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Institutions and economic growth in European post-transition economies[*]

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Abstract

This paper discusses the role of institutions in economic growth in selected European post-transition economies. During the 1990s, Central and Eastern European countries faced challenges adapting their political and economic systems to keep up with a rapidly changing global landscape. They needed new institutions like regulations, social norms, and organisations to support a capitalist economy. These institutions provide a framework for economic activity and guide individuals to act in ways that align with economic goals. They are crucial for creating a stable environment for economic growth, promoting investment and innovation, and reducing uncertainty, which is essential for economic success. To analyse this, we conduct an econometric analysis of 16 European post-transition countries from 1998-2019 using fixed-effect, Arellano and Bond's first difference GMM estimator, and the system GMM estimator. The results indicate that institutions significantly impact economic growth.

Keywords: *institutions, economic growth, European post-transition countries*

JEL classification: *O17, O43, O47, O57*

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1. Introduction

In endogenous growth theory, technological knowledge is included as a factor of production in the aggregate production function, alongside labour and physical capital. Unlike the traditional neoclassical model, growth in these models is driven primarily by accumulating knowledge, which has unique characteristics such as being a nonrival and partially exclusive good. Since it is an impure public good, it generates positive externalities that boost production efficiency, and production efficiency encourages growth. This leads to increased returns on the scale, resulting in growth in output per capita. However, accumulating knowledge alone is insufficient for quality economic growth. Converting knowledge into new goods and services is equally important. Healthy institutions facilitate this conversion and promote economic growth and development.

North and Thomas (1973) highlighted that factor accumulation and innovation are important for growth but only immediate factors. They believed that the primary explanation for comparative growth lies in institutional differences. North (1987; 1990) defined institutions as *the rules of the game in a society or, more formally, humanly devised constraints that shape human interaction.* Economic institutions, such as property rights and perfect markets, play a crucial role in economic growth. These institutions impact the structure of economic incentives in society and help allocate resources to their most efficient uses. On the other hand, political institutions determine the distribution of political power in a society and how individuals can exercise political power. Different political regimes encourage varying economic institutions and policies, leading to different economic outcomes.

Rodrik (2000; 2007) defines institutions as rules of behaviour designed by humans that govern and shape interactions. These rules help individuals form expectations about other people's actions. Rodrik also identifies five categories of economic institutions: property rights, regulatory institutions, macroeconomic stabilisation institutions, social security institutions, and conflict management institutions. In addition, he mentions two types of political institutions: participatory political institutions such as democracies and autocratic political institutions. Rodrik argues that political institutions are crucial in determining a country's regime.

Although there is not a clear agreement on why some countries have higher per capita income than others, most research suggests that institutional differences and property rights play a significant role. Countries with better institutions and more secure property rights tend to invest more in physical and human capital, using these resources more efficiently to increase their income levels (Acemoglu et al., 2014). Differences in institutions between countries are often explained by the endogenous nature of institutions, which means they are determined by society as a whole or individuals, depending on the distribution of political power in society, among other theories.

The CEE countries selected were formerly communist or socialist and have implemented political, economic, and institutional reforms over the past three decades. These reforms have allowed them to become more integrated into the global economy, leading to faster economic growth and improved living standards. As a result, this sample is ideal for analysing the role of institutions in their economic growth, as some countries have achieved higher levels of development than others. This difference in development can be attributed to the institutions in place in these countries, which have shaped their economic landscape. Furthermore, the CEE countries serve as a useful case study for other nations looking to replicate their success.

Using an econometric model, this paper tests the hypothesis that institutions play a significant role in the economic growth of 16 European post-transition countries. In addition to common variables for growth regression, we use economic freedom and governance indicators to proxy institutional quality. Our contribution is that while the importance of institutions for economic growth is widely recognised, research on the impact of institutions in the CEE region is relatively rare.

The introduction is followed by a review of the empirical literature, which provides an overview of relevant studies on the impact of institutions on economic growth. The literature will be categorised into several groups based on the influence of institutions on economic growth. The third part explains the methodology of the empirical research conducted. It describes the data and variables in the model and conducts a descriptive analysis. The fifth part presents the results and discusses their implications. The concluding observations summarise the key findings of the research and suggest potential areas for future study.

2. Literature review

Numerous studies in literature have explored the relationship between institutions and economic growth. While there is no consensus on the exact nature of this interaction, most evidence suggests that institutions play a significant role in improving economic growth. For instance, research has found that soft factors such as property rights, freedom from corruption, and market freedom can explain differences in GDP per capita dynamics across countries. Additionally, institutional quality has been found to positively impact economic growth and mitigate competition brought about by trade openness (Cermakova et al., 2020). Studies also highlight the importance of improving institutions for sustained growth, particularly in developing economies. These findings suggest that countries should prioritise building better institutions to promote economic growth.

Nguyen et al. (2018) studied the impact of institutional quality on economic growth in 29 emerging economies. They find that institutional quality significantly

impacts economic growth and can mitigate the competition brought by trade openness. Human capital and reduced corruption are key measures for boosting growth. Experts recommend improving institutional transparency and building better institutions to promote economic growth in developing countries (Liaqat et al., 2018). Masuch et al. (2017) provide empirical evidence that the quality of institutions is an important determinant of long-term growth in European countries. They highlight the negative impact of high government debt coupled with low institutional quality on growth and the potential of good institutions to alleviate the debt problem. Asghar et al. (2020) investigate the impact of institutional quality on economic growth in developing economies of Asia. They find a positive impact of institutional quality on economic growth, with causality running from institutions to growth. Sumanjeet (2015) discusses the role of institutions in economic growth and emphasises the need for improved institutional transparency to reduce corruption and promote economic growth. Sarwar et al. (2013) examine the relationship between institutions and economic growth in South Asia. They find a significant positive effect of institutions on economic growth and suggest that countries should focus on building better institutions for development.

Some authors argue that institutional changes can negatively impact a country's economic growth. For instance, a study by Campos et al. (2019) on Brazil's history from 1870 to 2003 revealed that formal and informal political instability can negatively affect economic growth, with varying short-term and long-term effects. Another analysis by Akinlo (2016) examined data from sub-Saharan Africa and found that institutions may hinder growth, while human capital and money supply can have a positive influence. However, physical capital and interest rates may have a negative impact on economic growth.

Research has investigated the impact of economic institutions on the growth of post-transition economies in Europe. In a recent study by Javadov et al. (2022), the effect of economic institutions on the growth of selected post-Soviet countries was analysed. The findings suggest that economic institutions play a significant role in economic growth in these countries. The study revealed that factors such as corruption control, political globalisation, and the human development index positively impact growth. At the same time, trade openness, total natural resources rent, and foreign direct investment (FDI) contribute to the overall economic growth. A similar study by Piątek (2016) found that countries with poorer institutions before the financial crisis experienced faster economic growth. Still, this growth did not lead to changes in state institutions. Institutional aspects such as property rights, rules and regulations, good governance, and the state have been emphasised in both old and new institutional economics as alternative approaches to economic problems. In the case of transition economies, institutional aspects are even more critical for economic development. Therefore, it is crucial to consider the significance of institutions when building efficient institutions for long-term growth, as institutions matter.

Recent research suggests that the impact of institutions on economic growth is multidimensional, encompassing factors such as infrastructure, investments, remittances, and more. For example, a study by Zergawu et al. (2020) analysed panel data from 99 countries between 1980 and 2015 to examine the impact of infrastructure capital and institutional quality on economic growth. Through a simple growth model incorporating these factors and interaction terms, they found a positive and significant impact on economic growth. In particular, improving institutional quality is crucial for maximising returns from infrastructure capital. Similarly, Catrinescu et al. (2009) argue that remittances contribute more to long-term growth in countries with better political and economic institutions. Zghidi et al. (2018) also found strong evidence of a positive relationship between remittances and economic growth in a study of four North African countries. Additionally, Busse and Hefeker (2007) identified several significant determinants of foreign direct investment inflows, including government stability, internal and external conflicts, corruption and ethnic tensions, law and order, democratic government, and quality of bureaucracy.

