Winners and Losers of EU Integration: Assessing the Economic Impact of European Union Membership for Transition Economies Using a Synthetic Control Method

Abstract

This paper explores how EU membership affects the economic growth of transition economies. Previous studies have linked EU accession to higher growth and improved institutional stability. However, these studies relied on simple comparisons. They failed to consider the historical and institutional differences between countries. Moreover, they failed to explain why growth rates vary among member states. This paper uses the Synthetic Control Method (SCM) to create a synthetic comparison group. The SCM isolates the effect of EU accession from other external factors. The analysis focuses on transitional economies that joined in 2004 and 2007. Additionally, multiple regression analysis explains the variation in growth. The results reveal significant disparities in economic outcomes following accession. While countries such as Lithuania, Latvia, Estonia, Slovakia, and Bulgaria experienced significant growth in GDP per capita, Hungary and Slovenia showed modest or negative effects. Furthermore, regression analysis identified investment in education, capital formation, trade openness, and fiscal discipline as major determinants of growth. These findings offer valuable insights for policymakers and highlight the structural and institutional conditions needed to maximize the benefits of economic integration.

AB Entegrasyonunun Kazananları ve Kaybedenleri: Sentetik Kontrol Yöntemi Kullanılarak Geçiş Ekonomileri için Avrupa Birliği Üyeliğinin Ekonomik Etkisinin Değerlendirilmesi

Özet

Bu makale, AB üyeliğinin geçiş ekonomilerinin ekonomik büyümesine nasıl etki ettiğini incelemektedir. Önceki çalışmalar, AB üyeliğini daha yüksek büyüme ve kurumsal istikrarın artmasıyla ilişkilendirmiştir. Ancak bu çalışmalar basit karşılaştırmalara dayanmaktadır. Ülkeler arasındaki tarihsel ve kurumsal farklılıkları dikkate almamışlardır. Ayrıca, üye ülkeler arasında büyüme oranlarının neden farklılık gösterdiğini açıklamamışlardır. Bu makale, Sentetik Kontrol Yöntemi (SCM) kullanarak sentetik bir karşılaştırma grubu oluşturmaktadır. SCM, AB üyeliğinin etkisini diğer dış faktörlerden ayırmaktadır. Analiz, 2004 ve 2007 yıllarında üye olan geçiş ekonomilerine odaklanmaktadır. Ayrıca, çoklu regresyon analizi büyümedeki farklılıkları açıklamaktadır. Sonuçlar, katılımın ardından ekonomik sonuçlarda önemli farklılıklar olduğunu ortaya koymaktadır. Litvanya, Letonya, Estonya, Slovakya ve Bulgaristan gibi ülkeler kişi başına GSYİH'da önemli bir büyüme kaydederken, Macaristan ve Slovenya ılımlı veya olumsuz etkiler göstermiştir. Ayrıca, regresyon analizi, eğitim yatırımları, sermaye oluşumu, ticaretin açıklığı ve mali disiplin gibi faktörlerin büyümenin temel belirleyicileri olduğunu ortaya koymuştur. Bu bulgular, politika yapıcılar için değerli bilgiler sunmakta ve ekonomik entegrasyonun faydalarını en üst düzeye çıkarmak için gerekli olan yapısal ve kurumsal koşulları vurgulamaktadır.

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1 Introduction

After the collapse of the Soviet Union in 1991, many countries transitioned from a planned economy to a market economy. For some of them, joining the European Union (EU) was important because it provided a new opportunity for economic growth, investment, and institutional stability. However, after joining the EU the benefits of EU membership have varied significantly across countries. This variation highlights an important question: What determines the economic success or failure of transition economies after EU accession?

While some previous studies have analyzed the impact of accession by comparing member and non-member countries, they have often overlooked the deep historical and institutional factors that characterize the economic experiences of transitional countries. The differences in infrastructure, level of economic reforms, and public policies led to varying outcomes after accession. That highlights the need for an analytical methodology capable of dealing with this diversity and complexity, which prompted researchers to use the Synthetic Control Method (SCM), which provides a more accurate framework for isolating the impact of accession from other external and internal factors.

This study, which focuses on transition economies that joined to EU in 2004 and 2007, seeks to reassess the economic impact of EU accession for transition economies by overcoming the methodological limitations of previous research. It uses SCM to construct a comparative framework that accounts for the unique characteristics of transitional economies, including institutional structures, levels of economic reform, and growth indicators. This methodology enables the creation of a counterfactual scenario, illustrating how transitional economies might have evolved in the absence of EU accession. As a result, the study determines the net effect of EU integration policies.

Recent economic literature emphasizes the importance of using advanced quantitative methods, as traditional comparative studies may yield misleading conclusions by disregarding structural differences between countries. Studies that make direct comparisons may fail to consider the effect of the domestic policies and institutional challenges that are faced by specific countries. In contrast, SCM incorporates multiple variables, including key economic and statistical indicators such as GDP, capital investment, and international trade volume, as well as indirect factors related to governance and corruption control.

