ANALYSIS OF THE IMPACT OF EUROPEAN FUNDS ON REGIONAL, ECONOMIC, AND SOCIAL DEVELOPMENT IN CENTRAL AND EASTERN EUROPEAN COUNTRIES

Bogdan Cosmin MOLDOVAN
PhD student, Doctoral School of Economic Sciences, University of Oradea, Romania
moldovan_bogdan_cosmin@yahoo.com

Abstract

The present research aims to analyze the impact of European funds on regional, economic and social development among Central and Eastern European states, a useful analysis in the framework of future financial exercises.

The purpose of this research is to explore ways to enhance the standard of living and improve the absorption rate of European funds in Central and Eastern Europe by: identifying how these countries manage European funds, including the funds in which they co-finance projects, analyzing the main shortcomings of the current systems, and proposing viable solutions to optimize the fund absorption model.

Keywords: *European funds, impact of European funds, regional development, economic and social development*

JEL clasification: *F62, F63, F65*

1. Introduction

Access to European Structural and Investment Funds has often been seen as one of the main benefits of joining the European Union. Despite this, the first years of implementation of European Union funding have been plagued by several difficulties, from weak state capacity to administer and implement EU aid, to legal loopholes and excessive politicisation.

Economic and social policy plays a dual role in driving economic growth and promoting social progress, particularly in addressing income inequality and reducing poverty. Research shows that cohesion policies have a positive effect on both economic performance and social advancement, with significant outcomes in reducing income inequality and alleviating poverty. However, the economic benefits related to poverty reduction take time to materialize, reflecting the gradual nature of policy impacts and the time required for investments to deliver tangible results.

The theory of economic growth is a central topic in economics, and its significance lies in the fact that the pursuit of development is one of humanity's primary driving forces. While economic growth is only one aspect of this broader development, it not only has direct impacts but can also support other dimensions of social progress. A key principle of the European Union is the convergence between Member States, specifically the reduction of development disparities, which can be achieved through faster economic growth in less developed countries.

The ultimate objective of the European Social Model is to ensure the simultaneous achievement of economic growth and social cohesion. One of the central objectives of the European Union, stipulated in the Maastricht Treaty, is to promote social and economic progress by strengthening these two essential pillars. It is widely recognized that the promotion of cohesion is one of the most prominent and important of the many political responsibilities of the European Union.

Cohesion policy has significantly contributed to accelerating the growth of prosperity in the European Union, reducing certain economic, social and territorial disparities.

Analyses of the impact of cohesion policy on European regional performance mainly focus on the economic dimension, measured by GDP per capita and, occasionally, by the employment rate or the level of education and health.

Contradictory trends can be observed in national investment policies. On one hand, there are measures aimed at liberalizing, promoting, and facilitating investment. On the other hand, there are regulations governing foreign direct investment (FDI). Countries have the authority to regulate FDI, and this uncertainty can negatively impact the volume of foreign investment. In less developed countries, there is a significant demand for foreign direct investment.

The practice of foreign direct investment (FDI) has advanced well beyond theoretical approaches. It is important to note that the theories surrounding FDI primarily focus on the cooperation of Western economies. Subsequently, the trend toward a more open economy and globalization emerges. In less developed countries, there is a significant demand for foreign direct investment

The most important factors of economic growth are GDP per capita, activity rate, employment rate, unemployment rate, foreign investment in development (FDI) and openness of foreign trade.

2. Literature review

This part of the presentation of the methodology used has the role of facilitating the reading of the following passages of the research paper, through the presentation of the sources of information that were used in the following.

The starting point of this research was the bibliographical and webliographic documentation from books, national and international articles or various current studies in the specialized literature. I will take into account both the national and European context. I took into account the statistical reports made available by local, national and last but not least those at the European level. I used the “Web of Science” platform to obtain bibliographical information.

Sabău-Popa (2010) briefly presents the budgetary developments of the European Union, since its establishment, the budgetary process at the level of the European Union, the budgetary impact of the member states on the European Union. In the last chapter of the work "The European Union Budget and Community Funds" he analyzes in detail the financing provided to the member states through the community funds allocated to the various common policies of the European Union. The main contributions of the paper are clarifications regarding the European Union's own resources, common policies and community funds, graphic and descriptive

analysis of European Union payments on the territory of the Member States, their contributions to the community budget, analysis of the absorption capacity of structural and cohesion funds in Romania, the conclusion reached being that facilitating the fastest possible absorption of funds allocated to Romania could be achieved by improving administrative capacity, in order to increase the eligibility of projects, establishing shorter deadlines for evaluation and response to funding applications, ensuring an adequate level of co-financing and using the expertise of commercial banks to access community funds.

