SOCIAL COHESION AND ECONOMIC DEVELOPMENT: DIFFERENT TRAJECTORIES OF EU MEMBER STATES

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Abstract

This paper examines the relationship between economic performance, income inequality, and income polarization tendencies in EU countries. Its aim is to identify groups of EU countries with similar economic and social development patterns using three indicators. The analysis is based on GDP per capita in PPS, the Gini coefficient, and the Top 10% / Bottom 50% ratio of national income, which compares the average income of the richest 10% of the population with that of the bottom 50%. All indicators are expressed relative to the EU-27 average (=100), allowing for a comparison of individual countries' positions relative to the EU benchmark. Cluster analysis was used to identify groups of countries with similar characteristics for two periods: 2014–2018 and 2019–2024. The cluster analysis identified four distinct groups. The results indicate that Slovakia, along with the Czech Republic and Slovenia, belongs to a cluster in which higher economic performance has not been accompanied by a significant increase in income inequality or polarization tendencies.

Key words: economic development, income inequality, income polarization tendencies, cluster analysis, European Union

JEL Code: C38, D31, O52

Introduction

Sustainable economic growth and the reduction of income inequality are two of the key conditions for macroeconomic stability and social cohesion. Real convergence of GDP per capita in the European Union is important given the relatively high degree of heterogeneity between the old member states and the new member states that joined the EU in 2004 and later. According to Eurostat data (2026), GDP per capita in the European Union shows significant divergence, with levels adjusted for price differences (Purchasing Power Standards) ranging from 65% of the EU average in Bulgaria and 68% in Greece to 133% in

the Netherlands and 127% in Denmark[1]. As countries converge in their economic performance, there is more room for the growth of markets for goods and services, which supports foreign trade, the diffusion of technology, and productivity growth. However, these positive effects may be offset by income inequalities and the concentration of income among wealthy segments of the population. Significant income inequalities can often lead to lower consumption and potential stagnation in the process of catching up to the living standards of wealthier countries. For this reason, it is important to monitor not only the convergence of countries' economic performance but also developments in the area of social cohesion. This paper therefore aims to identify groups of EU countries with similar characteristics in terms of economic development, income inequality, and polarization tendencies.

1 Literature Review

There are numerous studies on the course and causes of real convergence and most of them focus on evaluating this process in terms of average income or GDP per capita. Baumol (1986), as well as Barro and Sala-i-Martin (1992) established empirical and theoretical frameworks for how poorer economies catch up with richer ones. Other studies have examined the causes of income inequality and its negative impact on economic growth (Alesina & Rodrik, 1994; Barro, 2000). As noted by Cingano (2014), the positive effects of real convergence can be offset by income inequality and the concentration of income among wealthy segments of the population. Several studies published to date have confirmed differences among European Union member states. The lack of uniformity among EU member states can be examined using cluster analysis, which can identify hidden patterns and the complex structure of EU member states in terms of income inequality and economic growth. For example, Monfort et al. (2013) also conducted a cluster analysis of real convergence, confirming differences in economic growth across Europe and the existence of two convergence clubs within the EU-14 countries[2]. The hypothesis of convergence clubs in the EU was also confirmed by a study by García Solanes et al. (2025), which identified three convergence clubs among euro-area countries and confirmed significant differences among them in terms of GDP per capita. While real convergence is taking place at the level of the entire EU-27, this is no longer the case when member states are divided into smaller groups.

[1] Luxembourg and Ireland were excluded, as their GDP per capita in PPS reached 244% and 221% of the EU average, respectively, in 2024.

[2] EU-14 refers to the 14 countries that had been members of the European Union (excluding the United Kingdom) prior to the major enlargement that took place on May 1, 2004.

This is confirmed, for example, by an IMF study (Franks et al., 2018). According to the study, there has been no real convergence in per capita income levels among the original euro-area members since the introduction of the single currency. Income convergence stagnated in the early years of the single currency, and it reversed as a result of the global economic crisis, leading to divergence. In contrast, real income convergence has occurred among the new euro-area members. Another empirical paper by Cieślik and Wciślik (2020) suggests that there are no clear convergence trends within the EU-15[3]. However, convergence is taking place among the CEE-8[4] countries. László (2025) also examined the economic development of Central and Eastern European countries in comparison with the EU average, confirming that despite a strong correlation in GDP between EU countries and Central and Eastern European countries, the factors driving GDP growth continue to differ. The catching up of newer, smaller economies (such as Central and Eastern European countries) with founding members went hand in hand with the reduction of overall EU inequality. But instead of a single, uniform convergence path, EU member states tend to group into clusters of varying prosperity and inequality levels. Studies published to date show that, in economics, considerable attention has been paid to real convergence as well as income inequalities, but less so to income polarization in relation to real convergence, primarily due to the difficulty in measuring it. At the same time, there has been less research into how these phenomena are interrelated and whether EU countries can be grouped according to similar trends in economic development, inequality, and polarization. This paper therefore focuses on this very area.