This study focuses on two main objectives. First, it aims to measure the actual economic impact of EU accession on transitional economies by using the synthetic control method, with a specific emphasis on real GDP per capita as an indicator of economic growth. Second, it aims to identify the most pertinent factors enhancing or reversing the economic benefits of accession using the fixed effects model, with special attention to covariates such as investment in education, capital formation, trade openness, and financial stability.

We aim to contribute to the literature by providing an objective analysis based on advanced quantitative methods. In the meantime, the study highlights the need to explore the EU accession as a complex process with multiple internal and external determinants, which demands further research on the causal relationship between accession and real economic changes.

2 Literature Review

Academic studies on European integration began in the 1950s. (Haas, 1958) established the theoretical foundations for understanding the political and economic processes that lead to integration. (Viner, 1950) provided a framework for analyzing the effect of customs unions on the national economy. This paved the way for understanding the structural changes that follow the integration of countries. Early studies tried to assess the role of European integration in boosting economic growth among member countries. Studies by (Landau, 1995) and (De Melo, et. al, 1992) added important contributions. However, these studies were unable to provide conclusive evidence of a consistent growth premium as a result of European integration.

With the development of econometric methods, researchers moved to use panel data models to analyze the impact of integration on growth. (Henrekson, et. al, 1997) observed a moderate positive impact of around 0.6 to 0.8 percentage points per year in some countries. In contrast, (Vanhoudt, 1999) did not confirm a long-term growth premium. (Badinger, 2005) improved measurement techniques by proposing an index that takes into account the stages of integration rather than the duration of membership. (Crespo Cuaresma, et. al, 2008) studied the asymmetric effects of European membership and they found that less developed countries benefited from integration more than countries with higher income levels. Other studies focused on trade as a main channel for economic gains. such as, (Baldwin and Seghezza 1996) found that trade integration within the EU boosted investment in physical capital, and that led to increased productivity and economic growth. One of the main challenges in previous studies is the difficulty of constructing a hypothetical scenario that shows what would have happened if these countries had not joined the EU. (Boltho and Eichengreen, 2008) highlighted the difficulties of building such a model due to historical and institutional differences among countries.

2.1 Transition Economies and Economic Integration

After the collapse of the Soviet Union in 1989, the study of economic integration gained a new focus on the challenges of integrating transition economies into the global system. (Sachs and Warner, 1996) studied the factors that helped Central European countries transition to market economies. They found that many of these economies had the potential for rapid growth and at the same time they stressed the importance of structural reforms. The study also compared income levels before and after the transition. It offered clear policy recommendations for faster economic convergence with Western Europe. (Bal, 2004) studied economic growth and external financing in transition economies. he found significant differences in growth rates, and he linked that to the speed and quality of reforms, levels of external financing, and each country's initial economic conditions. (Stiglitz, 2002) provided a critical perspective and argued that rapid liberalization and privatization could harm economies unprepared for open competition.

2.2 Advanced Analytical Methods: Synthetic Control

(Athey and Imbens, 2017) emphasize the requirement for strong identification strategies in assessing policy effects because the lack of a valid comparison group will lead to biased estimates. This challenge has led researchers to utilize more advanced methods, such as the synthetic control method (SCM), which has been widely used to analyze the impact of policy interventions, such as EU accession. (Abadie and Gardeazabal, 2003) initially introduced SCM to evaluate the economic effects of conflicts. Later, (Abadie, et. al, 2010) expanded its application to policy analysis. By using this method, studies such as those by (Campos, et. al, 2014) and (Campos, et. al, 2019) studied the impact of EU membership on economic growth by using the SCM. However, these studies did not focus specifically on transition economies.

They used a donor pool comprised of advanced industrial countries like Canada, Australia, and Japan, which are completely different from transition economies. Additionally, they ignored key predictors such as economic freedom, gross capital formation, and control of corruption. Moreover, these studies used 1998 as the starting point for analyzing accession effects, based on the assumption that economic and institutional integration began before formal membership due to pre-accession agreements. This choice raises questions about the adequacy of the pre-accession period, especially since data for transition economies only began in 1990–1991 so this limitation may affect the accuracy of the synthetic model. Also, the effects of the period between 1998 and 2004 were not uniform, as the pace of reforms varied across countries, and some membership decisions were only finalized in 2002 and 2003. In addition, previous studies were limited to analyzing the period up to 2008, ignoring the impact of the global financial crisis and the long-term effects of integration.

In response to these gaps, this study focuses only on transition economies. This improves the accuracy of estimates by refining the choice of donor pool by including non-EU transition economies and similar non-advanced economies that underwent comparable reforms. The study also uses additional predictors such as economic freedom, gross capital formation, and the control of corruption. It uses the official accession date of 2004 to distinguish the effects of internal reforms from those of actual membership. The analysis provides estimates for both the short-term (five years after accession) and the long-term (ten years after accession and up to 2023). This design aims to evaluate the impact of the 2008 financial crisis and to understand the evolution of integration benefits over time. In addition, it adds transition economies that joined during the 2007 expansion, such as Romania and Bulgaria, to the analysis.

