

ECONOMIC IMPACT OF EU MEMBERSHIP



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Abstract

The chapter examines the economic impact of European Union membership, focusing on economic convergence, integration with the internal market, and the use of EU funds. It analyses the GDP growth trends and economic convergence of countries that joined the EU during the 2004, 2007, and 2013 enlargement waves, with a particular focus on the Visegrad Group. The chapter also explores the effects of EU membership on trade patterns, competitiveness, and innovation, highlighting the role of economies of scale and technological adoption in enhancing economic performance. Additionally, the chapter evaluates the impact of EU structural and cohesion funds on reducing regional disparities, improving infrastructure, and fostering sustainable development. Key findings indicate that while EU membership has generally accelerated economic growth and integration, outcomes vary across countries due to differences in governance, institutional capacity, and the absorption efficiency of EU funds.

Keywords: EU10, EU2, GDP growth, trade diversion, economies of scale, internal market, EU funds, economic convergence

1. Introduction

The EU has undergone several significant expansion waves, with the most recent ones occurring in 2004, 2007, and 2013. These waves are notable because they marked the most significant enlargement in the EU's history, bringing in a total of

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13 new Member States, primarily from Central and Eastern Europe. This expansion substantially transformed the political, economic, and cultural landscape of the EU by integrating countries with diverse historical backgrounds and socio-economic conditions. In this chapter, special attention will be given to the Visegrad countries (Poland, Hungary, the Czech Republic, and Slovakia), as they played a crucial role in the enlargement process. Their successful integration into the EU serves as a model for other post-communist nations and highlights the broader impacts of EU enlargement on regional stability and development.

This chapter explores the economic impact of EU accession by focusing on key areas where membership is expected to bring measurable change, namely GDP growth, economic convergence, integration through trade flows, access to the internal market, competitiveness effects, innovation, and the use of EU funds. These areas were selected because they represent the core mechanisms through which EU membership can significantly influence national economies. The aim of this chapter is to assess how EU accession impacted economic performance of new Member States in the areas referred to above. While other aspects of EU membership could be addressed, the selected topics provide a consistent and focused picture of the most policy-relevant and empirically observable economic effects.

To better understand the factors driving growth following EU accession and the lessons learned from the latest enlargement waves, several possible channels of economic growth will be assessed in this chapter. The first part of the chapter will examine GDP growth and convergence effects. Many of the new Member States were relatively less developed compared to the EU15. Their post-accession growth was partially driven by the convergence effect, where less developed countries grow faster as they catch up with more advanced economies. Second, the effects of integration into the single market will be analysed. EU membership grants access to the single market, leading to increased trade with other Member States. Deeper economic integration with the broader EU economy also provided new opportunities for businesses and industries, enabling economies of scale and improving productivity and competitiveness across sectors. The third aspect to be viewed relates to access to EU funds. New Member States received substantial financial support through EU structural and cohesion funds, which helped modernise infrastructure, stimulate economic activity, and support various development projects.

Some of these growth channels were activated even before formal EU accession, such as partial access to funds for candidate countries through programmes like PHARE, ISPA, and SAPARD. Additionally, the requirement to meet the Copenhagen accession criteria may have contributed to economic growth during the pre-accession period. In both cases, the EU's expansion into Central and Eastern Europe played a crucial role in extending the EU's influence and promoting economic convergence and market reforms across the continent.

In the chapter, a multitude of data sources is employed. For this reason, the time frame presented in tables and figures may not always be consistent, depending on the data availability and the up-to-date status of various databases. Additionally, the

benchmark aggregate can vary across databases, sometimes being EU28, EU27_2020, or EU27_2013.

2. GDP Growth and Economic Convergence

In historical terms, the concept of continuous economic growth is relatively recent, emerging with the Industrial Revolution, urbanisation, and healthcare improvements that began in the late 18th century. After World War II, economists, reflecting on the economic hardships of the interwar period, argued that closer economic ties between European countries could facilitate the continent's recovery by encouraging trade, investment, and cooperation. This belief was based on the idea that economic interdependence would not only drive prosperity but also reduce the chances of future conflicts by creating shared economic interests among nations. This vision paved the way for European integration efforts, including the establishment of the European Coal and Steel Community (ECSC) in 1951 and the European Economic Community (EEC) in 1957, both designed to support economic growth through collaboration and the elimination of trade barriers.

Figure No. 1 illustrates why the idea of economic integration leading to economic growth was ultimately widely embraced by European economists. The real GDP¹ growth rate in Europe between 1950 and 1973 was unprecedented, averaging 4.6%. Similarly high growth rates were observed for real GDP per capita and GDP per hour worked, as captured in the figure.

1 Real GDP is the total value of all goods and services produced within a country's borders over a specific period, adjusted for inflation or deflation. Unlike nominal GDP, which measures output at current prices, real GDP reflects the value of economic output using constant prices from a base year. This adjustment allows for a more accurate comparison of economic performance over time, as it accounts for changes in price levels.

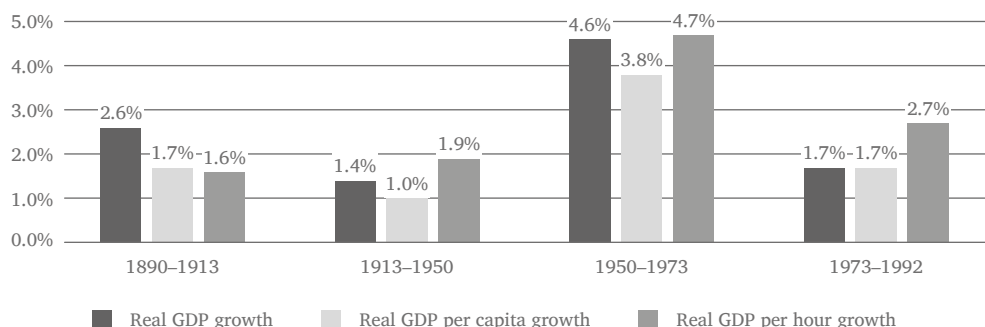


Figure No. 1
Phases of economic growth in Europe²

However, Figure No. 1 does not attribute economic growth solely to economic integration. Post-war reconstruction also contributed significantly to the economic development of that era. To better understand the role of economic integration, it is useful to examine the different forms of integration adopted by European countries. Table No. 1 provides a clear approach to this by analysing data on the extent and pace of economic integration and comparing growth rates across different groups. The table demonstrates that the EEC, which pursued deeper integration, experienced faster growth than the EFTA. For additional perspective, the table also includes growth figures for the USA and Japan.

	GDP in 1950 (in 1990 USD)	Ranking in Europe in 1950	Ranking in Europe in 1973	GDP growth rate between 1950 and 1973
EEC – average	4 825	8	6.8 (↑ by 1.2)	4.20%
EFTA – average	6 835	3.6	5 (↓ by 1.4)	3.00%
Other ³ – average	2 401	14.3	14.6 (↑ by 0.3)	5.20%
USA	9 573	n/a	n/a	2.40%
Japan	1 873	n/a	n/a	8.00%

Table No. 1
GDP per capita, country rankings and growth rates in Europe between 1950 and 1973⁴

² Baldwin and Wyplosz, 2022, p. 163.

³ Other countries include Ireland, Spain, Portugal and Greece.

⁴ Baldwin and Wyplosz, 2012, p. 214.

As reflected in Table No. 1, the EEC countries grew significantly faster than the EFTA countries, with a growth rate of 4.2% compared to 3% between 1950 and 1973. Additionally, the average ranking of EEC Member States improved by 1.2 places, while the average ranking of EFTA countries in Europe declined by 1.4 places.⁵ However, this difference could be attributed to the catch-up (or convergence) effect, where poorer countries tend to grow faster than wealthier ones. Table No. 1 also provides basic evidence of this effect, as both the EEC and the ‘Other countries’ group had lower GDPs than the EFTA countries, yet experienced higher GDP growth rates.

This ‘economic growth puzzle’ can be further untangled using various approaches. The most accurate would be to conduct an econometric analysis, using the level of economic integration as an explanatory variable, while controlling for different economic conditions. Another, simpler approach is to compare pre- and post-accession levels of economic growth. By examining GDP growth rates before and after each wave of enlargement, it can be assessed whether the accession of new countries stimulates economic activity, boosts trade, and enhances investment, leading to economic growth.

Table No. 2 presents the results of this comparison, showing the real GDP⁶ growth rates for new EEC/EU Member States, the EEC6, and the EU15 for the five-year period before and after each expansion wave. The EU15 is additionally used as a benchmark for existing Member States, alongside the original EEC6 (the founding members of the EEC), to minimise the impact of convergence effects by including more recently joined countries in the benchmark aggregate.

5 The group ranking is an average of country rankings, therefore it is not a whole number.

6 Real GDP is assessed using GDP in constant 2017 prices, as available in the Penn World Table, introduced by Feenstra, Inklaar and Timmer, 2015 and continually updated thereafter.

	EEC6	EU15	1973 enlargement: UK, Denmark, Ireland	1981 enlargement: Greece	1986 enlargement: Spain, Portugal	1995 enlargement: Finland, Austria, Sweden
Before (1968-1972)	23.4%	21.7%	10.2%			
After (1973-1977)	10.7% (↓12.7 p.p.)	9.3% (↓12.6 p.p.)	2.4% (↓7.8 p.p.)			
Before (1976-1980)	13.3%	11.9%		14.8%		
After (1981-1985)	6.9% (↓6.4 p.p.)	8.0% (↓3.9 p.p.)		2.3% (↓12.5 p.p.)		
Before (1981-1985)	6.9%	8.0%			6.7%	
After (1986-1990)	14.7% (↑7.8 p.p.)	15.0% (↑7.0 p.p.)			25.8% (↑19.1 p.p.)	
Before (1990-1994)	6.2%	5.8%				1.9%
After (1995-1999)	8.9% (↑2.7 p.p.)	11.6% (↑ 5.8 p.p.)				14.6% (↑12.7 p.p.)

Table No. 2⁷
Five-year real GDP growth rates before and after the 1973, 1981, 1986 and 1995 enlargements⁸

Several important insights can be drawn from Table No. 2. The first is that, except for Greece, all enlargement waves appear to have had growth effects. These effects are either reflected in higher GDP growth rates compared to the EEC6 and EU15, as seen in the 1986 and 1995 enlargements, or lower declines in growth rates, as observed in the 1973 enlargement. The second observation concerns Greece, which seems to have experienced negative growth effects following its accession to the EEC. Some interpret this as evidence of a rushed accession, when Greece may not have been economically prepared to join such an integrated group. Finally, it is important to consider periods of economic downturn. The impact of the oil crisis in the 1970s is evident, as GDP growth rates slowed down across all country groups, as well as the early 1980s economic slowdown, which prompted intensified efforts to complete the internal market.

⁷ Feenstra, Inklaar and Timmer, 2015; own design and calculations.

⁸ The GDP growth rates are calculated as growth over five-year periods, not as averages of yearly growth rates.

2.1. Overview of GDP Growth Trends

This section of the chapter will examine GDP growth trends following the 2004, 2007, and 2013 enlargements, both at the enlargement level and the country level. The same straightforward approach used in the previous section – comparing GDP growth rates before and after accession – will be applied here, with particular attention to country-specific details for each enlargement wave, particularly focusing on the Visegrad countries. To measure economic growth, the real GDP growth rate was selected due to its advantages over the nominal GDP growth rate when analysing economic performance, such as inflation adjustment, better comparisons over time, and improved cross-country comparisons.

2.1.1. Pre- and Post-Enlargement GDP Growth Trends

The EU enlargements in the new millennium were unprecedented in terms of both size and the historical background of the acceding countries. The 2004 enlargement increased the EU15 population by 19.5%, and the 2007 enlargement increased the size of the EU25 by 6.6%.⁹ On the other hand, the 2008 financial crisis soon followed, adding challenges to the EU integration process.

Table No. 3 illustrates the GDP growth rates for the EU28 across different enlargement periods, compared with the Member States of each enlargement wave. The table also includes values for the EU15 to better highlight the economic trends in the older Member States. For the 2004 enlargement, the real GDP growth rate increased by 8.4 percentage points for the EU28 and 7.3 percentage points for the EU10 countries, while the EU15 experienced a slowdown of 0.3 percentage points. This data suggests growth effects for the EU10. The 2007 enlargement, which included two new members, coincided with the 2008 financial crisis, which significantly impacted GDP growth rates in the newly enlarged EU. Although GDP growth rates remained positive in the enlargement countries (unlike in the EU15), the growth rate declined sharply by 25.7 percentage points, from 27.9% before the EU accession to only 2.2% after the accession. Lastly, regarding Croatia's accession in 2013, the combined effects of post-crisis recovery and EU membership resulted in a significant GDP growth rate increase of 20.3 percentage points, compared to the 9.6 percentage points in the EU15 and the 14.2 percentage points in the EU28 (see Table No. 3).

9 World Bank, 2024.

	EU15	EU28	2004 enlargement: EU10	2007 enlargement: EU2	2013 enlargement: Croatia
Before (1999-2003)	8.5%	15.5%	14.8%		
After (2004-2008)	8.2% (↓0.3 p.p.)	23.9% (↑8.4 p.p.)	22.1% (↑7.3 p.p.)		
Before (2002-2006)	8.6%	23.2%		27.9%	
After (2007-2011)	-0.6% (↓9.12 p.p.)	5.4% (↓17.8 p.p.)		2.2% (↓25.7 p.p.)	
Before (2008-2012)	-1.4%	2.0%			-11.1%
After (2013-2017)	8.4% (↑9.6 p.p.)	16.2% (↑14.2 p.p.)			9.2% (↑20.3 p.p.)

Table No. 3¹⁰

Five-year real GDP growth rates before and after the 2004, 2007 and 2013 EU enlargements¹¹

In the context of the previous enlargements, as presented in Table No. 2, the data from the most recent expansion waves appear to confirm the high growth and catch-up potential of less developed EU Member States, as well as the higher impact of the new EU Member States on the overall performance of the EU28. While Table No. 2 shows largely similar performance between the EEC6 and EU15, Table No. 3 reveals a much greater difference between the EU15 and EU28.

2.1.2. Analysis of GDP Growth Rates – Enlargement Waves and the Visegrad Countries

While European countries tend to be in similar phases of the business cycle, there is heterogeneity in the volatility of GDP growth. Figure No. 2 captures annual real GDP growth in new EU Member States from 1991 to 2019. The Visegrad countries and EU10 experienced relatively strong and consistent growth in the early 2000s, peaking around 2006–2007, immediately after the EU accession. A sharp decline is evident across all regions during the 2008–2009 global financial crisis, with GDP growth dropping significantly, particularly in the Visegrad countries and Croatia, followed by a slow recovery in the subsequent years. The EU15 countries, represented by a steadier line, show more moderate growth throughout the period. After 2010, all regions show signs of recovery, but growth rates remain lower than

¹⁰ Feenstra, Inklaar and Timmer, 2015; own design and calculations.

¹¹ The GDP growth rates are calculated as growth over five-year periods, not as averages of yearly growth rates.

in the pre-crisis period. The Visegrad and EU10 countries generally outperform the EU15 in terms of growth rates, although their growth stabilises post-crisis at lower levels than earlier.

