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Collapse and convergence: the economic impact of EU membership and institutional improvements in post-Soviet countries

Scott Auriat*

Abstract

This paper analyzes the economic growth trajectories of post-communist countries that emerged following the collapse of the USSR. I treat the Soviet Union's sudden dissolution as a natural experiment that triggered rapid institutional changes, providing a unique opportunity to iso- late institutions as the primary driver of growth. The central hypothesis is that countries that swiftly pursued EU membership experienced stronger economic performance than those that did not, with the underlying mechanism being improvements in institutional quality. The findings support this hypothesis, underscoring the pivotal role of high-quality institutional adoption in driving economic growth.

JEL Classification: O43, P20, F15

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1. Introduction

Economics as a discipline has long turned to history as a source of empirical insight. In particular, economists often seek natural experiments - historical events that allow for the isolation of causal mechanisms. A prominent example is found in Institutions as a Fundamental Cause of Long-Run Growth, where Acemoglu, Johnson, and Robinson examine the stark economic disparity between North and South Korea (Acemoglu, 2005). By 2000, South Korea's GDP per capita had surged to approximately $16,000, while North Korea's remained stagnantly low at around $1,000. The authors attribute this divergence to historical events that led to fundamentally different institutional trajectories. Yet, they argue that to establish the decisive role of economic institutions in shaping national prosperity, a broader natural experiment in institutional divergence is necessary (p. 22).

This paper takes up that challenge by leveraging the collapse of the USSR as a large-scale natural experiment. The dissolution of the Soviet Union created a rare opportunity to observe the effects of divergent institutional paths on economic outcomes. Of the 27 newly independent states that emerged from this geopolitical upheaval, 10 quickly pursued EU membership, adopting the institutional framework of

* University of Alberta - Email: scottauriat@gmail.com

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the European Union (EU) - an institutional gold standard characterized by the rule of law, property rights, and market-oriented policies. In contrast, the remaining 17 countries, which either did not pursue EU accession or had unsuccessful applications, retained elements of Soviet-era institutions and underwent a much more gradual transition. This paper investigates whether these differing institutional trajectories account for the economic disparities that have since emerged among post-communist states.

2. Literature Review and Research Agenda

2.1. Research Context: Institutional Divergence and Convergence

It is important to clarify from the outset what is meant by convergence and divergence, as these terms have specific theoretical meanings in economics, which will be explored in later sections. However, before delving into their formal definitions, it is useful to establish a broad conceptual understanding. Convergence refers to movement toward a common reference point, while divergence signifies movement away. The critical question, then, is: what exactly are we moving away from, and what are we moving toward?

When discussing divergence, I refer to the historical choices made by countries in the 19th century to adopt either communist or broadly defined liberal-democratic institutions. This framework is used in studies such as the comparison of North and South Korea - as discussed above. However, my primary focus is on the subsequent process of convergence - that is, once countries abandoned communist institutions, they began transitioning back toward the liberal-democratic frameworks of the West. This distinction is crucial, as the terms can be ambiguous without clear reference points.

In this line of research, the key question is whether institutional change leads to changes in eco- nomic outcomes. Divergence - defined as the adoption of less efficient institutions - should theoretically result in lower growth, as empirical evidence suggests. Conversely, convergence should reverse this process, a pattern I intend to demonstrate and which previous research has also confirmed. Ultimately, both divergence and convergence underscore the fundamental role of institutions in shaping economic performance.

The following subsections will outline the relevant literature directly related to this concept. First, I examine research on institutional divergence, which may extend beyond the 19th-century communist context. Next, I turn to studies on institutional convergence, particularly in the post-USSR set- ting. Finally, I will discuss this paper's key contributions and research agenda.

2.2. Natural Experiments in Institutional Divergence

The economic consequences of institutional divergence have been extensively studied in various historical contexts, where natural experiments have provided compelling evidence of the causal impact of institutions on long-term economic outcomes.

(Acemoglu et al., 2001) examine the long-term effects of institutional divergence stemming from the colonial era across various regions of the world. Of particular interest is their analysis of the north- ern regions of Mexico in comparison to the bordering U.S. states. They argue that initial differences in legal frameworks, property rights enforcement, and governance structures created persistent eco- nomic disparities, with the U.S. states achieving higher long-term growth due to the presence of more inclusive institutions.