Davidescu, A., Nae, T., & Florescu, M.-S (2024), ”From Policy to Impact: Advancing Economic Development and Tackling Social Inequities in Central and Eastern Europe”. This article highlights that cohesion policy covers a very wide range of EU policy activities, including infrastructure, telecommunications, research and development, competitiveness, vocational training, employment and social inclusion, as well as objectives to promote environmental sustainability and digitalisation — objectives that are in line with the perspectives of the green and digital transition.
Krajewska A., and Krajewski S. (2020), in their work *"The Labor Market in Poland and the Social Responsibility of the State and Business: Comparative Aspects"*, emphasize that in some countries, employment-related costs account for more than 50% of GDP, with relatively high long-term stability. They argue that high unemployment can lead to the proliferation of unethical activities. The authors conclude that the current labor market conditions in many countries require reform and the introduction of legal measures that strengthen employees' positions in their relationships with employers.

Farrell, M. (2004), in *"Regional Integration and Cohesion—Lessons from Spain and Ireland in the EU"*, explores the positive impact of structural funds on regional economic growth in Ireland and Spain. The main aim of the article is to analyze and highlight the contributions of these funds to regional development in both countries.
Calegari, Elena, Enrico Fabrizi, Gianni Guastella, and Francesco Timpano (2021), ”*EU regional convergence in the agricultural sector: Are there synergies between agricultural and regional policies?*”. This article analyzes the impact of cohesion policy on GDP per capita and societal well-being through a modified version of the adjusted human development index. The results of the study indicate that this cohesion policy significantly increased overall well-being in low-performing regions that used cohesion funds, with the results being particularly visible in improving education levels.

Maucorps, Ambre, Stefan Jestl, and Roman Romisch (2020), in ”*The Effects of the EU Cohesion Policy on Regional Economic Growth: Using Structural Equation Modelling for Impact Assessment*”. analyzed the effects of EU cohesion policy on economic growth for 276 European NUTS-2 regions between 2008 and 2016, using a structural equation consisting of a measurement component (with two latent variables) and a structural one. The results of the study support the existence and purpose of cohesion policy, where EU funding is essential for the economic development of European regions without other abundant sources of funding, focusing on alleviating structural deficiencies that hinder the efficient use of convergence investments.

3. The impact of European funds on regional, economic and social development in Central and Eastern European countries

The literature attempts to critically analyze the issues of EU regional development. In terms of context, apart from impact, the management of EU funds has attracted considerable attention from researchers. There have been several contributions that emphasize the importance of administrative and political factors and how they moderate the implementation of the process. In this sense, both factors could moderate not only the management of funding, but in the longer term, their impact as well.

Economic growth in Central and Eastern Europe over the past 25 years is a controversial topic in any country, but the debate is even more intriguing in developing nations. One of the core principles of the European Union is convergence among member states, which involves reducing development disparities. This can be achieved through faster economic growth in less developed countries.

Central and Eastern European countries exhibit diverse economic performances across different social landscapes. Prior to the COVID-19 pandemic, many countries, including Poland, Hungary, the Czech Republic, Slovakia, and Romania, recorded annual GDP growth rates between 3% and 5%, reflecting their growing economic significance relative to Western Europe.However, different levels of unemployment persist, with rates of around 6.1% in Poland, 4.1% in Hungary, 3.6% in the Czech Republic, 7.7% in Slovakia and 4.3% in Romania as of 2021.

Income disparities remain a challenge, especially between rural and urban areas, with economic inequalities widening. In some countries, health and social systems are outdated, welfare is affected, demographic changes are ongoing, population ageing and outward migration are increasingly common, these topics are of ongoing concern. EU funding has helped develop infrastructure and education, and digital transformation efforts are underway to support innovation and competitiveness.

The COVID-19 pandemic has had mixed economic impacts on Central and Eastern European countries. Some nations have experienced significant contractions due to lockdowns and disruptions in global supply chains, while others have shown resilience. These countries face challenges in managing income disparities, unemployment and demographic changes while striving to modernize infrastructure, improve healthcare and enhance digital capabilities.

