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THE EFFECT THAT EUROPEAN UNION MEMBERSHIP HAS ON THE GDP PER CAPITA LEVEL OF LAST 10 EU ASSOCIATION COUNTRIES

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Abstract

This paper is a continuation of a previous study on the economic integration of the European Union countries that have become part of the euro area. The main purpose of this study is to analyze the impact that the use of a single currency (euro) has had on the dynamics of GDP fluctuations in the countries that are part of the euro area. This part of the study begins with measuring the GDP per capita gap indicator one year before the country acceded to the EU and the level of GDP per capita on the year of membership in the EU. With secondary data obtained from official sources such as the World Bank and the central banks of the countries included in the analysis, a simple regression is constructed to see how the GDP of these countries has changed before and after they became part of the euro area. Based on the analysis, we conclude that in the case of the countries surveyed, EU membership has had a positive impact on the growth of this macroeconomic indicator. For the first part of the analysis, H0 is accepted: European integration has a positive effect on economic growth and GDP per capita.

Keywords: Economic growth, macroeconomic indicators, economic integration, GDP per capita, statistically significant, regression

INTRODUCTION

According to Viner (1950), economic integration will bring about real convergence in the levels of economic development between the countries involved in this integration. While Krugman (1991), (Romer, 1986, 1990; Lucas, 1988) in their studies, on the other hand emphasizes that integration can also cause asymmetry in the financial and economic developments of these countries. Several other empirical studies conducted in recent years on economic convergence argue that income levels tend to occur within homogeneous groups of countries, while heterogeneous groups are more likely to experience real divergence trends. For this reason the debate on economic integration and its effects on financial development will always be open to debate. The main discussion in this area will focus on the main factors that affect the convergence or economic divergence of countries. The main purpose of this paper is to empirically analyze the effects of EU enlargement on the economic growth of the ten new member states of Central and Eastern Europe (CEE-10), including its effect on their real convergence towards EU-15 level of development. To this end, we test the relationship between selected macroeconomic variables related to EU enlargement and the economic growth rate of CEE countries during the period 2010-2019.

In an ongoing challenge to accelerate growth, the economies of Southeast Europe need to explore its potential all economic channels contributing to this process. Meanwhile, previous studies do not find a significant link between financial development and economic growth in SEE countries, after updated analyzes in this regard are lacking. Economic development dynamics and specific characteristics that the financial markets in these economies manifest, some of it which, in the context of the European integration process, are economies relatively new market, have aroused interest among academics and policymakers. Other previous research [Mehl et al (2005)] find no empirical evidence for a causal link significant between finance and growth. Anyway, they suggest that the implementation of appropriate legal reforms in the financial sector would create the necessary environment for these reforms to have an impact positive growth.

Purpose of the study

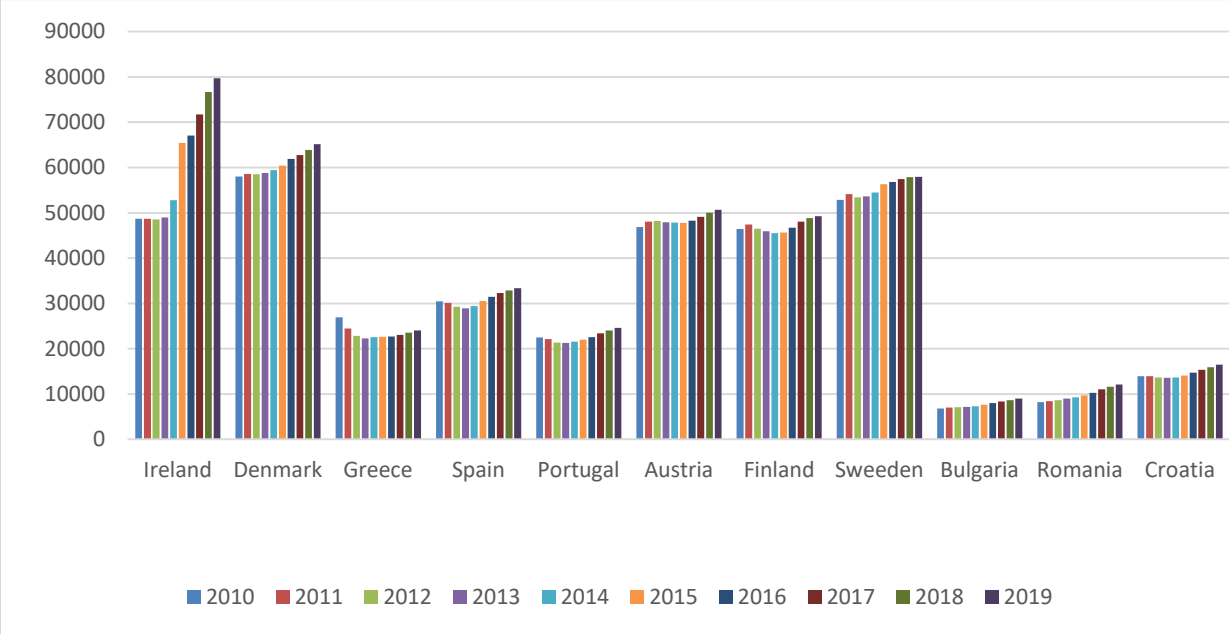
According to the empirical analyses, the purpose of this study is to investigate the effect that economic integration has on the level of GDP per capita as a dependent variable. The indentation is to find a positive relationship between economic growth and economic integration, especially in EU member countries.