3. Data and methodology

In this section, we delve into the details of the data, variables, and methodology used to investigate the impact of institutions on economic growth in 16 Central and Eastern European countries. We introduce the data and variables employed for the empirical analysis, followed by a comprehensive overview of the methodology adopted for data analysis.

3.1. Data and variables

We examine the role of institutions in economic growth in selected 16 European post-transition countries in the period 1998-2019 by analysing a reliable set of economic indicators from reputable international organisations. The sample for analysis consists of 16 countries from Central and Eastern Europe. These countries are the following: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Montenegro North Macedonia, Poland, Romania, Serbia, Slovak Republic and Slovenia.

Our main measure of economic growth is Gross Domestic Product at constant 2017 national prices (in millions of 2017 US dollars) from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023). We use the Index of Economic Freedom from the Heritage Foundation (2021), Economic Freedom from the Fraser Institute (2021), World Governance Indicators from the World Bank (2023) and the Corruption Perception Index from Transparency International (2023) to assess the country's institutional quality. We use these measures because they are widely accepted as reliable indicators of economic growth and institutional quality.

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The Index of Economic Freedom is a comprehensive measure used by the Heritage Foundation (2021) to assess the institutional quality of selected European post-transition countries. It is a comprehensive index that evaluates a country's economic freedom based on 12 quantitative and qualitative factors, including property rights, government integrity, and regulatory efficiency. The Index of Economic Freedom ranges from 0 to 100, with higher scores indicating greater economic freedom. The Heritage Foundation (2021), an American conservative think-tank, has been publishing the index annually since 1995, and it is widely recognised as a reliable source for assessing the institutional quality of a country.

The scatter chart below (Figure 1) depicts the relationship between the average Index of Economic Freedom from the Heritage Foundation (2021) and the average real GDP using a logarithmic scale for countries in the sample over the analysed period. The trend line reveals a positive correlation between economic freedom and real GDP, suggesting that policies fostering freedom can enhance economic performance. Nonetheless, it is essential to remember that correlation does not equate to causation, and other variables can also influence GDP.

Figure 1: Scatter chart of the average Index of Economic Freedom versus the average logarithm of real GDP in the period 1998-2019
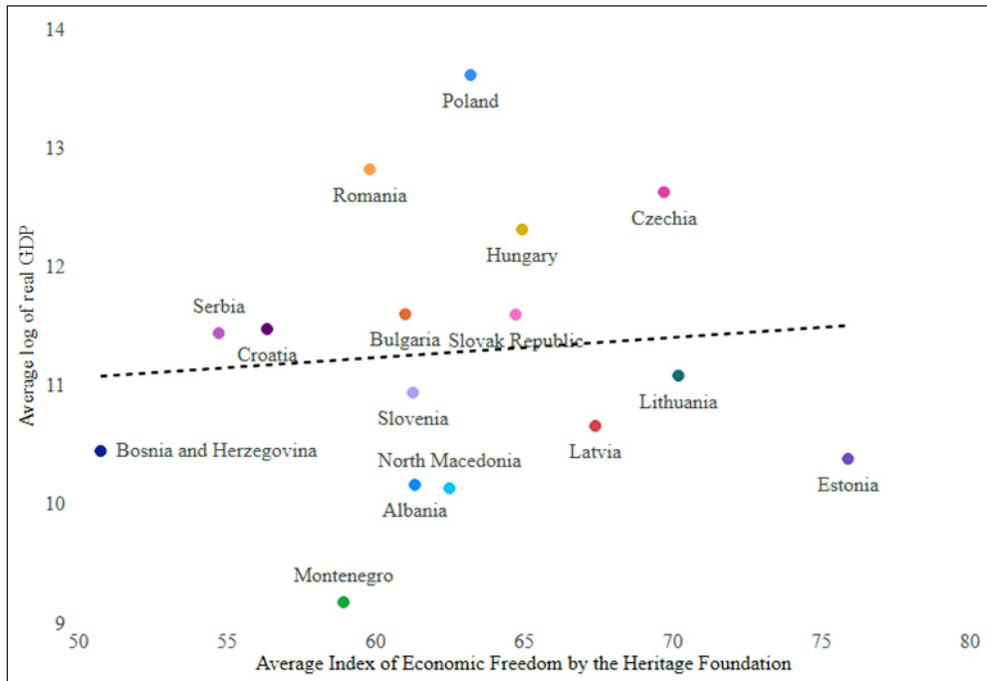
Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023) and The Heritage Foundation (2021)

The positive correlation in the scatter chart implies that countries with greater economic freedom tend to enjoy higher economic prosperity. This association indicates that measures to bolster economic freedom, such as reducing regulatory burdens, safeguarding property rights, ensuring government integrity, and promoting free trade, can cultivate an environment conducive to economic expansion. When businesses operate with fewer constraints and secure rights over their assets, they are more inclined to invest, innovate, and expand. These actions, in turn, drive heightened productivity and growth, thereby contributing to an increased real GDP.

When evaluating institutional quality in European post-transition countries, the Economic Freedom score from the Fraser Institute (2021) is often used as a reliable measure. This score is based on five key economic freedom areas: the size of government, legal system and property rights, sound money, freedom to trade internationally, and regulation. The Economic Freedom score ranges from 0 to 10, where higher scores indicate greater economic freedom in a particular country. Similar to the Index of Economic Freedom from the Heritage Foundation, the Economic Freedom score from the Fraser Institute (2021) is widely accepted as a credible indicator of institutional quality.

Figure 2 shows the relationship between average economic freedom and average real GDP using a logarithmic scale for countries in the analysed sample period, using the Economic Freedom Index from the Fraser Institute (2021). The trend line indicates a positive correlation between economic freedom and real GDP, suggesting that policies promoting freedom can improve economic performance. In this chart, the positive correlation is still evident, although the trend seems more moderate compared to the previous chart using the Heritage Foundation's (2021) index. This implies that while economic freedom is still linked to higher economic prosperity, the strength of this relationship may vary depending on the specific measures of economic freedom used.

The more moderate trend in the Fraser Institute (2021) chart suggests that the impact of economic freedom on GDP may not be as strong as indicated by the Heritage Foundation's (2021) index. It could be due to differences in the components and weightings of each index. The Fraser Institute (2021) may consider additional factors or place varying emphasis on aspects of economic freedom, leading to a slightly less steep correlation. Comparing the two charts highlights the importance of understanding the methodologies behind different indices. The Heritage Foundation's (2021) index showed a stronger positive trend, suggesting a more direct link between economic freedom and GDP. In contrast, the Fraser Institute's (2021) index indicates that while the relationship is still positive, other factors might play a more significant role, or the impact of economic freedom is more nuanced.

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These differences emphasise the need for policymakers to consider multiple perspectives when assessing economic conditions. Integrating insights from various economic freedom indices can achieve a more comprehensive and balanced understanding. This approach ensures that economic policies are well-informed and tailored to address a country's specific needs and circumstances, ultimately promoting more sustainable economic growth.