In terms of economic convergence, it is still difficult to qualify whether or not EU funds have led to an increase in national and per capita GDP (PPS). This is despite the fact that EU funds have been the main source of domestic investment and are cushioning, in both countries, the effects of the 2008 economic and financial crisis. As for spillover effects, there is some evidence of learning and adaptation of EU strategic frameworks, instruments and templates at national and local institutional levels. However, there have been several unintended consequences derived from the use of EU funds.

The aim of cohesion policy is that EU funding is essential for the economic development of European regions without other abundant sources of funding, focusing on alleviating structural deficiencies that hinder the effective use of convergence investments.

Cohesion policy has had a positive and significant impact at the EU level,

contributing to both regional economic growth and employment. Specifically, it has shown a positive effect on regional employment, helping to mitigate the effects of the Great Recession and supporting less developed regions during their recovery.

Our research is based on a sample of 10 countries: Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Romania, Slovakia, and Slovenia. These countries were selected based on their Central-Eastern European positioning, and the indicators were analyzed over the period 2007-2020.

The dependent and independent variables analyzed are essential to study the impact of European funds on regional, economic and social development. They are outlined in:

Independent variables	**Description**
1.Sustainable growth (SGRTH)	European funds spent on sustainable economic growth
1.1.Competitiveness for growth and employability (COMPGE)	European funds spent on competitiveness and employability
1.2. Cohesion for growth and employability (COHGE)	European funds spent on cohesion and employability
1.2.1.Structural Funds (STRFND)	European Structural Funds
1.2.2.Cohesion Fund (COHFND)	Cohesion Fund
2.1. Market-related expenses and direct payments (MREDA)	European funds spent under the Common Agricultural Policy - direct payments
2.2. Rural development (RDVLP)	European funds spent under the Common Agricultural Policy - Rural Development
Dependent variables	
1. GDP/capita (GDP/CAPITA)	GDP/capita
2. Real GDP (REALGDP)	Real economic growth
3. GINI (GINI)	Economic inequality indicator

Compared to studies conducted in Central and Eastern European countries, regarding the use of European funds, we did not start the econometric model with the stationarity and autocorrelation testing methods, but by analyzing cluster data using the K-Means Method.

The algorithm using K for clustering creates clusters using the mean value of the cluster object. The standard K-means algorithm uses the cluster number as a user parameter to choose the cluster center from the data set arbitrarily. The K-means clustering algorithm is classified as a partitional clustering algorithm. Partitioning data sets into clusters involves assigning each data point to the closest cluster center after determining a minimum squared error rate between the different data points in the data set and the mean of a cluster. The K-means algorithm aims to reduce the smallest number of squared errors associated with each K group. The K-means algorithm randomly selects a number of centers from the data set. Depending on the distance from each data point, each center is evaluated, and then assigned and

embedded in the closest control. As a result, the center of the group is re-evaluated due to the integration of the new member. In other words, the algorithm indicated by the K-means method is executed until the quality of the cluster member is stable The algorithm aims to minimize the sum of the squared error for each cluster of type k, which can be reduced to the following calculation formula:

$$J(c)=\sum_{k=1}^{k}\sum_{x\in c_k}\left\|x_i-\mu_k\right\|^2$$

Regarding the model developed, it is structured into 3 Clusters, depending on the link between GDP/capita and European funds spent on convergence, competitiveness and employability (indicators 1.1 and 1.2). The first cluster consists of the Czech Republic, Slovakia, Hungary, Estonia, Latvia and Lithuania and Slovenia, the second cluster consists of Romania, Bulgaria, and in the last cluster we included only Poland. This cluster presents the highest average level of GDP/capita and the lowest levels of European funds spent on competitiveness, cohesion or employability. Cluster 3, which includes only Poland, presents the lowest average level of GDP/capita and the highest values of European funds spent on competitiveness, cohesion or employability.