EMPIRICAL ANALYSES

GDP per capita dynamic of EU countries

The Gross Domestic Product per capita in the European Union was recorded at 44369.60 US dollars in 2019). The GDP per Capita, in the European Union, when adjusted by Purchasing Power Parity is equivalent to 250 percent of the world's average.

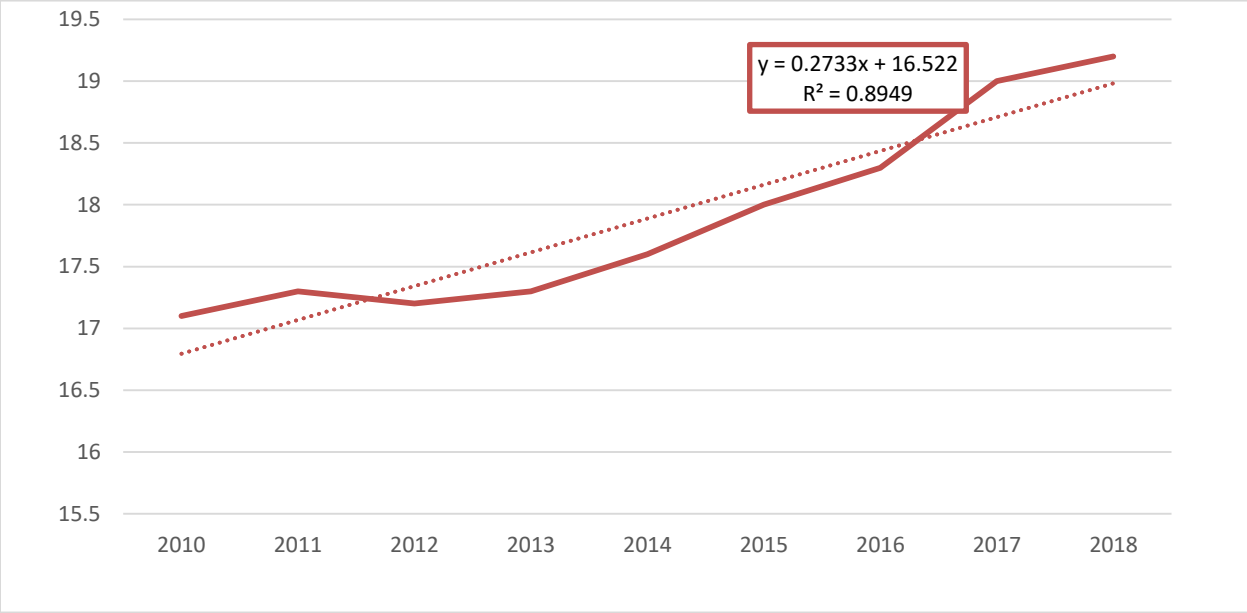
Graph 1. GDP per capita (constant 2010 USD) for EU countries



Source: World Bank Indicators, 2019

In 2019, Ireland recorded the second-highest level of GDP per capita in the EU-27, at 91% above the EU average, with only Luxembourg at a higher level. Bulgaria was the Member State with the lowest GDP per capita, at 47% below the EU average. Levels of actual individual consumption were somewhat more homogeneous, but still showed significant differences across Europe. Luxembourg recorded the highest level of AIC per capita in the EU-27, at 35% above the EU average, as well as the highest price level, at 47% above the EU average. In the last 10 years, the GDP per capita increased for almost all countries, except Greece where it declined. During the period of the financial crisis 2009-2012, this indicator has declined, for all countries because most of them have been affected by the financial crisis. The European Union's economy is stable, consolidated and integration brings long-term benefits to all countries included in the research.

