004-2017	Model 2 2004-2008	Model 2' 2004-2008	Model 3 2009-2013
	β (t)	β (t)	β (t)	β (t)
Log of initial per capita GDP at PPP	-2.16*** (-7.11)	-4.24*** (-7.01)	-4.24*** (-4.32)	-1.77*** (-3.79)
F statistics (*p*-value)	50.53 (0.0000)	49.17 (0.0000)	18.65 (0.0001)	14.37 (0.0006)
R^2	**0.6123**	**0.6058**	**0.6058**	**0.3099**

Significant codes: *** p < 0.01, ** p < 0.05, *p < 0.1
Source: own calculations based on the World Bank data.

Figure 1 indicates convergence among countries in the analysed group during the period of 2004-2017. The Figure plots per capita GDP in 2004 (X-axis) against the average per capita GDP growth rate in the period of 2004-2017 (Y-axis). The regression line has a downward slope; therefore, there is a negative relationship between the variables.

Figure 1 shows a high degree of dispersion among the Eastern Partnership countries, while the EU-28 Member States act as three distinct clubs. In the analysed period, the Eastern Partnership countries grew at an average per capita rate of 5.2%. The average rate in the European Union was 1.9%; 0.8% in the old Member States and 3% in the new Member States. Armenia, Azerbaijan, and Georgia achieved the highest per capita growth rates (5.7%, 7.8%, and 6.4% respectively). Belarus forms a club with the former transition countries; Bulgaria, Estonia, Latvia, Lithuania, Poland, Romania, and the Slovak Republic. Their average per capita growth rate is 4.2%. These countries achieved the highest per capita growth rates in the European Union. Ukraine's per capita growth rate is 2%, close to the average rate of the second club; Croatia, the Czech Republic, Hungary, Malta and Slovenia. However, Ukraine's per capita GDP in 2004 was only 31.7% of the second club's average. Cyprus forms a club with the old Member States, excluding Ireland and Luxembourg. Luxembourg's per capita GDP has been the highest in the European Union, while Ireland's average per capita growth rate is 3.5%, which is close to the first club's rate. The Eastern Partnership country's average per capita GDP in 2004 was 20.4% of the EU-28 average and increased to 28.8% in 2017.

We estimate nine conditional convergence models; three models with economic variables (Models 4-6) and six models with economic and socio-political variables (Models 7-12). The empirical results can serve as a recommendation for countries when choosing which policies should be pursued in order to increase per capita GDP growth rates.

Table 3 presents the regression results for conditional convergence, when economic variables are included in the models.