3 Methodology, Sample and Data

This section explains how we use the SCM to assess whether joining the European Union has delivered measurable gains for transitional countries in real GDP per capita. This method creates an artificial control group by forming a weighted set of countries that have not undergone the treatment (in this case, EU membership).

Following (Abadie, et. al, 2010), Let us Consider a setting with $J + 1$ regions, where only the first region (the "treated unit") is exposed to an intervention during periods $T_0 + 1$ to T. The remaining J regions

form an untreated "donor pool" of potential control units. This design allows for the estimation of intervention effects by comparing outcomes between the treated region and a synthetic control constructed from the untreated regions.

The potential outcomes for each region i at the time t are defined as follows:

Y_{it}^N: The outcome that would have been observed in the absence of the intervention.

Y_{it}^I: The outcome that would have been observed under the intervention from period $T_0 + 1$ to T. The effect of the intervention on region i at time t is thus expressed as $\alpha_{it} = Y_{it}^I - Y_{it}^N$. The observed Y_{it} outcome can be represented as:

$$Y_{it} = Y_{it}^N + \alpha_{it} D_{it},$$

where D_{it} is a binary indicator that equals 1 if region i is exposed to the intervention at time t and 0 otherwise. For the treated region.

To estimate the intervention effect α_{it} for $t > T_0$, the key challenge lies in constructing Y_{it}^N, the counterfactual outcome for region i in the absence of the intervention. The synthetic control approach assumes that Y_{it}^N follows a factor model:

$$Y_{it}^N = \delta_t + \theta_t Z_i + \gamma_t \mu_i + \varepsilon_{it},$$

where δ_t is an unknown common factor with constant factor loadings across units, Z_i is a $(r \times 1)$ vector of observed covariates (not affected by the intervention) θ_t, is a $(r \times 1)$ vector of unknown parameters, γ_t is a $(1 \times F)$ vector of unobserved common factors, μ_i is an $(1 \times F)$ vector of unknown factor loadings, and the error terms ε_{it} are unobserved transitory shocks at the region level with zero mean.

The synthetic control for the treated region is constructed as a weighted average of the untreated regions, defined by a vector of weights $W = (w_1, w_2, \ldots w_{J+1})$. These weights are non-negative $(w_j \geq 0)$ and sum to one $(\sum_{j=2}^{J+1} w_j = 1)$. The weights are chosen to ensure that the synthetic control closely matches the treated region in terms of pre-intervention outcomes and covariates:

$$\sum_{j=2}^{J+1} w_j Y_{jt} \approx Y_{1t}, \text{ for } t = 1, \ldots, T_0,$$

$$\text{And: } \sum_{j=2}^{J+1} w_j Z_j = Z_1.$$

Once synthetic control is constructed, the intervention effect for the treated region is estimated as:

$$\alpha_{it} = Y_{1t} - \sum_{j=2}^{J+1} w_j^* Y_{jt}, \text{ for } t > T_0$$

Where w_j^* are the optimal weights.

3.1 Data and Specification

This study uses the SCM to assess the economic impact on transition economies that joined the European Union in 2004 and 2007. To create a suitable counterfactual, the donor pool consists of three groups: (1) former Soviet Union countries (Russia, Ukraine, Kazakhstan, Kyrgyz Republic, Azerbaijan, Georgia, and Moldova); (2) Eastern European countries (Albania, North Macedonia, and Croatia); and (3) a group of global economies that implemented reforms in the 1980s and 1990s, including Argentina, Brazil, Colombia, Chile, Malaysia, Indonesia, Mexico, South Africa, South Korea, China, India, New Zealand, Uruguay, Peru, Costa Rica, and Turkey. Including these diverse economies creates a balanced framework for comparison, capturing economic and institutional differences.

Because of the complexity of transition economies, where structural reforms unfold at different paces, carefully selecting predictor variables is critical. The study uses important macroeconomic and institutional indicators to create synthetic control estimates. The variables and their respective time coverage are as follows: population, GDP (constant 2015 US$), foreign direct investment, net inflows as a percentage of GDP, agriculture, forestry, and fishing value added as a percentage of GDP, industry (including construction) value-added as a percentage of GDP, economic freedom of the world index (current), Control of corruption estimate, trade as a percentage of GDP, and Gross capital formation as a percentage of GDP.

The main data source is the World Bank's Development Indicators database. The predictor variables are averaged over the pre-treatment period, excluding missing data. Since the analysis involves transition economies, data availability from the early 1990s is constrained by structural transformations and inconsistencies in reporting. However, these variables generally show stability over short periods, helping to reduce potential biases from missing data. Additionally, some transition economies, such as Belarus, Uzbekistan, Armenia, and Turkmenistan, were excluded from the control group due to severe data limitations, ensuring the robustness of the analysis. This study focuses on economic outcomes over ten years after EU accession. It balances the need for enough time for the treatment to take effect with the potential decrease in synthetic estimate quality over time.