2 Data and methodology

The analysis is based on three indicators that capture economic and social developments in EU countries between 2014 and 2024. The economic performance of the countries was measured using GDP per capita in PPS, income inequality using the Gini coefficient, and income polarization using the proxy indicator Top 10% / Bottom 50% ratio of national income[5]. This indicator is not a traditional measure of income polarization, but it allows for the identification of polarizing tendencies in society by capturing the income gap between the

[3] EU-15 refers to the 15 countries that had been members of the European Union prior to the major enlargement that took place on May 1, 2004.
[4] CEE-8 includes the Czech Republic, Slovakia, Poland, Hungary, Slovenia, Estonia, Lithuania, and Latvia.
[5] This indicator expresses the ratio of the average income of the wealthiest 10% of the population to the average income of the bottom 50% of the population (pre-tax national income). Traditional income polarization indicators were not used due to the lack of comparable data for the countries under review and the period in question.

highest-income group and the bottom half of the population. The analysis covered 25 member states of the European Union. Two countries – Luxembourg and Ireland – were excluded from the analysis. These countries occupy a unique position within the EU in terms of GDP per capita[6] and could therefore skew the results of the cluster analysis. All three indicators were expressed in relative terms compared to the EU-27 average (where EU-27 = 100). This allowed for a comparison of individual countries with the EU average, with Luxembourg and Ireland remaining in the EU-27 reference average but not included in the cluster analysis itself. Two periods were analysed: 2014–2018 and 2019–2024. The first period can be characterized as a relatively stable period of economic growth following the resolution of the financial and debt crisis, while the second period includes the COVID-19 pandemic, the energy crisis, and growing geopolitical uncertainties. For each country, the average values of individual indicators were calculated for these two periods and then compared with the EU-27 average. Subsequently, hierarchical cluster analysis using Ward's method was applied to identify countries with similar characteristics.

3 Results

Using cluster analysis, the countries of the European Union were divided into groups with similar characteristics in terms of economic performance, income inequality, and approximated income polarization trends. Based on this analysis, four clusters of countries were identified; their detailed characteristics, composition and changes between the two periods are presented in Table 1.

The results of the cluster analysis show that the composition of the clusters did not change significantly between the two periods. The Socially Cohesive Economies cluster proved to be the most stable, comprising the Czech Republic, Slovenia, and Slovakia in both periods.

[6] Significantly higher GDP figures in these countries are associated with a higher proportion of cross-border workers and the activities of multinational corporations. These factors increase a country's GDP, but they do not lead to a proportional increase in the standard of living of the population.

Tab. 1: Cluster characteristics

Cluster	Main characteristics	Countries 2014–2018	Cluster shifts	Countries 2019–2024
Core economies	High GDP, low inequality, low polarization tendencies	AT, BE, DE, DK, FI, FR, MT, NL, SE	*DE, FR, MT* shifted to the mixed economies cluster	AT, BE, DK, FI, NL, SE
Socially cohesive economies	Medium GDP, low inequality, low polarization tendencies	CZ, SI, SK	No major changes	CZ, SI, SK
High-inequality and polarized economies	Lower GDP, high inequality, stronger polarization tendencies	BG, LT, RO	EE and LV joined the cluster	BG, EE, LT, LV, RO
Mixed economies	Intermediate GDP levels with income inequality and polarization tendencies close to the EU average	CY, EE, EL, ES, HR, HU, IT, LV, PL, PT	DE, FR and MT joined the cluster; EE and LV shifted toward the high-inequality and polarized economies cluster	CY, DE, EL, ES, FR, HR, HU, IT, MT, PL, PT

Source: compiled by the authors

Table 2 shows the average values of GDP per capita in PPS, the Gini coefficient, and the Top 10% / Bottom 50% ratio of national income for individual groups of countries in the two periods. While the average GDP per capita in PPS for the Mixed Economies cluster rose from 76% to 89% of the EU average, that of the High-inequality and Polarized Economies cluster increased from 62% to 74% of the EU average. In contrast, the smallest change was observed in the Core Economies cluster, where the average economic performance increased by only 1 percentage point relative to the EU average.