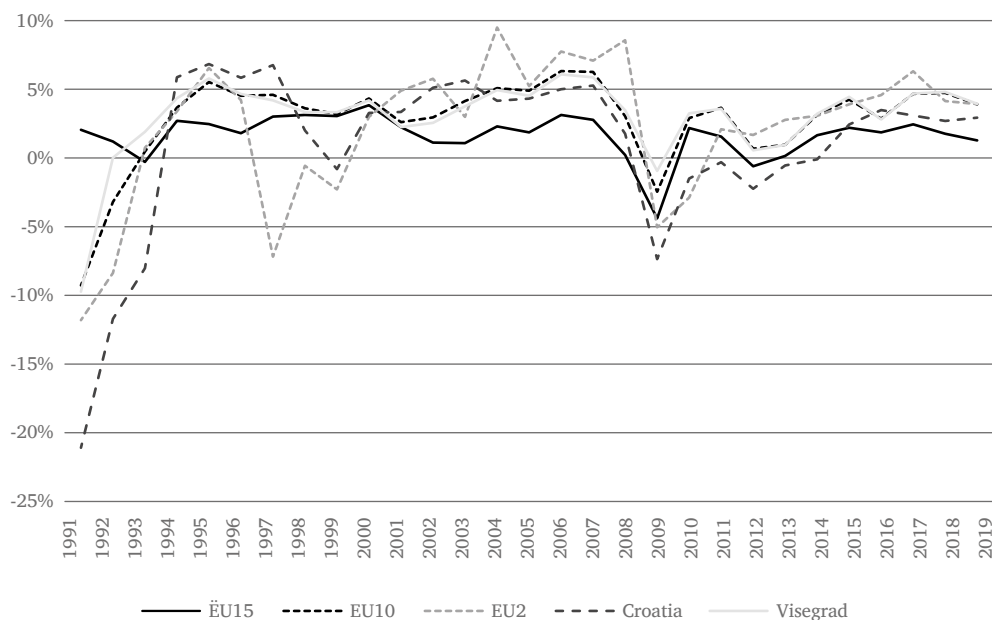


Figure No. 2¹²
Annual real GDP growth in the EU15 and in the new Member States

Figure No. 2 also shows negative real GDP growth rates in the 1990s for the recent EU Member States. These figures can be attributed to several key factors related to the economic transitions taking place in these countries. Most of the EU10 countries were transitioning from centrally planned economies to market-oriented systems. This transition involved major structural reforms, privatisation, and the creation of new institutions, which initially led to economic instability and contractions in real GDP, and periods of recession. Furthermore, several countries in the region, such as Croatia and Slovenia, were directly affected by the Yugoslav Wars.¹³ This impacted economic growth during the decade, as infrastructure was damaged, and economic uncertainty impacted investment flows negatively. New EU Member States were also affected by broader global economic factors in the 1990s, such as the Russian financial crisis in 1998, which had a spill-over effect on the economies

¹² Feenstra, Inklaar and Timmer, 2015; own design and calculations.

¹³ Nation, 2003.

of Central and Eastern Europe due to trade and financial links with Russia.¹⁴ Lastly, real GDP growth was slowed down by the legal and institutional reforms to meet the EU's standards for the future EU accession. While these reforms were essential for long-term growth, they involved short-term economic disruptions, contributing to lower growth during the transition period.

The five-year GDP growth before and after EU accession for new Member States are captured in Figure No. 3. Most countries, like Poland, Slovakia, and the Baltic states (Estonia, Latvia, Lithuania), saw significant increases in GDP growth after joining the EU, indicating the positive impact of EU membership on economic performance. However, some countries, such as Hungary and Cyprus, experienced a decline or stagnation in their growth rates post-accession, suggesting mixed results depending on specific national conditions.



Figure No. 3¹⁵
Five-year real GDP growth rates before and after 2004, 2007 and 2013 EU enlargements¹⁶

A more detailed, annual view on the growth rates is captured in Table No. 4. As a group, the Visegrad countries experienced an average real GDP growth rate of 3.2% in the five years before EU enlargement and 5% during the first five years after enlargement. However, there is some heterogeneity among the four countries. Slovakia and the Czech Republic experienced the highest post-accession growth rates, while Hungary lagged with a growth rate below the group average.

¹⁴ Dungey et al., 2002.

¹⁵ Feenstra, Inklaar and Timmer, 2015; own design and calculations.

¹⁶ The GDP growth is calculated as growth over five-year periods, not as averages of yearly growth rates.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	1999– 2003 avg.	2004– 2008 avg.
Visegrad countries	3.3%	4.2%	2.2%	2.6%	3.8%	4.9%	4.5%	6.1%	5.9%	3.5%	3.2%	5.00%
Czech Republic	1.4%	4.0%	3.0%	1.6%	3.6%	4.8%	6.6%	6.8%	5.6%	2.7%	2.7%	5.3%
Hungary	3.1%	4.5%	4.1%	4.7%	4.1%	4.8%	4.2%	4.0%	0.2%	1.1%	4.1%	2.9%
Poland	4.7%	4.6%	1.3%	2.0%	3.5%	5.0%	3.5%	6.1%	7.1%	4.2%	3.2%	5.2%
Slovakia	-0.1%	1.2%	3.3%	4.5%	5.5%	5.3%	6.6%	8.5%	10.8%	5.6%	2.9%	7.4%

Table No. 4¹⁷

Annual real GDP growth rates before and after the 2004, 2007 and 2013 EU enlargements¹⁸

The Czech Republic experienced strong economic growth during the five years following its EU accession, averaging 5.3%, compared to a pre-accession average annual growth rate of 2.7% (see Table No. 4 for specific annual rates). With this growth rate, the Czech Republic ranked 7th in the EU25, between Bulgaria (6.7%) and Ireland (5.7%). Although its pre-accession growth was below the Visegrad average, in the years following enlargement, the Czech Republic exceeded the group average, being outperformed only by Slovakia.

Similar to the Czech Republic, Hungary also saw economic growth in the five years after joining the EU, but with a below-average annual rate of 2.9%, up from the pre-accession rate of 4.1%. This placed the country 18th among the EU28, far below other new Member States. While its growth prior to accession was above the Visegrad group's average, in the post-enlargement years, Hungary fell below the group's average, being the last in the Visegrad group. The country performed particularly poorly in 2007 and 2008, as it was impacted by fiscal austerity measures, high public debt, and the early effects of the global financial crisis.¹⁹

Poland experienced economic growth both before and after EU accession, with a pre-accession five-year average growth rate of 3.2%, and an even stronger post-accession average of 5.2%. Poland consistently outperformed many other new EU Member States (ranking 9th in the EU25 during 2004–2008) in the post-accession period, largely due to sound economic policies and stable domestic demand. Even during the global financial crisis, Poland's economy proved resilient, maintaining

¹⁷ Feenstra, Inklaar and Timmer, 2015; own design and calculations.

¹⁸ The GDP growth rates for the 5 years are calculated as averages of yearly growth rates.

¹⁹ Andor, 2009.

positive growth and becoming one of the EU's best performers (in 2008, the country was outperformed only by Romania, Bulgaria and Slovakia).

Slovakia also demonstrated significant growth, with a modest pre-accession five-year average of 2.9%, which rose to 7.4% in the five years after accession, making it the fastest-growing post-accession economy in the Visegrad group. Slovakia's growth was driven by major structural reforms and increased foreign investment, particularly in the automotive sector.²⁰ In the post-enlargement period, Slovakia outperformed all other Visegrad countries.

2.2. Economic Convergence

Economic convergence refers to the process where less developed or poorer countries catch up richer countries by growing at a faster pace than the latter ones.²¹ This difference in economic growth rates results in narrowing the income gap between them over time.

In the context of the EU, convergence is often assessed in terms of GDP per capita or productivity levels approaching those of more developed Member States. The literature distinguishes between beta convergence and sigma convergence. Beta convergence represents a negative relationship between initial income levels and subsequent growth rates, implying that poorer countries would grow faster than richer ones. On the other hand, sigma convergence refers to a decline in the dispersion of income levels across countries over time, implying that gradually, EU Member States should exhibit more synchronised growth rates. By definition, sigma convergence implies the existence of beta-convergence, otherwise poorer countries could not become synchronised with richer ones.²²

There is strong evidence of the fact that economic integration leads to economic convergence, through the functioning of various convergence factors such as trade, capital and human flows, technology transfers, investment in human capital etc.²³ Eastern and Southern European countries, including Poland, Romania, Greece, and Portugal, have exhibited substantial economic catch-up in income levels relative to the EU average, particularly after accession. However, convergence patterns have not been uniform across Member States, and more recent debates have pointed to the need to consider not only absolute convergence but also issues of quality of growth and regional inequalities.²⁴

20 Banerjee and Zeman, 2022.

21 Barro and Sala-i-Martin 1992.

22 Sala-i-Martin, 1996.

23 Baldwin and Wyplosz, 2022.

24 European Commission, 2023.

2.2.1. Convergence Theory and Evidence of Economic Catch-Up

The reduction of disparities among EU Member States is addressed in the economic literature as either real or nominal convergence. Real convergence refers to the process by which poorer countries or regions achieve higher economic growth rates than richer ones, thereby reducing income disparities over time. It focuses on the convergence of real economic variables such as GDP per capita, productivity, living standards, and employment rates. Real convergence targets improvements in economic well-being, structural transformation, and output levels. In contrast, nominal convergence refers to the alignment of monetary and financial variables among countries or regions, often as a prerequisite for joining a monetary union, such as the Eurozone. Key indicators of nominal convergence include inflation rates, interest rates, exchange rate stability, and the ratio of fiscal deficits to GDP.²⁵

While real convergence indicators provide a deeper understanding of the convergence processes in EU countries, indicators of nominal convergence offer a more straightforward and simple view of convergence between EU countries. Moreover, EU members share a certain level of similarity in structural characteristics due to economic ties, instruments aimed at enhancing this convergence, such as EU funds, and, in the Eurozone, identical monetary policy. The following section of the chapter will focus on indicators of nominal convergence between EU Member States.

2.2.2. Comparative Analysis of GDP Per Capita

The real GDP per capita in absolute terms increased continuously in all EU Member States. Figure No. 4 illustrates the convergence of new EU Member State groups toward the GDP per capita of the EU15, with the EU15 benchmarked at 100%. Over the observed period, EU10 and Visegrad countries show a steady upward trend in GDP per capita relative to the EU15, especially after the early 2000s, indicating gradual convergence. Both groups surpassed the 50% mark subsequently, and continued to close the gap with the EU15. EU2 lags behind the other groups, with their GDP per capita remaining significantly lower as a ratio to the EU15 values. However, the figure indicates a slow but consistent upward trend, suggesting continuing convergence, though at a slower pace compared to the other regions. Croatia is also showing convergence, its growth trajectory is more gradual but shows significant improvement over time.

25 Lein, Leon-Ledesma and Nerlich, 2009.

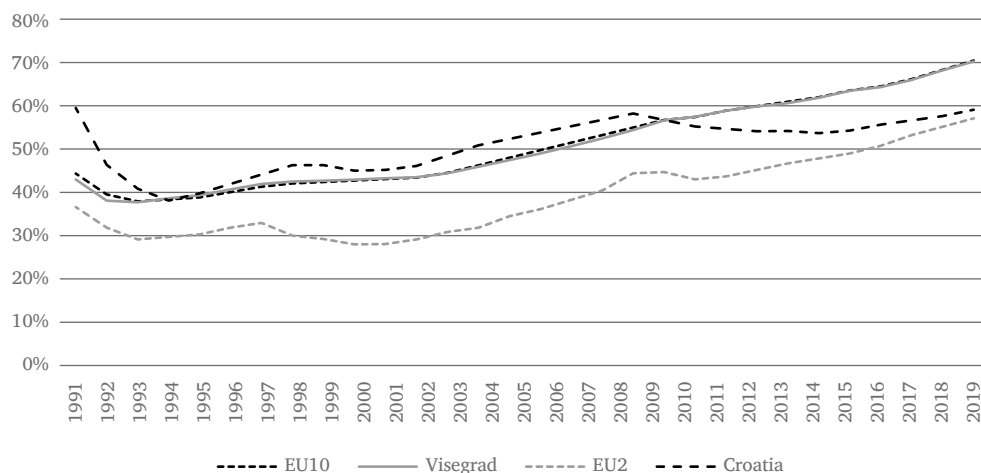


Figure No. 4²⁶
Real GDP per capita as a ratio of the EU15 GDP per capita

Figure No. 5 illustrates GDP per capita as a ratio of the EU15 values. The Czech Republic leads the group, with its GDP per capita steadily increasing and reaching 80% of the EU15 average by 2019. Poland and Slovakia show significant improvement over time, closing the gap with Hungary at around 2010. Poland's GDP per capita continued to increase at a relatively fast pace, even during and after the financial crisis of 2008. Hungary's growth has been relatively consistent but slower, surpassing 60% of the EU15 average by 2019. Slovakia had the slowest start in the Visegrad group but shows a strong upward trajectory, reaching values similar to Hungary since 2010.

26 Feenstra, Inklaar and Timmer, 2015; own design and calculations.

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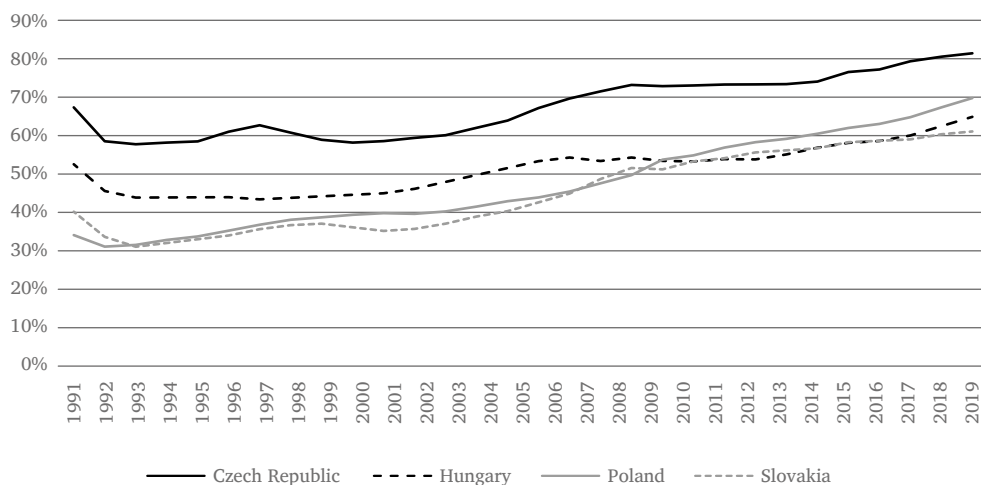


Figure No. 5²⁷

Real GDP per capita as a ratio of the EU15 GDP per capita – Visegrad countries

Similar to GDP growth, not all GDP per capita growth can be attributed to EU accession. Boronenko, Mensikovs, and Lavrinenko,²⁸ for instance, examined the impact of EU accession on GDP per capita growth and economic convergence in the EU10 and EU2, finding that the high increase in GDP per capita observed in the new Member States is not directly a result of EU membership but rather a result of their self-development under market economy conditions. On the other hand, the post-Soviet countries implemented market economy principles with the aim of better integrating into the EEC/EU economy. In any case, convergence is not guaranteed, and factors such as poor governance, lack of infrastructure, and socio-political instability can hinder this process. Therefore, the EEC/EU has focused on a multitude of tools aimed at boosting and supporting economic convergence. The following chapters will address some of these tools.

2.3. Summary

A comparative analysis revealed that deeper economic integration, as seen with the EEC countries, led to faster growth compared to the less integrated regions like EFTA. The EU enlargements in 2004, 2007, and 2013 contributed to GDP growth through economic convergence, as less developed nations grew faster while integrating into the EU single market. However, post-enlargement GDP growth in the Visegrad countries varied. Beyond long-term convergence, outcomes were mixed and

²⁷ Ibid.

²⁸ Boronenko, Mensikovs and Lavrinenko, 2014.

dependent on governance, infrastructure, and market conditions. Despite challenges such as the 2008 financial crisis, most new Member States demonstrated resilience. The Visegrad countries generally experienced strong economic growth following EU accession, with most countries benefiting from the EU membership. The Czech Republic, Poland and Slovakia emerged as strong performers, demonstrating resilience even during the global financial crisis. Hungary struggled with slower post-accession growth, highlighting the importance of sustainable fiscal management and structural stability in capitalising on the benefits of EU membership.