3.2 Fixed Effects Model

After applying the SCM to assess the impact of EU membership on the economic growth of transition countries. By using panel data, we will use a fixed effects model to identify the key factors that explain growth differences among these countries. The analysis focused on countries that joined in 2004 and covered the period from 2004 to 2013. The independent variables which selected based on economic literature and theories on growth and the potential impact of EU membership. These variables include investment in education (measured by government expenditure on education as a percentage of government expenditure), capital formation (measured by gross capital formation per capita in constant 2015 US$), trade openness (measured by the sum of exports and imports as a percentage of GDP), and fiscal discipline (measured by the gross debt of general government as a percentage of GDP and general government deficit as a percentage of GDP). The main data source is the World Bank's Development Indicators database and the OECD database

4 Results

This section analyzes how joining the European Union has affected 10 transition economies by using SCM to estimate the economic impact.

Table 1 presents the synthetic estimates of average GDP per capita growth up to 2023, offering 5- and 10-year post-accession comparisons with actual values. While the results include the period until 2023, the subsequent analysis will focus on the 10-year post-accession period. This approach balances the need for sufficient time for the treatment effects to materialize with the potential decline in the quality of synthetic estimates over extended periods.

Country	5 years post-accession	10 years post-accession	Estimated until 2023
Poland	1.63%	2.66%	8.01%
Czech	5.24%	5.14%	5.97%
Slovakia	8.81%	14.41%	17.83%
Hungary	1.88%	-1.78%	-0.80%
Slovenia	2.82%	-0.66%	-3.39%
Lithuania	19.73%	20.01%	27.23%
Latvia	25.16%	22.69%	25.41%
Estonia	16.34%	15.28%	17.13%
Bulgaria	12.26%	11.56%	13.72%
Romania	5.67%	4.73%	9.93%

Table 1. *Average estimates of real GDP per capita growth for transition economies after joining the EU in 2004 and 2007*

During the 5 years of post-accession, all countries showed positive growth. This reflects the benefits of new market access, increased investment flows, and early structural reforms. However, over 10 years' post-accession, the impact of the 2008 global financial crisis becomes evident. Countries like Slovenia and Hungary, which had modest positive growth in the short term, shifted to negative growth rates in the medium term. This change is likely due to reduced financing opportunities and increased fiscal challenges, such as rising debt and budget deficits.

The estimates until 2023, while less precise due to the long forecasting period, confirm that Slovenia continues to face long-term negative effects. In contrast, nations such as Slovakia and Poland doubled their gains. Overall, the table highlights those countries like Lithuania, Latvia, Estonia, Bulgaria, and Slovakia benefited more from EU accession, while Hungary and Slovenia experienced modest or even negative effects.

These findings are consistent with previous studies, such as Campos et al. (2019), which highlighted the economic benefits of EU membership. However, they differ in estimating the average of these benefits, particularly for countries like Hungary and Slovenia.

Figure 1 illustrates the actual versus synthetic GDP per capita trends for transition economies that joined the EU in 2004 and 2007. These graphs visually demonstrate the extent to which actual GDP per capita deviated from the synthetic estimates, indicating the economic impact of EU accession.

4.1 The Differences in Economic Benefits of Transitional Economies Joining the European Union

Why have some transitional economies gained significantly from joining the European Union, while others have experienced only modest or stable benefits? What factors explain these differences? To answer these questions and highlight the variation across countries and over time of the benefits from EU membership that we estimated above, it is worth using fixed effects model for 10 years post-accession.

This model uses data from 8 countries (countries that joined in 2004) over 10 years after joining, with 80 observations. The R-squared value is 0.87291, meaning the model explains about 87%. The adjusted R-squared is 0.84313, and the F-statistic is 54.9499 with a p-value below 0.001, showing strong statistical significance.

To check for serial correlation, the Breusch-Godfrey/Wooldridge test was performed. The test result (chi-square = 15.939, p-value = 0.1014) suggests that serial correlation is not a major issue.

The Breusch-Pagan test was also conducted to check for heteroscedasticity. The result (BP = 11.933, p-value = 0.1542) indicates that the error terms have constant variance, meaning heteroscedasticity is not a problem.

