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Different Paths of State Institutions Development – Convergence and Divergence in Post-Socialist Countries

Zróżnicowanie ścieżek rozwoju instytucji państwa – konwergencja i dywergencja w krajach postsocjalistycznych

Abstract

This study analyses the evolution of state institutions in 18 Central and Eastern European countries that have transitioned from authoritarian, centrally planned economies to democratic market economies. The aim is to assess the quality of their state institutions vis-à-vis those of the EU-15 and to evaluate and compare the levels of socio-economic development in countries whose convergences have followed different paths. To this end, an index to assess institutional quality was developed; one that incorporates political freedom, economic freedom, and governance quality. Sigma convergence analysis and cluster analysis were employed to identify paths of convergence and divergence. Estonia and the Czech Republic were shown to have made significant progress, while Russia and Belarus have lagged behind. Each country was assigned to one of five groups on the basis of similar convergence characteristics. Changes in GDP per capita and the HDI within the identified groups were subsequently examined. Despite overall progress, substantial disparities in institutional quality and socio-economic development persist in CEE.

Keywords: Socio-Economic Development, Central and Eastern Europe, Economic Transition, Convergence and Divergence, Cluster Analysis.

JEL: 052, P20, P30, P51

Streszczenie

W artykule poddano analizie ewolucję instytucji państwa w 18 krajach Europy Środkowej i Wschodniej, które przeszły transformację od autorytarnych, centralnie planowanych gospodarek do demokratycznych gospodarek rynkowych. Celem była ocena, czy doszło do konwergencji pod względem jakości instytucji państwa w porównaniu do krajów UE-15 oraz jaki jest poziom rozwoju społeczno--gospodarczego w krajach o różnej ścieżce konwergencji. Stworzono wskaźnik oceny jakości instytucji, który uwzględniał wolność polityczną, wolność gospodarczą oraz jakość rządzenia. Do identyfikacji ścieżek konwergencji i dywergencji zastosowano analizę konwergencji typu sigma oraz analizę skupień. Znaczące postępy zaobserwowano w takich krajach jak Estonia i Czechy, podczas gdy Rosja i Białoruś pozostawały w tyle. Na podstawie uzyskanych wyników wyróżniono pięć grup krajów o zbliżonej charakterystyce procesów konwergencji. Następnie przedstawiono zmiany PKB per capita oraz HDI w wyróżnionych grupach. Mimo ogólnego postępu, wciąż istnieją znaczne dysproporcje w zakresie jakości instytucji i rozwoju społeczno-ekonomicznego między krajami CEE.

Słowa kluczowe: rozwój społeczno-gospodarczy, Europa Środkowo-Wschodnia, transformacja gospodarcza, konwergencja i dywergencja, analiza skupień.

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1. Introduction

The liberation of Central and Eastern European (CEE) countries from Soviet dominance, followed by the dissolution of the Soviet Union, constituted a critical juncture in the view of Acemoglu & Robinson (2012), who describe it as a pivotal event that changed the political and economic balance of society. Indeed, it made the systemic transition possible. The aim of the changes was to establish democracy and introduce a market economy. This necessitated abolishing the communist party's monopoly on power and moving to a system of democracy and political pluralism, and switching from a centrally managed economy to a market economy.

The systemic transition in post-socialist countries involved major institutional changes, and the government was primarily responsible for its implementation. The government introduced new formal institutions which influenced economic outcomes. State institutions in socialist countries did not foster economic growth. They were characterized by a lack of political and economic freedom, weak protection of property rights, poor law enforcement, and low quality of governance. Additionally, they lacked direct experience in applying democratic principles and the rule of law, and had scant respect for civil rights, all of which are indispensable to a developed market economy. At the beginning of the transformation period, the post-socialist countries formed a relatively homogeneous group, and their distance from democratic capitalist economies was immense (Piątek, 2016). The scope of changes required to establish a democratic market economy was extremely broad, and state institutions were at the core of these transformations.

This paper presents and assesses the development of state institutions in 18 CEE countries during their systemic transformation from autocratic, centrally planned economies to democratic market economies. We address the following research questions:

- Have the state institutions of CEE countries been converging towards those of developed democratic market economies or diverging away from the them?
- What is the level of socio-economic development in CEE countries clustered by paths of institutional development?

To answer these questions, the following steps were taken. Firstly, an institutional quality assessment index was introduced; one based on measures of political freedom, economic freedom, and governance quality. Secondly, the changes in institutional quality in post-socialist countries and the EU-15 were characterized. Thirdly, a sigma convergence analysis was employed to examine whether the state institutions of post-socialist countries are catching up with developed market economies. Finally, the CEE countries were grouped by convergence/divergence, and their socio-economic development was analysed.

The paper is structured as follows. Section 2 reviews the literature on institutional convergence/divergence and its determinants in post-socialist countries. Section 3 presents the data sources, outlines the empirical strategy, and details the development of the institutional quality assessment index. Section 4 presents the results, with a primary focus on the sigma convergence analysis of CEE countries relative to the EU-15, and on grouping them on the basis of their convergence/divergence using

cluster analysis. The socioeconomic development of these groups in comparison to the EU-15 is additionally examined. Finally, conclusions are drawn, and directions for further research are proposed.

2. Literature review

The post-socialist systemic transition began in CEE and the former Soviet Union in the 1990s. It was an unprecedented institutional change that resulted in a comprehensive alteration of the social order; one that encompassed values, institutions, and social relations (Otta, 1994, p. 21; Ratajczak, 2009; Wilkin, 2006, p. 111). The CEE countries were initially a homogeneous group in terms of their political and economic systems (Kitschelt 2003). The goals of the systemic transition, at least initially, were to establish democracy, (re)build a market economy, and implement the rule of law. This transition entailed radical changes designed to introduce a new logic to underpin the functioning of politics, the economy, and society (Åslund, 2002). Politically, this meant abandoning an authoritarian, single-party system and embracing a democratic one. Socially, it meant a shift away from collectivism to individualism. Economically, a centrally planned economy was replaced with free-market institutions, e.g. economic freedom and the protection of property rights (Bałtowski & Miszewski, 2007, p. 52). It is important to note that the changes in these spheres were interdependent (Metelska-Szaniawska & Milczarek, 2005, p. 404). Thus the transition required a change of state institutions, and its implementation required a strong and broad public support.