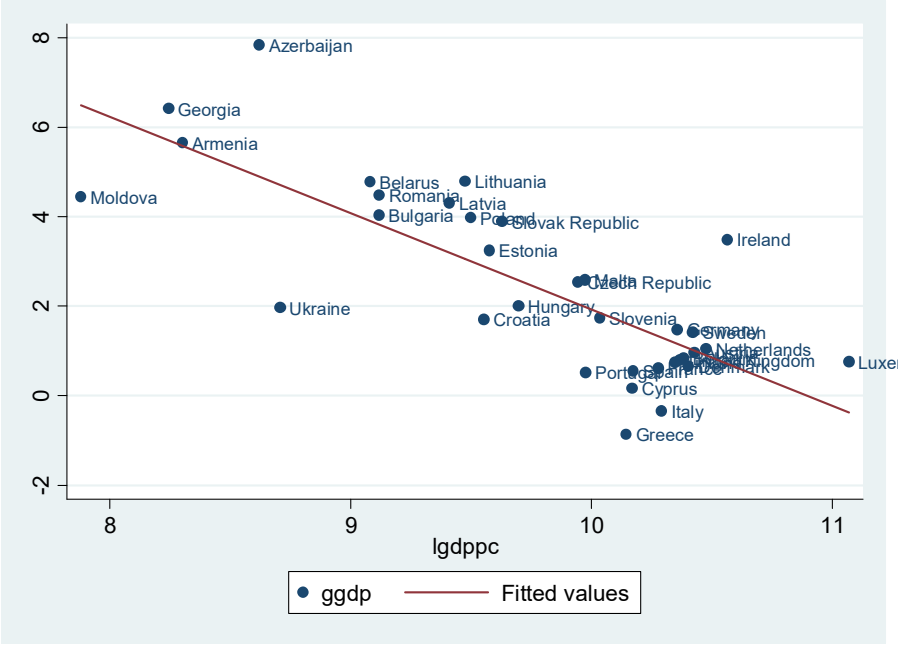

Figure 1. Absolute convergence of the Eastern Partnership and European Union countries, 2004-2017
Source: own calculations based on World Bank data.

Table 3. Conditional convergence of the Eastern Partnership and EU-28 countries, when economic variables are included in the models

Statistic	Model 4 2004-2017	Model 5 2004-2008	Model 5'	Model 6 2009-2013
	β (t)	β (t)	β (t)	β (t)
Log of initial per capita GDP at PPP	-2.04*** (-5.73)	-2.36** (-2.26)	-2.36* (-1.93)	-1.71*** (-3.46)
Economic openness (%)	0.01** (2.40)	0.01 (0.64)	0.01 (0.77)	0.01* (1.73)
Gross fixed capital formation (% of GDP)	0.22*** (3.19)	0.32** (2.64)	0.32** (2.31)	0.10 (0.95)
Inflation rate (annual %)	-0.08 (-1.23)	0.23 (1.05)	0.23 (0.90)	0.02 (0.25)
F statistics (*p*-value)	22.46 (0.0000)	17.81 (0.0000)	8.31 (0.0001)	5.32 (0.0025)
R^2	**0.7560**	**0.7107**	**0.7107**	**0.4231**

Significant codes: *** p<0.01, ** p<0.05, *p<0.1
Source: own calculations based on World Bank, and World Economic Outlook data.

The regression results show that, when economic variables are included in the models, the Eastern Partnership countries converge towards the EU-28 at the rate of 2.04% during

the period of 2004-2017. In the period before the crisis, the convergence rate is the highest among the analysed periods, 2.36%, and decreases to 1.71% during the crisis period. Based on these results, we can conclude that the recent financial crisis had a negative impact on the conditional convergence process.

The issue of heteroskedasticity is again detected in the pre-crisis model. When a regression with a heteroskedasticity robust standard error is estimated (Model 5'), the convergence rate remains the same, but the *p*-value increases from 0.032 to 0.064.

Tables 4 and 5 present the regression results for conditional convergence models, when economic and socio-political variables are included. Models 7-9 include Belarus in the analysis, while Models 10-12 exclude the country as an outlier.

Belarus is excluded from the analysis because the country's official unemployment rate during the analysed period is 0.73%. However, it is estimated that the real rate ranges between 5% and 10%, or even higher. Unemployed people in Belarus do not register with the employment agencies because (a) the level of unemployment benefits is extremely low and (b) the people who do register have to participate in public work programmes, which include seasonal agricultural work or street sweeping where the payment is low (Preiherman, 2012).

Table 4. Conditional convergence of the Eastern Partnership and the EU-28 countries, with economic and socio-political variables included in the models