Economic convergence, a key feature of EU integration, was evident as GDP per capita in the Visegrad countries gradually approached the EU15 average. While factors such as market reforms and external financial crises influenced this growth, the impact of EU membership remained significant. The experience of these countries highlights the critical role of effective fiscal management and structural reforms in maximising the benefits of EU membership.

3. Integration With the Internal Market

The term internal market refers to an economic arrangement in which multiple countries or regions agree to eliminate barriers to trade, and allowing for the free movement of goods, services, capital, and people across borders. This concept is central to the EU, which has established an extensive internal market among its Member States. As a result, businesses can operate across borders with greater ease, and consumers benefit from a wider variety of products and services at competitive prices.²⁹

A single market goes beyond the removal of traditional trade barriers and the movement of factors of production, it also involves harmonising regulations and standards to ensure a level playing field for all participants. This harmonisation helps prevent businesses from being disadvantaged by different rules and regulations in different regions. For example, the EU has established common standards for product safety, environmental regulations, and consumer rights, allowing goods and services to flow freely without needing to meet significantly different criteria in each country. Such integration is designed to promote fair competition and increase productivity by encouraging companies to scale up and compete within a larger market.³⁰ The benefits of an internal market are not limited to economic gains, they also have social and political dimensions. By facilitating the free movement of people, an internal market supports the mobility of workers, students, and tourists, which can lead to increased cultural exchange and a deeper sense of unity among participating

²⁹ European Commission, 2024a.

³⁰ Badinger, 2007; Ambrose et al., 2019.

regions. This mobility also helps address labour shortages and skill mismatches by allowing workers to move to areas where their skills are in demand.³¹

The EEC/EU has experienced several waves of enlargement, some of which have significantly influenced the size and effectiveness of the single market. Figure No. 6 presents data on employment, population, and real GDP at constant 2017 prices (in millions of 2017 USD) over the period from 1958 to 2019. During this time, there was a steady increase in the population, which accelerated slightly until the early 2000s and then stabilised, as the 2007 and 2013 enlargements encompassed fewer and mostly smaller countries. Employment generally followed a similar trend but appears to grow at a slightly slower pace, mostly because of population ageing in the EU. Meanwhile, real GDP exhibits a significant upward trend, reflecting robust growth in the economic size of the EEC/EU as well as the size of the internal market.

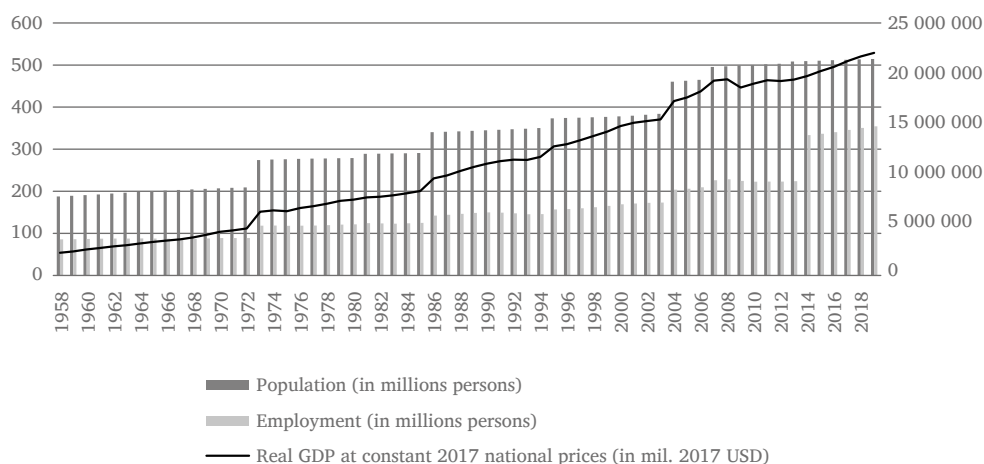


Figure No. 6³²

*Evolution of the size of the EEC/EU internal market over time
(Employment and Population on the left axis and GDP on the right axis)*

The increase in the size of the EEC/EU internal market across various enlargement waves is captured in Table No. 5. The most significant enlargement was the first one in 1973, which increased the EU's population by 30.5%, significantly boosting the potential market size and demand within the internal market. This same enlargement wave increased EEC employment by almost one-third and EEC GDP by nearly 30%. The 2004 enlargement by the EU10 brought a 19.2% increase in population and a 9.2% increase in real GDP, highlighting the economic potential

31 Rolfe and Hudson-Sharp, 2016 provide extensive case studies on selected industries in the UK.

32 Feenstra, Inklaar and Timmer, 2015; own design and calculations.

of the newly integrated countries but also reflecting the lower economic level of the new Member States.

	Population (in millions of persons)	Employment (in millions of persons)	Real GDP at constant 2017 national prices (in mil. 2017 USD)
1973 – United Kingdom, Ireland and Denmark	30.5%	31.7%	27.9%
1981 – Greece	3.5%	3.2%	2.7%
1986 – Spain and Portugal	16.7%	12.9%	12%
1995 – Austria, Sweden and Finland	6.2%	6.7%	6.3%
2004 – EU10	19.2%	16.7%	9.2%
2007 – Romania and Bulgaria	6.1%	6.0%	2.7%
2013 – Croatia	0.8%	0.7%	0.5%

Table No. 5³³

Increase of the size of the EEC/EU internal market by the enlargement wave

The recent enlargement waves have brought in countries with younger, developing market economies, which required substantial adjustments to meet the EU's economic and institutional standards. These newer members had to undertake comprehensive reforms to align with the EU's legal and economic systems, facilitating smoother integration into the single market. The aim of the process was not only to deepen the integration within the EU, but also to enhance economic stability and growth in the joining countries, contributing to a more cohesive European economic area. Unlike the initial expansions, which focused primarily on economic cooperation, more recent Member States had to meet more strict and explicit requirements to ensure alignment with the EU's core values and policies. The Copenhagen criteria were established to ensure that new members adhered to standards of democracy, the rule of law, human rights, and a functioning market economy before joining.³⁴

The following section of the chapter will examine how the integration of new Member States, with a special focus on the Visegrad countries, into the European Union's internal market, has impacted their economies, particularly in terms of trade, competitiveness and innovation potential. First, trade integration will be assessed, including changes in trade volumes and trade balances over time, as well

³³ Ibid.

³⁴ EUR-lex, 2024.

as shifts in major trade partners and the types of goods and services exported. It then explores how access to the EU market has influenced the competitiveness of these countries, providing opportunities for economies of scale and expanded market access. The chapter also discusses the role of innovation and technological adoption in enhancing competitiveness, as integration has encouraged the Visegrad countries to invest in R&D and adopt new technologies, thus supporting their economic transformation and growth within the EU framework.

3.1. Trade Integration and Patterns

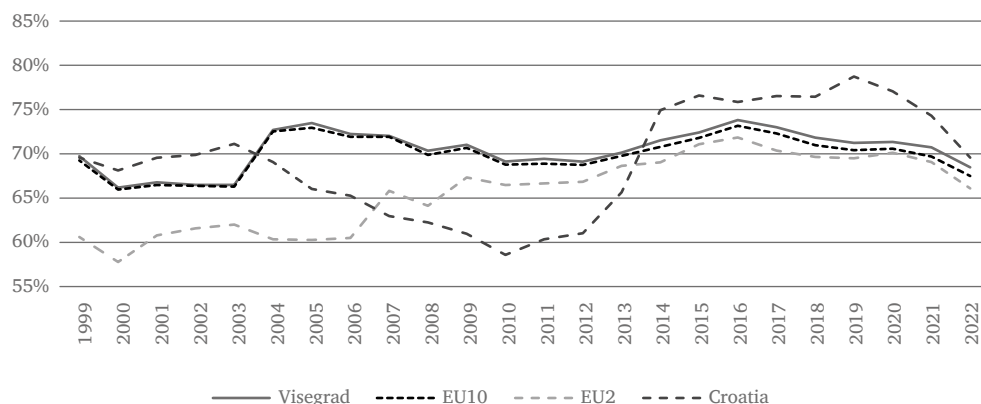
The EU enlargements of 2004, 2007, and 2013 significantly shaped the trade landscape of the new Member States, including the Visegrad countries. The accession of these countries to the EU led to their full inclusion in the EU single market, resulting in the removal of trade barriers, the harmonisation of standards, and the opportunity to participate fully in the EU's free movement of goods, services, and capital.

3.1.1. Trade Diversion and Trade Balance With the EU

Trade diversion refers to a situation in international trade where the formation of a preferential trade agreement causes a shift in trade patterns, diverting imports from a global producer to a producer within the trade bloc. This occurs because the trade bloc reduces or eliminates tariffs among its members, making intra-bloc goods artificially cheaper compared to goods from external countries, even if the latter are produced at a lower cost. Baldwin and Wyplosz³⁵ discuss trade diversion in the context of economic integration and regionalism, emphasising that while trade agreements can enhance trade within the bloc, they may also distort global trade by reducing imports from more competitive producers outside the bloc.

Following EU accession, the new Member States experienced a substantial increase in trade volumes with other EU Member States. The integration into the EU market also led to changes in the trade partners of the Visegrad countries. Prior to accession, their trade was often oriented towards regional partners or, in some cases, towards non-EU countries due to historical and geopolitical ties. After joining the EU, there was a noticeable shift towards intra-EU trade. However, Figure No. 7 and Figure No. 8 show that trade diversion followed somewhat different paths in terms of the pace of each expansion wave and direction of trade (exports and imports). For instance, in terms of imports, the Visegrad countries experienced a more rapid shift towards the EU compared to exports. On the other hand, export ties with the EU were already strong, as by 2004, 80% of Visegrad exports were directed towards the EU28, while for imports, the ratio was 73%. In this sense, the potential for trade diversion in exports was already partly exhausted.

35 Baldwin and Wyplosz, 2022.

Figure No. 7³⁶

Trade diversion in imports of the EU10, Visegrad group, EU2 and Croatia from EU28 (ratio of imports from EU28 over total imports)

The decrease in the ratio of exports from Visegrad countries to the EU between 2004 and 2013 (see Figure No. 8) can be attributed to several economic and structural factors. One key reason is the diversification of trade partners. After joining the EU, the Visegrad countries increasingly integrated into global markets, building stronger trade relations with non-EU countries such as China, Russia, and the United States. The global financial crisis of 2008–2009 caused economic stagnation in many EU Member States, leading to a reduced demand for imports. Changes in production and supply chains further impacted export ratios. Visegrad countries are deeply integrated into EU-based supply chains, particularly in the automotive sector. However, during this period, global competition intensified, and some supply chains began shifting to lower-cost regions outside the EU. Another factor is structural limitations and competitiveness issues. While the Visegrad countries specialise in medium- and high-tech goods, limited progress in upgrading product sophistication may have affected their ability to maintain or expand their market share within the EU.

36 Eurostat, 2020a; own calculations.

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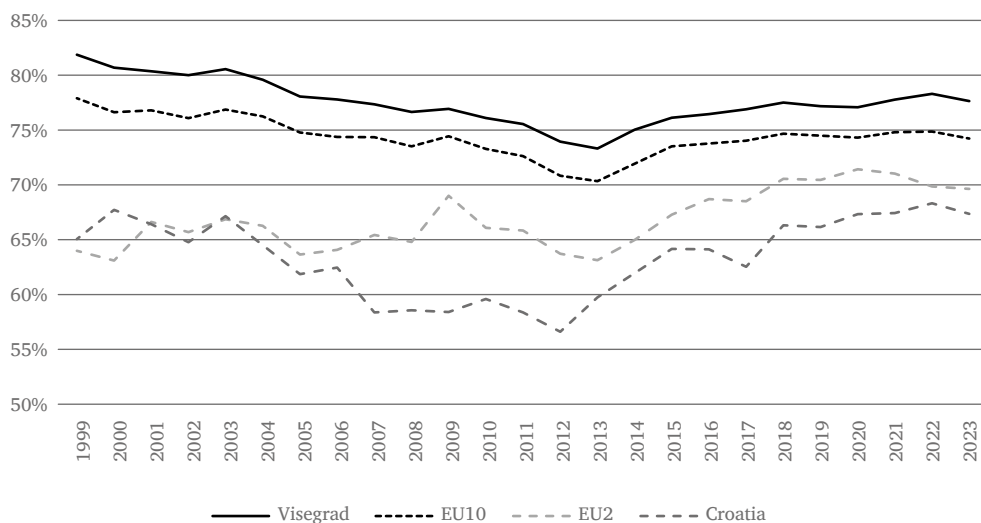


Figure No. 8³⁷

Trade diversion in exports of the EU10, Visegrad group, EU2 and Croatia to EU28 (ratio of exports to EU28 over total exports)

Figure No. 9 confirms that times of economic distress, namely the financial crisis in 2008 and the COVID-19 crisis after 2019, affected the trade balances of the new Member States with the EU.

37 Eurostat, 2020a; own calculations.

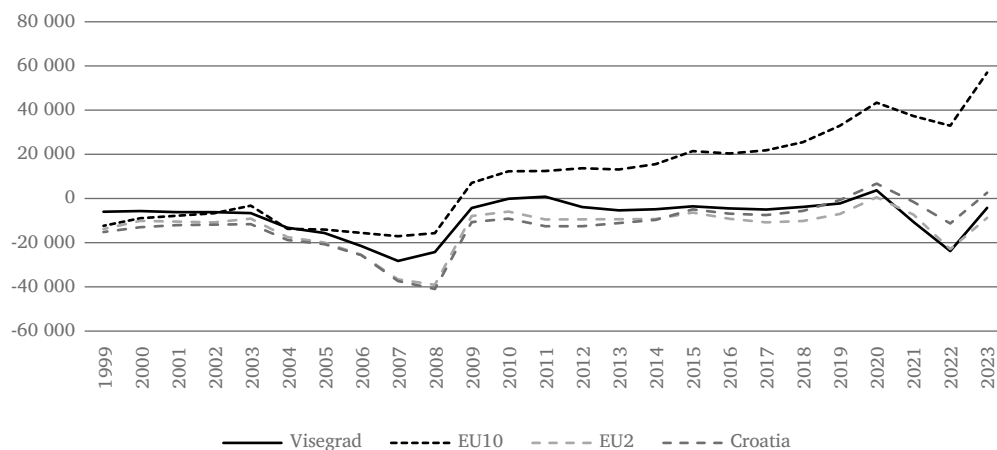


Figure No. 9³⁸
Trade balances (exports-imports) of the EU10, Visegrad group, EU2 and Croatia with EU28 (in millions EUR)

Figure No. 10 shows the trade balances of the Visegrad countries with the EU28. The Czech Republic and Poland consistently improve their trade balance with the EU, while Slovakia and Hungary exhibit a fluctuating trade balance. However, they are still able to maintain an overall positive trade balance with the EU.

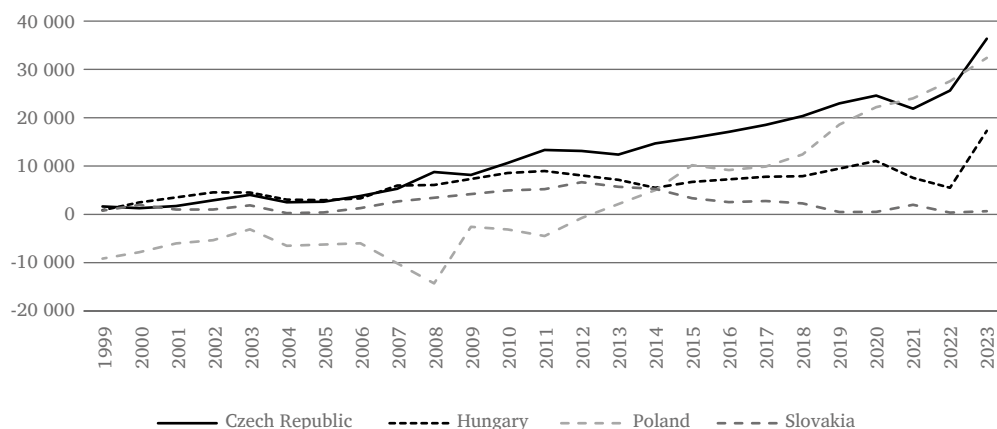


Figure No. 10³⁹
Trade balances (exports-imports) of the Visegrad countries with EU28 (in millions EUR)

³⁸ Ibid.