Although the starting point of the transition, i.e. an autocratic centrally planned economy, and the end goal, i.e. a democratic market economy, were known, there was no theory that described and explained the transition process (Dewatripont & Roland, 1996, p. 1). To this day, there is no comprehensive model or theory of economic transition. This can be attributed to several factors. One is the sheer magnitude of the changes that a systemic transition requires. Another is that these changes involve formal rules and institutions. Additionally, the results of the transition are also influenced by informal rules. These tend to change more slowly, thereby making the transition less radical than originally intended (North, 1990, p. 91). Finally, due to the interaction between formal and informal rules, it may turn out that the recently introduced formal institutions operate differently in the new conditions than they did in the economy from which they originated (Hamilton, 1932, p. 86). Although a transition involves breaking away from the existing system, path dependence, where institutional arrangements and social relations influence institutional choices and their outcomes, nevertheless emerges (Dzionek-Kozłowska, 2009, p. 220). For this reason, informal institutions played an important role in post-socialist countries. Unfortunately, the norms and values 'inherited' from a centrally planned economy do not foster the transition to a market economy, where initiative and entrepreneurship are crucial (Mickiewicz, 2010, p. 13). Post-socialist societies were characterized by a lack of work ethic, an acceptance of corruption as a necessary evil for conducting business, a dualism of norms—official and declared on the one hand, private and

adhered to on the other—and a collective, egalitarian mindset (Sztompka, 1996, p. 120; Winiecki, 1999, p. 204). A conflict between the newly introduced formal institutions and the prevailing ethos, formed and consolidated during the previous era, was therefore inevitable.

This interaction between the economic, political, and social spheres complicates the theoretical modelling of ongoing transformations. Considering J. Nye's observation (2008, p. 75) that our understanding of the dynamics of institutional changes remains highly underdeveloped, these factors make it unlikely that a comprehensive theory capable of explaining the complexities of post-socialist transformation—even within the economic sphere alone—will emerge in the near future. However, there is a body of literature that identifies the drivers of institutional change in transition countries. Beck & Laeven (2006), using the Worldwide Governance Indicators (WGI) to assess institutional change, identified dependence on natural resources and socialist-era historical experiences as key factors influencing institution-building during the transition period. Di Tommaso, Raiser & Weeks (2007), utilising EBRD indicators, concluded that institutional change is not only heavily path-dependent but also driven by political and economic liberalisation, along with external support, e.g. EU accession. Dimitrova-Grajzl (2007), focusing on Southeast and Central Eastern European countries, analysed the WGI and Property Rights Index (a component of the Index of Economic Freedom) and highlighted the significant role that history and path dependency have played in institutional quality, e.g. the legacy of Ottoman rule is notably negative, whereas that of Habsburg rule is positive. Schweickert et al. (2011) examined the effects of incentives linked to potential NATO and EU membership on institutional change, and found that these incentives are crucial for institutional development in transitioning nations. BenYishay & Grosjean (2014) found that imperial legacies, along with the initial concentration of natural resources and the mining sector, accounted for much of the variation in success across economic and political reforms. Schönfelder & Wagner (2016) examined how the European integration process influenced the trajectory of institutional development from 1996 to 2012. Using a dynamic panel data model and the six WGIs to assess institutional quality, they generally found that the prospect of EU membership has a positive impact across most WGIs. Piątek, Pilc & Szarzec (2019), using four sets of indicators, viz. Freedom House's Political Freedom measure, the Heritage Foundation's Index of Economic Freedom, the WGI, and EBRD indicators, identified the main drivers of institutional development in transition countries as their cultural and historical proximity to Western Europe, along with their applications to join international organisations (EU, NATO, WTO) that impose specific democratic and market-economy standards as prerequisites to membership. Piątkowski (2021) indicates that the EU was the key driver of institution building and structural reforms in Poland during that country's EU accession process in the late 1990s and early 2000s.

The CEE countries have become increasingly diverse (Åslund, 2007) over the past 2–3 decades. Some have reformed their institutions sufficiently to join the European Union (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia in 2004; Bulgaria, Romania 2007; Croatia 2013), while others have

abandoned their efforts to build a democratic market economy (Belarus, Russia) (Chepurenko & Szanyi, 2022). In yet other cases (Moldova and Ukraine), social divisions and geopolitical factors have made it unfeasible to join the EU (Cameron & Orenstein, 2012). As a result, after more than 30 years of transition, the countries of CEE are markedly diverse in terms of their political and economic institutions and their levels of economic welfare (Gomułka, 2023), with Poland recording the fastest economic growth in this group (Piątkowski, 2018).

The present paper contributes to the literature on institutional change and convergence/divergence in the transition countries of Central and Eastern Europe. Research indicates that particularly rapid changes in state institutions occurred in the early transition years, prior to EU accession (Piątek, 2016). There was far less incentive to initiate institutional change once EU membership had been obtained (Epstein & Sedelmeier, 2008; Vachudova, 2010). Tendencies to curb democracy, weaken the rule of law, and undermine checks and balances have been observed in some countries (Grzymala-Busse, 2019; Piątek, 2023). Even those CEE countries that have joined the EU differ institutionally from the older Member States. Gardawski & Rapacki (2021) and Próchniak et al. (2023) designate the institutional systems of these countries as 'patchwork capitalism', and highlight the distinctive characteristics that set them apart from the rest of the EU. There are several empirical studies that attempt to directly measure the convergence or divergence of institutions between EU countries and CEE countries. Schönfelder & Wagner (2019) investigated unconditional beta- and sigma-convergence in institutional quality within the Euro Zone, the EU, and prospective EU members. They used the WGI, the OECD Product Market Regulation Indicator, and the World Bank's 'Doing Business distance to frontier indicator' over three time frames: 1996–2012, 1998–2013, and 2005–2013. Their findings provide empirical support for institutional beta-convergence within the EU and its aspirant countries. The sigma-convergence analysis further supports this, showing a reduction in institutional variance across the broad group of EU members, accession countries, candidates, and potential candidates. Glawe & Wagner (2021) examined the formation of institutional convergence clusters from 2002 to 2018. Their findings reveal the presence of multiple institutional clusters, with certain countries caught in a low-quality institutional trap. Additionally, they observed that these convergence clusters primarily align with geographic regions, highlighting a conspicuous northwest-southeast divide. Most CEE countries fell into the lower institutional quality clusters (Estonia was a notable exception). Totleben & Piątek (2024) investigate sigma-convergence in institutional quality in CEE and the EU using the WGI, the Fraser Institute Economic Freedom Index, and the Freedom House Political Rights and Civil Liberties index. They find that economic freedom has converged across all the analysed country groups, with post-socialist states catching up to the EU-15, and the Baltic states even surpassing the 'Old Union' in this regard. They also note diverse trends in political freedom – specifically, convergence in the Baltic and Southeastern European countries, ambiguous results for Central Europe (convergence until 2004, divergence thereafter), and increasing restrictions in Eastern Europe, particularly Belarus and Russia, leading to divergence from the EU-15.

The present study contributes to the literature by applying a broader set of institutional change indicators, and using them to construct an institutional quality assessment index. It also stands out by virtue of its long analysis period (using data from 1996 to 2023). Furthermore, it quantifies the economic outcomes of these changes by means of the HDI and GDP per capita, within the identified institutional convergence clubs. It uses a set of institutions that Acemoglu & Robinson (2012) describe as inclusive institutions and which the literature identifies as significantly impacting economic growth and development, including in post-socialist countries (e.g.: Raimbaev, 2011; Piątek, Szarzec & Pilc, 2013; Alexiou, Vogiazas & Solovev, 2020; Miłaszewicz, 2021). Institutional convergence/divergence is examined across three dimensions, viz. political freedom, economic freedom, and quality of governance.