Figure 2: Scatter chart of the average Economic Freedom score versus the average logarithm of real GDP in the period 1998-2019
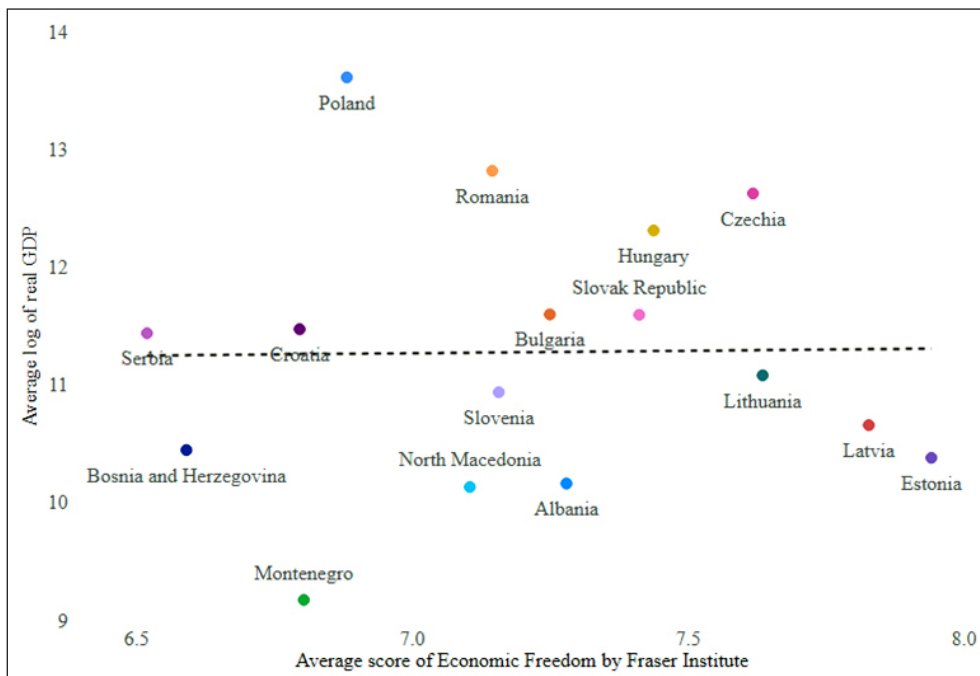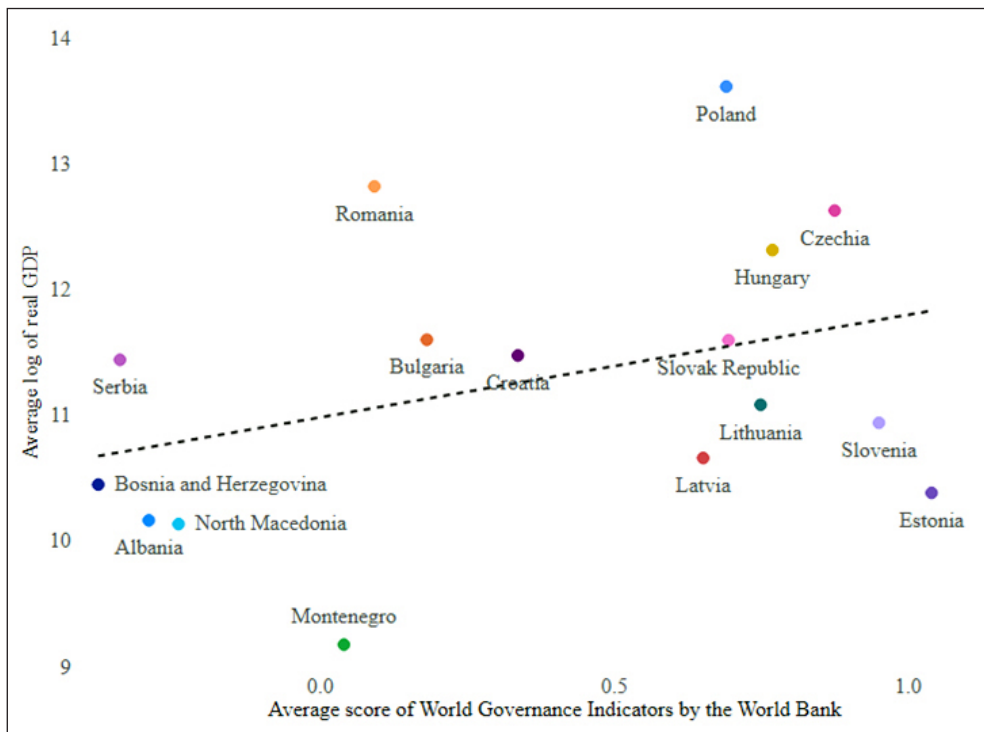

Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023) and The Fraser Institute (2021)

The World Governance Indicators evaluate a country's institutions based on six categories: voice and accountability, political stability and absence of violence/ terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption. We have averaged the six categories into one. The World Governance Indicators range from -2.5 to 2.5, with higher scores indicating better institutional quality.

The scatter chart below (Figure 3) illustrates the relationship between the average score of World Governance Indicators by the World Bank (2023) and the average real GDP, using a logarithmic scale for countries over the analysed period. The

trend line shows a positive correlation between governance quality and real GDP, suggesting that policies promoting good governance can enhance economic performance. This correlation indicates that improving governance quality, such as enhancing the rule of law, controlling corruption, ensuring regulatory quality, and maintaining political stability, can create an environment conducive to economic growth. Effective governance provides a stable and predictable environment for economic activities, encourages investment, and fosters sustainable development, leading to increased real GDP.

Figure 3: Scatter chart of the average World Governance Indicators score versus the average logarithm of real GDP in the period 1998-2019

Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023) and the World Bank (2023)

A comparison of the Economic Freedom Index from both the Heritage Foundation (2021) and the Fraser Institute (2021) reveals a stronger positive correlation between governance quality and real GDP. While economic freedom is crucial, effective governance appears to have a more substantial impact on economic prosperity. The trend line in this chart is steeper, indicating that improvements in governance quality are more closely linked to increases in GDP.

The Heritage Foundation's (2021) index showed a strong positive correlation between economic freedom and GDP, suggesting a direct link between economic policies that promote freedom and economic performance. However, the Fraser Institute's (2021) index displayed a more moderate trend, indicating that the impact of economic freedom on GDP might be less pronounced when measured by this index. In contrast, the World Governance Indicators (World Bank, 2023) chart shows the strongest positive correlation, implying that governance quality may be more critical in determining economic prosperity.

These comparisons highlight the multifaceted nature of economic growth. While economic freedom contributes significantly to economic performance, governance quality encompasses broader factors that provide a foundation for sustainable growth. Effective governance ensures a fair and predictable environment, reducing risks and uncertainties that can hinder economic activities.

For policymakers, these insights emphasise the need for a balanced approach considering economic freedom and governance quality. By improving governance alongside promoting economic freedom, countries can create a more robust environment for economic activities, fostering long-term growth and stability. Integrating insights from various indices, such as those from the Heritage Foundation (2021), Fraser Institute (2021), and World Bank (2023), provides a comprehensive understanding of the factors driving economic prosperity. This holistic approach is essential for designing well-informed policies that address multiple dimensions of development, ultimately leading to sustainable economic growth.

As mentioned earlier, the Corruption Perception Index from Transparency International (2023) is utilized to measure the quality of institutions in the selected European post-transition countries. This index evaluates the level of corruption in a country's public sector based on expert opinions and surveys. The CPI ranges from 0 to 100, where higher scores indicate lower levels of corruption. It is widely regarded as a reliable indicator of institutional quality, and many studies have examined its correlation with economic growth.

Figure 4 illustrates the connection between the average score of the Corruption Perception Index by Transparency International (2023) and the average real GDP, using a logarithmic scale for countries in the sample over the analysed period. The trend line demonstrates a positive correlation between the perception of lower corruption and real GDP, suggesting that reducing corruption can positively impact economic performance. This correlation indicates that reducing corruption, which enhances transparency and accountability, can create an environment conducive to economic growth. When corruption is perceived to be low, businesses encounter fewer obstacles, leading to increased investment and sustainable development. These actions drive higher productivity and growth, increasing real GDP.