³⁹ Ibid.

Developing trade integration of the Visegrad countries with the EU28 is obvious, with the Czech Republic and Poland being particularly strong performers in the long run. However, as Vlčková (2018) points out, a positive balance or increasing exports do not necessarily mean that the competitiveness of the respective countries increases. There is a significant difference between (gross) exports and domestic value-added exports, as (gross) exports also include value added created in other countries (previously imported and used to create the final exported product). For this reason, the next part of the chapter will focus on qualitative aspects, namely country and export complexities in the Visegrad countries.

3.1.2. Shifts in Complexity and Comparative Advantages in the Visegrad Countries

Country export sophistication can be assessed using the Economic Complexity Index (ECI), which takes two key dimensions, diversity and ubiquity, into consideration. Diversity reflects the range of products a country exports, while ubiquity indicates how commonly those products are exported by other countries. Countries with higher economic complexity typically export a broader range of goods that are less ubiquitous. Research has shown a positive relationship between ECI and per capita income, suggesting its potential to forecast economic growth.⁴⁰ The ECI provides information on the country rankings at the global level. Figure No. 11 illustrates the evolution of the rankings of the Visegrad countries according to the ECI. The Czech Republic has consistently been the most complex of the Visegrad countries, followed by Hungary. Slovakia ranks third, while Poland ranks last. However, at the global level, all Visegrad countries are way above the median. In terms of evolution after the EU accession, the strongest increase in ranking was recorded by Hungary and the Czech Republic.

40 Sankot et al., 2023.

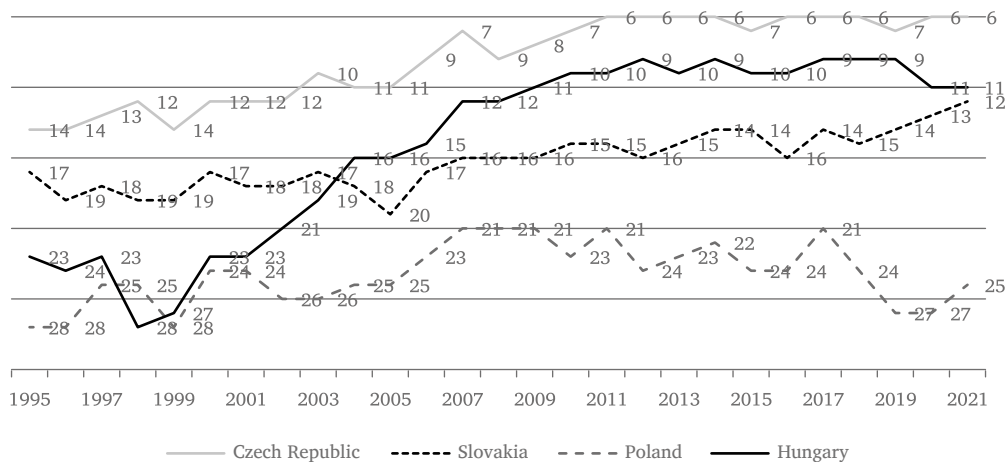


Figure No. 11⁴¹
Evolution of ECI ranking of the Visegrad countries

The Product Complexity Index (PCI) evaluates the level of technological advancement associated with producing specific goods, reflecting the capabilities necessary for their manufacture. Highly complex items include products like chemicals, electronics, and machinery, whereas simpler goods, such as raw materials and basic agricultural products, are ranked as the least complex.⁴² The Revealed Comparative Advantage (RCA) is a measure used to determine whether a country is a significant exporter of a specific product by assessing its relative advantage or disadvantage in exporting that product. This approach follows Balassa's definition, which states that a country is considered an effective exporter of a product if its export share exceeds the product's share of global exports. In the following section, the normalised version of this indicator is used, allowing for comparisons of the index across time and space.⁴³ The threshold value for both the PCI and normalised RCA is zero. Values above zero indicate sophisticated products exported with a comparative advantage, while values below zero represent non-sophisticated products exported ineffectively (without a comparative advantage). The value of the normalised PCI changes over time due to the changing complexity of a product relative to the global export structure.

The following tables (Table No. 6 to Table No. 9) illustrate the evolution of export complexity (PCI of the exported products) and revealed comparative advantages (RCA of the exported products) in each of the Visegrad countries. The tables present the PCI and RCA of the top 20 exported products by export value, i.e., those with the highest shares of total national exports. To balance visualisation quality with clarity,

41 The Growth Lab at Harvard University, 2024a.

42 Sankot et al., 2023.

43 Sejkora and Sankot, 2017.

two years were selected: 2004 and 2014. The year 2004 marks the accession, while 2014 represents a decade later, providing a period sufficiently removed from the financial crisis that began in 2008, allowing ample time for comparative advantages, export volumes, PCIs, and RCAs to adjust. The product classification follows the HS 1992 4-digit system.

Table No. 6 shows that between 2004 and 2014, there were significant changes in the export composition of products from the Czech Republic. Overall, the country became more specialised, as reflected in the higher average RCA. The average RCA of the top 10 products increased from 0.82 to 1.52, while the average for the top 20 products rose from 0.9 to 1.13. On the other hand, the PCI of the top exported products declined, decreasing from 0.78 to 0.64 for the top 10 products and from 0.84 to 0.76 for the top 20 products. At present, the country experiences a favourable pattern of export growth, with the largest contribution to export growth coming from products with a high PCI, such as Electrical machinery and equipment and Industrial Machinery.⁴⁴

2004			2014		
	RCA	PCI		RCA	PCI
Trailers and semi-trailers	0.03	1.37	Trailers and semi-trailers	0.80	0.49
Aircraft launching gear & ground flying trainers	0.67	1.49	Aircraft launching gear & ground flying trainers	1.28	1.40
Transmission shafts	0.17	1.02	Transmission shafts	0.93	0.87
Containers for multimodal transportation	1.15	-0.45	Containers for multimodal transportation	0.78	-0.22
Pulleys and winches	1.44	1.57	Parts for electrical apparatus	0.12	0.65
Travel sets	1.07	0.20	Electric trains	1.02	0.85
Semiconductor devices	0.63	0.59	Cigarette lighters	4.20	0.29
Electric trains	0.57	1.05	Travel sets	1.30	0.34
Rubber inner tubes	0.94	0.25	Rubber inner tubes	0.93	0.29
Refined copper and copper alloys	1.51	0.68	Transmission apparatus for radio, telephone and TV	3.86	1.44
Parts for electrical apparatus	-0.20	1.24	Electric signal and traffic controls	-0.01	1.21
Machines and apparatus semiconductors, electronics	-0.26	0.75	Pulleys and winches	1.04	1.48
Rare-earth metals	1.11	-0.05	Machines and apparatus semiconductors, electronics	0.49	1.28

44 The Growth Lab at Harvard University, 2024b.

2004			2014		
	RCA	PCI		RCA	PCI
Transmission apparatus for radio, telephone and TV	2.59	1.77	Phosphatic fertilisers	-0.24	0.60
Electrical lighting equipment used for motor vehicles	0.68	0.87	Refined copper and copper alloys	1.45	0.89
Centrifuges	0.25	1.22	Fork-lift trucks	1.61	1.11
Containers for compressed or liquified gas	1.17	0.59	Semiconductor devices	0.45	0.28
Printers and copiers	0.33	0.82	Rare-earth metals	1.74	-0.44
Railway coaches, not self-propelled	1.41	0.81	Synthetic rubber	0.60	0.82
Silk yarn	2.75	1.06	Batteries	0.32	1.55
Average of top 10	0.82	0.78	Average of top 10	1.52	0.64
Average of top 20	0.90	0.84	Average of top 20	1.13	0.76

Table No. 6⁴⁵
Shift in export complexity of the Czech Republic (2004 and 2014)⁴⁶

Hungary also exhibited a high share of sophisticated products in its export mix. The average PCI of the top 10 and top 20 products performed better compared to that of the Czech Republic, decreasing from 0.97 to 0.86 for the top 10 products and increasing from 0.77 to 0.79 for the top 20. The country also experienced a rise in the average RCA of its top exported products, measured as a ratio of total national exports, increasing from 2.01 to 2.41 for the top 10 products and from 1.72 to 1.79 for the top 20 (Table No. 7).

Currently, Hungary continues its trajectory of export growth, with the largest contributions coming from high-complexity products, particularly electrical machinery and equipment, as well as vehicles.⁴⁷

45 The Growth Lab at Harvard University, 2024c.

46 The product categorisation is HS 1992 4-digit. The RCA and PCI are normalised to ensure time comparability.

47 The Growth Lab at Harvard University, 2024b.

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2004			2014		
	RCA	PCI		RCA	PCI
Parts for electrical apparatus	3.63	1.24	Trailers and semi-trailers	0.98	0.49
Transmission shafts	0.64	1.02	Aircraft launching gear & ground flying trainers	0.80	1.40
Equipment for temperature change of materials	6.86	1.39	Equipment for temperature change of materials	7.66	1.04
Calendering or other rolling machines, other than for metals or glass	4.99	1.52	Phosphatic fertilisers	0.59	0.60
Aircraft launching gear & ground flying trainers	0.34	1.50	Transmission shafts	0.25	0.87
Trailers and semi-trailers	-0.10	1.38	Electric signal and traffic controls	0.68	1.21
Semiconductor devices	1.70	0.59	Semiconductor devices	2.23	0.27
Containers for multimodal transportation	1.45	-0.47	Calendering or other rolling machines, other than for metals or glass	3.73	1.66
Phosphatic fertilisers	-0.03	0.58	Watch straps	5.93	1.25
Electronic integrated circuits	0.59	0.95	Containers for multimodal transportation	1.30	-0.23
Bituminous mixtures	-0.17	-0.99	Bituminous mixtures	-0.29	-1.03
Travel sets	1.17	0.19	Rubber inner tubes	1.19	0.29
Electronic printed circuits	0.93	0.46	Electric trains	1.03	0.85
Railway service vehicles	4.04	1.16	Ships' derricks; cranes	1.12	1.62
Electric trains	0.54	1.05	Other rail locomotives	1.59	0.73
Electric signal and traffic controls	0.31	0.98	Centrifuges	1.03	1.19
Electrical apparatus for > 1kV	3.70	0.18	Synthetic rubber	0.92	0.82
Thermionic, cold cathode or photocathode tubes	1.88	0.31	Travel sets	0.77	0.34
Watch straps	1.50	1.29	Pulleys and winches	0.81	1.48
Ships' derricks; cranes	0.49	1.02	Sound storage media	3.45	0.97
Average of top 10	2.01	0.97	Average of top 10	2.41	0.86
Average of top 20	1.72	0.77	Average of top 20	1.79	0.79

Table No. 7⁴⁸
*Shift in export complexity of Hungary (2004 and 2014)*⁴⁹

48 The Growth Lab at Harvard University, 2024c.

49 The product categorisation is HS 1992 4-digit. The RCA and PCI are normalised to ensure time comparability.

In contrast to the Czech Republic and Hungary, Poland and Slovakia (Table No. 8 and Table No. 9) exhibit lower export complexity among the Visegrad countries. However, they demonstrated significant growth in the first 10 years after accession. The average PCI of the top 20 products increased by 0.12 in Poland and 0.24 in Slovakia.

The RCA of Poland's top exports decreased significantly, mainly due to the product Petroleum oils, crude, which exhibits volatile values over time and is therefore not consistently present in the top 20, despite having a high RCA value. If this product had been excluded from the top 20 in 2004, the average RCA would have been 1.39 (Table No. 8).

2004			2014		
	RCA	PCI		RCA	PCI
Trailers and semi-trailers	-0.03	1.37	Aircraft launching gear & ground flying trainers	0.58	1.40
Aircraft launching gear & ground flying trainers	0.30	1.49	Trailers and semi-trailers	-0.19	0.49
Calendering or other rolling machines, other than for metals or glass	4.63	1.51	Travel sets	2.48	0.34
Travel sets	3.59	0.20	Semiconductor devices	1.81	0.28
Photographic cameras	2.19	-0.03	Bituminous mixtures	-0.38	-1.02
Slide fasteners	1.87	0.25	Slide fasteners	1.46	0.49
Containers for multimodal transportation	1.34	-0.45	Photographic cameras	1.36	-0.45
Tar distilled from coal, lignite etc.	1.74	-0.75	Transmission shafts	-0.20	0.88
Petroleum oils, crude	8.10	0.01	Phosphatic fertilisers	-0.16	0.60
Semiconductor devices	0.93	0.59	Parts for electrical apparatus	0.03	0.65
Containers for compressed or liquified gas	2.32	0.59	Calendering or other rolling machines, other than for metals or glass	1.69	1.66
Gliders, hang gliders	0.07	1.02	Containers for multimodal transportation	0.44	-0.22
Copper powders and flakes	1.56	-1.49	Rubber inner tubes	0.61	0.29
Rubber inner tubes	0.61	0.25	Sulphur, crude	3.56	-0.81
Bituminous mixtures	-0.40	-0.97	Copper powders and flakes	0.91	-1.43
Refined copper and copper alloys	1.31	0.68	Containers for compressed or liquified gas	1.19	0.42
Flat-rolled products of stainless steel of a width > 600 mm	3.07	-0.14	Gliders, hang gliders	0.05	0.33

2004			2014		
	RCA	PCI		RCA	PCI
Electronic integrated circuits	0.00	0.95	Poultry	2.01	0.21
Flat rolled iron, width > 600mm, clad	0.98	-0.72	Weighing machinery	0.12	1.19
Men's shirts	0.35	-1.22	Bobbins, spools, cops of paper	1.88	0.21
Average of top 10	2.47	0.42	Average of top 10	0.68	0.37
Average of top 20	1.73	0.16	Average of top 20	0.96	0.28

Table No. 8⁵⁰
Shift in the export complexity of Poland (2004 and 2014)⁵¹

The RCA of Slovakia's top exported products has remained relatively stagnant (Table No. 9). However, it is generally higher than the values for the Czech Republic and Hungary. This can be partially attributed to the small size of the Slovak economy, which inherently leads to higher export specialisation due to more limited productive capabilities.

According to the Growth Lab at Harvard University,⁵² the more recent evolution in these two countries is favourable. The largest contribution to export growth comes from moderate and high complexity products in Poland (Business and Industrial Machinery), and high complexity products in Slovakia (Vehicles and Industrial Machinery).