The case of East and West Germany further exemplifies how institutional divergence can shape economic outcomes. Despite starting from similar economic baselines at the end of World War II, East Germany's centrally planned economy stagnated, while West Germany's market-oriented system experienced rapid growth. Following reunification, the integration of East Germany into the institutional framework of the West led to substantial, though incomplete, economic convergence (Fuchs-Schundeln and Alesina, 2007; Becker et al., 2020).

China and Taiwan provide another key example. While both regions shared a common cultural and historical foundation, post-1949 Taiwan embraced democratic governance and market-friendly institutions, whereas China, under Maoist policies, followed a rigid centrally planned model. The economic divergence between the two was significant until China initiated market reforms in the late 20th century (Rodrik, 2000; Ang, 2013).

It is also worth noting (Rodrik et al., 2004), while the study does not employ a natural experiment design, it provides compelling evidence that institutional quality exerts a greater influence on economic performance than geography or trade integration alone.

2.3. Studies on the Economic Impact of EU Membership

The economic trajectories of post-communist countries following the collapse of the USSR, particularly the role of EU membership, have been extensively studied. This research builds upon the foundational work of (Campos and Coricelli, 2002), which examines the economic outcomes of post-Soviet institutional transitions up to 2002. Their study highlights that timely and well-structured reforms yield significantly better long-term economic outcomes than delayed or inconsistent policies. The process of EU integration - characterized by the adoption of institutional frameworks that enhance market stability, strengthen the rule of law, and improve regulatory quality - has been widely recognized as a key driver of economic convergence.

More recent analyses, such as those by (Campos et al., 2019) and (Grassi, 2024), further emphasize the strong positive effects of EU membership on economic performance. These studies highlight the role of institutional harmonization, foreign direct investment (FDI) inflows, and access to larger markets as critical mechanisms through which EU accession fosters economic growth.

2.4. Limitations of Past Research

Although extensive research has examined the economic impact of EU membership (see (Campos and Coricelli, 2002; Campos et al., 2019; Grassi, 2024)), much of this work focuses on the overall effects of membership rather than directly isolating the role of institutions. This raises a broader and more nuanced question: rather than merely assessing the impact of EU accession, what are the eco- nomic consequences of rapidly adopting high-quality institutions? The key insight is to shift the focus to institutional transitions - which began well before formal EU accession - as the primary causal mechanism driving economic outcomes, rather than treating accession as a strictly binary event driving differing economic outcomes.

When examining post-Soviet countries that joined the EU, it is crucial to recognize that the process of institutional alignment began the moment these countries applied for membership. In this sense, EU accession functioned more as a formal certification of institutional transformation rather than its starting point. As a result, a significant share of the economic and institutional gains materialized before the official accession date. Acknowledging this earlier onset of institutional change provides a more nuanced perspective on the causal relationship between institutional quality and economic performance, allowing for a more accurate assessment of the long-term impact of institutional reforms.

Previous research has acknowledged this nuance. For example, (Campos et al., 2019) notes that "although EU membership may be binary, there is a continuum of degrees of economic integration which cannot be fully captured by a dummy variable." In this light, the goal of the paper is to take a deeper look at this already-noted inconsistency.

Building on the question of the effects of institutions versus merely joining the EU, another key issue arises: what is the appropriate comparison group? In (Grassi, 2024), synthetic controls are used, comparing EU members to synthetic counterparts drawn from any country in the world. While this approach may be valid when evaluating the general effect of EU membership - since any non-EU country can serve as a comparison - it is inadequate when analyzing the impact of institutional change. In that case, the comparison group must be more refined, ensuring that institutional backgrounds are comparable.

To address this, I construct synthetic controls exclusively from post-Soviet countries that did not join the EU. This refinement allows for a more precise analysis of institutional effects by ensuring that treated and control units share a common historical and institutional starting point. The following subsection details the specific methodology used to address these concerns.

2.5. Research Approach and Assumptions

Given the limitations of past research and the refined question this paper seeks to address, the analysis is structured around four complementary approaches, each grounded in distinct assumptions:

- **Panel regression, based on the assumption that institutional convergence began as early as 1993.**

If 2004 is an unreliable benchmark for measuring the effects of EU accession - given that institutional transitions began much earlier - the synthetic control method faces a fundamental limitation. Specifically, if 1993 marks the point when some countries effectively became "treated", the approach is constrained by data availability, as these countries did not formally exist before 1991, and reliable data is only available from 1993 onward. To address these challenges, I employ panel regression starting in 1993, demonstrating that EU member states converged at a significantly faster rate than post-communist countries that did not join the EU.