Figure 4: Scatter chart of the average Corruption Perception Index versus the average logarithm of real GDP in the period 1998-2019
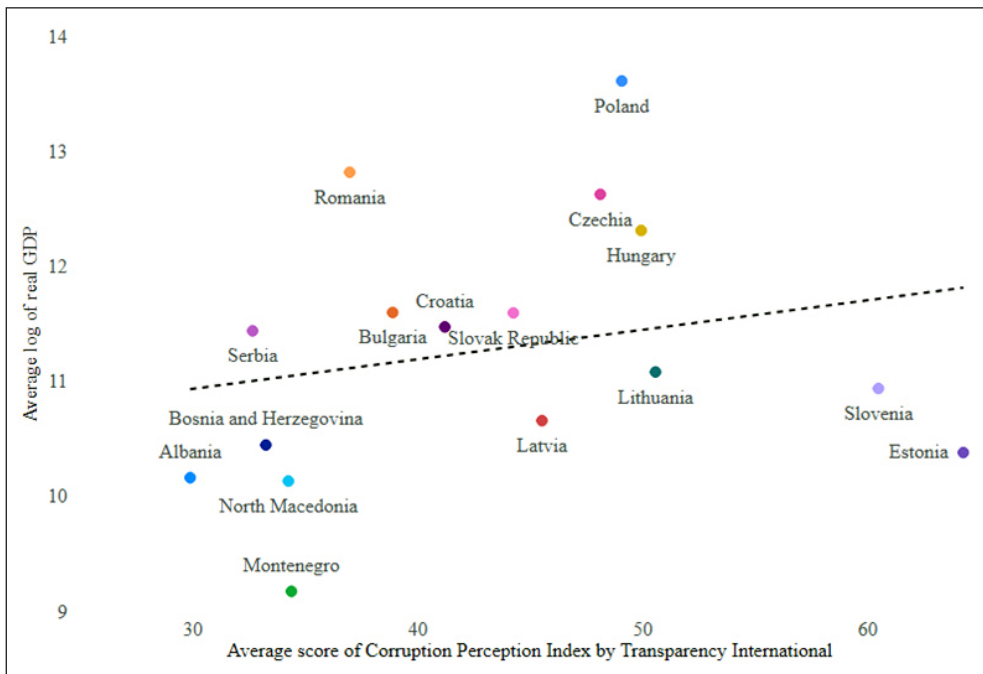
Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023) and The Transparency International (2023)

When comparing this chart with previous ones using the Economic Freedom Index from the Heritage Foundation (2021), the Fraser Institute (2021), and the World Governance Indicators (World Bank, 2023), it is clear that the positive correlation between lower corruption perception and GDP is significant. However, the trend is less pronounced than the World Governance Indicators (World Bank, 2023). The Heritage Foundation (2021) and Fraser Institute (2021) indices displayed varying strengths of positive correlation with GDP, with the World Governance Indicators (World Bank, 2023) showing the strongest correlation.

These comparisons highlight that while economic freedom and governance quality are crucial, the perception of corruption also plays a vital role in economic prosperity. Effective anti-corruption measures can enhance trust and stability, both essential for economic activities. Policymakers should consider integrating anti-corruption strategies with efforts to improve economic freedom and governance quality, creating a comprehensive approach that fosters a robust environment for economic growth. This holistic strategy ensures that economic policies are well-informed, addressing multiple facets of development to achieve sustainable economic prosperity.

It is important to acknowledge that while economic freedom, governance quality, and low corruption play significant roles in driving economic performance, they are not the only factors at play. Numerous other variables influence a country's economic outcomes. For instance, a country with high economic freedom but low political stability may struggle to attract investment or sustain growth. Likewise, strong infrastructure and a skilled workforce can enhance the benefits of economic freedom by boosting productivity and efficiency. In this context, we use regression analyses to test the relationship between institutional variables and economic growth, considering physical capital, human capital, population, trade, and inflation variables.

Given these complexities, policymakers need to adopt a comprehensive approach when developing economic policies. While increasing economic freedom is crucial, it must be accompanied by strategies that address other critical aspects of economic development. For instance, improving educational systems can create a more skilled labour force that drives innovation and economic growth. Additionally, investing in infrastructure can lower transaction costs and enhance market access, maximizing the benefits of economic freedom.Maintaining political stability and strengthening institutions can create a more predictable and secure environment for economic activities. This holistic approach ensures that the potential benefits of economic freedom are fully realised and sustained over the long term. Additionally, monitoring and evaluating policy impacts are essential for making data-driven adjustments and effectively responding to emerging challenges and opportunities.

The positive correlation between economic freedom, governance quality, low corruption, and real GDP highlighted in the previous scatter charts underscores the importance of policies that promote economic freedom. However, for these policies to be most effective, they must be part of a broader strategy that addresses various dimensions of economic development. By adopting a multifaceted approach, policymakers can establish a strong foundation for sustainable economic growth and prosperity.

Descriptive statistics for variables used in the full sample from 1998-2019 are presented in Table 1. We use the capital stock at constant 2017 national prices (in millions of 2017 US dollars) as a measure of capital. Effective employment is calculated by multiplying the number of people engaged in employment (in millions) with the human capital index. The human capital index is based on years of schooling and returns to education from the Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023). However, due to data scarcity in Bosnia and Herzegovina, Montenegro, and North Macedonia, the human capital index is calculated only based on gross enrollment in tertiary education. Missing data is calculated using the linear interpolation method. As other control variables, we use inflation measured by the annual percentage of consumer prices from the World Bank (2023) World Development Indicators as a measure of macroeconomic stability, trade openness as a sum of exports and imports as

a percentage of GDP from the World Bank (2023) database, and population in millions from the Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023).

Table 1: Descriptive statistics of the variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Real GDP (in millions of 2017 US dollars)	352	153,457.2	212,124.3	6,532.507	1,214,222
Capital (in millions of 2017 US dollars)	352	588,657.4	617,964.1	19,850.78	2,887,940
Employment (in millions)	352	3.125	3.836	0.176	16.212
Human capital	352	3.146	0.28	2.584	3.849
Index of Economic Freedom (HF)	352	62.682	7.994	29.4	79.1
Economic Freedom (FI)	352	7.213	0.573	5.281	8.22
World Governance Indicators (WB)	352	0.365	0.507	-1.214	1.234
Corruption Perception Index (TI)	352	43.378	11.737	13	74
Inflation	352	4.925	8.851	-1.584	95.005
Trade openness	352	106.229	32.700	22.492	189.804
Population (in millions)	352	7.641	9.311	0.613	38.568

Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023), The Heritage Foundation (2021), The Fraser Institute (2021), the World Bank (2023) and the Transparency International (2023)

Table 2 indicates the strength and direction of the relationships between the variables. The correlation coefficients range from -1 to 1, where -1 indicates a perfect negative correlation, 0 indicates no correlation, and 1 indicates a perfect positive correlation. As can be seen from the table, there is a positive and statistically significant correlation between real GDP and institutional quality measures, such as the Index of Economic Freedom, World Governance Indicators, and Corruption Perception Index. In addition, a positive and significant correlation exists between real GDP and capital, employment and human capital. This suggests that countries with better institutions and more physical and human capital have higher economic growth. This relationship is further supported by countries with higher economic growth, which tend to have better institutional quality and greater investments in capital, employment, and human capital.

On the one hand, there is a clear negative correlation between real GDP and inflation and trade openness. The negative correlation between real GDP and inflation is not surprising, as inflation reduces the value of money, which results in less money being available for consumer spending, ultimately leading to reduced economic growth. Concerning trade openness, the negative correlation can be explained by the gradual closure of economies following the global financial crisis in 2008.

Table 2: Correlation matrix of the variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Real GDP	1.00										
(2) Capital	0.88*	1.00									
(3) Employment	0.95*	0.82*	1.00								
(4) Human capital	0.28*	0.49*	0.17*	1.00							
(5) Index of Economic Freedom (HF)	0.12*	0.23*	0.01	0.59*	1.00						
(6) Economic Freedom (FI)	0.01	0.15*	-0.12*	0.55*	0.85*	1.00					
(7) World Governance Indicators (WB)	0.25*	0.38*	0.16*	0.71*	0.66*	0.59*	1.00				
(8) Corruption Perception Index (TI)	0.20*	0.27*	0.07	0.71*	0.69*	0.64*	0.84*	1.00			
(9) Inflation	-0.03	-0.03	0.14*	-0.24*	-0.36*	-0.45*	-0.27*	-0.31*	1.00		
(10) Trade openness	-0.11*	0.06	-0.24*	0.65*	0.59*	0.61*	0.63*	0.65*	-0.34*	1.00	
(11) Population	0.94*	0.78*	0.99*	0.12*	-0.04	-0.16*	0.12*	0.03	0.11*	-0.28*	1.00

Note: * denotes significance level at 10%

Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023), The Heritage Foundation (2021), The Fraser Institute (2021), the World Bank (2023) and the Transparency International (2023)

The correlation matrix suggests that institutional quality, good governance, capital, employment efficiency and openness to trade play a crucial role in driving economic growth in European post-transition countries. However, further analysis is required to investigate the relationship between these factors and their impact on economic growth. The study aims to determine whether these factors have a significant statistical impact on economic growth and its direction.