3. Data sources and empirical strategy

The empirical analysis was conducted using data from 18 CEE countries classified as post-socialist by the European Bank for Reconstruction and Development (2013), viz. Albania (ALB), Belarus (BLR), Bulgaria (BGR), Croatia (HRV), Czech Republic (CZE), Estonia (EST), Hungary (HUN), Latvia (LVA), Lithuania (LTU), Moldova (MDA), North Macedonia (MKD), Poland (POL), Romania (ROU), Russia (RUS), Serbia (SRB), Slovakia (SVK), Slovenia (SVN), and Ukraine (UKR). The analysis involves the following steps: (a) constructing an institutional quality assessment index based on selected indices; (b) performing a sigma convergence analysis of the state institutions of CEE vis-à-vis those of the EU-15; (c) grouping CEE countries by their convergence/divergence similarities; and (d) presenting the changes in socio--economic development within these groups.

Institutional convergence has been examined across three dimensions: (1) economic freedom, (2) political freedom, and (3) quality of governance. Several authors and organizations have attempted to assess these dimensions by creating various indices and rankings. The most commonly used indices are: (1) the Economic Freedom Index, developed by the Heritage Foundation (IEF, the Index of Economic Freedom); (2) the Political Freedom Index, developed by Freedom House (FIW, Freedom in the World); and (3) the Index of Governance Quality, published by the World Bank as part of the Worldwide Governance Indicators (WGI) database.

The Index of Economic Freedom (IEF) is constructed by evaluating four broad categories: rule of law, government size, regulatory efficiency, and open markets. Scores range from 0 to 100, where 0 signifies no economic freedom and 100 indicates full economic freedom. The index covers the period 1995–2024.

The Political Freedom Index (FIW) is composed of the Political Rights and Civil Liberties sub-indices. Each sub-index is measured on a scale of 1 to 7, where 1 signifies full political freedom and 7 signifies its complete absence. The Political Freedom Index is their arithmetic mean, and covers the period 1973–2024.

The assessment of governance quality (WGI), as proposed by the World Bank, is based on six sub-indices: voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law,

and control of corruption. Each sub-index is measured on a scale of -2.5 to + 2.5 (the greater the value, the higher the assessment). The Governance Quality Index is their arithmetic mean, and covers the period 1996–2023.[1]

These indices have different characteristics (economic freedom and governance quality are stimulants, while political freedom is a destimulant) and are based on different scales. To ensure comparability, normalization has been applied according to the following formulas:

$$\text{for stimulants: } n_{INSTi,t} = \frac{INST_{i,t} - \min(INST)}{\max(INST) - \min(INST)} \tag{1}$$

$$\text{for destimulants: } n_{INSTi,t} = \frac{\max(INST) - INST_{i,t}}{\max(INST) - \min(INST)} \tag{2}$$

where: n_{INST}—normalized index; $INST$—original index value (IEF, FIW, WGI); $min(INST)$—minimum value the variable INST can take; $max(INST)$—maximum value; i—country; and t—year.

All three indices were now positive stimuli expressed on a scale of 0 (indicating the worst assessment in the given area) to 1 (the best assessment).

Next, the value of the institutional assessment index ($INST_{overall}$) per country per year was determined as the geometric mean of the normalized indices,[2] as given by the following formula (see also Table 1):

$$INST_{overalli,t} = \sqrt[3]{n_{IEFi,t} {}^{*} n_{FIWi,t} {}^{*} n_{WGIi,t}} \tag{3}$$

These $INST_{overall}$ indices were then used to investigate whether the institutions of CEE countries were converging with those of the pre-2004 European Union members (the so-called EU-15). To this end, the standard deviation between the institutional quality assessments of individual countries and those of the EU-15 was calculated using the following formula:

$$SD(INST_{overall})_{i,t} = \sqrt{\frac{\left(INST_{overalli,t} - \overline{INST_{overall\,EU-15,t}}\right)^2}{2}} \tag{4}$$

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[1] Data gaps for 1997, 1999, and 2001 were filled with the arithmetic mean of the previous and following years.

[2] The use of the geometric mean eliminates potential substitution between institutions and indices. Any deterioration in any area (political freedom, economic freedom, governance quality) leads to a greater decrease in the $INST_{overall}$ value than if, e.g., the arithmetic mean were used. Alternatively, convergence can be assessed in each area separately (the Pearson correlation coefficients for INSToverall with IEF, FIW, and WGI are 0.6855, 0.9052, and 0.8813, respectively; for more details, see Appendix 2 (IEF), Appendix 3 (FIW), and Appendix 4 (WGI)). However, given the objective of the present article, a combined assessment of institutions was employed.

where: $SD(INST_{overall})$ is the standard deviation of the institutional quality assessment; and $(\overline{INST_{overall\ EU\text{-}15}})$ is the average institutional quality assessment for the EU-15.

Next, the parameters of the sigma convergence equation were estimated for each country using Ordinary Least Squares (OLS)[3]:

$$SD\left(INST_{overall}\right)_{i,t} = \alpha_0 + \alpha_1{}^*t + \varepsilon_{i,t} \tag{5}$$

where: ε—random error.

Negative and statistically significant α_1 parameters associated with the time variable indicate convergence, i.e. that the variation in institutional quality between a given CEE country and the EU-15 has been decreasing. Due to data limitations, calculating $INST_{overall}$ values for the early years of the political transition (1990–1995) is not possible, although some countries (the Czech Republic, Estonia, Hungary, Poland, Slovenia, and Lithuania) significantly improved their state institutions during this time. For these countries, the estimated convergence parameters may be underestimated, potentially affecting the robustness of the regression results. Nevertheless, in the first study year (1996), their institutional quality was far removed from the democratic market economies of the EU-15.

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[3] Regression equations for sigma convergence were estimated for three sub-periods: 1996–2023, 1996–2004, and 2005–2023. The causes and consequences are described in Section 4 (Results).