Graph 2. GDP per capita of the European Union[1]



Source: World Bank Indicator, 2019

The purpose of this empirical analysis is to present the effect of European Union membership on the GDP per capita level. This part of the study begins with measuring the GDP per capita gap indicator one year before the country acceded to the EU and the level of the GDP per capita on the year of membership in the EU. For this part of the study we have two hypotheses:

H0: European integration has a positive effect on economic growth and GDP per capita.

H1: European integration has no positive effect on economic growth and GDP per capita.

The result of the paper is derived from the following equation adapted for our analyses (Campos, Corielli, and Moretti 2014).

$$\tau_{it} = Y^{I}_{it} - Y^{C}_{it}$$

where,

Y^{I}_{it} is the level of GDP per capita of each country (first year of membership)

$_{it}$ is the level of GDP per capita one the year membership.

[1]**Source:** World Bank, World Development Indicator 2019.

Table 2. GDP per capita for each country (first year of membership and one year before membership (values are in billion dollars)

Country	Year when becoming a member of the EU	GDP per capita in the membership year(Y^{I}_{it})	GDP per capita one year before ($_{it}$)	τit = $Y^{I}_{it} - Y^{c}_{it}$	Interpretation
Czech Republic	2004	16930	16143	787	Increase
Sweden	1995	37870	36628	1242	Increase
Poland	2004	9610	9136	474	Increase
Hungary	2004	12574	11969	605	Increase
Rumania	2007	8020	7369	651	Increase
Bulgaria	2007	6477	6034	443	Increase
Croatia	2013	13658	13621	37	Increase

Source: Author 2019, data obtained from World Bank

Table 2 shows that the integration effect has been positive for all countries, GDP per capita on which of them is higher than the year before the membership.

Table 3: Percentages change in GDP per capita

County	GDP per capita on membership year	GDP per capita current year (2019)	Percentages change in GDP per capita
Czech Republic	16930	23833	increased by 41%
Sweden	37870	57975	increased by 53%
Poland	9610	17386	increased by 80.1%
Hungary	12574	17466	increased by 39%
Rumania	8020	12131	increased by 51%
Bulgaria	6477	9026	increased by 39%
Croatia	13621	16454	increased by 20%

Source: Author 2019, data obtained from World Bank

The above table presents the changes in the percentage of GDP per capita indicator, based on the value of GDP per capita of each country in the year of EU accession and the value of this indicator for the current year (2019). The change in the percentage of GDP per capita is positive for all countries, but in different values for each of them. The highest value of GDP change per capita was in Poland with about 80 percentage points, while the lowest value of this change was in Croatia with about 20 percentage points. The change in the percentage of GDP

per capita so low for Croatia compared to other countries, is related to the fact that this country is the last to join the EU (2013) and as a result has not yet reached all development potentials. According to the analysis of the GDP indicator per capita, we conclude that in the case of the countries surveyed, EU membership has had a positive impact on the growth of this macroeconomic indicator. For the first part of the analysis, H0 is accepted: *European integration has a positive effect on economic growth and GDP per capita.*

THE METHODOLOGY

This paper is used regression among dependent and independent variables to see the relationship and impact between themselves, and to conclude which of the variables has a positive and negative effect on GDP[2] per capita. The data of the sample of seven countries have been loaded into Statistical Package for Social Sciences (SPSS) datasheet and the program has been run to measure the effects of the independent variables on GDP per capita as being the dependent variable and the rest of the following 4 criteria being the independent variables:

- Population (in millions)
- Gross Domestic Product (GDP) in billion USD
- GDP growth rate (latest) per annum
- Inflation (on consumer price index)

Linear regression

$$Y=a+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\mu$$

$$GDP\ per\ capita=a+\beta_1\ Inflation+\beta_2 GDP\ growth\ rate+\beta_3\ Population+\beta_4\ Gross\ Domestic\ Product+\mu$$

The variables were tested for a 95% confidence level and α = 5%.

On the model summary above R square equal to 1 means that 100% of the variations on the dependent variable are explained by the variability of the independent variables. R which is the square root of RR shows the correlation between the dependent variable and independent variables. 100% means that there is a high correlation between dependent and independent variables. ANOVA (Analysis of variance) table above, F value

[2] The GDP per capita consists of the components: GDP for a given period; C (spending for final goods and services; I- spending for goods and services by domestic private investors; G- government spending, X-exports or foreign purchases and M- imports.

being positive means that explained variance is greater than an unexplained variance. The significance-p-value being lower than 0.005 means that there is a statistically highly significant relationship among the variables that are not due to chance. On the coefficient table t values are greater than 2, for population and inflation however there is an inverse relationship, GDP in billion PPP. That means these three independent variables are statistically significant in explaining the variances on the dependent variable (GDP per capita). P values on the far right of the same table are supplementing this information that these three independent variables are statistically significant on dependent variables by having values between (0.000 – 0.031). Population (in an inverse relationship) and Gross Domestic Product is the most significant and inflation being the least among the three most statistically significant independent variables. The population`s being in an inverse relationship is a consequence of the mathematical relationship between GDP and population to calculate GDP per capita as the population is the denominator on the formula (GDP/population). The higher the population the lower the GDP per capita. The other independent variables that are in a positive relationship with the dependent variable means that the higher, GDP in billion US dollars the higher the GDP per capita income. The other variable, GDP growth rate, has been weak in explaining the changes independent variable. The variables that have a significant effect on the dependent variable have been highlighted by red (3). The remaining independent variables have no significant effect on GDP per capita.