3.2. Empirical methodology

We use the neoclassical Solow growth model (Solow, 1956) in the form of the Cobb-Douglass production function to understand the role of institutions in economic growth in the selected 16 European post-transition countries from 1998 to 2019. The Solow growth model is a widely accepted economic theory that explains economic growth through the accumulation of capital and technological progress. The Cobb-Douglass production function is a specific formulation of the Solow growth model that assumes constant returns to scale to capital and labour inputs. It is expressed as:

$$Y = A \times K^{\alpha} \times (hL)^{1-\alpha} \tag{1}$$

where Y is output, K is capital, hL is effective labour, A is total factor productivity, and α is the share of capital in total income.

Using an extended growth model, we aim to examine how institutional quality affects economic growth. We expand upon the Solow model by introducing institutional quality and other control variables as explanatory variables to measure their impact on economic growth.

$$lny_{it} = C + \gamma lny_{it-1} + \delta INST_i t + \lambda lnX it + \mu_i + \eta_t + u_{it} \tag{2}$$

where lny_{it} is the log value of real GDP, lny_{it-1} is lagged log value of GDP, $INST_{it}$ is one of the institutional variables mentioned above, lnX_{it} is log value of control variables used in the model in a concrete country i, in a certain period t. μ_i is the country fixed effect and η_t is the period effect.

There are multiple methods to assess equation. The ordinary least squares method and fixed effect are the most straightforward and convenient techniques. But, because lny_{it-1} is correlated μ_i, estimating the above equation with these methods produces a biased estimate. Using the difference between variables in the original data can be an alternative to solve this issue.

$$\Delta lny_{it} = \gamma \Delta lny_{it-1} + \delta \Delta INST_{it} + \lambda \Delta lnX_{it} + \Delta \eta_t + \Delta u_{it} \tag{3}$$

To tackle the issue of endogeneity, this study employs the Arellano and Bond (1991) first difference GMM estimator and/or the system GMM estimator (Arellano and Bover, 1995; Blundell and Bond, 1998) to estimate the parameters.

4. Results and discussion

The table below (Table 3) displays the findings of our econometric analysis, where we used the Index of Economic Freedom by the Heritage Foundation (2021) to gauge the country's institutional quality. Our dependent variable is the logarithm of real GDP, and we have included all the independent and control variables. We used various estimation techniques, such as pooled OLS, fixed effect, Arellano and Bond first difference GMM, and system GMM, as mentioned earlier.

The Index of Economic Freedom coefficient is statistically significant at 1% in the fixed effect model. This suggests a positive relationship between economic freedom and real GDP growth. The coefficient value is 0.004, meaning that a one-unit increase in the index boosts real GDP by an average of 0.004% while holding all other variables constant. This finding aligns with the idea that greater economic

freedom creates a favourable environment for business operations, leading to increased productivity and growth. Empirical studies indicate that improvements in economic freedom, such as reduced government intervention and enhanced property rights, stimulate economic activities by promoting entrepreneurship and attracting foreign investment (de Haan and Sturm, 2000; Dawson, 2003).

Table 3: Results from the regression model using the Index of Economic Freedom by the Heritage Foundation (2021) as a measure of institutional quality

Dependent variable: RGDP (log)	Pooled OLS	Fixed effect	Difference GMM	System GMM
Real GDP (-1) (log)	-	-	0.009 (0.987)	0.066 (0.091)
Capital (log)	0.231*** (0.028)	0.328*** (0.038)	-0.08 (0.093)	-0.14*** (0.027)
Effective employment (log)	0.429*** (0.068)	0.479*** (0.071)	0.111* (0.063)	0.11** (0.046)
Index of Economic Freedom (HF)	0.003 (0.002)	0.004*** (0.001)	-0.001** (0.0004)	-0.001 (0.001)
Inflation	-0.007*** (0.001)	-0.003*** (0.0006)	0.0003*** (0.0001)	0.0002 (0.0001)
Trade openness	0.003*** (0.0004)	0.003*** (0.0003)	0.002*** (0.0003)	0.002*** (0.0003)
Population (log)	0.404*** (0.059)	-0.936*** (0.149)	0.745 (0.951)	0.065* (0.034)
Constant	6.454*** (0.323)	7.136*** (0.513)	-	1.382*** (0.286)
R-squared	0.971	0.869	-	-
F-test	1,949.85***	364.70***	-	-
AR (2) test	-	-	-1.99*	-2.073**
Sargan test	-	-	11.414	10.24

Note: *, **, *** denotes significance levels at 10%, 5% and 1%, respectively

Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023), The Heritage Foundation (2021), the World Bank (2023)

The pooled OLS model has a positive, but not statistically significant, coefficient of 0.003 for the Index of Economic Freedom. This suggests a potential positive relationship between economic freedom and GDP levels. However, the lack of statistical significance implies that this relationship might not be robust in this estimation method. The significant positive coefficient in the fixed effect model indicates that economic freedom consistently benefits GDP growth when accounting for unobserved heterogeneity.

The first difference in the GMM model shows a negative, yet statistically significant, coefficient of -0.001. The negative coefficient might indicate that while economic freedom is associated with higher GDP levels, its marginal effect on GDP growth diminishes over time, particularly in economically free and developed countries. This could reflect the saturation effect, where additional increments in economic freedom yield smaller growth benefits. Countries with a higher Index of Economic Freedom are typically more developed nations and tend to have lower economic growth rates (Knack and Keefer, 1995). The contrasting findings between different models might explain the varying sensitivity to short-term versus long-term effects of institutional quality on economic performance, as Acemoglu et al. (2001) discussed. While the fixed effect model captures the immediate benefits of economic freedom on GDP, the dynamic GMM models highlight the complexities of sustaining growth in mature economies where the marginal returns to improvements in economic freedom might diminish (Rodrik et al., 2004).

In the system GMM model, the Index of Economic Freedom coefficient is negative (-0.001) and not statistically significant. This might suggest that in the context of dynamic panel data accounting for potential endogeneity, the direct impact of economic freedom on GDP growth is less clear-cut. The system GMM method addresses potential biases in the estimations by using lagged variables as instruments, providing a more robust analysis of the dynamic relationships. The mixed results across different models underscore the complexity of the relationship between institutional quality and economic performance, where short-term dynamics might obscure long-term benefits and vice versa.

Capital input significantly and positively affects real GDP growth in the pooled OLS and fixed effect models, indicating that increased capital investment is crucial for economic growth. The positive relationship underscores the importance of capital accumulation in enhancing production capacity and economic output (Mankiw et al., 1992). However, the negative coefficient in the system GMM model may reflect diminishing returns to capital or potential measurement issues in dynamic panel data settings. Effective employment consistently exhibits a positive and significant impact across all models, highlighting the critical role of labour force efficiency in driving economic growth. This suggests that better workforce utilisation, possibly through education and training, significantly contributes to higher GDP levels (Barro, 1991). Inflation shows mixed effects, with a negative and significant coefficient in the OLS and fixed effect models, aligning with the typical understanding that higher inflation hampers growth (Fischer, 1993). This negative impact of inflation on growth can be attributed to the uncertainty and reduced purchasing power it creates, deterring investment and consumption. Conversely, trade openness consistently has a positive influence on real GDP, demonstrating that greater integration into global markets fosters economic development by expanding

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market opportunities and facilitating technology transfer (Edwards, 1998). Population effects are mixed, possibly reflecting the diverse impacts of demographic changes on different economies. While a larger population can provide a greater labour force and consumer base, it may also strain resources if not managed effectively (Bloom and Canning, 2001).