2004			2014		
	RCA	PCI		RCA	PCI
Trailers and semi-trailers	0.89	1.37	Trailers and semi-trailers	1.51	0.49
Bituminous mixtures	0.43	-0.99	Semiconductor devices	6.37	0.27
Aircraft launching gear & ground flying trainers	0.43	1.49	Aircraft launching gear & ground flying trainers	0.60	1.40
Parachutes	22.19	1.64	Parts for electrical apparatus	1.05	0.64
Flat-rolled iron, width < 600mm, not clad	2.52	0.37	Bituminous mixtures	-0.07	-1.03
Containers for multimodal transportation	1.72	-0.47	Parachutes	20.18	1.23
Transmission shafts	-0.10	1.01	Rubber inner tubes	1.42	0.29

50 The Growth Lab at Harvard University, 2024c.

51 The product categorisation is HS 1992 4-digit. The RCA and PCI are normalised to ensure time comparability.

52 The Growth Lab at Harvard University, 2024b.

2004			2014		
	RCA	PCI		RCA	PCI
Rubber inner tubes	1.42	0.23	Transmission shafts	0.00	0.87
Hot rolled bars of iron	1.87	-0.22	Containers for multimodal transportation	0.65	-0.23
Travel sets	1.07	0.18	Electromechanical domestic appliances	1.34	1.79
Machine tools for molding and forging metals	4.98	0.64	Flat-rolled iron, width < 600mm, not clad	1.55	0.41
Vacuum cleaners	2.47	0.83	Hot rolled bars of iron	1.44	0.04
Aluminium foil < 0.2 mm	1.15	-0.55	Vacuum cleaners	2.20	1.28
Other uncoated paper and paperboard	1.99	0.48	Ships' derricks; cranes	0.58	1.62
Semiconductor devices	0.61	0.58	Electronic integrated circuits	1.07	0.46
Flat-rolled iron, width < 600mm, clad	2.66	-0.04	Transmission apparatus for radio, telephone and TV	2.02	1.44
Slide fasteners	0.56	0.24	Air conditioners	8.01	0.87
Electric soldering machines	0.78	0.29	Travel sets	0.48	0.34
Textile footwear	0.97	-0.94	Textile footwear	0.74	-0.76
Rare-earth metals	1.54	-0.06	Rare-earth metals	1.18	-0.46
Average of top 10	3.24	0.46	Average of top 10	3.30	0.57
Average of top 20	2.51	0.31	Average of top 20	2.62	0.55

Table No. 9⁵³
Shift in the export complexity of Slovakia (2004 and 2014)⁵⁴

The above-mentioned results raise questions about developing suitable export strategies, supporting competitive and innovative companies, and being selective in attracting foreign investment. These aspects are of particular importance for new Member States. However, such measures must be taken considering the national context. Gotz,⁵⁵ for instance, shows that the average contribution of foreign firms to value creation varies across the Visegrad countries, being the highest in Hungary and Slovakia and lower in the Czech Republic and Poland. In the latter case, this could either indicate that domestic firms generate significant value-added or that foreign firms are not engaged in activities with high value-added.

53 The Growth Lab at Harvard University, 2024c.

54 The product categorisation is HS 1992 4-digit. The RCA and PCI are normalised to ensure time comparability.

55 Gotz et al., 2020.

3.2. Market Access, Competitiveness and Innovation

The integration into the EU internal market can significantly impact the competitiveness of new Member States, providing new opportunities for market access and facilitating economies of scale. This section discusses how the EU membership was reflected in the ability of these countries to access new markets, achieve economies of scale, and enhance their competitiveness through innovation and technological adoption.

3.2.1. Access to New Markets and Economies of Scale

EU membership allows Member States to benefit from a larger customer base and a larger market for inputs. Economies of scale refer to the cost advantages that enterprises can achieve due to an increase in the scale of production, resulting in a decrease in average costs per unit. As companies expand their production, they spread fixed costs (such as administration, facilities, and machinery) over a larger number of units, leading to lower per-unit costs. Additionally, large-scale operations can lead to efficiencies in purchasing, labour, and operations. There are two main types of economies of scale, (1) internal economies of scale, and (2) external economies of scale). In internal economies, of scale, cost savings are reached within a company as it grows, stemming from technical efficiencies (such as specialised machinery), managerial efficiencies (increased specialisation of workers' roles), bulk purchasing (buying inputs in bulk at a lower unit price, financial (larger firms often obtain lower interest rates for credits), etc. External economies of scale bring cost advantages that transpire in all firms within an industry as the industry itself grows, often due to improvements in infrastructure, supply chains, or a larger skilled labour pool.⁵⁶ Economies of scale are therefore crucial, allowing firms to lower prices or invest in further expansion. Many studies provide evidence of economies of scale, including those achieved through integration with the EU. The economies of scale are particularly evident in sectors producing tradable goods, which is often the manufacturing sector.⁵⁷

Figure No. 12 illustrates the growth in manufacturing output for the Visegrad countries and the EU28. All Visegrad countries experienced significant growth in manufacturing output, surpassing the EU28 average, particularly after 2010. Slovakia shows the strongest growth trajectory, particularly after 2013. The 2008 financial crisis caused a noticeable decline in manufacturing output across all regions, but recovery was robust in the Visegrad countries, outpacing the EU28 in subsequent years. These results suggest potential positive effects from access to an enlarged EU market.

⁵⁶ Krugman, Obstfeld and Melitz, 2023.

⁵⁷ Chen, Imbs and Scott, 2009.

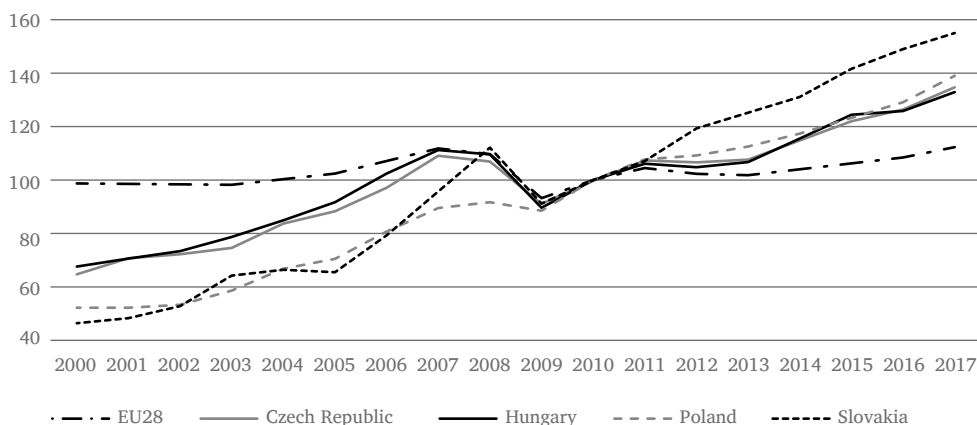


Figure No. 12⁵⁸
Growth in the manufacturing output of Visegrad Countries
(NACE C, index, 2010=100)

Figure No. 13 depicts producer prices in the industry for the Visegrad countries and the EU28. Over the period, all countries experienced an overall upward trend in producer prices, reflecting general price growth in industrial sectors. However, the rate of increase was lower than the rate at which output grew (as shown in Figure No. 12), potentially due to increased competitiveness following accession to the EU market.

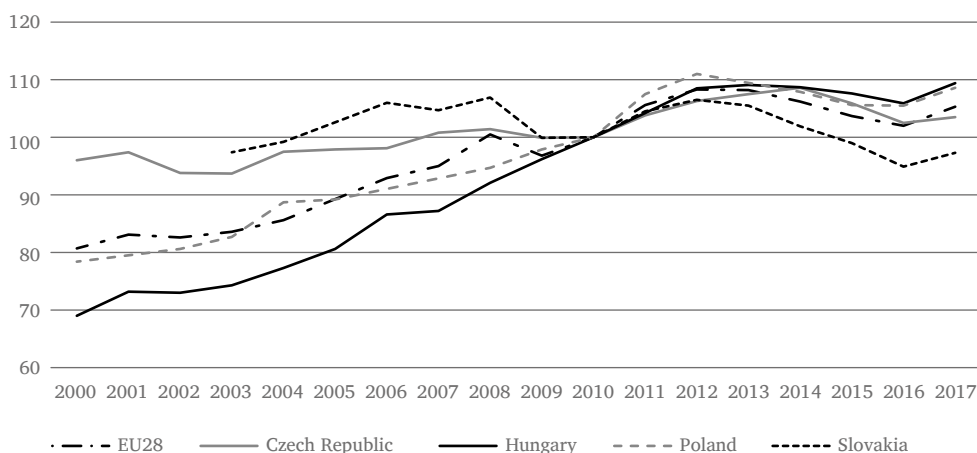


Figure No. 13⁵⁹
Producer prices in industry (NACE B-E36, index, 2010=100)

⁵⁸ Eurostat, 2024b.

⁵⁹ Eurostat, 2024c; own calculations.

3.2.2. *Innovation and Technological Adoption*

The transfer of technology and knowledge through investment and participation in EU research programs has been essential in modernising industries in the recent enlargement waves. This section examines how EU membership has influenced R&D spending, technology adoption, and innovation, as well as the role of innovative companies in facilitating these advancements.

R&D spending is usually quantified in absolute terms, such as EUR or EUR per inhabitant, as well as in relative terms, most often as a ratio over GDP. GERD/GDP represents the proportion of a country's total economic output that is spent on R&D. This measure is often used to capture how much of the country resources are dedicated to R&D relative to the size of the economy. GERD/GDP is particularly useful for cross-country comparisons where countries have different economic sizes. GERD in EUR per inhabitant measures the R&D expenditure per person within the country. This metric is useful for understanding the scale of R&D investment on a per-capita basis, providing information about the potential direct or indirect benefits that individuals in the country might experience due to R&D spending. It can provide more insight into whether the average citizen is likely to experience the benefits of R&D spending, such as improved technology, healthcare advancements, and economic opportunities. In smaller, highly innovative countries, for instance, GERD per inhabitant might be high even if GERD/GDP is moderate, reflecting substantial per-capita investment.

Figure No. 14 illustrates the GERD/GDP across different enlargement waves. The values increased over time but never reached the target value of 3% as outlined in the strategy Europe 2020.⁶⁰

GERD/GDP for the EU10, EU2, and Croatia was and remains substantially lower than the EU average, but shows a gradual increase, especially for EU10 and Croatia, and a stagnation for the EU2. The figures suggests that EU accession may have positively impacted R&D investments in new Member States, as indicated by the gradual increase in GERD as a percentage of GDP in most of them, as EU membership provided access to additional funding, support for innovation, and structural reforms, all these channels supporting the R&D expenditure in new Member States. However, the values remain below the EU27 average, indicating a continued gap but also a positive trajectory toward increased R&D investment.

60 European Commission, 2020.

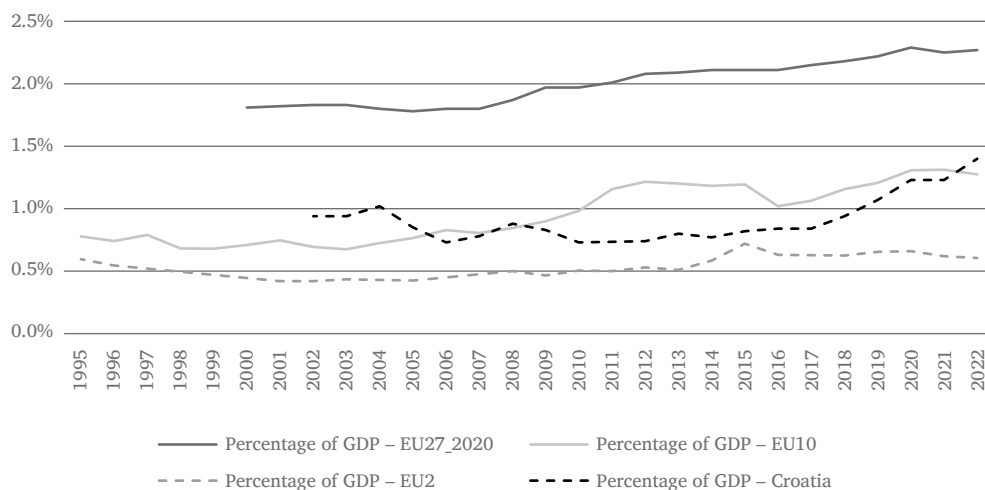


Figure No. 14⁶¹
GERD as a percentage of GDP in EU27, EU10, EU2 and Croatia

Zooming in for the Visegrad countries, heterogeneity is obvious (Figure No. 15). The Czech Republic consistently exhibits the highest GERD/GDP, increasing from around 1% in the early 2000s to over 2% by 2015, with a slight decline in recent years. Hungary follows, with a stable GERD ratio slightly below 1% for much of the period, before a gradual increase towards 1.5% after 2015. Poland and Slovakia both exhibit lower GERD/GDP levels, generally below 1%, with Poland demonstrating a gradual upward trend and Slovakia remaining relatively flatter with minor fluctuations. This chart highlights the Czech Republic and Hungary's stronger emphasis on R&D investment relative to their GDP compared to Poland and Slovakia.

61 Eurostat, 2024d, own calculations.

ECONOMIC IMPACT OF EU MEMBERSHIP

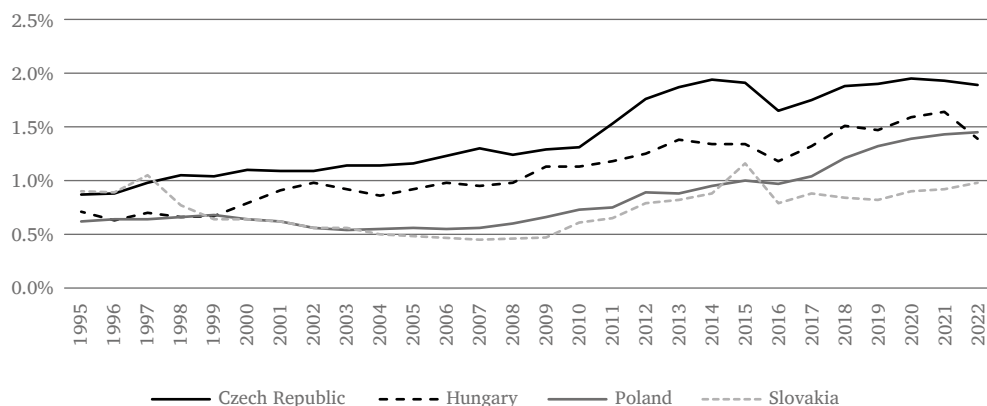


Figure No. 15⁶²
GERD as a percentage of GDP in the Visegrad countries

Slightly differing from the GERD/GDP evolution, Figure No. 16 shows that starting in the early 2000s, GERD per capita grew significantly in all Visegrad countries. This trend highlights a strong commitment to R&D investment, likely influenced by EU membership and access to additional funding. The group however also exhibits a certain heterogeneity, with the highest values in the Czech Republic over the entire time series, and the lowest ones in Slovakia.

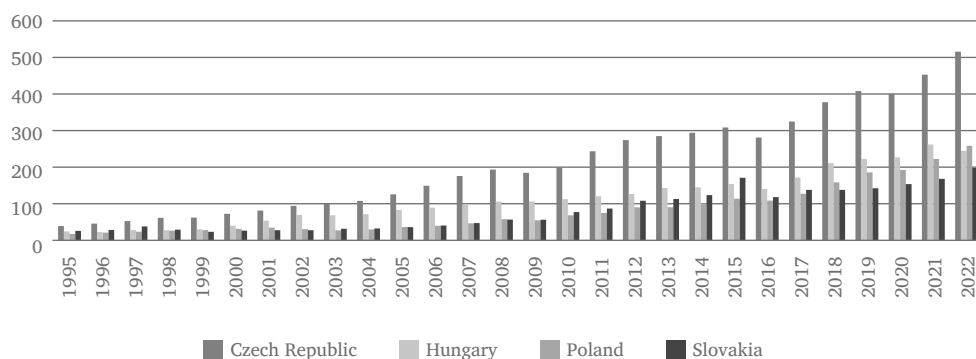


Figure No. 16⁶³
GERD in EUR per inhabitant in the Visegrad countries

62 Ibid.

63 Ibid.

The differences amongst Visegrad countries are also visible when looking into the growth rates of GERD per inhabitant and GERD/GDP, as captured in Table No. 6. The table provides a breakdown of the growth rates between 1999 and 2008, with five-year averages presented for the periods 1999–2003 and 2004–2008, to capture the pre- and post-accession values.