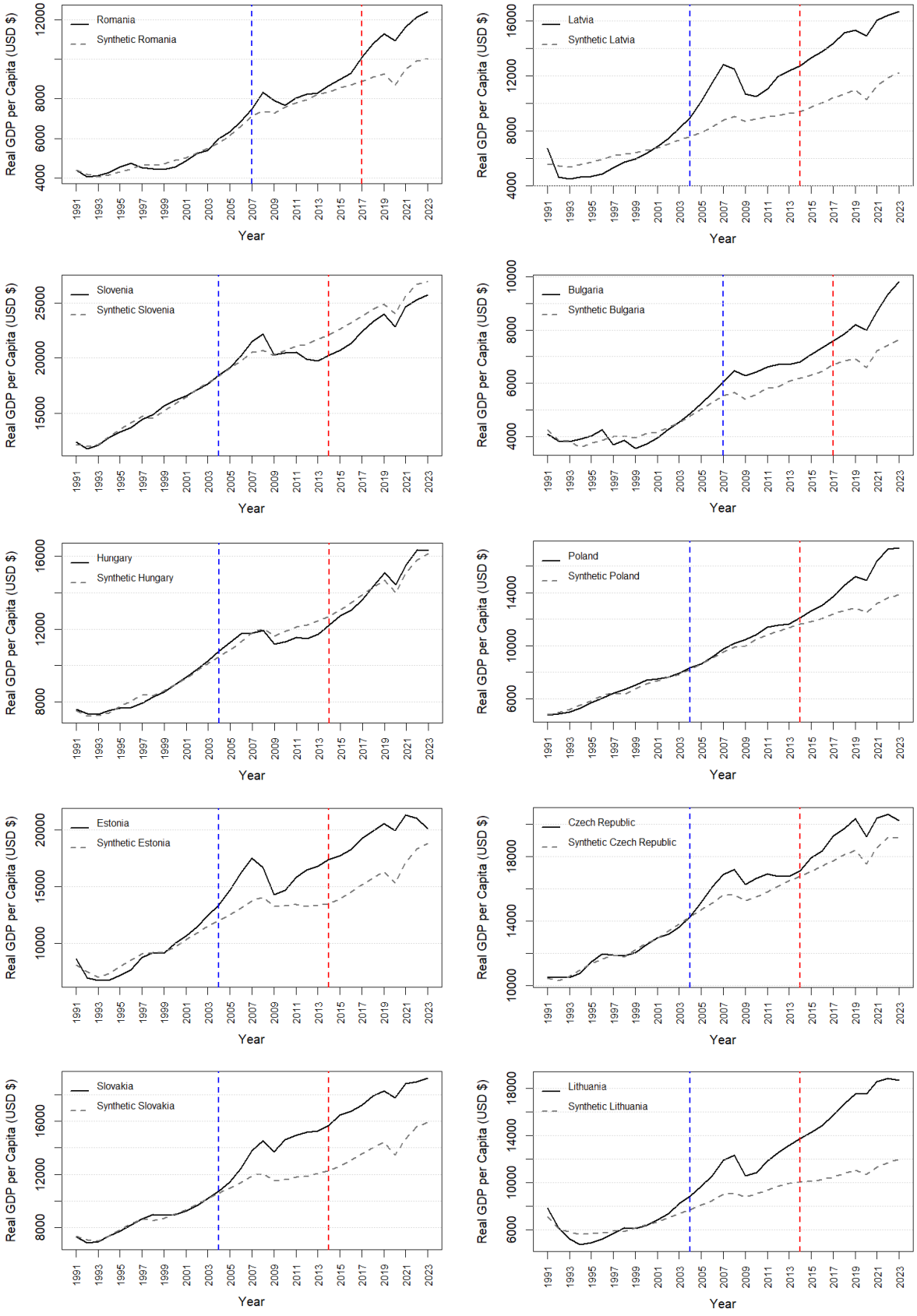

Figure 1. *Actual vs Synthetic GDP per Capita: 2004 - 2007 Expansion*

Variables	Coefficient	Error
Government expenditure on education, total (% of government expenditure)	0. 816356**	(0. 300070)
Gross capital formation per capita (constant 2015 US$)	0. 169176***	(0. 033298)
Trade (% of GDP)	0. 399167***	(0. 055607)
General government deficit (% of GDP)	-0. 056742**	(0. 020990)
Gross debt of general government (% of GDP)	-0. 162313***	(0. 041612)
Manufacturing, value added (% of GDP)	-0. 946807***	(0. 261334)
Economic Globalization	-0. 399157.	(0. 209466)
GDP per capita_lag1	0. 396439***	(0. 060233)

Standard errors are in parentheses. Significance levels: *** p < 0.001, ** p < 0.01, * p < 0.05, and p < 0.1. The model controls differences across countries using fixed effects.

Table 2. *Determinants of the GDP per capita growth dividends from EU membership*

The results in Table 2 indicate that the impact of EU accession on GDP per capita growth depends on a transformation process that is influenced by multiple structural and institutional factors. Investments in education and human capital, reflected in increased government spending on education, play a positive role in raising the quality of productivity, which enhances the competitiveness of countries in the long term. Additionally, capital formation per capita is a key factor in supporting economic infrastructure. Furthermore, higher trade ratios as a percentage of GDP appear as indicators of economic openness.

On the other hand, the results show that negative fiscal indicators, such as high government deficits and high levels of public debt, are real impediments to growth. The impact of the 2008 global financial crisis, which exacerbated these financial imbalances, is particularly noteworthy in this context. Moreover, while globalization expands market opportunities and facilitates capital flows, it also introduces risks associated with economic volatility. Economies that are overly reliant on global economic activities may experience adverse effects during periods of crisis. The analysis further indicates that countries with economies heavily dependent on industrial sectors faced negative consequences upon joining the European Union due to increased competition.