Table 1.
Values of institutional assessment index (INSToverall)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
EU-15	0.79	0.79	0.79	0.79	0.79	0.80	0.82	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.80	0.81	0.80	0.80	0.80	0.80	0.80	0.80	0.81	0.81	0.81	0.80
ALB	0.47	0.47	0.43	0.43	0.43	0.50	0.54	0.54	0.55	0.53	0.55	0.56	0.57	0.58	0.59	0.58	0.58	0.58	0.61	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.61
BGR	0.56	0.56	0.56	0.57	0.57	0.61	0.66	0.66	0.67	0.68	0.68	0.68	0.66	0.67	0.65	0.66	0.66	0.66	0.66	0.66	0.66	0.67	0.68	0.68	0.67	0.67	0.67	0.68
BLR[a]	0.29	0.29	0.29	0.27	0.28	0.27	0.27	0.28	0.22	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.24	0.24	0.25	0.25	0.25	0.33	0.27	0.27	0.26	0.25	0.22	0.21
CZE	0.75	0.75	0.74	0.74	0.72	0.74	0.74	0.75	0.76	0.76	0.77	0.77	0.77	0.78	0.78	0.79	0.78	0.78	0.79	0.79	0.79	0.80	0.80	0.80	0.80	0.80	0.81	0.80
EST	0.73	0.75	0.76	0.77	0.76	0.78	0.79	0.79	0.81	0.80	0.81	0.82	0.82	0.81	0.81	0.81	0.80	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.84	0.84	0.85	0.84
HRV	0.48	0.47	0.49	0.51	0.60	0.61	0.62	0.63	0.64	0.63	0.63	0.63	0.63	0.66	0.68	0.69	0.69	0.69	0.69	0.68	0.68	0.68	0.69	0.69	0.69	0.70	0.69	0.69
HUN	0.71	0.70	0.71	0.72	0.74	0.75	0.75	0.74	0.75	0.76	0.76	0.76	0.77	0.76	0.75	0.73	0.73	0.73	0.70	0.69	0.66	0.67	0.64	0.63	0.64	0.64	0.64	0.63
LTU	0.66	0.69	0.69	0.70	0.69	0.72	0.73	0.75	0.73	0.77	0.77	0.77	0.77	0.76	0.77	0.77	0.78	0.78	0.79	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.78	0.78
LVA	0.65	0.69	0.69	0.70	0.69	0.71	0.72	0.73	0.73	0.75	0.75	0.73	0.73	0.73	0.70	0.70	0.70	0.71	0.72	0.72	0.75	0.74	0.74	0.75	0.76	0.77	0.77	0.77
MDA	0.53	0.52	0.56	0.55	0.55	0.53	0.51	0.52	0.50	0.51	0.51	0.52	0.49	0.51	0.53	0.55	0.55	0.55	0.55	0.54	0.54	0.55	0.53	0.53	0.56	0.57	0.57	0.57
MKD							0.53	0.55	0.55	0.54	0.56	0.57	0.58	0.58	0.59	0.59	0.60	0.60	0.59	0.57	0.57	0.58	0.59	0.61	0.61	0.61	0.61	0.60
POL	0.70	0.70	0.71	0.71	0.70	0.71	0.72	0.71	0.70	0.71	0.71	0.71	0.73	0.73	0.75	0.75	0.76	0.76	0.77	0.77	0.74	0.73	0.71	0.71	0.71	0.71	0.70	0.70
ROU	0.56	0.60	0.61	0.59	0.59	0.59	0.59	0.59	0.57	0.60	0.63	0.64	0.65	0.65	0.66	0.66	0.65	0.66	0.67	0.67	0.67	0.68	0.67	0.68	0.68	0.68	0.68	0.67
RUS	0.48	0.47	0.45	0.43	0.39	0.39	0.39	0.39	0.36	0.36	0.36	0.36	0.35	0.35	0.35	0.35	0.35	0.36	0.31	0.31	0.25	0.26	0.26	0.26	0.26	0.26	0.24	0.23
SRB														0.60	0.60	0.61	0.61	0.62	0.63	0.63	0.61	0.60	0.59	0.56	0.57	0.57	0.57	0.56
SVK	0.61	0.61	0.66	0.67	0.67	0.69	0.70	0.70	0.75	0.76	0.77	0.77	0.77	0.77	0.77	0.77	0.76	0.76	0.75	0.75	0.75	0.75	0.72	0.72	0.75	0.75	0.75	0.75
SVN	0.69	0.72	0.74	0.73	0.71	0.73	0.74	0.74	0.74	0.74	0.75	0.74	0.75	0.76	0.76	0.76	0.75	0.75	0.75	0.74	0.75	0.74	0.76	0.77	0.77	0.75	0.78	0.78
UKR	0.45	0.46	0.44	0.45	0.44	0.44	0.44	0.45	0.49	0.55	0.55	0.54	0.54	0.52	0.50	0.47	0.47	0.46	0.48	0.48	0.48	0.49	0.48	0.51	0.50	0.53	0.46	0.46

Note: [a]—Due to the zero value of n_FIW in 2021–2023, it was not possible to calculate the geometric mean (Equation 1); instead, the arithmetic mean was calculated and adjusted by the average ratio of the arithmetic and geometric means in earlier years.

Source: own calculation based on data from the Heritage Foundation, Freedom House, and the World Bank.

Hierarchical cluster analysis was then performed to identify and group countries with similar patterns of convergence and divergence observed during the study period. Hierarchical clustering was chosen for its effectiveness in grouping observations based on a predefined measure of dissimilarity. A dissimilarity matrix was generated using Euclidean distance as the metric. This was calculated as follows:

$$d(i,j) = \sqrt{\sum_{k=1}^{p} \left(x_{i,k} - x_{j,k} \right)^2} \qquad (6)$$

where: x_{ik} and x_{jk} are the values of the k variable for observations i and j, respectively; and p is the number of variables.

The variables analysed in the clustering process included the sigma convergence coefficients for the three subperiods (1996-2023, 1996-2004, and 2005-2023), and the initial and final values of $INST_{overall}$. The complete linkage method, also known as the farthest neighbour method, was employed. This method defines the distance between clusters as the maximum distance between any pair of observations (one from each cluster). This approach tends to produce more compact and spherical clusters by minimizing the maximum within cluster distance. This makes it particularly suitable for datasets with distinct, well-separated groups.

Finally, changes in the level of socioeconomic development (using the Human Development Index and GDP per capita) were analysed, and the results categorised according to the groups to which countries had been assigned.

4. Results

4.1. Institutional Convergence in CEE countries

In the first step, the initial (1996) and final (2023) values of the institutional quality index in each of the analysed countries (based on data presented in Table 1) were compared, as presented in Figure 1.