In the Czech Republic, the average annual growth rate for GERD per inhabitant increased from 10.2% in the 1999–2003 period to 14.3% in 2004–2008, indicating a strengthening in per-capita investment in R&D. However, GERD/GDP shows a more modest increase, from an average annual growth rate of 1.7% to just 1.8%, suggesting that R&D spending grew roughly in line with GDP. Poland's GERD per inhabitant also exhibits a significant increase in its average growth rate, from 11.4% in the earlier period to 16.4% in 2004–2008, indicating a significant rise in R&D spending per capita. The average growth in GERD/GDP also improved, from -3.8% in 1999–2003 to a positive 2.2% in 2004–2008, showing a stronger prioritisation of R&D investment relative to GDP growth in the latter period.

Slovakia's GERD per inhabitant also increased in average growth rate, from -0.7% in 1999–2003 to 12.7% in 2004–2008, indicating a significant improvement in per-capita R&D investment. However, GERD/GDP showed a decline in the latter period, with average growth falling from -5.9% to -3.8%, indicating that while per-capita investment increased, R&D spending did not keep pace with GDP growth.

On the other hand, Hungary saw a decline in its average annual growth rate for GERD per inhabitant, from 20.7% in 1999–2003 to 9.1% in 2004–2008. Similarly, GERD/GDP also declined, from an average growth of 7.2% to 1.4%, reflecting a broader deceleration in R&D investment relative to economic growth in the latter period.

During the 2004–2008 period, all Visegrad countries increased their per-capita investment in R&D compared to the previous period. However, GERD/GDP shows a more diversified picture, with only the Czech Republic and Poland maintaining or increasing their R&D spending relative to GDP. Hungary and Slovakia, meanwhile, saw declines in GERD/GDP, suggesting that while absolute R&D spending grew, it did not keep pace with GDP growth, potentially signalling a lower prioritisation of R&D in the broader economic context.

ECONOMIC IMPACT OF EU MEMBERSHIP

	1999	2000	2001	2002	2003	1999-2023	2004	2005	2006	2007	2008	2004-2008
Czech Republic												
EUR/inhab.	1.2%	16.2%	12.3%	15.7%	5.6%	10.2%	8.6%	16.4%	18.9%	17.6%	10.0%	14.3%
% of GDP	-1.0%	5.8%	-0.9%	0.0%	4.6%	1.7%	0.0%	1.8%	6.0%	5.7%	-4.6%	1.8%
Hungary												
EUR/inhab.	8.7%	31.4%	35.5%	29.1%	-1.5%	20.7%	4.3%	16.3%	7.7%	8.7%	8.6%	9.1%
% of GDP	1.5%	17.9%	15.2%	7.7%	-6.1%	7.2%	-6.5%	7.0%	6.5%	-3.1%	3.2%	1.4%
Poland												
EUR/inhab.	6.2%	11.4%	10.6%	-11.4%	-11.6%	1.0%	10.0%	21.7%	9.2%	16.7%	24.4%	16.4%
% of GDP	3.0%	-5.9%	-3.1%	-9.7%	-3.6%	-3.8%	1.9%	1.8%	-1.8%	1.8%	7.1%	2.2%
Slovakia												
EUR/inhab.	-19.2%	13.4%	4.9%	-0.7%	14.1%	2.5%	3.0%	11.7%	11.4%	16.4%	20.9%	12.7%
% of GDP	-16.9%	0.0%	-3.1%	-9.7%	0.0%	-5.9%	-10.7%	-2.0%	-4.0%	-4.3%	2.2%	-3.8%

Table No. 10⁶⁴

Growth rates of GERD per inhabitant and GERD/GDP in the Visegrad countries⁶⁵

Another useful indicator to capture of the innovative potential of the country is the number of persons with tertiary education employed in science and technology. A higher proportion of educated individuals working in the fields of science and technology suggests a strong base of skilled professionals capable of driving research, development, and technological advancements. This workforce can enhance innovation capacity by contributing to R&D activities, adopting and creating new technologies, and fostering knowledge-intensive industries, all of which are essential for maintaining a competitive, innovation-driven economy.

Figure No. 17 presents the percentage of the labour force with tertiary education employed in science and technology fields in the Visegrad countries, compared to the EU27 average. Over time, all countries show a gradual upward trend, indicating an increasing proportion of highly educated individuals entering professions in science and technology. The EU27 average is consistently leading, although individual countries, particularly the Czech Republic and Poland, have shown significant progress, closely approaching EU standards by 2023.

Hungary and Slovakia, while also demonstrating growth, remain slightly behind the EU27 average and other peers. The steady increase across all countries highlights a regional shift toward higher educational attainment and employment in

⁶⁴ Ibid.

⁶⁵ The five-year growth rates are calculated as arithmetic averages of annual growth rates.

science and technology sectors, likely influenced by policies aimed at enhancing the knowledge economy.

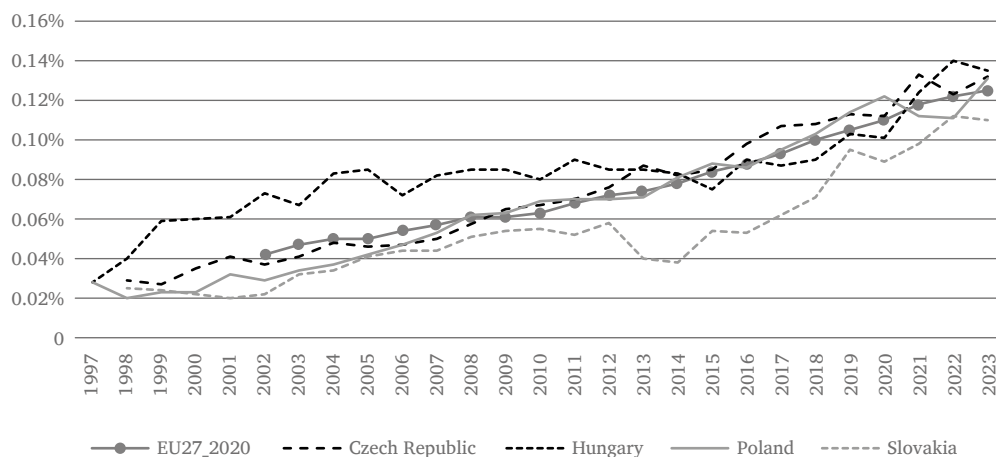


Figure No. 17⁶⁶

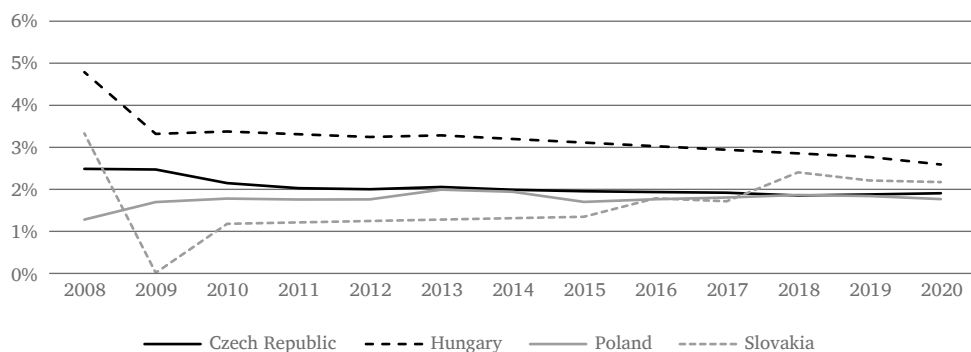
Persons with tertiary education (ISCED) and employed in the fields of science and technology, percentage of population in the labour force

Figure No. 18 shows the ratio of high-technology manufacturing enterprises to the total number of manufacturing enterprises in the Visegrad countries from 2008 to 2020. The EU aggregate values are not included, due to limited data availability.⁶⁷ Across the period, the ratios in all four countries remain relatively low and stable, indicating a modest proportion of high-tech enterprises within their manufacturing sectors. However, the decline caused by the financial crisis was not recovered yet. The Czech Republic has the highest ratio, hovering at around 3%, with a slight decline over time. Hungary follows, with a ratio just below the Czech Republic's, showing a stable trend close to 2.5%. Poland and Slovakia exhibit the lowest ratios, each sustaining a range between 1% and 2%, with little variation over the years.

The generally flat trends across all countries suggest that the growth of high-technology manufacturing enterprises has been slow, with little change over the examined period. This low proportion could imply challenges in transitioning toward high-tech manufacturing within these economies or may reflect structural limitations in their manufacturing sectors. The stable but low ratios highlight a potential area for policy focus to foster the development of high-tech industries in the region.

⁶⁶ Eurostat, 2024h; own calculations.

⁶⁷ The average for the only available years (2008–2010 and 2015–2016) is 2.27%. See Eurostat, 2024g; own calculations.

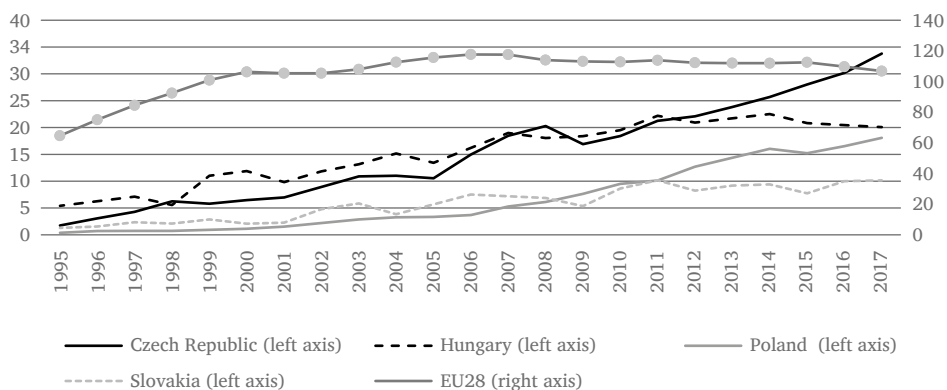
Figure No. 18⁶⁸

Ratio of high-technology manufacturing enterprises over the total number of enterprises in the manufacturing sector

Figure No. 19 illustrates patent applications submitted to the European Patent Office (EPO) per million inhabitants for the Visegrad countries and the EU28 average from 1995 to 2017, when the data availability concludes. The EU28 average is consistently the highest, maintaining a level above 100 applications per million inhabitants throughout the period, indicating a strong patenting potential across the EU.

Among the Visegrad countries, the Czech Republic shows the highest patent application rate, steadily increasing and peaking at around 30 applications per million by 2017. Hungary follows, though at a lower level, maintaining around 10-15 applications per million inhabitants. Poland shows significant growth in patent applications from 2010 onward, reaching close to Hungary's level by 2017, which could reflect a growing focus on innovation and intellectual property. Slovakia remains the lowest among these countries, with only a slight increase over time, staying below 10 applications per million inhabitants. The overall trend suggests that while the Visegrad countries are increasing their patenting activities, they still lag considerably behind the broader EU28 average. This gap highlights a potential area for further development in innovation and patenting efforts to enhance competitiveness within the EU.

68 Eurostat, 2024g; own calculations.

Figure No. 19⁶⁹

Patent applications to the EPO by priority year, number per million inhabitants

3.3. Summary

The expansion of the EU internal market through enlargement waves has significantly increased its size, with major impacts on population, employment, and GDP. The 2004 enlargement was particularly transformative, adding 19.2% to the EU's population and 9.2% to GDP. Trade integration in the Visegrad countries after accession resulted in greater intra-EU trade, but factors like global competition and structural limitations affected export performance. Economic complexity, as measured by indices like ECI and PCI, shows varied progress, with the Czech Republic and Hungary leading in export sophistication compared to Poland and Slovakia.

Market access and economies of scale have improved competitiveness, particularly in the manufacturing sectors of the Visegrad countries. R&D investment has increased post-accession, although levels remain below the EU27 average, with the Czech Republic showing the strongest performance in the Visegrad group. High-tech manufacturing remains a small proportion in total enterprises, indicating untapped potential for transitioning to more advanced industries. Lastly, patent applications in the Visegrad countries are growing but still lag behind EU28 levels, underlining the need for improved innovation policies.

⁶⁹ Eurostat, 2024f; own calculations.

4. Use of EU Funds

EU funds play a crucial role in promoting economic development, reducing regional disparities, and strengthening social cohesion across the European Union.⁷⁰ These instruments are designed to support infrastructure development, innovation, employment, and environmental sustainability.⁷¹ For the new Member States EU funding has been crucial in supporting socio-economic transformation and narrowing the development gap with older Member States.

Numerous studies have confirmed the positive impact of EU funds on economic convergence and regional growth. Becker⁷² and Mohl and Hagen⁷³ showed that cohesion policy has contributed to higher GDP growth and improved public infrastructure in recipient regions. Similarly, Crescenzi and Giua⁷⁴ concluded that EU structural funds boost regional innovation and human capital, especially when combined with strong institutional capacity. In countries like Poland and Romania, EU funds have facilitated significant improvement in transport infrastructure, access to public services and regional competitiveness. However, as Ederveen⁷⁵ shows, the quality of institutions is crucial in determining the growth effects of EU funding. This chapter will address access to and use of EU funds in new Member States, as well as variations in fund allocation and absorption rates.

4.1. The Impact of EU Funds on Economic Development

The history of EU funds reflects the evolving priorities of European integration, from supporting economic recovery after World War II to promoting regional cohesion and addressing contemporary challenges like climate change and digital transformation. Table No. 11 presents an overview of their historical development.

⁷⁰ Baldwin and Wyplosz, 2022.

⁷¹ European Commission, 2022.

⁷² Becker et al., 2010.

⁷³ Mohl and Hagen, 2010.

⁷⁴ Crescenzi and Giua, 2016.

⁷⁵ Ederveen et al., 2006.

ESIF FUNDS – FUNDS JOINTLY MANAGED BY THE EC AND THE EU MEMBER STATES	
1. Early foundations of the EU funds (1950s–1970s)	
1957 – The European Social Fund (ESF)	• created under the Treaty of Rome • to support worker mobility, improve employment, and address labour market imbalances
1962 – The European Agricultural Guidance and Guarantee Fund (EAGGF)	• established to modernise agriculture • to stabilise rural incomes as part of the Common Agricultural Policy
2. The emergence of regional cohesion (1970s–1980s)	
1975 – the European Regional Development Fund (ERDF)	• introduced to address regional disparities, especially in less-developed regions of the EU • the first European structural fund
3. The completion of the single market and cohesion policy (1990s)	
1992 – The Cohesion Fund (CF)	• introduced by the Maastricht Treaty • to reduce disparities, targeting countries with GNI per capita below 90% of the EU average (focus on environmental and transport infrastructure)
1993 – The European Maritime and Fisheries Fund (EMFF)	• to ensure environmental, economic and social sustainability in the fisheries and aquaculture sectors
4. Further enlargement and modernisation of the EU funds (2000s)	
European Agricultural Fund for Rural Development (EAFRD)	• was created in within the reform of the common agricultural policy • to promote rural development • uses the low environmental impact of the projects as a criterion for granting financial assistance
2004 and 2007 – the two Eastern Enlargement waves	• access of the EU8 and EU2 dramatically increased the role and impact of EU funds • the structural and cohesion funds became crucial instruments in completing the transition and supporting the integration of the new Member States into the EU.
2007 – Reform of the EU Funds	• introduced a simplified framework with three main objectives: • convergence (supporting regions with GDP per capita below 75% of the EU average) • regional competitiveness and employment (supporting innovation and business growth in less developed regions) • European territorial cooperation (supporting cross-border and interregional collaboration)
5. The emergence of sustainability and innovation (2014–2020)	
2020 – alignment to the EU broad strategic goals	• stronger emphasis on aligning funds with the EU broader strategic goals (Europe 2020) • increasingly directed toward innovation, green energy, and digital infrastructure

NGEU PROGRAMME – TWO NEW FINANCIAL INSTRUMENTS	
6. The post-Covid recovery and economic resilience of Member States (2021–2027)	
2021 – the Recovery and Resilience Facility (RRF)	• introduced in response to the COVID-19 pandemic • to help Member States recover from the pandemic and build more resilient economies
2021 – the Recovery Assistance for Cohesion and the Territories of Europe (REACT-EU)	• implemented in part through the ERDF and the ESF, underlining how NGEU and the ESIF objectives overlap

Table No. 11⁷⁶
Overview of historical development of the EU funds

The history of EU funds reflects the evolving priorities of European integration, beginning with efforts to support post-war recovery and culminating in their current role in promoting sustainability, innovation, and socio-economic cohesion. The origins of the EU funds date back to the 1950s when the European Coal and Steel Community established a model for pooling resources in key industries.⁷⁷ In 1957, the European Social Fund was introduced under the Treaty of Rome to improve worker mobility, address labour market imbalances, and boost employment opportunities. The European Agricultural Guidance and Guarantee Fund (EAGGF), created in 1962, aimed to modernise agriculture and stabilise rural incomes, laying the foundation for the Common Agricultural Policy. Later, this fund was transformed into the European Agricultural Fund for Rural Development (EAFRD).⁷⁸

By the 1970s, the importance of regional cohesion increased. In 1975, the European Regional Development Fund (ERDF) was established to address disparities in regional economic development, particularly in less-developed areas like southern Italy and parts of Ireland. During the 1980s, the EU began to prioritise cohesion policy more strongly to support economically weaker Member States, such as Greece, Spain, and Portugal, upon their accession. The importance of cohesion gained importance in the context of the project to finalise the single market and the Single European Act was adopted in 1986.⁷⁹

In the 1990s, the focus of the EU further focused on regional development and cohesion, both because of building the Single Market, as well as preparing the EU for future enlargements. After the Eastern enlargements in 2004 and 2007, the impact of the EU funds increased significantly. Namely, the structural and cohesion funds became crucial for supporting the economic transformation and integration of these new members into the EU ecosystem. In 2007, the EU reformed the funding

⁷⁶ Forte Campos and Rojas, 2021; own compilation.