Table 3 provides a comparative overview of economic performance indicators for the period 2004–2013, which helps explain the differences between countries. High-performing Countries that achieved significant benefits, such as Lithuania, Latvia, and Estonia, showed high levels of investment in education, capital formation, and trade volume, coupled with relatively stable financial indicators (lower deficits and reduced public debt).

Underperforming Countries that have shown negative or limited impacts (Hungary and Slovenia) face institutional and fiscal challenges, such as higher levels of deficits and debt, which have limited their ability to convert European integration opportunities into actual economic growth. These challenges were exacerbated by the 2008 financial crisis.

Average Indicators for Ten Years (2004 - 2013)	LVA	LTU	EST	SVK	CZE	SVN	POL	HUN
Government expenditure on education, total (% of government expenditure)	15.1	15.3	16.4	10.0	10.8	13.0	12.7	10.8
Gross capital formation per capita (constant 2015 US$)	3533	2289	4251	3559	4427	5204	2048	3060
Trade (% of GDP)	109.6	128.9	128.3	160.2	128.3	130.9	80.4	151.3
General government deficit (% of GDP)	-1.8	-2.3	0.5	-4.2	-3.0	-7.4	-4.9	-3.7
Gross debt of general government (% of GDP)	33.8	33.7	10.7	46.9	40.5	45.8	58.2	81.4
Manufacturing, value added (% of GDP)	11.4	17.3	14.0	18.2	22.0	19.3	16.4	18.6
Economic Globalization	77.5	74.6	85.4	77.5	77.7	72.5	66.6	82.9
GDP (constant 2015 billion US$) (2004 – 2013)	24.1	35.4	20.9	73.5	169.2	41.1	387.9	114.9
GDP growth (annual %) 2004 – 2013)	4.1	3.9	3.0	4.0	2.4	1.6	4.0	1.1
GDP growth (annual %) (1991 – 2003)	0.1	-0.2	1.6	1.6	1.0	2.1	3.5	1.3

Table 3. *Indicators of transition economies joining the European Union in 2004*

We also find it important to note that Slovenia was one of the countries with the highest growth rate before accession, driven by an export-led growth model. It maintained a flexible monetary policy and kept devaluing the currency to boost exports. However, after accession, Slovenia faced intensified competition in export markets, a challenge further aggravated by its premature entry into the Eurozone in 2007. This shift eliminated its ability to devalue its currency to maintain competitiveness. Consequently, Slovenia started policies reliant on debt

accumulation and foreign investment, leading to a rapid build-up of external debt, and that was confirmed by Kržan (2014).

4.2 Placebo Tests

To rigorously assess the robustness of our synthetic control estimates, we conduct comprehensive placebo tests designed to validate that the observed divergences in GDP per capita are attributable solely to EU accession and not to spurious fluctuations or model misspecification.

4.3 Placebos In-Space

Spatial placebo tests were conducted by reassigning the treatment to all units in the donor pool that did not experience EU accession. By measuring the fit, in terms of RMSPE, between the synthetic and actual outcomes before and after the treatment, taking the ratio between them, and then comparing these ratios across countries, we get a measure of how rare treatment effect of a certain magnitude is compared to measured placebo effects in countries where no treatment took place. Table 3 reports the ranking of each treated country's RMSPE ratio when compared to the ratios of the donor units, where rank 1 would be the most extreme relative divergence post-treatment.

For example, the low RMSPE ratio for Slovaki ranking second among 36 cases indicates that there is a treatment effect. Moreover, Using the conventional conversion, the “p-value” of the result of Slovaki would be 2/36, or roughly 0.055, which isn’t significant at 5%. This test may reduce the reliability of the results. However, this could be due to the limited pre-treatment period used for estimation and the limited number of donor pool countries. This does not imply the absence of a treatment effect. Notably, most previous studies using the synthetic control method to estimate the impact of EU membership did not apply these placebo tests. For example, Campos (2019) assessed the robustness of results by repeating the analysis with a thousand randomly selected donor pools and did not do placebo test.

Figure 4 further demonstrates the GDP per capita gaps between treatment countries and the donor pool, graphically substantiating the distinctiveness of the treatment effects.

Country	Slovakia	Czech	Estonia	Lithuania	Slovenia
Ratio Rank	2/36	7/36	9/36	10/36	12/36
Country	Latvia	Bulgaria	Hungary	Romania	Poland
Ratio Rank	13/36	17/36	22/36	24/36	28/36

Tablo 4. *Rank of the main estimate RMSPE- ratio Compared to placebo RMSPE- ratio.*