Figure 1.
Initial and final values of the institutional assessment index
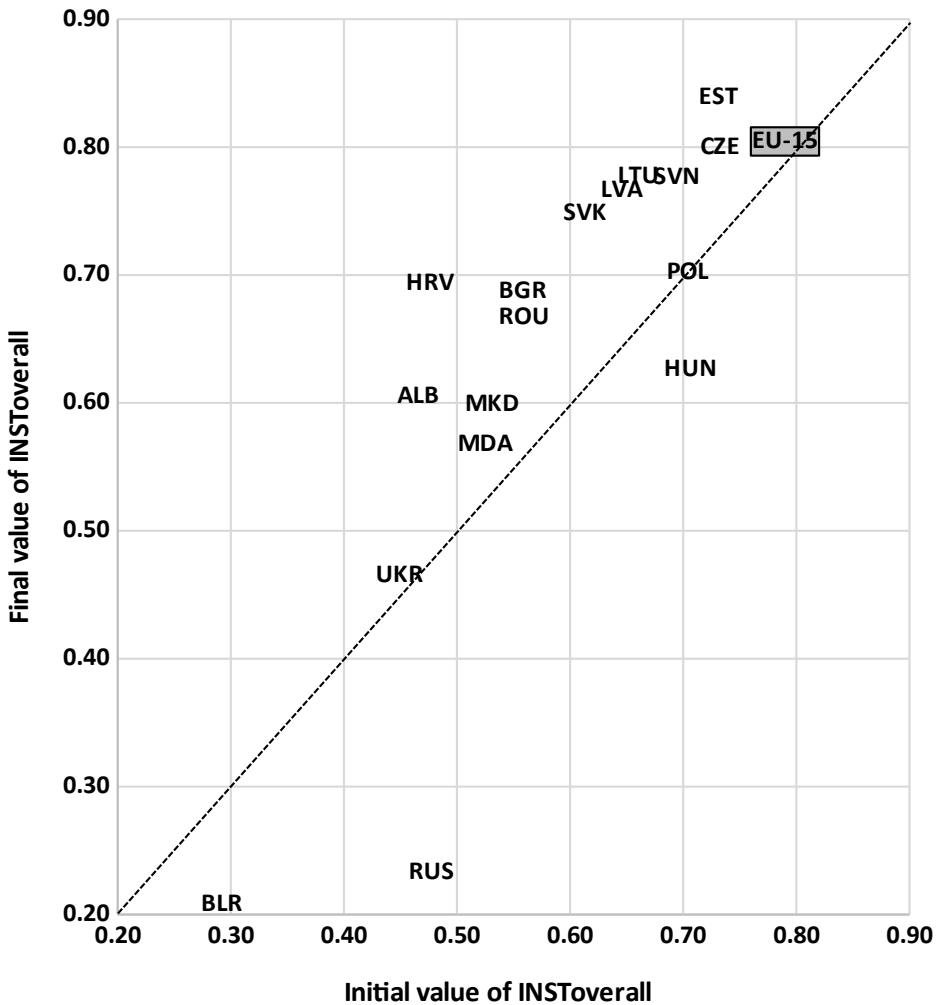
The assessment of institutional quality in the EU-15 remained almost unchanged throughout the study period (0.7899 in 1996 and 0.8044 in 2023) and stayed at a relatively stable level, reaching its highest value in 2002 ($INST_{overall} = 0.8163$).

Although the analysed CEE countries were relatively similar in terms of state institutions at the beginning of the transformation period, they quickly began to diverge. This divergence was clearly noticeable by the mid-1990s. Belarus ($INST_{overall} = 0.2923$ in 1996), Ukraine (0.4494), Albania (0.4658), Croatia (0.4764), and Russia (0.4778) were still characterised by significantly lower levels of political freedom, economic freedom, and quality of governance. By contrast, institutional change had

been proceeding rapidly, as evidenced by high assessments of institutional quality, in the Czech Republic (0.7524), Estonia (0.7313), Hungary (0.7064), Poland (0.7040), Slovenia (0.6945), and Lithuania (0.6605).

The virtually constant level of institutional quality in the EU-15, combined with the low initial values for the CEE countries, imply that convergence leads to an increase in $INST_{overall}$ values. The most significant progress was observed in Croatia (an increase of 0.2169 in $INST_{overall}$ between 1996 and 2023), Albania (+0.1394), and Slovakia (+0.1348). Overall, an increase in this index was recorded in 13 of the 18 analysed countries. A decline in institutional quality was recorded in Russia (-0.2449), Belarus (-0.0844), and Hungary (-0.0806), while in Poland it remained almost unchanged (-0.0018).

A sigma convergence regression analysis was employed to test whether the convergence or divergence has been significant (see Equation 5). The study of convergence was conducted for all CEE countries across three periods. The first period encompasses the entire research timeframe (1996-2023). This was determined by the availability of statistical data. The second period covers 1996-2004, with the key date being the enlargement of the European Union,[4] which required that the national laws and state institutions of candidate countries comply with EU standards. This was the largest ever EU enlargement, adding eight CEE countries. The third period covers 2005-2023. The analysis of this period is particularly important, as noted by Ratajczak (2017), due to the 'second transformation' that occurred in some countries. This was accompanied by a regress in economic and political freedom, and a deterioration in the quality of governance. Similarly, Epstein & Sedelmeier (2008) point out the lack of (political) incentives for institutional convergence after EU accession. The sigma convergence coefficients, along with the 95% confidence interval, are presented in Figure 2.

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[4] As a robustness check, 2007 was also considered as a cut-off point, as this was the year that Romania and Bulgaria joined the EU. However, this adjustment did not significant change the results.