Statistic	Model 7 2004-2017	Model 7' 2004-2017	Model 8 2004-2008	Model 8' 2004-2008	Model 9 2009-2013
	β (t)	β (t)	β (t)	β (t)	β (t)
Log of initial per capita GDP at PPP	-1.91*** (-4.11)	-1.91** (-2.62)	-1.52 (-0.97)	-1.52 (-0.77)	-1.27*** (-2.08)
Economic openness (%)	0.004 (1.09)	0.004 (1.19)	0.001 (0.10)	0.001 (-0.14)	0.005 (0.94)
Gross fixed capital formation (% of GDP)	0.16** (2.11)	0.16* (2.00)	0.21 (1.52)	0.21* (1.83)	0.03 (0.27)
Inflation rate (annual %)	-0.09 (-1.13)	-0.09 (-1.16)	0.33 (1.16)	0.33 (0.98)	0.01 (0.06)
General government debt (% of GDP)	-0.02* (-1.80)	-0.02** (-2.32)	-0.03 (-1.53)	-0.03*** (-2.96)	-0.02 (-1.50)
Population growth (annual %)	0.08 (0.24)	0.08 (0.15)	0.11 (0.17)	0.11 (0.09)	-0.50 (-1.03)
Unemployment rate (annual %)	-0.02 (-0.29)	-0.20 (-0.28)	0.17 (0.91)	0.17 (0.91)	-0.13 (-1.55)
F statistics (*p*-value)	13.97 (0.0000)	17.60 (0.0000)	10.61 (0.0000)	19.08 (0.0000)	4.39 (0.0025)
R^2	**0.7900**	**0.7900**	**0.7407**	**0.7407**	**0.5419**

Significant codes: *** p<0.01, ** p<0.05, *p<0.1

Source: own calculations based on World Bank, World Economic Outlook, and Eurostat data.

The results for conditional convergence, when economic and socio-political variables are included, are consistent in both cases, whether Belarus is included or excluded from the analysis. The selected countries converge in the periods 2004-2017 and 2009-2013.

When Belarus is included in the analysis, the convergence rate in the entire analysed period is 1.91%, compared to 2.23% when the country is excluded. During the crisis period, together with Belarus, the countries converge at the rate of 1.27%, and at the rate of 2.33%, when the country is excluded. In the pre-crisis period 2004-2008, the beta coefficients are negative, but not statistically significant. Based on these results we can conclude that the recent financial crisis did not negatively impact the conditional convergence process, when economic and socio-political variables are included in the analysis.

Table 5. Conditional convergence of the Eastern Partnership and the EU-28 countries, with economic and socio-political variables included in the models, excluding Belarus

Statistic	Model 10 2004-2017	Model 10' 2004-2017	Model 11 2004-2008	Model 11' 2004-2008	Model 12 2009-2013
	β (t)	β (t)	β (t)	β (t)	β (t)
Log of initial per capita GDP at PPP	-2.23*** (-3.91)	-2.23*** (-3.02)	-1.53 (-0.97)	-1.53 (-0.84)	-2.33*** (-2.98)
Economic openness (%)	0.004 (1.02)	0.004 (1.11)	0.001 (0.11)	0.001 (0.16)	0.004 (0.76)
Gross fixed capital formation (% of GDP)	0.11 (1.18)	0.11 (1.15)	0.20 (1.44)	0.20* (1.91)	-0.03 (-0.28)
Inflation rate (annual %)	-0.19 (-1.46)	-0.19* (-1.73)	0.31 (1.05)	0.31 (0.93)	-0.61* (-1.91)
General government debt (% of GDP)	-0.02* (-2.00)	-0.02** (-2.67)	-0.03 (-1.56)	-0.03*** (-3.14)	-0.02* (-2.00)
Population growth (annual %)	0.15 (0.45)	0.15 (0.28)	0.21 (0.32)	0.21 (0.17)	-0.33 (-0.70)
Unemployment rate (annual %)	-0.02 (-0.24)	-0.02 (-0.24)	0.24 (1.16)	0.24 (1.18)	-0.14* (-1.86)
F statistics (*p*-value)	13.37 (0.0000)	18.71 (0.0000)	9.81 (0.0000)	25.58 (0.0000)	4.47 (0.0017)
R^2	**0.7892**	**0.7892**	**0.7332**	**0.7332**	**0.5703**

Significant codes: *** p<0.01, ** p<0.05, *p<0.1
Source: own calculations based on World Bank, World Economic Outlook, and Eurostat data.