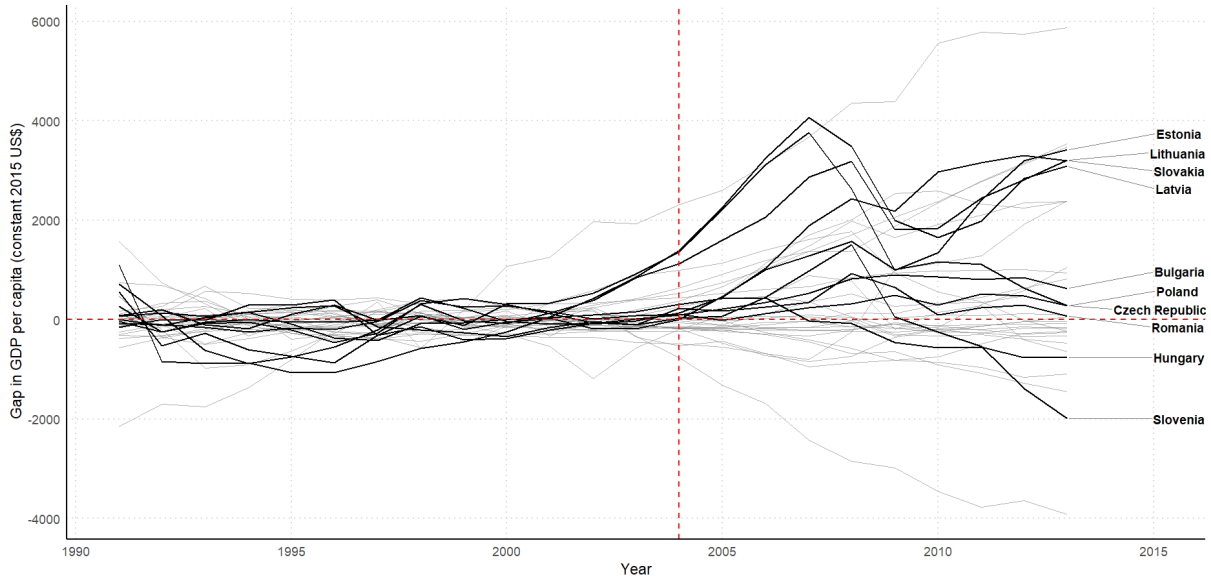

Figure 6. *GDP Per Capita Gaps in Treatment Countries and Donor Pool Countries*

4.4 Placebos In-Time

In this test, we reassign the treatment to the year 2000 for all countries in our sample, a period during which no policy change related to EU accession occurred. This counterfactual test is intended to verify that the synthetic control method does not generate significant deviations when no treatment effect is present. The temporal placebo results, as seen in Figure 3, underscore those significant deviations in GDP per capita only emerge following the actual policy intervention.

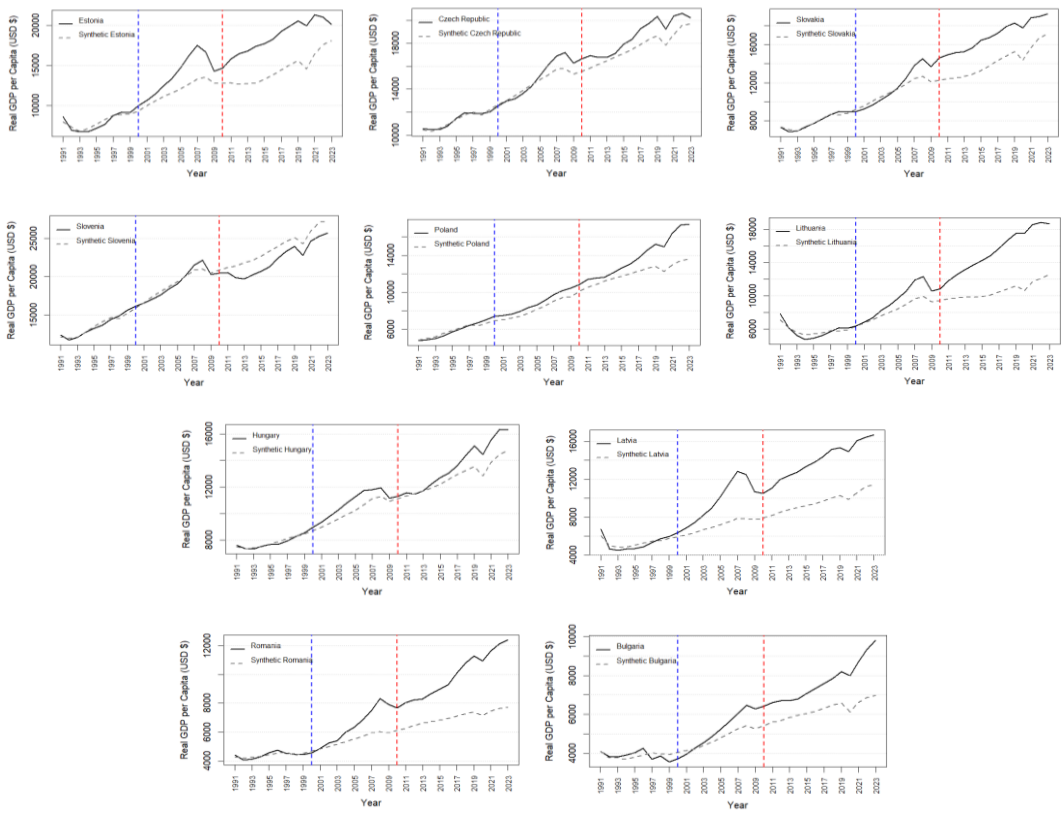

Figure 3. *Actual vs Synthetic GDP per Capita (2004- 2007 Expansion): Placebos In-Time*

5 Concluding Remarks

This study makes a significant contribution to the empirical and theoretical discussion of economic integration. The study assesses the impact of the joining of ten transition economies to the EU. By applying the SCM and the fixed-effects model, the study explores the complex causal mechanisms through which European integration influences the economic trajectories of these countries.