Figure 2.
Results of Sigma Convergence Estimation (based on the variable INST$_{overall}$)
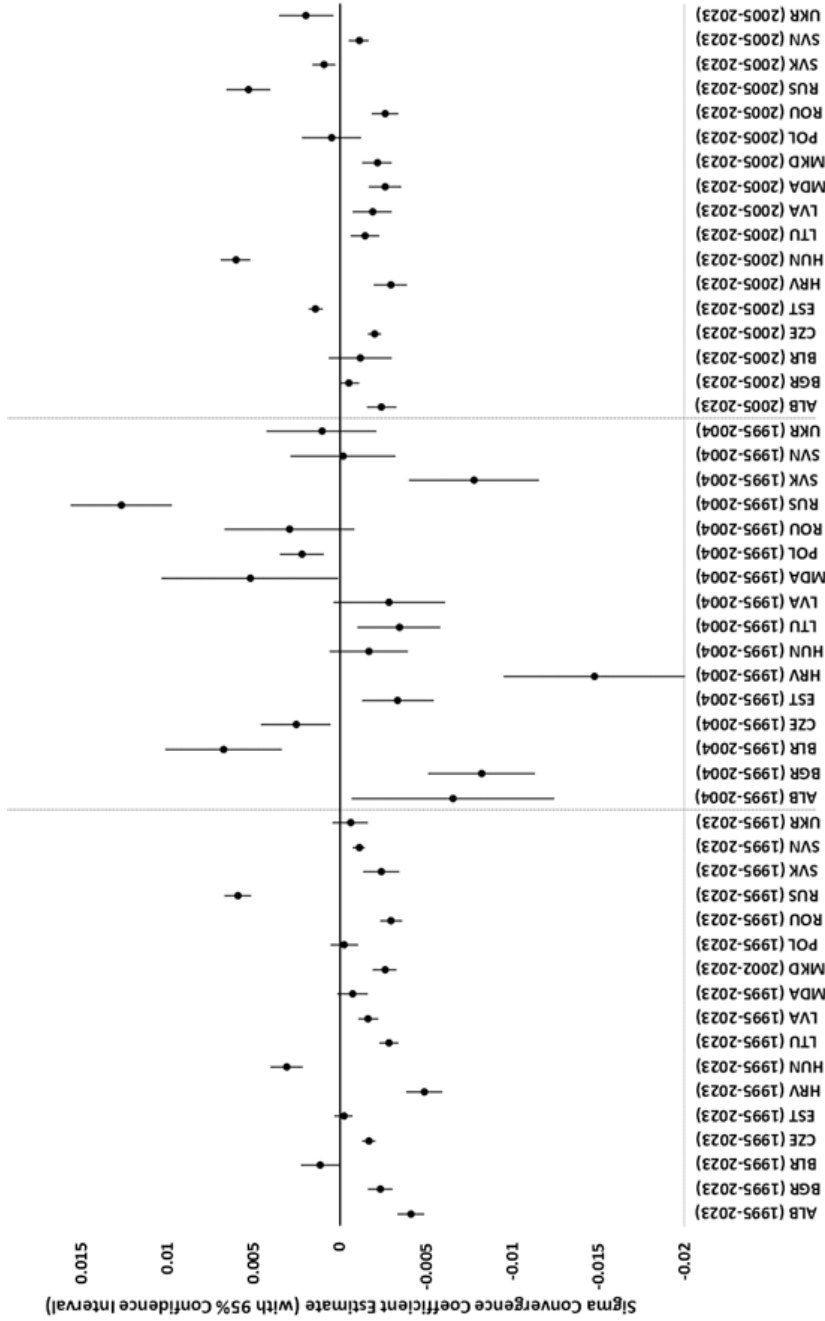
It was not possible to determine sigma convergence parameters for Serbia during the study period due to data deficiencies. For most of the remaining countries, statistically significant and negative values of the α_1 parameter were observed, indicating the presence of convergence. The process occurred most rapidly in Croatia (α_1 = -0.00489), Albania (α_1 = -0.00413), and Romania (α_1 = -0.00297). Divergence processes were observed in Russia (α_1 = 0.00594), Hungary (α_1 = 0.00308), and Belarus (α_1 = 0.00118). Statistically significant α_1 parameters were not obtained for Moldova, Ukraine, Poland, or Estonia. These results may be affected by the initial availability of statistical data. The Czech Republic ($INST_{overall_{1996}}$ = 0.7254), Estonia (0.7313), Hungary (0.7064), Poland (0.7040), and Slovenia (0.6945) had partially closed the gap between themselves and the EU-15 in the first few years of the transition. Therefore, comparing changes in institutional quality from 1996 onwards results in the loss of this initial rapid improvement effect, which should be considered when analysing the estimated parameters.

In the early years of the study period (up to 2004), convergence was observed in 6 countries (Croatia, Bulgaria, Slovakia, Albania, Latvia, and Estonia), while divergence was noted in Russia, Belarus, Moldova, the Czech Republic, and Poland. In the remaining countries (except Romania and Ukraine), the regression parameters indicated divergence, although they were not statistically significant at the 5% significance level. From 2005 onwards, convergence continued to be observed in Croatia (with the fastest pace among the analysed countries, driven by its desire to join the EU), as well as Moldova, Romania, Albania, North Macedonia, the Czech Republic, Latvia, Lithuania, and Slovenia. Divergence, on the other hand, was noted in Hungary, Russia, Belarus, and Slovakia. Surprisingly, divergence was also observed in Estonia. This country, however, had not only caught up with the EU-15, but outperformed it.

The sigma convergence analysis reveals that many countries have made progress in aligning their institutional quality with EU-15 standards. However, the variability in results highlights both significant improvements in certain countries and ongoing challenges in others.

4.2. Institutional Convergence/Divergence Clubs

The analysed countries were grouped according to the extent to which the quality of their institutions have converged to those of the EU-15. The most common approach in similar analyses involves geographical classification, most frequently based on a proposal from the European Bank for Reconstruction and Development, that divides CEE into Central Europe, Southeastern Europe, Eastern Europe, and the Baltic States. However, as demonstrated by Totleben & Piątek (2024), these groups have become increasingly heterogeneous (especially since 2004), and this has resulted in a loss of informational value. For example, although Hungary has been diverging in terms of political freedom and quality of governance, the improved performance of other countries has led to the Central European group as a whole not experiencing divergence. Consequently, cluster analysis was conducted to deviate

from the traditional geographical classification and instead compare groups of countries that are similar in terms of their convergence (or divergence) characteristics.

Each CEE country was assigned to one of five distinct groups on the basis of this cluster analysis.[5] The first group comprised Albania, North Macedonia, Croatia, Bulgaria, and Slovakia; the second group comprised the Czech Republic, Slovenia, Lithuania, Latvia, Estonia, and Poland; the third group comprised Moldova, Romania, and Ukraine; the fourth group comprised Belarus and Russia;[6] and the fifth group comprised Hungary. The complete results of the cluster analysis are presented in online Appendix 1 (dendrogram and input parameters), with a summary provided in Table 2.

Table 2.

Input parameters for cluster analysis by group

		Group #1	Group #2	Group #3	Group #4	Group #5
Countries:		ALB, MKD, HRV, BGR, SVK	CZE, SVN, LTU, LVA, EST, POL	MDA, ROU, UKR	BLR, RUS	HUN
Sigma Convergence Coefficient Estimate	Period: 1996–2023	-0.00327	-0.00129	-0.00143	0.00356	0.00308
	Period: 1996–2004	-0.00884	-0.000884	0.00307	0.00974	-0.00166
	Period: 2005–2023	-0.00141	-0.00075	-0.00108	0.00208	0.00607
INSToverall	Initial value (1996)	0.52935	0.69803	0.51134	0.38504	0.70643
	Final value (2023)	0.66436	0.77669	0.56651	0.22040	0.62585

Source: own elaboration based on data from the Heritage Foundation, Freedom House, and the World Bank.

The first group includes countries that converged with the EU-15 in each of the examined (sub)periods. The greatest progress in guaranteeing political freedoms, economic freedoms, and quality of governance was also recorded in these countries (average increase in INST$_{overall}$ between the initial and final values of 0.13501). The second group includes countries that had the best institutional quality assessments both at the beginning and at the end of the studied period, along with continuous convergence towards the EU-15. Notably, a particularly rapid pace of convergence was observed up to 2004 - the year in which all these countries joined the EU. The countries in the third group exhibited slight convergence towards the EU-15, especially after 2004. In the early years of the study, they were characterised by relatively low institutional quality, but in subsequent years, they made modest progress (an increase in INST$_{overall}$ from 0.51134 in 1996 to 0.56651 in 2023). Despite this, a significant gap remains between them and the EU-15. The countries

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[5] The number of groups was determined using the within sum of squares (WSS), eta-squared, and proportional reduction of error (PRE), where the optimum was found to be 6 groups, beyond which only minimal improvements resulted.