⁷⁷ European Commission, 2002.

⁷⁸ Forte Campos and Rojas, 2021.

⁷⁹ EUR-lex, 2018.

framework, introducing a simplified structure focused on three key objectives – convergence, regional competitiveness and employment, and European territorial co-operation. Between 2014 and 2020, the EU funds aligned closely with the Europe 2020 Strategy, which emphasised smart, sustainable, and inclusive growth. During this period, investments shifted toward innovation, green energy, and digital infrastructure, reflecting the EU's evolving priorities. The focus moved from basic infrastructure development to fostering high-tech and sustainable solutions.⁸⁰

In the current period (2021–2027), EU funds have become even more strategic, with a strong emphasis on addressing global challenges like climate change, digital transformation, and green transitions. The Recovery and Resilience Facility (RRF), introduced in response to the COVID-19 pandemic, aims to help Member States recover, while building more resilient and sustainable economies. These efforts are in line with the European Green Deal, reinforcing the EU commitment to a green and digital future.

The EU funds are allocated and implemented within specific multiannual financial frameworks, which are typically set for 7-year periods. These frameworks define the EU budget priorities and funding allocations, ensuring a structured and predictable approach to financial planning across Member States. Each multiannual financial framework specifies the total budget available, the categories of spending, and the rules for accessing funds. Within these frameworks, the ESIF funds operate according to programming periods. During each period, Member States propose Operational Programs tailored to their national or regional priorities, which must align with broader EU goals such as economic growth, social inclusion, and environmental sustainability. Before 2007, the structure of EU funds was simpler but still aimed at promoting economic development, reducing disparities, and fostering cohesion among Member States. The funding framework was organised around Structural Funds and the Cohesion Fund, which were central to supporting regional development. Before 2007 funds were more fragmented and targeted at specific sectors or challenges, and the programming and management processes were less optimised compared to the post-2007 period.

4.1.1. The Role of EU Funds in the New Member States

The programming period between 2007–2013 was the first full funding period for the EU10 and EU2. Between 2004 and 2020, these nations were among the largest beneficiaries of EU structural and investment funds. It must be however noted that the 2007–2013 funding programme ran simultaneously with the world financial crisis, which could have resulted in a higher effort of new Member States to use these funds. Figure No. 20 shows that the EU10 received 41% of the EU funds during the 2007–2013 programme and 39.1% for the 2014–2020 programme.

80 Commission, 2024e.

The Visegrad countries benefited from most of these funds, exceeding ratios of 1/3 in both previous programming periods.

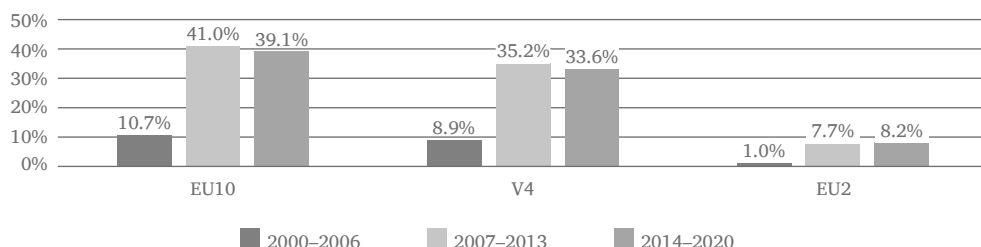


Figure No. 20⁸¹
Ratios of enlargement wave over total EU funds

Table No. 12 provides an overview of EU funds allocated per programming period across EU Member States,⁸² showing total funds, funds as a percentage of GDP, and funds per inhabitant. In absolute terms, larger economies like Poland, Spain, and Italy received the highest amount of funds (altogether 37.2% of all EU funds in 2007–2013), reflecting their significant population sizes and development needs. Similarly, smaller states such as Luxembourg and Malta received comparatively lower amounts due to their smaller population.

In relative terms, new Member States exhibit the highest funds-to-GDP ratios, particularly during the 2007–2013 and 2014–2020 periods. For instance, Hungary received funds equivalent to 28.2% of its GDP during 2007–2013 and 16.7% in 2014–2020. In terms of EU funds per inhabitant, the first five countries during the 2007–2013 programming period include the Baltic countries, which are rather small in terms of population, but also Hungary and the Czech Republic. Within the Visegrad countries, the higher ratio of funds per inhabitant in 2007–2013 was recorded in Hungary (2.86 thousand EUR per inhabitant), and the smallest in Poland (2.22 thousand EUR per inhabitant).

81 European Commission, 2024b; own calculations.

82 Countries are ranked in the table according to the funds-to-GDP ratio for the 2007–2013 programming period.

	EU Funds (in million EUR)			EU funds-to-GDP ratio			EU Funds per inhabitant (in thousand EUR per inhabitant)		
	2000– 2006	2007– 2013	2014– 2020	2000– 2006	2007– 2013	2014– 2020	2000– 2006	2007– 2013	2014– 2020
Hungary	3 344	28 556	21 171	4.5%	28.2%	16.7%	0.33	2.86	2.17
Lithuania	1 709	8 538	7 270	9.9%	27.7%	16.9%	0.50	2.74	2.53
Latvia	1 284	5 585	4 397	11.5%	27.3%	16.7%	0.56	2.64	2.25
Estonia	776	4 126	3 917	8.4%	24.9%	16.1%	0.56	3.10	2.97
Bulgaria	697	8 893	7 087	3.5%	23.0%	13.4%	0.09	1.20	1.04
Poland	13 408	80 569	73 233	6.1%	22.4%	15.5%	0.35	2.12	1.93
Slovakia	1 887	12 687	10 229	6.0%	18.7%	11.9%	0.35	2.35	1.88
Czech Republic	2 798	28 245	19 905	3.0%	18.0%	10.2%	0.27	2.71	1.88
Romania	1 804	24 125	23 176	3.0%	17.8%	12.3%	0.08	1.18	1.18
Portugal	23 438	25 433	23 220	15.9%	14.5%	12.0%	2.25	2.41	2.24
Slovenia	490	5 014	3 392	1.9%	13.9%	7.9%	0.25	2.46	1.64
Malta	84	917	606	1.7%	13.4%	5.0%	0.21	2.22	1.30
Greece	25 008	23 507	18 633	14.4%	11.0%	10.5%	2.29	2.12	1.73
Cyprus	106	763	867	0.8%	4.0%	4.3%	0.15	0.93	1.00
Spain	57 108	41 955	32 035	7.0%	3.9%	2.8%	1.36	0.91	0.69
Italy	30 086	36 077	35 114	2.1%	2.2%	2.0%	0.52	0.61	0.58
Finland	2 055	3 711	4 147	1.3%	1.9%	1.9%	0.39	0.69	0.75
Ireland	3 718	3 244	3 634	2.5%	1.8%	1.2%	0.94	0.72	0.76
Croatia		806	7 132		1.8%	14.4%		0.19	1.75
Austria	1 779	5 175	4 995	0.8%	1.7%	1.4%	0.22	0.62	0.57
Germany	30 146	33 990	22 322	1.3%	1.3%	0.7%	0.37	0.42	0.27
France	15 644	20 860	23 747	1.0%	1.0%	1.0%	0.25	0.32	0.36
Sweden	2 044	3 495	3 145	0.7%	0.9%	0.7%	0.23	0.37	0.31
United Kingdom	16 006	14 163	12 198	0.8%	0.7%	0.5%	0.27	0.23	0.19
Belgium	1 986	2 469	2 126	0.7%	0.7%	0.5%	0.19	0.23	0.19
Denmark	580	1 080	1 159	0.3%	0.4%	0.4%	0.11	0.20	0.20
Netherlands	2 773	2 245	1 568	0.5%	0.3%	0.2%	0.17	0.14	0.09
Luxembourg	77	145	237	0.3%	0.3%	0.4%	0.17	0.29	0.40

Table No. 12⁸³
Overview of EU funds per programming period

83 European Commission, 2024b; Eurostat, 2024i; Eurostat, 2024j; own calculations.

Comparing the three programming periods, both the absolute amounts and the relative indicators confirm that the 2007–2013 programming period played a strategic importance in the EU cohesion policies following the recent enlargements and during the economic crisis.

Although the EU10 countries joined the EU towards the end of the 2000–2006 period, they managed to attract 10.7% of the total EU funds (8.9% for the Visegrad countries). The EU10 countries exhibit a certain heterogeneity in terms of the types of funds used, while Malta made the most use of the ERDF, and the remaining countries predominantly utilised the CF, particularly Cyprus, Slovenia, Latvia, and Estonia (Figure No. 21).

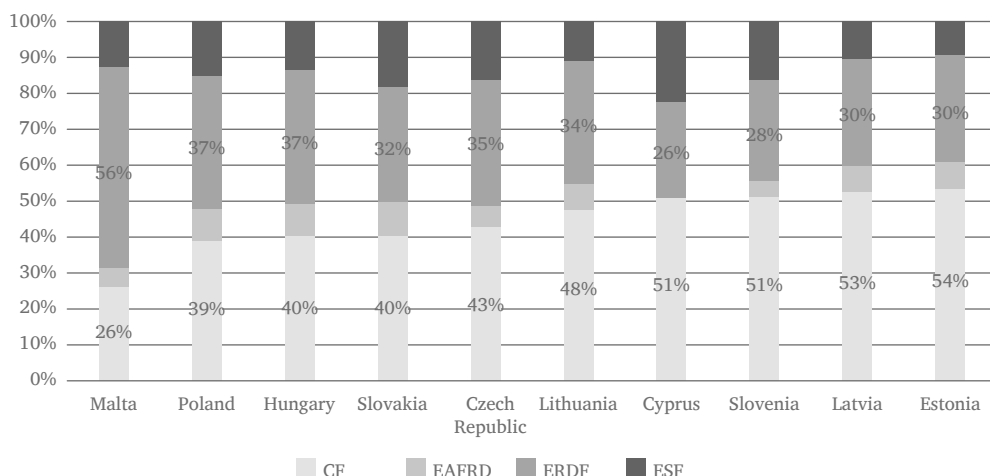


Figure No. 21⁸⁴
EU funds per type of fund – the 2000-2006 programming period

During the programming periods 2007-2013 and 2014-2020, the predominant fund was the ERDF (Figure No. 22 and Figure No. 23). In Romania, the EAFRD was also an important source of funds, strengthening the importance of the agricultural sector for the country.

84 European Commission, 2024b; own calculations.

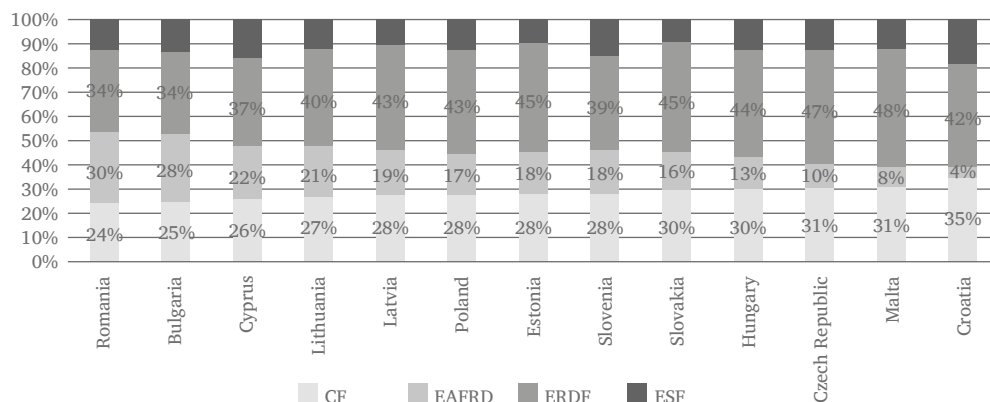


Figure No. 22⁸⁵

EU funds per type of fund in the EU10, EU2 and Croatia – the 2007-2013 programming period

Figure No. 22 and Figure No. 23 also highlight the Visegrad countries, showing that while all members employ most of their funds from the ERDF, in Poland and Slovakia the importance of the EAFRD was relatively higher in 2007–2013 (17% and 16%, respectively). In the 2014–2020 period, Hungary and Slovakia increased the share of funding coming from the ESF (from 13% to 19% and from 9% to 21%, respectively), suggesting these countries experienced increasing need to target employment and address labour market imbalances.

85 Ibid.

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Figure No. 23⁸⁶
EU funds per type of fund in the EU10, EU2 and Croatia – the 2014-2020 programming period

Accordingly, the decreasing ratio of the CF in total inward funding will be further contextualised in the forthcoming subchapters, which will provide insights into the progress toward reaching the 90% threshold of the EU GDP per capita required to access the fund.

4.1.2. Impact on Reducing Disparities and Infrastructure Development

The first part of the chapter defined the concept of real and nominal convergence. As nominal convergence in terms of GDP per capita was addressed in the first part of the chapter, the next section will focus on another important channel for reducing economic disparities, namely investing in infrastructure development. Key indicators of infrastructure development measure the capacity, quality, and accessibility of essential systems and services that support economic activity and improve living standards. These indicators typically cover transportation, energy, communication, water, and social infrastructure. One of the most used and publicly available indicators is the length of motorways. This indicator reflects the capacity and quality of a country's transport network, which is essential for economic growth and regional connectivity. Motorways facilitate the efficient movement of goods and people, reducing travel times and logistical costs while improving access to markets, employment, and services. A well-developed motorway network supports industrial development, trade, and tourism, and enhances a region's competitiveness by integrating it into broader domestic and international supply chains.

86 Ibid.

Figure No. 24 illustrates the development of the motorway and e-road network (in kilometres) in EU10 countries. It shows a significant expansion in some countries while others have experienced slower or minimal growth. Poland stands out with the most dramatic increase in motorway and e-road length, increasing from 246 km in 1995 to nearly 1 712 km by 2020. This reflects substantial investment in transport infrastructure, supported heavily by EU cohesion and structural funds. Hungary also shows consistent growth.