- **Synthetic control analysis with a refined counterfactual.**

This approach assumes that the benefits of institutional transition only materialized after 2004. However, rather than relying on broad comparisons, I construct synthetic controls exclusively from non-EU post-Soviet countries to provide a more relevant counterfactual. This helps control for unobserved differences between treated and control groups, ensuring a more precise assessment of the institutional effects on economic outcomes.

- **A focused comparison of the Baltic States with Moldova, Ukraine, and Belarus.**

This group of six countries - three that joined the EU (the Baltics) and three that did not - serves as an ideal comparison set due to their geographic similarities. The key distinction is that the Baltic states have access to northern ocean ports, while the other three countries have southern ports. However, since economic growth theories emphasize access to trade rather than the specific orientation of a port, neither group holds a geo- graphic advantage over the other. Nevertheless, they were not equally strategic to Russia, which sought to maintain access to a warm-water port in the south. By comparing these countries, I effectively isolate geography as a competing explanation for their divergent economic outcomes. My findings demonstrate that institutional differences - shaped by this otherwise inconsequential geographic distinction - rather than geography itself, were the primary drivers of their economic trajectories.

- **A detailed case study of Poland versus Ukraine.**

This comparison serves as a natural experiment within the broader natural experiment. Both countries shared similar historical, cultural, and economic foundations

before the collapse of the Soviet Union but followed markedly different trajectories afterward. By examining a range of economic metrics, I assess the extent to which EU accession and institutional alignment contributed to Poland's economic success while Ukraine lagged behind - a divergence that has become even more pronounced in light of the 2022 Russian invasion of Ukraine. This section critically demonstrates that human capital, as a competing explanation, does not hold.

By integrating these four dimensions, this paper offers a more refined analysis of the economic impact of institutional transition, contributing significantly to the broader literature on institutions as a fundamental driver of growth.

3. Background Concepts: A Broad Literature Review and Preliminary Results

While the previous section provided a focused review of the literature and outlined the research framework, this section serves as a broader motivation. It explores the challenges of isolating the fundamental causes of growth and examines the historical context. With this foundation in place, we can then transition to the empirical analysis.

3.1. The Endogenous Nature of Growth

> "The aggregate production function is just the first step in understanding differences in output per worker. Findings in the production function framework raise deeper questions such as the following: why do some countries invest more than others in physical and human capital? And why are some countries so much more productive than others?" (Hall and Jones, 1999)

Understanding the drivers of economic growth is a complex challenge. At its core, any explanation of growth involves estimating a production function. Consider the formulation:

$$y = f(I, k, h, G) \qquad (1)$$

where:

- I denotes institutional quality;
- k represents physical capital per worker;
- h measures human capital per worker;
- G signifies geographic quality;
- y denotes income or output per capita.

It is reasonable to assume that y increases with each of these inputs. However, a fundamental issue arises: endogeneity. Any increase in I, k, h, or G leads to higher output, but this growth, in turn, fuels further investment in these very inputs. Since today's output becomes tomorrow's input, the production process inherently exhibits feedback loops, making it difficult to disentangle cause from effect. In historical analyses, this results in the simultaneous rise of all factors alongside production, complicating efforts to identify the primary driver of growth.

Economic growth, therefore, operates as a self-reinforcing cycle - improvements in one factor enable further advancements in the others. This raises a critical question: What initiates this cycle? What is the fundamental cause of long-run economic growth?

3.2. Reviewing and Addressing Alternative Explanations for the Fundamental Causes of Growth

The primary objective of this paper is not merely to demonstrate that countries which joined the EU experienced better economic outcomes, but to establish that institutional improvements brought about by EU membership were the fundamental drivers of this growth. In other words, the goal is to demonstrate that institutional changes were the primary driver of the higher growth rates observed in EU member states compared to non-members, effectively initiating the virtuous cycle described above. To support this claim, it is crucial to examine other potential fundamental drivers of growth and rule them out as primary causes. This section will offer a list of other potential causes and a brief review of each.

There is no universally accepted list of the fundamental causes of economic growth, so I will not overly justify my selection. However, the list presented below is, in my view, comprehensive and representative. Importantly, even if other lists differ, they generally refer to conceptually similar factors under different names.

The four fundamental causes of growth considered in this paper are:

- **Geography**
- **Culture**
- **Human Capital**
- **Institutions**

The Geography Hypothesis suggests that geographic factors are the fundamental causes of economic growth. According to this view, natural endowments such as climate, soil fertility, resource availability, and disease prevalence influence agricultural productivity, population health, and labor productivity, which in turn shape long-term economic outcomes.