Three economic variables are included in the analysis; economic openness, inflation rate, and gross fixed capital formation, and three socio-political variables; general government debt, unemployment rate, and population growth rate.

When economic variables are included in the models, economic openness and gross fixed capital formation are determinants of growth. Economic openness has a positive estimated coefficient during the periods 2004-2017 and 2009-2013. Gross fixed capital formation has a positive impact on per capita growth in the periods 2004-2017 and 2004-2008. The inflation rate is not a statistically significant variable in any of the analysed periods; therefore, it is not a determinant of growth.

When economic and socio-political variables are included in the models, general government debt is a determinant of the per capita growth rate during the entire period for both models, and in the crisis period, when Belarus is excluded from the analysis.

General government debt has a negative impact on per capita growth. Gross fixed capital formation has a positive impact in the entire period, when Belarus is included in the analysis. In the crisis period, unemployment and inflation negatively affect per capita growth, when Belarus is excluded from the analysis.

Heteroskedasticity is detected in both models for the entire period and the pre-crisis period. When regressions with heteroskedasticity robust standard errors are estimated, the results for the conditional convergence rates do not change. The difference occurs in the determinants of growth in the models; gross fixed capital formation, general government debt, and inflation rate. These variables are not statistically significant in the original models. Gross fixed capital formation and general government debt are determinants of per capita growth in both corrected models during pre-crisis period. The inflation rate is a statistically significant variable in the model, when Belarus is excluded from the analysis, in the entire period. Population growth rate is the only variable that is not statistically significant in any model.

CONCLUSIONS

In this article we investigate the convergence process of the Eastern Partnership countries towards the twenty-eight Member States of the European Union. The analysed period is between 2004 and 2017 with two sub-periods: the pre-crisis period 2004-2008 and the crisis period 2009-2013. Two types of beta convergence are analysed: absolute (unconditional) and conditional convergence.

The empirical results suggest that the Eastern Partnership countries converge towards the EU-28 in every analysed period. The recent financial crisis had a negative impact on the convergence process, since the convergence rate during 2009-2013 is lower than the rate in 2004-2008.

The regression results for conditional convergence models, when economic variables are included in the analysis, show that the convergence rate during 2004-2008 is the highest of the three periods.

When economic and socio-political variables are included in the models, the highest convergence rate is found throughout the entire analysed period. However, when Belarus is excluded from the analysis, the beta coefficient is the highest during the crisis period. Even though the beta coefficients are negative in the pre-crisis period, they are not statistically significant in the estimated models. Therefore, we do not have enough evidence to reject the research hypotheses, because the analysed countries converge, in absolute or conditional terms, in at least one analysed period.

The only selected macroeconomic variable that does not affect per capita growth rate is the population growth rate. The remaining variables are statistically significant in at least one analysed period. Economic openness and gross fixed capital formation have a positive impact on per capita growth, while the inflation rate, general government debt and the unemployment rate have a negative impact.

According to the empirical results of the study, economic openness and gross fixed capital formation promote per capita growth within the group. The results imply that the countries should increase their efforts in opening their economies to more investment and promoting trade, which is one of the main benefits of the EU membership.

The study also shows that the countries should pursue policies that will decrease unemployment and general government debt, and stabilise inflation. Improvements in these areas will lead to higher per capita growth rates while speeding up the convergence process. As a result, the Eastern Partnership countries could eventually catch up with the living standard of the European Union.

The main limitation of this study is the availability of data. A post-crisis period analysis would give a better overview on how the recent financial crisis affected the convergence process. The period of 2014-2017 is not suitable, because periods used in the analysis should not be shorter than five years.

Once we have data for the post-crisis period of 2014-2018, we will be able to conduct new research. This research will provide a complete overview on the effects of the recent financial crisis on the convergence process in the selected regions. We can also analyse the convergence process of the Eastern Partnership countries towards the separate groups within the European Union; the old Member States (EU-15) and the CEE countries (EU-11).

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