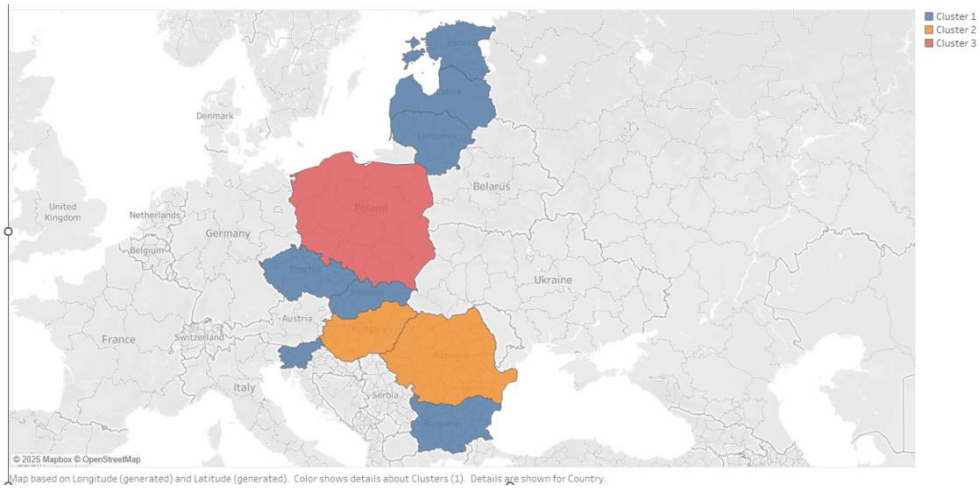

Figure 1. Clustering of CEE countries according to GDP/capita and European funds spent on sustainable economic development,
Source: author's processing

A series of control tests on variables were used in this model to assess the robustness of the results, while examining the social, economic and demographic aspects of the Central and Eastern European countries analyzed and the impact of European funds on them.

Table 1 presents the descriptive statistics for the analyzed variables. Although our sample includes 10 countries with emerging economies, the average values for the selected indicators are quite high.

Table no.1

Variables	Average	Minimum	Maximal	Standard deviation	Variant
SGRTH	2342.092	162.164	13588.828	2860.360	8181661.196
COMPGE	100.973	12.769	406.253	69.492	4829.149
COHGE	2197.823	111.398	13301.468	2752.133	7574236.682
STRFND	1474.879	60.792	9562.280	1890.907	3575526.199
COHFND	713.394	5.056	4573.755	899.913	809842.952
MREDA	772.111	0.928	3595.150	874.093	764038.936
RDVLP	412.696	0.001	1996.505	436.623	190639.208
GDP/CAPITA	13505.119	1389	27360	5023.584	25236393.89
REALGDP	2.008	-5.3	8.4	2.660	7.202
GINI	34.477	24.3	44.1	4.719	22.265

Source: author's processing

Compared to other variables, the variation of the GDP/capita variable is much larger. This indicates that we would have a nonlinear model. As a result, in the regression analysis the variables in absolute sizes will be logarithmic. To verify the robustness of the model and the clustering results, we changed the dependent variable to GINI. The description of the methodology used will provide a more precise detail of the regression form.

Table no.2

		Centers						
Clusters	Number of Items	Avg. Gini	Avg. Cohfnd	Avg. Cohge	Avg. Compge	Avg. Strfnd	Avg. Mreda	Avg. Rdvlp
Cluster 1	4	29.873	651.75	1992.0	98.056	1332.1	587.42	274.51
Cluster 2	5	38.335	318.52	985.23	78.696	659.05	501.09	333.3
Cluster 3	1	33.6	2934.4	9084.0	224.02	6125.1	2866.0	1362.5