The Socially Cohesive Economies cluster recorded a decline in both indicators. In contrast, in the High-inequality and Polarized Economies cluster, the values of both indicators remained virtually unchanged. The average Gini coefficient in this cluster was significantly above the EU average in both analysed periods, indicating a higher level of income inequality compared to the EU average. The difference is even more pronounced in the Top 10% / Bottom 50% ratio of national income, where the value reached 140% of the EU average in both periods. While in the Socially Cohesive Economies and Mixed Economies clusters,

economic growth was accompanied by a reduction in income inequality and a weakening of polarization tendencies in income distribution, the High-inequality and Polarized Economies cluster saw no improvement in any of the monitored indicators of social disparities despite rising economic levels.

Tab. 2: Average cluster characteristics relative to the EU average (=100) and changes between 2014–2018 and 2019–2024

	GDP			Gini coefficient			Top10 % / Bottom 50 %		
	2014–2018	2019–2024	Change	2014–2018	2019–2024	Change	2014–2018	2019–2024	Change
EU-27	100	100	0	100	100	0	100	100	0
Core economies	119	120	1	90	90	0	89	83	-6
Socially cohesive economies	82	85	3	83	78	-5	71	68	-3
High-inequality and polarized economies	62	74	12	115	116	1	140	140	0
Mixed economies	76	89	13	108	101	-7	105	99	-6

Source: compiled by the authors

The developments in economic performance, income inequality, and polarization differed among countries (Figure 1). In 2019-2024, the Core Economies cluster consisted exclusively of the old EU member states. Of these, only Denmark and the Netherlands managed to slightly increase their relative economic performance compared to the EU average during the analysed period. GDP per capita in the other countries belonging to this cluster declined relative to the EU average, and their economies thus converged toward the EU average from above. This trend was most pronounced in Austria and Sweden. Gini coefficient values increased in all countries in this cluster except Belgium, where they decreased relative to the EU average during the second analysed period. The ratio of the average income of the top 10% to the average income of the bottom 50% decreased in half of the countries in this cluster and increased in the other half. Countries where this indicator increased included Denmark and the Netherlands, the only two countries in the Core Economies cluster to record increases in all three variables.

The composition of the Socially Cohesive Economies cluster remained consistent. The cluster consists exclusively of new member states that joined the European Union in 2004. These economies scored below the EU average in all three indicators. Based on the relative GDP per capita indicator, Slovenia made the most significant progress towards the EU average, and the Czech Republic's relative economic performance also improved slightly.

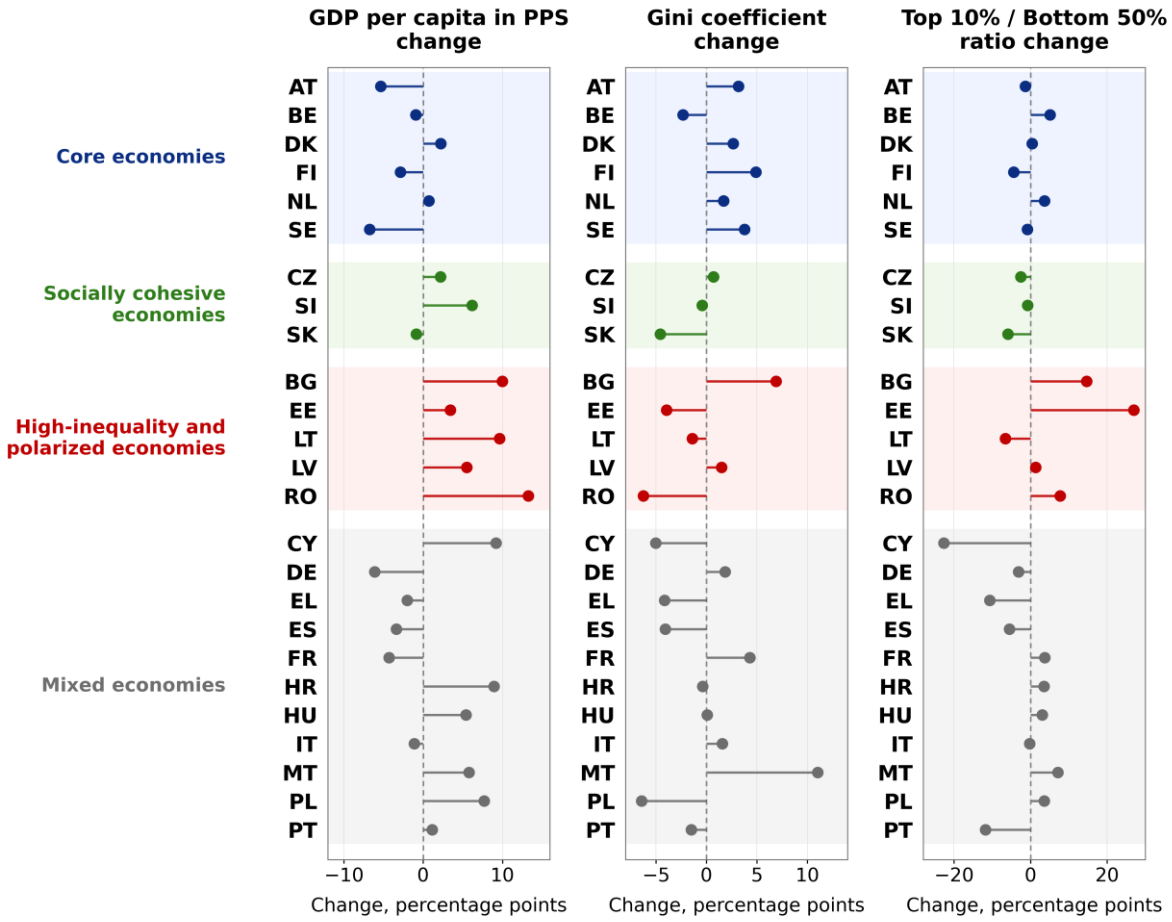
Only Slovakia recorded a slight decline in its relative economic performance compared to the EU average during the period under review. Differences among countries in the Socially Cohesive Economies cluster were also evident in the evolution of the Gini coefficient. While this indicator declined in Slovakia and Slovenia during the second observed period, income inequality in the Czech Republic slightly increased. The ratio of the average income of the top 10% to the average income of the bottom 50% decreased in all three countries belonging to this cluster, indicating a more favourable income distribution and relatively faster income growth for the bottom half of the population compared to the top 10%.