Notable proponents of this hypothesis include (Diamond and Ordunio, 1999), who argued that geographic advantages facilitated the development of complex civilizations by providing favorable conditions for agriculture and resource accumulation. Similarly, (Sachs, 2001) highlighted the ad- verse impact of tropical diseases and landlocked geography on economic growth. Additionally, (Gallup et al., 1999) demonstrated that coastal regions and areas with navigable rivers experience higher growth due to enhanced trade opportunities and access to global markets.

However, critics argue that geography alone cannot explain the vast disparities in economic development and that institutional quality plays a more decisive role (Acemoglu et al., 2001; Robinson and Acemoglu, 2012).

The Culture Hypothesis posits that cultural values are the fundamental drivers of economic growth. It argues that societies with distinct core values - shaped by unique historical experiences - make different economic decisions, such as savings rates, risk tolerance, and investment behaviors, which ultimately influence long-term growth.

Various scholars have contributed to this perspective. Notably, (Mokyr, 2016) explores how cultural attitudes towards knowledge and innovation fostered technological progress during the Indus- trial Revolution. Similarly, (McCloskey, 2016) emphasizes the role of changing social norms and cultural attitudes towards commerce and entrepreneurship in driving economic transformation during the same period.

A key limitation of the Culture Hypothesis - particularly in the context of modern economic growth - is its inability to account for rapid changes in growth rates. There is no theoretical framework explaining how cultural values can shift quickly enough to trigger sudden economic booms.

For example, cultural explanations struggle to account for growth miracles like those in China and Singapore. When Mao died, China suddenly leaped to double-digit growth rates, yet it is difficult to imagine that its culture underwent a fundamental shift at that moment.

The perspective advanced in this paper is that while culture plays a crucial role in shaping and embedding institutions within a society, its influence on economic growth is indirect and limited. Institutions evolve from cultural norms, but unlike culture, they can change rapidly. Thus, while cultural values may lay the foundation for institutional frameworks, institutions themselves provide a more compelling and immediate explanation for economic growth.

For example, property rights can be implemented virtually overnight, but changing a society's cultural attitudes towards property ownership is a much slower process. In this sense, culture serves as a deep-rooted source of institutional formation but is insufficient to explain modern economic growth patterns. Institutions, once established, drive economic performance more directly and effectively.

Human Capital has recently become an important refutation to the idea that institutions are the dominant cause of growth. The argument can be summed up as "knowledge-spillover effects emanating from workers and entrepreneurs with superior education and skill, ... enhance the productivity of others with whom they interact" (Ehrlich, 2007). Put differently, the productivity from human capital buys good institutions, not the other way around.

For example, consider an important critique of (Acemoglu et al., 2001); a famous paper suggesting Europeans caused poverty or prosperity where they colonized depending on if they set of inclusive or extractive institutions which in turn was caused by if they could live in a country, given disease ecology, or not. The critique points out that "the Europeans who settled in the New World may have brought with them not so much their institutions, but themselves, i.e., their human capital" (Glaeser et al., 2004). Much of the research highlighting the importance of institutions often overlooks the fact that strong institutions often coexist with high levels of human capital. In the literature, the causal relationship between the two remains unclear.

This paper makes a key contribution by showing that human capital alone cannot explain the success of post-communist countries, whereas institutional quality can. By controlling for human capital, two critical insights emerge: first, both EU and non-EU post-Soviet countries had relatively high levels of human capital; second, human capital formation lagged behind institutional change, reinforcing the argument that institutions were the primary driver of economic growth.

Among the potential drivers of growth, geography poses the most significant challenge to isolating the effects of institutional change. As previously discussed, culture evolves too slowly to explain the rapid economic transformations observed, and human capital is not statistically significant in the results. To address this, I examine the three Baltic states - Latvia, Lithuania, and Estonia - and contrast them with Moldova, Ukraine, and Belarus. Despite their similar geographic proximity to major European trade hubs, their economic trajectories diverged sharply.

3.2. Historical Context

3.3.1. Divergent Paths

> "Our country has not been lucky. It was decided to carry out this Marxist experiment on us. In the end we proved that there is no place for this idea-it has simply pushed us off the path taken by the world's civilized countries " Boris Yeltsin (1992) (Judt, 2006)

The above quote serves as both an ideological and chronological introduction to this section. Just months before this statement was made, the Soviet Union dissolved, fragmenting into multiple in- dependent states, including Russia. This quote, from Boris Yeltsin, the first president of the Russian Federation, encapsulates the urgency felt by many newly independent states to break away from Soviet institutions and communism. Most of these states sought to swiftly adopt Western institutions, a shift most notably seen in their efforts to join the European Union through the PHARE Programme. PHARE, an acronym for "Poland and Hungary Assistance for the Restructuring of the Economy," was initially designed to support Poland and Hungary in their transition to market economies.