[6] Formally, Belarus and Russia should be considered separate groups (see dendrogram in online Appendix 1). However, they are treated as a single group due to the fact that they are the only countries with a low initial level of INSToverall, that subsequently diverged from the EU-15. Additionally, even at a higher cut-off level of dissimilarity, they would still be the sole members of a single group.

in the fourth group were characterised by the lowest institutional quality in the early period, and despite this, they continued to diverge from the EU-15, especially after 2016. There was a gradual reduction in their economic and political freedoms. The fifth group contains an outlier. Hungary had high initial institutional quality ratings and continued to close the gap to the EU-15 until 2004. However, due to the decline in its political freedoms and quality of governance, especially since 2011, it has clearly diverged since then. The current $INST_{overall}$ value is lower than it was in 1996 (a decrease of 0.08058).

4.3. Socioeconomic Development of CEE countries

The final part of the study involves comparing the convergence of state institutions of the analysed countries with their socio-economic development. As a socioeconomic indicator, the weighted average Human Development Index (HDI) was established for each analysed group (using population as the weight):

$$populationweighted\ HDI_t = \sum\nolimits_{i=1}^{n} \frac{HDI_{i,t} * pop_{i,t}}{pop_{i,t}} \tag{7}$$

where: HDI is the value of the Human Development Index; n is the number of countries in the analysed group; $pop_{i,t}$ is the population of country i in year t.

This enabled the HDI value for the average resident of the EU-15 to be calculated. This value served as the ‹frontier› in the subsequent analysis. Weighted average HDI values were then similarly computed for the groups of countries identified in the previous section. The differences between the population-weighted HDI for the EU-15 and the respective groups are presented in Figure 3. The same procedure was conducted for PPP GDP per capita (see Figure 4).

Figure 3.
Distance to the 'frontier'—population-weighted HDI by group compared to the EU-15
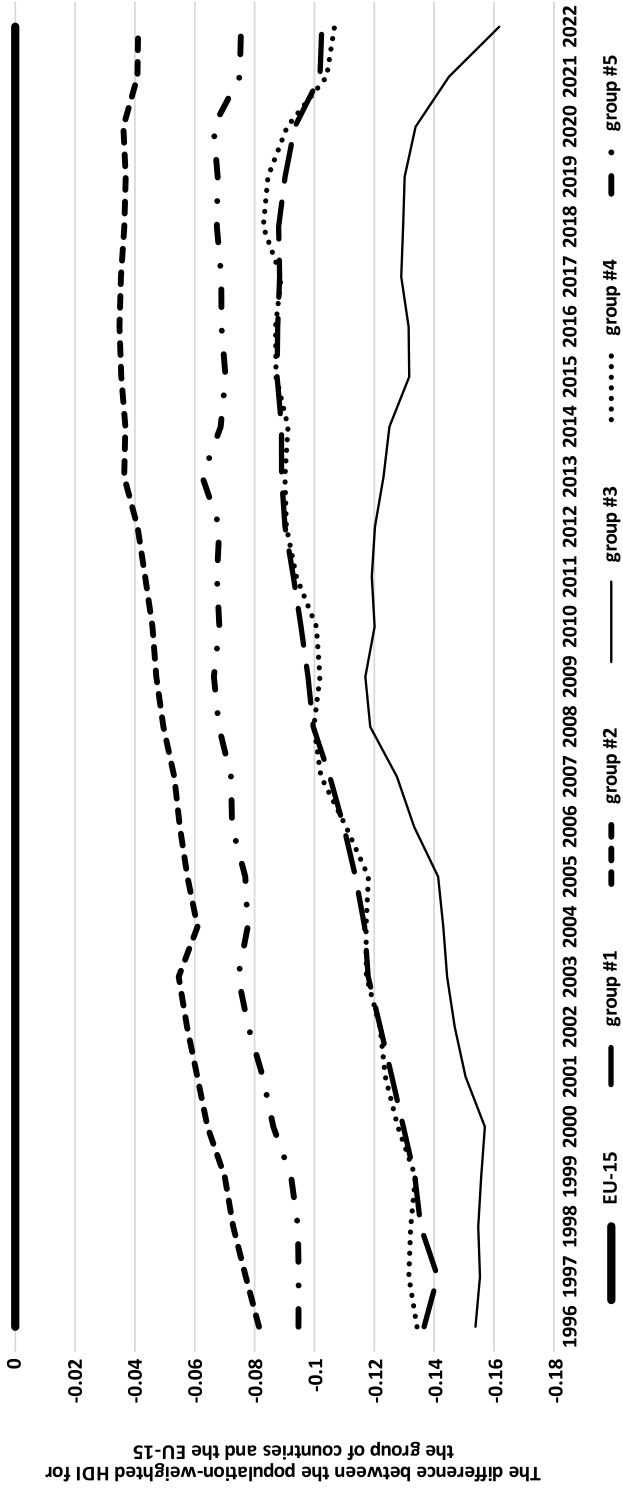
Source: own elaboration based on UNDP and World Bank data.

Figure 4.
Distance to the frontier—average GDP per capita (PPP) by group compared to the EU-15
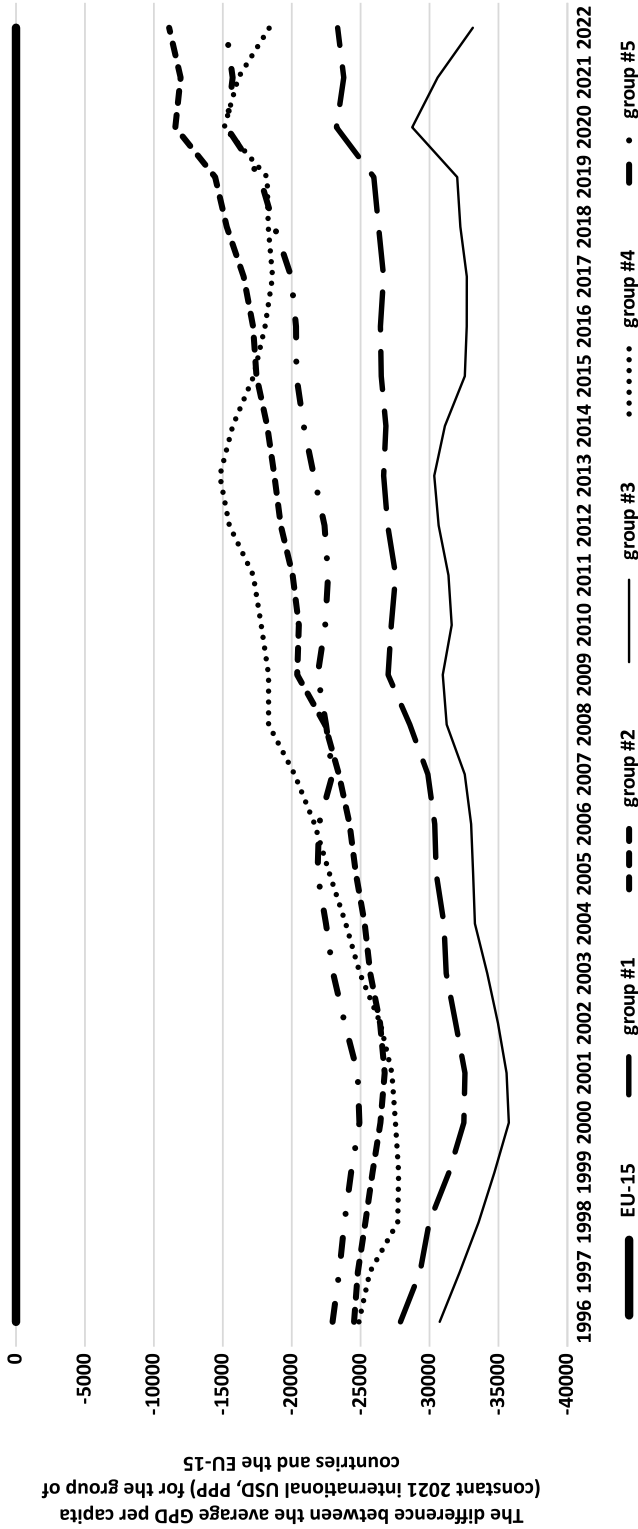
Source: own elaboration based on World Bank data.