Table 4: Results from the regression model using the Economic Freedom score by the Fraser Institute (2021) as a measure of institutional quality

Dependent variable: RGDP (log)	Pooled OLS	Fixed effect	Difference GMM	System GMM
Real GDP(-1) (log)	-	-	0.157[*] (0.081)	0.063 (0.089)
Capital (log)	0.238[***] (0.028)	0.328[***] (0.034)	-0.054 (0.106)	-0.163[***] (0.032)
Effective employment (log)	0.474[***] (0.066)	0.453[***] (0.07)	0.062 (0.069)	0.11[***] (0.04)
Economic Freedom (FI)	-0.027 (0.028)	0.078[***] (0.019)	0.013 (0.008)	0.016[**] (0.006)
Inflation	-0.008[***] (0.001)	-0.002[***] (0.001)	0.0002 (0.0002)	0.0003 (0.0002)
Trade openness	0.003[***] (0.0004)	0.003[***] (0.0003)	0.001[***] (0.0001)	0.002[***] (0.0002)
Population (log)	0.348[***] (0.056)	-0.88[***] (0.149)	1.06 (1.029)	0.088[**] (0.037)
Constant	6.802[***] (0.341)	6.809[***] (0.482)	-	1.488[***] (0.309)
R-squared	0.971	0.872	-	-
F-test	1,944.21[***]	374.84[***]	-	-
AR (2) test	-	-	-1.654[*]	-2.059[**]
Sargan test	-	-	14.475	10.128

Note: *, **, *** denotes significance levels at 10%, 5% and 1%, respectively

Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023), The Fraser Institute (2021), the World Bank (2023)

In the following regression analysis (Table 4), we used the Economic Freedom score from the Fraser Institute (2021) as a proxy for the country's institutional quality. In the fixed effect model, the Economic Freedom score from the Fraser Institute (2021) shows a statistically significant coefficient at 1%, indicating a positive relationship between economic freedom and real GDP growth. The coefficient value is 0.078, suggesting that a one-unit increase in the Economic Freedom score boosts real GDP by an average of 0.078%, holding all other variables constant. This

aligns with the notion that greater economic freedom, characterised by minimal government intervention and strong property rights, promotes a favourable business environment, enhancing productivity and economic growth. The pooled OLS model, however, shows a negative. However, there is no statistically significant coefficient of -0.027 for the Economic Freedom score, suggesting a potential negative relationship that lacks robustness in this estimation method. The fixed effect model's significant positive coefficient underscores the consistent benefits of economic freedom on GDP growth when unobserved heterogeneity is accounted for.

The first difference in the GMM model presents a positive but not statistically significant coefficient of 0.013. This indicates that while economic freedom is associated with higher GDP levels, its effect on GDP growth is less clear in this model, possibly due to the dynamic nature of economic freedom's impact over time. This could reflect the complexities of institutional quality affecting short-term versus long-term economic performance. Countries with higher Economic Freedom scores typically experience different growth dynamics, and the marginal effects might vary depending on their development stage. The varying results between different models might be explained by their sensitivity to short-term versus long-term effects, as Acemoglu et al. (2001) discuss. The fixed effect model captures immediate benefits, while dynamic GMM models highlight the nuanced and potentially diminishing returns in mature economies (Rodrik et al., 2004).

In the system GMM model, the Economic Freedom coefficient is positive and statistically significant at 5%, with a value of 0.016. This indicates that, in a dynamic context accounting for potential endogeneity, an increase in the Economic Freedom score leads to an average increase of 0.016% in the real GDP growth rate. The system GMM method, by addressing biases using lagged variables as instruments, provides a robust analysis of the dynamic relationships between economic freedom and GDP growth. This model's positive and significant coefficient underscores the importance of institutional quality in fostering economic growth over time despite potential short-term complexities.

Regarding control variables, capital and effective employment consistently impact real GDP growth, similar to the previous model. Capital input significantly and positively affects real GDP growth in the pooled OLS and fixed effect models, while the system GMM model shows a negative coefficient. Effective employment consistently shows a positive and significant impact across all models. Inflation has mixed effects, with a negative and significant coefficient in the OLS and fixed effect models. Trade openness consistently positively influences real GDP across all models. Population effects are mixed, reflecting diverse impacts in different economies.

The World Governance Indicators have a significant impact on economic growth (Table 5). In the fixed-effect model, the World Governance Indicators (WGI) from the World Bank (2023) show a statistically significant coefficient at 1%, indicating a positive relationship between governance quality and real GDP growth. The coefficient value is 0.264, suggesting that a one-unit increase in the WGI boosts real GDP by an average of 0.264%, holding all other variables constant. This result supports the view that strong governance, characterised by effective government institutions, regulatory quality, and the rule of law, creates a stable environment conducive to economic growth (Kaufmann et al., 2009). The pooled OLS model also shows a positive and statistically significant coefficient of 0.252 for the WGI, further underscoring the positive impact of good governance on economic performance. The fixed-effect model's significant positive coefficient highlights the consistent benefits of robust governance on GDP growth when accounting for unobserved heterogeneity.

Table 5: Results from the regression model using the World Governance Indicators from the World Bank (2023) as a measure of institutional quality

Dependent variable: RGDP (log)	Pooled OLS	Fixed effect	Difference GMM	System GMM
Real GDP(-1) (log)	-	-	0.102* (0.059)	0.056 (0.091)
Capital (log)	0.183*** (0.027)	0.385*** (0.028)	-0.145*** (0.043)	-0.157*** (0.026)
Effective employment (log)	0.309*** (0.063)	0.447*** (0.065)	0.132*** (0.033)	0.14*** (0.026)
World Governance Indicators (WB)	0.252*** (0.034)	0.264*** (0.03)	-0.03** (0.015)	-0.016 (0.022)
Inflation	-0.005*** (0.001)	-0.002*** (0.0006)	0.0002* (0.0001)	0.0001 (0.0001)
Trade openness	0.002*** (0.0004)	0.003*** (0.0003)	0.001*** (0.0002)	0.002*** (0.0002)
Population (log)	0.558*** (0.056)	-0.614*** (0.141)	-0.135 (0.398)	0.05 (0.032)
Constant	7.299*** (0.302)	6.155*** (0.448)	-	1.550*** (0.254)
R-squared	0.975	0.891	-	-
F-test	2,251.89***	449.30***	-	-
AR (2) test	-	-	-2.066**	-2.096**
Sargan test	-	-	13.598	12.063

Note: *, **, *** denotes significance levels at 10%, 5% and 1%, respectively

Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023), the World Bank (2023)

The first difference in the GMM model presents a negative, yet statistically significant, coefficient of -0.03. It suggests that while governance quality is associated with higher GDP levels, its marginal effect on GDP growth diminishes over time, particularly in well-governed and developed countries. It may indicate a saturation effect, where additional improvements in governance yield smaller growth benefits. The mixed results between different models might be explained by their sensitivity to short-term versus long-term effects of governance quality on economic performance (Rodrik et al., 2004). While the fixed-effect model captures the immediate benefits of good governance on GDP, the dynamic GMM models highlight the complexities of sustaining growth in mature economies where the marginal returns to improvements in governance might diminish.

The system GMM model's WGI coefficient is negative (-0.016) and not statistically significant. This suggests that in the context of dynamic panel data accounting for potential endogeneity, the direct impact of governance quality on GDP growth is less clear-cut. The system GMM method, by addressing biases using lagged variables as instruments, provides a robust analysis of the dynamic relationships between governance quality and GDP growth. The mixed results across different models underscore the complexity of the relationship between institutional quality and economic performance, where short-term dynamics might obscure long-term benefits.

Regarding control variables, capital and effective employment consistently impact real GDP growth, similar to the previous model. Capital input significantly and positively affects real GDP growth in the pooled OLS and fixed-effect models, while the system GMM model shows a negative coefficient. Effective employment consistently shows a positive and significant impact across all models. Inflation has mixed effects, with a negative and significant coefficient in the OLS and fixed-effect models. Trade openness consistently positively influences real GDP across all models. Population effects are mixed, reflecting diverse impacts in different economies.