Table 4. Regression model estimations

Model Summary

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	1.000[a]	1.000	1.000	0.00010	1.000	6685315 .339	4	30	0.000

a. Predictors: (Constant), Gross Domestic Product, GDP growth, Inflation, Population

b. Dependent Variable: GDP per capita

Table 5. ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	0.256	4	0.064	668531 5.339	.000[b]
	Residual	0.000	30	0.000		
	Total	0.256	34			

a. Dependent Variable: GDP per capita

b. Predictors: (Constant), Gross Domestic Product, GDP growth, Inflation, Population

Table 6. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.011	0.063		191.310	0.000
	Inflation	0.000	0.000	-0.001	-2.259	0.031
	GDP growth	-1.225E-0	0.000	0.000	-0.192	0.849
	Population	-1.001	0.007	-0.148	-136.504	0.000
	Gross Domestic Product	0.999	0.001	1.144	1112.524	0.000

CONCLUSIONS

In conclusion, *European integration has a positive effect on economic growth and GDP per capita.* According to the analyses, GDP has a positive correlation with GDP per capita, so we can say the higher value of GDP leads to the higher the GDP per capita.

The hierarchy of the t and P values in table 1 concludes:

- The population has an inverse relationship with the GDP per capita, the beta coefficient for the population is -0.148. Other things being equal, the lower the population the higher the GDP per capita.
- GDP as an absolute number has a positive correlation with GDP per capita, the beta coefficient for GDP is 1.144. The higher GDP the higher the GDP per capita.

- Inflation has a negative correlation with the GDP, the higher the inflation the lower the GDP per capita, the beta coefficient for inflation is -0.001.

The findings above can have the following implications in practical context:

- Governments should take possible measure to increase GDP. Incentives to erase regional discrepancies in growth, incentives for small business initiatives, incentives for exporters if there is a negative gap in the foreign trade figures are some examples. Keeping the government budget in balance and borrowing at a minimum so that interest rates in the economy are kept stable. Stable interest rates will not fuel inflation in the economy. Sustained production growth with minimum government deficit and a balanced foreign trade will curb inflation pressures in the economy and bring stability which in turn will curb unemployment.
- The other aspect of the challenge of population growth is mobilizing the female population into the workforce which will help further increase the GDP per capita.

The main conclusions of this study will be listed below:

All 28 countries of the European Union have met the Copenhagen criteria and only 21 of them have met the Maastricht criteria. Bulgaria, Romania, Poland, Sweden, Czech Republic, Hungary, and Croatia have not yet met the Maastricht criteria.

The increase of the population in a certain country leads to a decrease in the per capita income, as a consequence of the proportion of the income with a larger number of inhabitants. The larger the population, the lower the per capita income.

The increase in the level of Gross Domestic Product leads to an increase in per capita income. These two variables have a positive relationship with them. In the EU countries included in the regression analysis, as a result of GDP growth, the level of GDP per capita has also increased.

Inflation on the other hand is negatively related to the level of GDP per capita in the analyzed countries. The higher the inflation rate, the lower the value of GDP per capita.

Scope for further studies:

This empirical study serves as an essential basis to be used by other researchers who intend to study the role of economic integration in increasing the level of per capita income. Future studies, to give even more convincing results, can expand the number of places taken in the analysis and the number of variables included in the model.

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APPENDIX

Abbreviations

EU	European Union
GDP	Gross Domestic Product
FTA	Free Trade Area
MU	Monetary Union
WB	World Bank
FDI	Foreign Direct Investment
CEE	Central European Countries
EMU	European Monetary union
ESCB	European System of Central Banks
ECB	European Central Bank
FTA	Free Trade Area
EC	European Community
ECSC	European Coal and Steel Community
EA	European Agreements
Lev	Bulgarian currency
CZK	Czech currency-koruna
HRK	Croatian currency-kuna
HUF	Hungarian currency-forint
PLN	Polish currency-zloty
RON	Romanian currency-len
SEK	Swedish currency-krona