Slovakia and the Czech Republic demonstrate steady but less significant growth, with Slovakia surpassing 800 km by 2020 and the Czech Republic reaching approximately 1 300 km. Geographically smaller countries like Cyprus, Lithuania, and Estonia show minimal increases, with their road network lengths remaining under 400 km by 2020. Data for Malta and Latvia is not available.

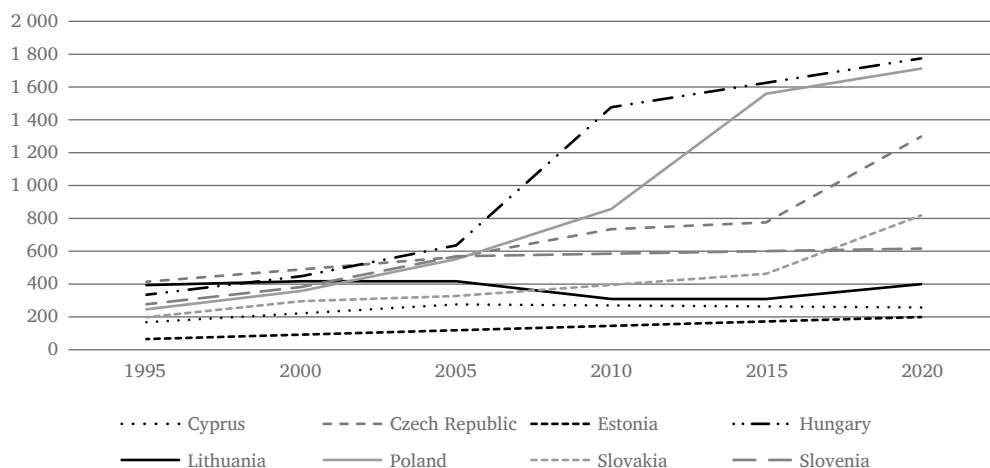


Figure No. 24⁸⁷
Length of motorways and e-roads (km) – EU10⁸⁸

The indicators employed in the above chapter are only selected indicators of measurement of regional disparities. There are many other indicators. Over time, available knowledge to measure and assist the cohesion of EU regions increased significantly. One very interesting tool is the Convergence monitoring hub developed by the Eurofound, who started providing data on various sectors of convergence, namely social, economic, institutional, and environmental.⁸⁹

⁸⁷ Eurostat, 2024k.

⁸⁸ Missing data for Malta and Latvia.

⁸⁹ Eurofound, 2024.

4.2. Effectiveness and Efficiency of EU Fund Utilisation

While EU funding has been transformative for new Member States, questions about the efficiency and effectiveness of fund utilisation still remain.⁹⁰ This section examines the absorption rates of the EU funds, pointing out the main challenges faced by the new Member States and the effective use of EU funds.

4.2.1. Assessment of Fund Absorption Rates

Fund absorption rates are generally measured as the ratio of funds used over allocated funds. The European Commission has adjusted the structure of the reported data on the use and absorption of EU funds over the years. Availability of data for the 2000–2006 and 2007–2013 programming periods is limited, therefore, this section focuses on the 2014–2020 programming period. Figure No. 25 presents the absorption rates of EU funds during the 2014–2020 programming period across Member States, measured as the ratio of Total eligible spending and Total eligible costs.⁹¹ The results show significant variations in the ability of countries to effectively absorb EU funds, reflecting differences in administrative capacity, governance, and project implementation efficiency. New Member States are generally moderate to low performers, even though they still benefit from high amounts of funding. The Czech Republic and Poland exhibit absorption rates of 60% and 59%, respectively, while Hungary and Slovakia fall below the average, with rates of 49% and 50%, respectively.

⁹⁰ Ederveen et al., 2006; Santos et al., 2023.

⁹¹ The Total eligible costs represent the total amount allocated to the projects in euro, selected by the programme managers. The Total eligible spending is the expenditure eligible for reimbursement in euro, as reported by the beneficiary projects to the programmes. See European Commission, 2024d.

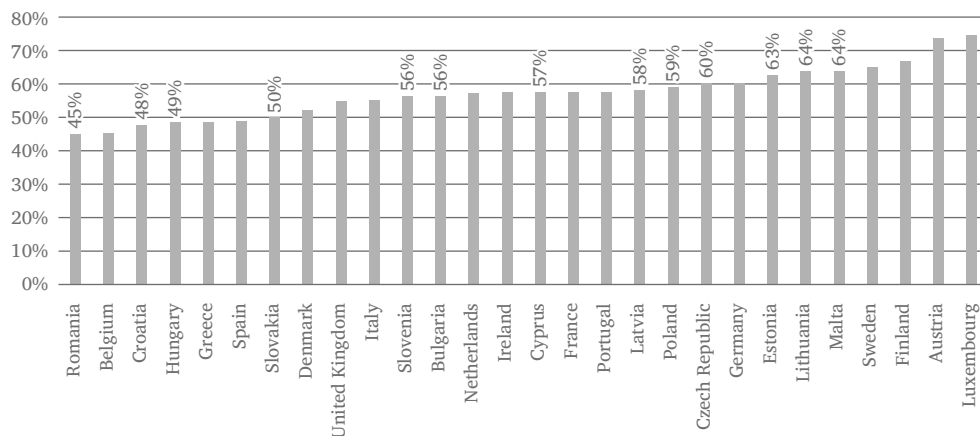


Figure No. 25⁹²

Absorption rates of EU funds – the 2014-2020 programming period

The funding of projects comes from two sources: EU financing and national contributions. Figure No. 26 shows the ratio of the Ratio of EU funding to the Total amount planned. Hungary and Poland have higher levels of EU financing compared to the Czech Republic and Slovakia (84% and 82% versus 74% and 78%, respectively).

92 European Commission, 2024c; own calculations.

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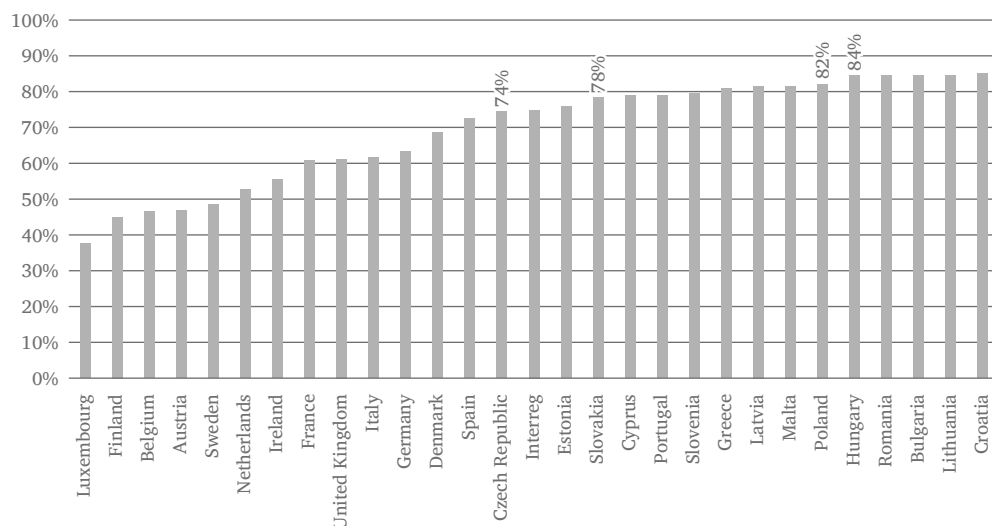


Figure No. 26⁹³

Ratio of EU funding over Total amount planned – the 2014-2020 programming period

In this context, Figure No. 27 presents two alternative measures of the absorption of EU funds per Member State, measured as the ratio of Total eligible spending to Total amount planned and the ratio of Total eligible costs to Total amount planned. These ratios reflect the ability of EU countries to utilise the total maximum available amount, regardless of the source of financing (whether EU financing or Member State contributions). Interestingly, the position of the Visegrad countries is somewhat different. Slovakia now ranks the last in the group, ensuing from not only a low absorption ability, but also higher national co-funding ratio. On the other hand, Hungary, despite a poor absorption rate, ranked rather well because most of the funding came from the EU sources. The Czech Republic and Poland are rather at the EU average in terms of ratio of Total eligible spending over Total amount planned.

93 Ibid.

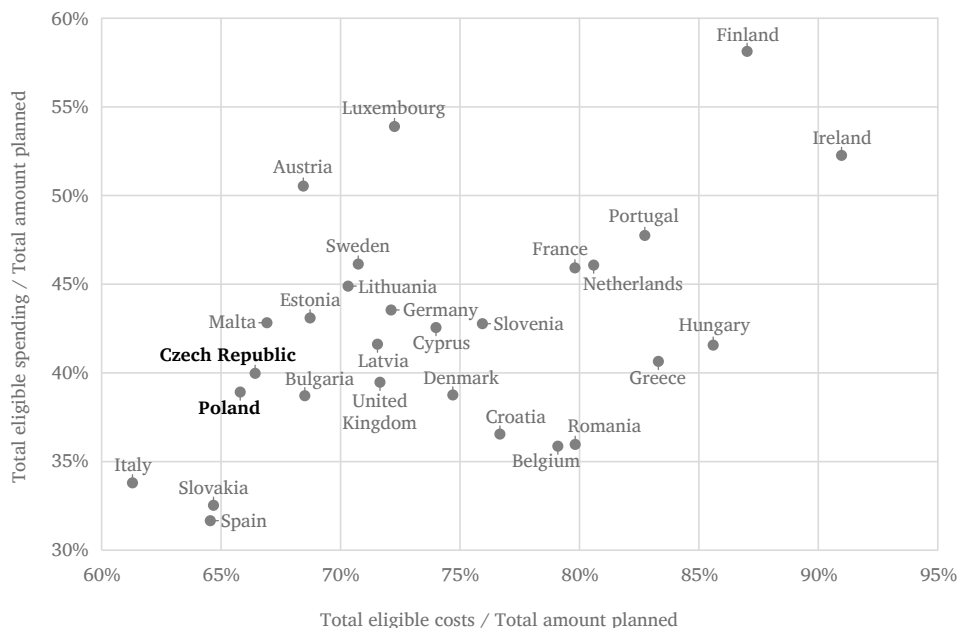


Figure No. 27⁹⁴
Absorption rates of EU funds – the 2014-2020 programming period

The figures above highlight a common challenge for new EU Member States, including the Visegrad countries, in achieving high absorption rates. Administrative inefficiencies, such as the decentralised system of managing the structural programmes in Poland,⁹⁵ insufficient institutional capacity, and delays in project implementation appear to be significant barriers.

4.2.2. Further Challenges in Using EU Funds

According to Ciffolilli and Pompili⁹⁶, variations in fund absorption and performance across Member States can be explained by four key groups of factors: (1) those related to the EU policy and legal framework, (2) the national institutional, political, and legal context, (3) the national socio-economic context, and (4) administrative capacity. Among these, new Member States often struggle most with the second and fourth categories, encompassing institutional weaknesses and administrative inefficiencies.

⁹⁴ Ibid.

⁹⁵ Balcerowicz, 2007.

⁹⁶ Ciffolilli and Pompili, 2024.

In Romania, for example, while EU funds have contributed to economic growth, their effectiveness has been inconsistent. Marin⁹⁷ identifies uneven absorption rates across Romanian municipalities, with rural areas particularly underfunded. These disparities are rooted in weak administrative capacity and limited access to co-financing resources. Recent improvements in fund management have narrowed some gaps, but challenges remain. Similarly, in Hungary, issues such as political patronage and governance inefficiencies have undermined the transformative potential of EU funds.⁹⁸ Bulgaria also faces persistent difficulties in fund absorption due to institutional weaknesses and administrative capacity deficits, as highlighted by Dimulescu, Doroftei, and Pop.⁹⁹

Corruption and mismanagement further complicate fund utilisation in some of the new Member States. Roman, McGee, and Achim¹⁰⁰ and Roman, Popescu, and Achim¹⁰¹ document widespread irregularities in Romania, ranging from procurement fraud to clientelism. These issues have motivated the EU to implement stricter auditing and monitoring mechanisms. Slovakia has faced similar challenges, with allegations of mismanagement leading to delays and, in some cases, funding suspensions. Improving governance and transparency remains essential for enhancing fund absorption and ensuring the effective use of resources.

To address these persistent challenges, governance reforms are crucial, particularly in countries like Bulgaria and Romania, where corruption and inefficiencies hinder fund absorption.¹⁰² Strengthening institutional frameworks and ensuring continuity in political support are essential for maximising the impact of EU funds. Marin¹⁰³ further emphasises the need for targeted policies to address rural-urban disparities, particularly in Romania and Hungary. Allocating resources based on regional needs can significantly improve equity and efficiency.

Despite these challenges, success stories from other Member States underscore the transformative potential of EU funds when effectively aligned with national priorities. Estonia, for example, has used EU funds to establish itself as one of the most digitally advanced nations in the EU. The strategic integration of fund allocation with national development goals plays a crucial role of the effective use of EU funds. Furthermore, emerging trends highlight the growing significance of EU funds in advancing renewable energy and environmental sustainability. Investments in clean energy initiatives have not only supported national green agendas but have also promoted broader EU climate objectives, demonstrating the dual impact of such targeted funding.

97 Marin et al., 2023.

98 Pinar and Kaharasan, 2024.

99 Dimulescu, Doroftei and Pop, 2013.

100 Roman, McGee and Achim, 2023.

101 Roman, Popescu and Achim, 2023.

102 Dimulescu, Doroftei and Pop, 2013.

103 Marin et al., 2023.

4.3. Summary

EU funds play a vital role in promoting economic development, reducing regional disparities, and increasing social cohesion across Member States. Over time, the focus of EU funding has evolved, shifting from basic economic recovery after World War II to modern priorities such as climate change, digital transformation, and sustainability. Primarily directed through structural and investment funds, they support key areas such as infrastructure, innovation, job creation, and environmental sustainability. For newer Member States, EU funds have been transformative, supporting significant improvements in transportation, public services, and regional competitiveness.

The 2004 and 2007 enlargements marked a strong increase in the importance of EU funds, particularly for the Visegrad countries, which were among the largest beneficiaries. These funds supported their economic transition and integration into the EU, although challenges like the 2008 financial crisis emphasised the need for efficient fund utilisation. Recent programming periods have aligned closely with strategic goals like the European Green Deal, emphasising innovation, green energy, and digital infrastructure. Despite substantial investments, newer Member States often struggle with low absorption rates due to governance inefficiencies, institutional weaknesses, and corruption.

5. Summary

The chapter studied the economic impacts of EU membership, with a focus on economic convergence, market integration, and the utilisation of EU funds, particularly in the context of the 2004, 2007, and 2013 enlargement waves and with a special focus on the Visegrad countries. It reviewed how EU membership has impacted the economies of newer Member States, enabling them to align more closely with the standards and growth trajectories of the EU15.

Key findings illustrate that while new Member States have significantly advanced in economic convergence, outcomes have varied due to factors such as governance quality, institutional capacity, and the ability to effectively absorb and utilise EU funds. Structural and cohesion funds played a critical role in addressing regional disparities, supporting the modernisation of infrastructure.

The analysis of trade patterns revealed important shifts in export complexity and competitiveness, noting considerable progress in high-tech industries, particularly in leading countries such as the Czech Republic and Hungary within the Visegrad group. However, the analysis also revealed persistent gaps in research and innovation investments compared to older EU members, indicating a need for sustained efforts in technological advancement and R&D activities in the new Member States.

Lessons from the previous EU enlargements also emphasise the importance of thorough preparation and alignment with EU standards before accession. It is crucial for successful integration to ensure that candidate countries meet economic, governance, and institutional criteria, as outlined in the Copenhagen criteria. The efficient use of EU funds requires building strong administrative capacities and governance structures in new members to maximise the benefits of financial support. Economic convergence can be accelerated by prioritising infrastructure development, innovation, and export sophistication, which are critical for sustainable growth.

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