The Corruption Perception Index has a positive and statistically significant impact on real GDP growth (Table 6). In the fixed-effect model, the Corruption Perception Index (CPI) from Transparency International (2023) demonstrates a statistically significant coefficient at 1%, indicating a positive relationship between corruption perception and real GDP growth. The coefficient value is 0.006, suggesting that a one-unit increase in the CPI boosts real GDP by an average of 0.006%, holding all other variables constant. This result supports the view that lower corruption levels (higher CPI scores) create a more conducive environment for economic growth by fostering trust in institutions and reducing transaction costs (Mauro, 1995). The pooled OLS model also shows a positive and statistically significant coefficient of 0.013 for the CPI, further underscoring the positive impact of lower corruption on economic performance. The fixed-effect model's significant positive coefficient highlights the consistent benefits of reducing corruption on GDP growth when accounting for unobserved heterogeneity.

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Table 6: Results from the regression model using the Corruption Perception Index from Transparency International (2023) as a measure of institutional quality

Dependent variable: RGDP (log)	Pooled OLS	Fixed effect	Difference GMM	System GMM
Real GDP (-1) (log)	-	-	0.128 (0.089)	0.077 (0.11)
Capital (log)	0.191*** (0.025)	0.361*** (0.03)	-0.109* (0.063)	-0.142*** (0.027)
Effective employment (log)	0.3*** (0.058)	0.336*** (0.07)	0.112* (0.059)	0.121** (0.05)
Corruption Perception Index (TI)	0.013*** (0.001)	0.006*** (0.001)	-0.001 (0.001)	-0.001 (0.001)
Inflation	-0.005*** (0.001)	-0.002*** (0.001)	0.0003** (0.0001)	0.0001 (0.001)
Trade openness	0.002*** (0.0004)	0.003*** (0.0003)	0.001*** (0.0002)	0.002*** (0.0002)
Population (log)	0.571*** (0.05)	-0.693*** (0.147)	0.099 (0.630)	0.053 (0.039)
Constant	6.773*** (0.273)	6.612*** (0.462)	-	1.389*** (0.264)
R-squared	0.978	0.882	-	-
F-test	2,545.52***	409.92***	-	-
AR (2) test	-	-	-2.046**	-2.016**
Sargan test	-	-	14.167	10.51

*, **, *** denotes significance levels at 10%, 5% and 1%, respectively.

Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023), the World Bank (2023) and the Transparency International (2023)

The first difference in the GMM model presents a negative but not statistically significant coefficient of -0.001. This suggests that while lower corruption is associated with higher GDP levels, its marginal effect on GDP growth diminishes over time, particularly in already low-corruption and developed countries. This may indicate a saturation effect, where further reductions in corruption yield smaller growth benefits. The mixed results between different models might be explained by their sensitivity to short-term versus long-term effects of corruption reduction on economic performance (Treisman, 2000). While the fixed-effect model captures the immediate benefits of lower corruption on GDP, the dynamic GMM models highlight the complexities of sustaining growth in mature economies where the marginal returns to improvements in corruption perception might diminish.

In the system GMM model, the CPI coefficient is negative (-0.001) and not statistically significant. This suggests that in the context of dynamic panel data accounting for potential endogeneity, the direct impact of corruption perception on GDP growth is less clear-cut. The system GMM method, by addressing biases using lagged variables as instruments, provides a robust analysis of the dynamic relationships between corruption perception and GDP growth. The mixed results across different models underscore the complexity of the relationship between institutional quality and economic performance, where short-term dynamics might obscure long-term benefits.

Regarding control variables, capital and effective employment consistently impact real GDP growth, similar to the previous model. Capital input significantly and positively affects real GDP growth in the pooled OLS and fixed-effect models, while the system GMM model shows a negative coefficient. Effective employment consistently shows a positive and significant impact across all models. Inflation has mixed effects, with a negative and significant coefficient in the OLS and fixed-effect models. Trade openness consistently positively influences real GDP across all models. Population effects are mixed, reflecting diverse impacts in different economies.

Two specification tests are crucial to ensure the validity of the GMM estimation method. These are the Sargan test and the Arellano–Bond test. The Sargan test verifies that the instruments used in the estimation are not correlated with the error term. Meanwhile, the Arellano–Bond test detects the presence of second-order serial correlation in the error term. Results from both tests are presented in the lower section of all tables. The Hansen test has a p-value greater than 0.05 in all models or a statistically insignificant result, indicating the instruments' validity. The estimation results were not weakened by instrumental proliferation since the strategy Roodman (2009) suggested was followed. The p-value of the Arellano–Bond test shows different results. Tables 3 and 4 indicate that we cannot reject the null hypothesis of no second-order serial correlation in the difference GMM model at a 5% significance level, and the same applies to the system GMM model at a 1% significance level. Arellano-Bond tests for the difference and system GMM models from Tables 5 and 6 have p-values greater than 0.01, indicating that we cannot reject the null hypothesis at a 1% significance level. Overall, the results of the system GMM are satisfactory and robust.

The Index of Economic Freedom positively impacts real GDP growth, but the first difference in the GMM model suggests a negative coefficient. Institutional quality, estimated using the Economic Freedom score, positively impacts economic growth. The World Governance Indicators significantly impact economic growth, with a positive coefficient in the fixed effect model and a negative impact in the difference GMM model. The Corruption Perception Index also has a positive impact on real GDP growth. To sum up, the analysis emphasises the significance of institutional

factors in shaping economic growth, highlighting the intricate nature of these relationships. The reliability of the findings is reinforced by the consistency of results across models and the robustness of the GMM estimations.

The institution's quality, measured by different indicators, positively impacts economic growth in post transition countries (Buterin et al., 2017). In our case, all four institutional indicators positively and significantly impact real GDP growth. Except for the impact of World Governance Indicators, the strength of other institutional indicators is mild, but they impact positively and significantly. These countries underwent institutional reforms that varied in effectiveness at increasing transparency and accountability (Beck and Laeven, 2006). This led to improved rule of law, increased political stability, and more efficient regulatory environments, which attracted foreign investment and increased domestic entrepreneurship. After the financial crisis, the implementation of these reforms began to lag, and their effects were weakened. Therefore, it is necessary to maintain and further improve the quality of institutions to sustain economic growth in the long run (Moers, 1999).

It is important to sustain and improve institutional quality for long-term economic growth, as emphasised by (Moers, 1999). However, the impact of institutional indicators on post-transition countries' economies is complex. In our case, all four institutional indicators significantly influenced real GDP growth, highlighting the crucial role of effective institutional reforms. Though some indicators showed mild strength, their positive impact on economic growth indicates their contribution to transparency, accountability, and overall governance. The effectiveness of institutional reforms in enhancing transparency and accountability varies, as noted by Beck and Laeven (2006). Therefore, continuous efforts are needed to strengthen these foundations. Improvements in the rule of law, political stability, and regulatory environments have been instrumental in attracting foreign investment and promoting domestic entrepreneurship. However, the slowdown in implementing reforms post-financial crisis poses a challenge, which calls for a renewed commitment to maintain and advance institutional quality for sustained economic prosperity.

In the difference and system GMM models, we use the differences between variables to observe the negative impact of institutions. This is expected because, in these models, the dependent variable is different, and the results show the effect of institutions on the economy's growth rate. As economies grow over time, their growth rates become smaller (Tebaldi and Elmslie, 2008). Therefore, it is essential to consider this trend when analysing the effects of institutions on the economy's growth rate. By doing so, we can better understand how institutions impact economic growth and identify ways to improve economic performance over time.