All the identified groups were closing the gap with the EU-15 in terms of HDI values between 1996 and 2008. After the 2007–2008 global economic crisis, the gap with the EU-15 continued to decrease in those countries belonging to Groups 1, 2, 4, and 5 until the onset of the COVID-19 crisis. In Group 3, however, the HDI gap has been widening since 2009. The EU-15 overcame the shocks related to COVID-19 more effectively than CEE. Hence, the HDI gap between them has been widening since 2020. Notably, these declines were greater among those countries with the lowest institutional quality ratings (i.e., Group 3 as well as Groups 1, and 4), suggesting that countries with better institutional quality responded more effectively to this exogenous shock.

Similarly, differences in GDP per capita has decreased in countries with the best institutional quality (Groups 2 and 5), and in countries whose institutional convergence has been rapid (Group 1). Countries with lower institutional quality (Groups 3 and 4), after an initial GDP per capita convergence, have since diverged (mainly following Russia's annexation of Crimea in 2013). Countries with higher institutional quality (Groups 1, 2 and 5) also absorbed the exogenous shocks brought about by COVID-19 more effectively. There was even a smaller GDP gap between Group 2 countries and the EU-15 in 2022 than in 2020.

5. Concluding remarks

Discussions on the significance of state institutional development in CEE countries transitioning toward a democratic market economy have constituted a pivotal aspect of economic and political discourse. The present study presents a full picture of the convergence of the state institutions of post-socialist countries towards those of the EU-15. At the beginning of the transformation, CEE countries were quite homogenous in terms of their state institutions, but over the course of 30 years they have pursued different institutional development paths (Rapacki et al., 2020). The following conclusions can be drawn:

1. In the early years of the systemic transition (up to 1996), the most significant progress in ensuring political freedom, economic freedom, and governance quality was made by the Czech Republic, Hungary, Slovenia, Estonia, Lithuania, and Poland. All these countries joined the EU in 2004, which indicates that the desire to join the EU was a driving force behind these changes.
2. The first country to close the gap with the EU-15 was Estonia, which achieved this in 2004, followed by the Czech Republic in 2017. Slovenia, Latvia, and Lithuania are also very close to accomplishing this. The poorest institutional quality is observed in Ukraine, Russia, and Belarus.
3. This study corroborates the findings previously established in the literature, which indicate that the process of institutional convergence was predominantly concentrated in the years leading up to acquiring EU membership (Schönfelder & Wagner, 2019; Totleben & Piątek, 2024). By contrast, the pace of convergence decelerated markedly during the subsequent period, with certain trends even exhibiting a reversal towards institutional divergence.

4. The findings obtained here provide evidence for the existence of institutional convergence clusters, as described by Glawe and Wagner (2021) within the context of the EU. Nevertheless, this observation warrants further in-depth investigation to confirm its robustness and explore its underlying mechanisms.
5. Based on the cluster analysis, which compared the paths of state institutions development, five country clubs were identified:
    *   Group 1 (Albania, North Macedonia, Croatia, Bulgaria, Slovakia): countries with a very rapid convergence rate but with very weak institutions at the beginning of the study period;
    *   Group 2 (Czech Republic, Slovenia, Lithuania, Latvia, Estonia, Poland): countries exhibiting convergence throughout the study period (a particularly rapid pace of convergence was observed up to 2004) as well as prior to the study period;
    *   Group 3 (Moldova, Romania, Ukraine): exhibited slight convergence towards the EU-15, particularly after 2004;
    *   Group 4 (Belarus, Russia): countries that have diverged from the EU-15;
    *   Group 5 (Hungary): an outlier, with a fast rate of convergence before 2004, and clear divergence in 2005–2023.
6. The smallest gap in socio-economic development, as measured by the HDI, is in the countries in Group 2, while the largest gap persists in Group 3. This suggests that absolute levels of institutional quality are a better predictor than the convergence rate. Furthermore, the gap between all groups and the EU-15 has been widening since 2020. A similar pattern is observed in terms of GDP per capita (PPP): the smallest gaps are found in Group 2, and the largest Group 3. Since 2020, the gap has only been widening Group 4 and Group 5 countries.
7. As a result, after almost 30 years of transition, these countries are very heterogeneous with respect to their political and economic institutions and level of economic welfare.

The analysis of the development of state institutions development in post-socialist countries would be a fruitful topic for future research. Firstly, whether institutional convergence clusters exist should be examined. After the initial period of the transformation, political changes in Russia and Belarus led these countries to abandon the pursuit of building democratic market economies (Chepurenko & Szanyi, 2022). In the cases of Moldova and Ukraine, the social climate and geopolitical situation were not conducive to aligning their economies with those of the EU (Cameron & Orenstein, 2012). Consequently, it can be assumed that CEE countries not only became institutionally diverse but also that distinct groups of countries—referred to as institutional convergence clusters—emerged. Secondly, as discussed above, the main drivers of institutional development in the post-socialist countries of CEE are the cultural and historical proximity of these countries to Western Europe and the application for membership in international organisations (EU, NATO, WTO), which established certain requirements concerning democracy and a market economy. However, whether ruling politicians have been a driving force is an issue that has yet to be thoroughly examined. Above all, the analysis

should focus on the role of the ruling politicians responsible for making decisions about reforms and shaping the directions of political and economic changes ('top--down' or 'bottom-up') at the beginning of the transition process. These individuals should be characterised on the basis of various criteria and subsequently linked to the directions and pace of the reforms they designed and implemented. Moreover, the analysis could be expanded to explore the role of societies (collectivist vs. individualistic) and their expectations for further improvement of state institutions once the transition process has been completed. These topics present particularly interesting avenues for inquiry, especially in the context of comparative studies of post-socialist countries.

Funding

Data availability

The data and materials used in this study are publicly available on the ResearchGate.

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