Findings show that the economic benefits from the EU membership were not the same. Lithuania, Latvia, Estonia, Slovakia, and Bulgaria have all seen significant growth in real GDP per capita, while Hungary and Slovenia have had modest or even negative growth. That confirms the importance of structural factors and domestic financial conditions in shaping the impact of economic integration.

In the short term, five years after accession, real GDP per capita growth was positive across all ten countries. Improved market access, structural reforms, and rising investment flows drove this. However, in the longer term, after ten years, while some countries, such as Lithuania, Latvia, Estonia, and Slovakia, maintained strong growth, Hungary and Slovenia performed poorly, recording negative growth rates.

These results suggest that the initial benefits of European integration may fade due to structural challenges, including rising fiscal deficits, increasing public debt, and exposure to global economic shocks. Simply joining the EU does not guarantee long-term economic prosperity. The fixed-effects model analysis indicates that higher government spending on education, increased capital formation per capita, and greater trade openness are positively linked to economic growth. In contrast, negative financial indicators, particularly high budget deficits and growing public debt, hinder growth. These insights emphasize the need for policymakers to implement comprehensive structural reforms and maintain fiscal discipline to maximize the benefits of EU integration.

While this study sheds light on the economic effects of EU membership, further research is needed to explore the long-term impacts in greater detail. Future studies might examine how various economic sectors—industry, services, and agriculture—interact with European integration. Additionally, exploring the labor market impacts, such as employment rates, wage growth, and labor mobility, could offer important insights into workforce dynamics within the EU. Evaluating regional differences between urban and rural areas could also help develop more balanced policies for inclusive and sustainable growth. Broadening research in these areas will support policymakers in creating effective strategies for long-term economic development and stability.

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Appendix

Poland							
Donor country	Albania	Malaysia	South Africa	Korea, Rep.	China	India	Uruguay
Weight w_j	0.411	0.024	0.201	0.239	0.014	0.009	0.101

***Table 5**: Country weights in the synthetic Poland*

Czech Republic									
Donor country	Croatia	Russian Federation	Kazakhstan	Malaysia	Mexico	South Africa	Korea, Rep.	New Zealand	Peru
Weight w_j	0.140	0.095	0.015	0.182	0.012	0.023	0.002	0.276	0.255

***Table 6**: Country weights in the synthetic Czech Republic*

Slovakia				
Donor country	Croatia	Malaysia	New Zealand	Peru
Weight w_j	0.499	0.344	0.067	0.089

***Table 7**: Country weights in the synthetic Slovakia*

Hungary									
Donor country	Croatia	Azerbaijan	Moldova	North Macedonia	Malaysia	Korea, Rep.	New Zealand	Peru	Costa Rica
Weight w_j	0.309	0.001	0.224	0.032	0.077	0.088	0.076	0.005	0.185

***Table 8**: Country weights in the synthetic Hungary*

Slovania				
Donor country	Croatia	Korea, Rep.	New Zealand	Uruguay
Weight w_j	0.442	0.269	0.210	0.072

***Table 9**: Country weights in the synthetic Slovania*

Lithuania					
Donor country	Russian Federation	Azerbaijan	Moldova	Georgia	New Zealand
Weight w_j	0.371	0.001	0.001	0.507	0.119

***Table 10**: Country weights in the synthetic Lithuania*

Lativa							
Donor country	Croatia	North Macedonia	Malaysia	South Africa	New Zealand	Peru	Costa Rica
Weight w_j	0.289	0.213	0.040	0.064	0.003	0.082	0.309

***Table 11**: Country weights in the synthetic Lativa*

Estonia		
Donor country	Croatia	Korea, Rep.
Weight w_j	0.9	0.1

***Table 12**: Country weights in the synthetic Estonia*

Bulgaria							
Donor country	Croatia	Azerbaijan	Moldova	Albania	Colombia	South Africa	Turkiye
Weight w_j	0.088	0.002	0.047	0.047	0.005	0.352	0.175

***Table 13**: Country weights in the synthetic Bulgaria*

Romania								
Donor country	Croatia	Ukraine	Azerbaijan	Colombia	Korea, Rep.	New Zealand	Turkiye	Peru
Weight w_j	0.137	0.061	0.216	0.148	0.049	0.012	0.083	0.296

***Table 14**: Country weights in the synthetic Romania*