All economies in the High-inequality and Polarized Economies cluster performed very well in terms of GDP per capita, and their growth was above average. Compared to the EU average, they started with a relatively low economic performance, and their higher growth rate indicates a process of catching up during the analysed period. However, the rise in the relative economic performance at the aggregate macroeconomic level was accompanied by a corresponding decline in income inequality and the ratio of income between the top 10% and the bottom 50% of the population only in Lithuania. The other countries in this cluster experienced an increase in income inequality or a deterioration of distributional disparities. This was particularly visible in Bulgaria and Latvia.

The Mixed Economies cluster consists of both old and new EU member states. The average values of all three indicators in the second analysed period were closest to the EU-wide averages in this cluster, which is particularly true for the Gini coefficient and the Top 10%/Bottom 50% polarization indicator (Table 2). With regard to GDP per capita, the cluster was divided into old and new member states. All new member states, which joined the EU in 2004 and later, converged toward the EU average during the second observed period. In contrast, the old member states (with the exception of Portugal) recorded a decline in the relative level of their GDP per capita compared to the EU average during the second analysed period. In Greece and Spain, this decline in relative economic performance was accompanied by a reduction in income inequality and relatively faster income growth among the bottom 50% of the population compared to the top 10%. In France, for example, the trend was less favourable, because in addition to a relative decline in the economic performance in the form of lower GDP per capita, there was an increase in income inequality and faster income growth among the wealthiest 10% of the population. From the perspective of social cohesion and economic growth, we observed favourable developments in Cyprus and Portugal, where growth in the relative economic performance reflected in a relatively higher GDP per capita

was accompanied by a decline in income inequality and faster income growth among the bottom 50% of the population. In contrast, Malta and Hungary experienced a rise in relative economic performance alongside a worsening of income inequality and faster income growth among the wealthiest segments of the population.

Fig. 1: Changes in economic performance, income inequality, and income polarization tendencies within the identified clusters of EU countries between the periods 2014–2018 and 2019–2024.



Source: Composed using Eurostat and World Inequality Database (WID) data

Conclusion

The results of the analysis revealed heterogeneous trends within the European Union in terms of GDP per capita, income inequality, and polarization tendencies. It is problematic that some countries are converging toward the EU-27 average in terms of GDP per capita, but income inequality and polarization tendencies in society are on the rise too.

Interestingly, during the analysed period, Slovakia and the Czech Republic, along with Slovenia, were classified as socially cohesive economies with a relatively favourable income distribution. Slovakia maintained a more favourable position than the Czech Republic and Slovenia in terms of both income inequality and polarization trends.

From the perspective of each country's economic policy, it is essential not only to focus on implementing measures that support economic growth and economic convergence, but also to ensure that improvements in economic performance do not lead to a widening of social disparities.

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