Source: author's processing

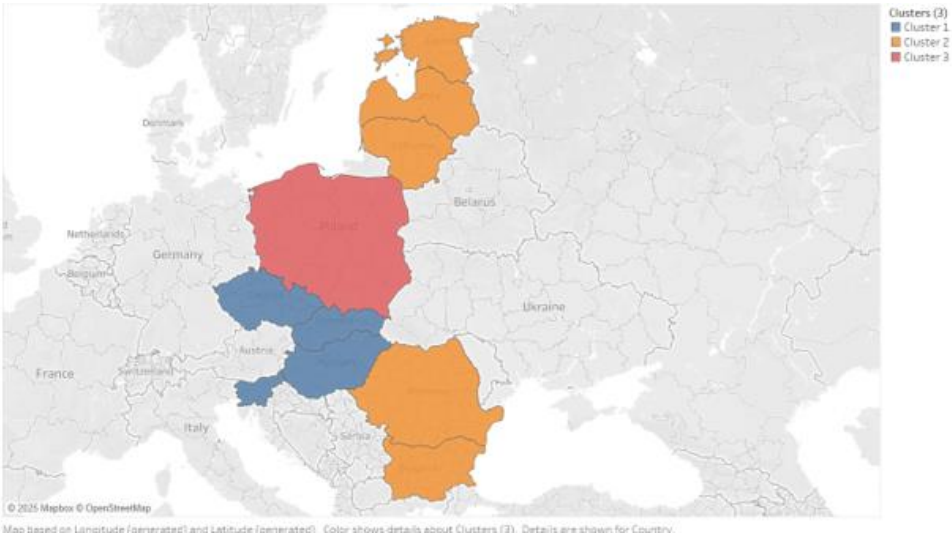

Figure 2. Clustering of CEE countries according to GINI and European funds spent on sustainable economic development,
Source: author's processing

Cluster 1 presents the lowest values of the GINI indicator and the highest values of European funds spent in the analyzed sample, compared to Cluster 2 which has the highest values of the GINI indicator and the lowest values of European funds spent.

4. Conclusions

EU funds have had a relatively significant and often visible impact on the economy, particularly in investments related to public, social, educational, and institutional infrastructure. However, the exact effects of these funds remain ambivalent, difficult to qualify, and challenging to measure precisely.

Regarding economic growth over the past 25 years, it can be divided into three distinct phases in each country in the region: transformational decline, the convergence period, and recession. The recession was followed by rapid growth in all countries, leading to convergence with Western European economies. Overall, the entire region experienced substantial growth during this period, which also contributed to significant convergence with more developed Western European nations. On the other hand, the main driver of this rapid growth was capital accumulation.

References:

1. Bachtler, J., Begg, I., Polverari, L., & Charles, D. (2013). Evaluation of the main achievements of cohesion policy programmes and projects over the longer term in 15 selected regions (from 1989–1993 Programme Period to the Present (2011.CE.16.B.AT.015), Final Report to the European Commission (DG Regio), European Policies Research Centre, University of Strathclyde (Glasgow) and London School of Economics,
2. Calegari, Elena, Enrico Fabrizi, Gianni Guastella, and Francesco Timpano (2021). EU regional convergence in the agricultural sector: Are there synergies between agricultural and regional policies? Papers in Regional Science 100: 23–50,
3. Davidescu, A., Nae, T., & Florescu, M.-S. (2024). From Policy to Impact: Advancing Economic Development and Tackling Social Inequities in Central and Eastern Europe. Economies,
4. Farrell, Mary. 2004. Regional integration and cohesion—Lessons from Spain and Ireland in the EU. Journal of Asian Economics 14: 927–46,
5. Gudowski, J., Piasecki, R. (2020), Foreign Direct Investment from Emerging Markets. Theory and Practice, "Comparative Economic Research. Central and Eastern Eu¬rope", 23 (2), pp. 7–19,
6. Krajewska, A., Krajewski, S. (2020), The Labor Market in Poland and the Social Re¬sponsibility of the State and Business: Comparative Aspects, "Comparative Econom¬ic Research. Central and Eastern Europe", 23 (1), pp. 93–109,
7. Maucorps, Ambre, Stefan Jestl, and Roman Romisch (2020). The Effects of the EU Cohesion Policy on Regional Economic Growth: Using Structural Equation Modelling for Impact Assessment. wiiw Working Paper. Vienna: The Vienna Institute for International Economic Studies,
8. Polster, C. (2021). Economic Development and Growth in Central and Eastern Europe. Comparative Economic Research. Central and Eastern Europe, 69-84,
9. Sabău-Popa, C. D. (2010), *Bugetul Uniunii Europene şi Fondurile Comunitare*, Editura Economică, București, ISBN: 978-973-709-525-1,
10. Surubaru, N.-C. (2021). European funds in Central and Eastern Europe: drivers of change or mere funding transfers? Evaluating the impact of European aid on national and local development in Bulgaria and Romania. European Politics and Society, 203-221. doi:10.1080/23745118.2020.1729049,
11. Witkowska, J. (2020), The European Union's Screening Framework for Foreign Direct Investment: Consequences for External Relations, "Comparative Economic Research. Central and Eastern Europe", 23 (1), pp. 19–36.

Internet sources:

- https://cohesiondata.ec.europa.eu/cohesion_overview/14-20
- https://data.gov.ro/dataset/proiecte-contractate
- https://ec.europa.eu
- https://mfe.gov.ro
- https://ec.europa.eu/eurostat
- https://databank.worldbank.org
- https://www.oecd.org