5. Conclusion

Romer (1990) proposed that a nation's commitment to innovation can result in higher levels of prosperity. Meanwhile, North and Thomas (1973) argued that institutions, such as property rights and market structures, play a crucial role in the growth of economies. Societies with institutions supporting the accumulation of factors, innovation, and efficient allocation of resources tend to thrive. Different political regimes encourage diverse institutions and policies, leading to varying economic outcomes. This paper analyses the impact of institutions on economic growth in 16 European countries that have undergone a transition. The study applies econometric analysis to the data from 1998 to 2019, using fixed-effect, Arellano and Bond's first difference GMM estimator, and the system GMM estimator.

The scatter charts collectively illustrate the significant impact of economic freedom and governance quality on real GDP, with each factor making a distinct contribution to economic performance. The charts, using indices from the Heritage Foundation (2021) and the Fraser Institute (2021), indicate a positive correlation between economic freedom and GDP, with the Heritage Foundation's (2021) index showing a stronger relationship. This underscores the importance of policies that reduce regulatory burdens and promote free trade to drive economic prosperity. In contrast, the chart using the World Governance Indicators by the World Bank (2023) reveals the strongest positive correlation, suggesting that good governance, including the rule of law and control of corruption, is crucial for economic growth. Furthermore, the chart using the Corruption Perception Index by Transparency International (2023) highlights the significant role of reducing corruption in fostering economic growth. However, this trend is less pronounced than with governance quality. These findings emphasise the multifaceted nature of economic growth and advocate for a balanced approach that integrates efforts to improve economic freedom, governance quality, and anti-corruption measures to achieve sustainable economic development.

The econometric analysis uncovers a complex relationship between institutional quality and real GDP growth, as various indices measure. According to the Index of Economic Freedom by the Heritage Foundation (2021), there is a significant positive relationship between economic freedom and GDP growth in the fixed effect model. This indicates that policies promoting economic freedom can create a conducive environment for business operations and economic expansion. However, the first difference GMM model suggests that the benefits of economic freedom diminish over time, particularly in developed countries, suggesting a saturation effect. The Fraser Institute's (2021) Economic Freedom score also shows a positive relationship with GDP growth in the fixed effect model, but the mixed results in other models highlight the nuanced impacts of economic freedom on economic performance.

The World Governance Indicators demonstrate the strongest positive correlation with real GDP, emphasising the critical role of good governance in economic growth. Effective governance, characterised by the rule of law and regulatory quality, creates a stable environment that encourages investment and sustainable development. The Corruption Perception Index also indicates that lower corruption positively impacts GDP, underscoring the importance of transparency and accountability in fostering economic prosperity.

Across all models, capital input and effective employment consistently positively influence GDP growth, while inflation and trade openness have varying effects. The findings highlight the importance of a balanced approach integrating efforts to improve economic freedom, governance quality, and anti-corruption measures to achieve sustainable economic development. Maintaining and enhancing institutional quality remains crucial for long-term economic growth, especially in post-transition countries.

The paper has several limitations. One limitation is our use of proxies for institutions and governance, such as the Index of Economic Freedom by the Heritage Foundation (2021), the Economic Freedom Index by the Fraser Institute (2021), the World Governance Indicators by the World Bank (2023), and the Corruption Perception Index by Transparency International (2023). These measures are aggregate and based on perceptions and may not fully capture institutional quality and the nuanced nature of governance. The subjectivity of these indices, influenced by respondents' biases and external factors, could affect our results' accuracy and reliability. Another limitation is the potential endogeneity issue in our analysis, despite using advanced econometric techniques like the system GMM to address it. Endogeneity arises when explanatory variables are correlated with the error term, leading to biased and inconsistent estimates. Although the GMM method helps mitigate this issue by using lagged variables as instruments, it cannot eliminate the risk of endogeneity, especially in complex dynamic relationships between institutions and economic growth.

Additionally, the study focuses on a specific set of countries and periods, which may limit the generalizability of our findings. The economic and institutional contexts of the sampled countries might differ from those in other regions, affecting the applicability of the results to a broader global context. Moreover, data scarcity in these countries necessitated the use of interpolation techniques to fill gaps, which might introduce inaccuracies and affect the reliability of the results. Future research should consider a more diverse set of countries and extend the analysis over different time frames to enhance the robustness and applicability of the conclusions. Expanding the scope of the study to include a wider variety of countries with different economic structures and institutional backgrounds will provide a more comprehensive understanding of the relationship between institutional quality and economic growth. Additionally, employing more sophisticated data collection and

estimation techniques can help mitigate the limitations posed by data scarcity and improve the accuracy of the findings.

This research catalyses more advanced qualitative and quantitative research on the impact of institutions on economic growth in post-transition European countries. By expanding the study to include a wider range of countries and utilising more sophisticated data collection and estimation techniques, future research can provide a more detailed understanding of how institutional quality affects economic performance. These comprehensive research efforts will enhance academic discourse and provide valuable insights for policymakers seeking to improve institutional frameworks. Implementing these findings in academic and practical settings can significantly enhance the quality of institutions in post-transition countries, creating a more favourable environment for sustainable economic growth.

Enhancing the quality of institutions in these countries will significantly contribute to future economic growth. Stronger institutions can lead to improved governance, reduced corruption, and increased economic freedom, which is crucial for attracting investment, encouraging entrepreneurship, and enhancing overall productivity. As these countries develop, robust institutions will ensure political stability, economic resilience, and social progress. Therefore, these findings' ongoing research and practical application are essential for long-term economic development and prosperity in post-transition European countries.

The research findings suggest several practical policy implications for post-transition European countries. It is crucial to strengthen economic freedom by reducing regulatory burdens and promoting free trade to promote economic growth. Simplifying administrative procedures and streamlining regulatory processes can encourage entrepreneurship and attract foreign investment. Encouraging trade openness and reducing barriers will further integrate these countries into the global economy. Additionally, it is essential to focus on enhancing governance quality. This can be achieved by strengthening the rule of law through transparent and efficient judicial systems and improving regulatory quality, creating a stable business environment. Addressing corruption is equally important. Implementing robust anti-corruption measures, promoting transparent public procurement processes, and imposing strong penalties for corrupt practices can enhance transparency and accountability. Public participation and oversight in governance processes will further bolster anti-corruption efforts. To foster innovation and investment, support for research and development is crucial, along with attracting both domestic and foreign investment by ensuring political stability and protecting investor rights.

Moreover, investing in human capital development, particularly in education and healthcare, will help build a skilled and healthy workforce essential for economic productivity. Finally, addressing macroeconomic stability through effective monetary policies to control inflation and maintain fiscal discipline will create a

conducive economic planning and investment environment. By implementing these policy recommendations, post-transition European countries can establish a robust institutional framework that supports sustainable economic growth, social progress, and political stability, laying the foundation for long-term prosperity.

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Institucije i gospodarski rast u europskim post-tranzicijskim gospodarstvima

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Sažetak

U ovom radu raspravlja se o ulozi institucija na gospodarski rast u odabranim europskim post-tranzicijskim gospodarstvima. Tijekom 1990-ih godina, zemlje srednje i istočne Europe suočile su se s izazovima prilagođavanja svojih političkih i ekonomskih sustava kako bi održale korak s brzo promjenjivim globalnim okruženjem. Potrebne su im bile nove institucije poput propisa, društvenih normi i organizacija u cilju potpore kapitalističkom gospodarstvu. Te institucije pružaju okvir za gospodarsku aktivnost i usmjeravaju pojedince da djeluju u skladu s ekonomskim ciljevima. One su ključne za stvaranje stabilnog okruženja za gospodarski rast, promicanje ulaganja i inovacija te smanjenje neizvjesnosti, što je ključno za gospodarski uspjeh. Da bismo to istražili, proveli smo ekonometrijsku analizu 16 europskih post-tranzicijskih zemalja od 1998. do 2019. godine koristeći fiksni učinak, Arellanovu i Bondovu prvu razliku između GMM procjenitelja i sustavnog GMM procjenitelja. Rezultati pokazuju da institucije značajno utječu na gospodarski rast.

Ključne riječi: *institucije, gospodarski rast, europske post-tranzicijske zemlje*

JEL klasifikacija: *O17, O43, O47, O57*

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