However, the program later expanded to include ten countries. From this point forward, I will refer to the ten nations that joined the EU in 2004 as the PHARE countries.

Following the dissolution of the Soviet Union, a pronounced gap in GDP per capita emerged be- tween post-communist states and the market-based liberal democracies of Western Europe. By 1993, the GDP per capita of Italy - a representative Western European economy - stood at approximately $18,000 in purchasing power parity (PPP) terms. In contrast, that same year, Poland's GDP per capita was just $5,000, the Czech Republic's $3,500, Slovakia's $3,000, Latvia's $2,000, and Slovenia's

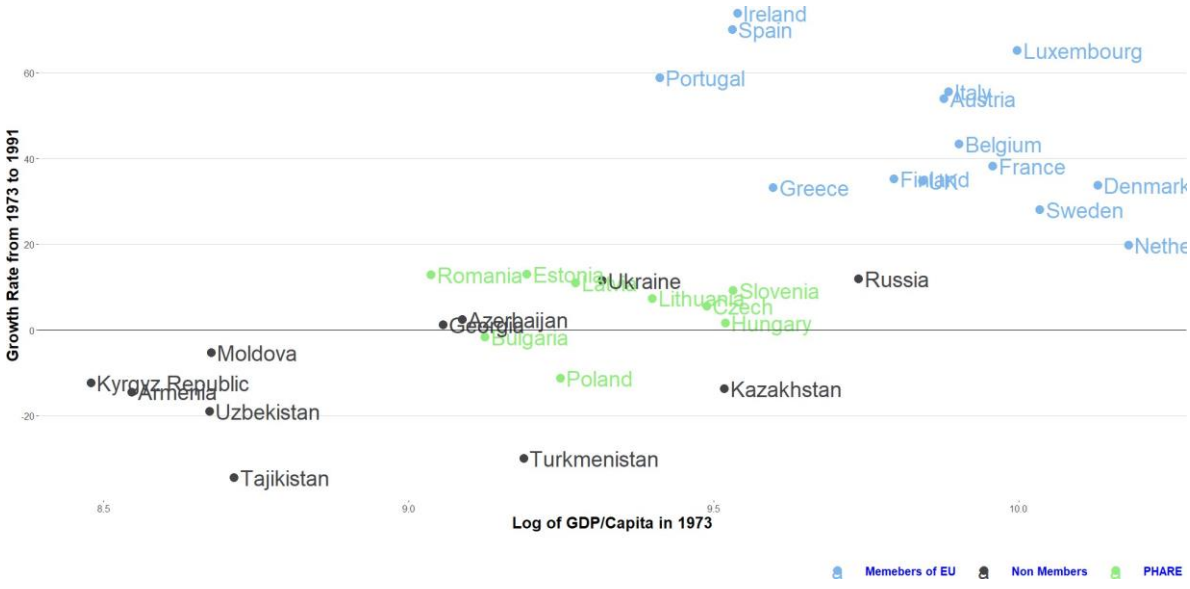
$6,000 - figures that reflected a significant developmental lag. Across the former Eastern Bloc, GDP per capita ranged from one-sixth to one-third of Western European levels, underscoring the extent of economic divergence (Aslund, 2013; Campos and Coricelli, 2002; Milanovic et al., 1998).

The end of the Cold War marked the conclusion of Europe's division between East and West. The demolition of the Berlin Wall not only symbolically reunited Berlin but also paved the way for Eastern Europe to reconnect with Western European institutions.

Figure 1 illustrates these divergent economic trajectories. From 1973 to 1991, Soviet/Communist- influenced countries (shown in green and black) experienced lower growth rates compared to EU countries (shown in blue). The upward slope of the data suggests a pattern of divergence, where wealthier countries grew faster.

As discussed, divergence and convergence have precise meanings in economics. In a standard convergence analysis, growth rates over a given period are regressed on the log of GDP per capita at the start of the period. The resulting coefficient indicates whether poorer countries are falling behind (if positive) or catching up (if negative) relative to wealthier nations in the sample. In this case, the plot clearly illustrates divergence, as poorer countries show no signs of closing the income gap with their richer counterparts. For key foundational papers on this topic, see (Barro and Sala-i Martin, 1992; Mankiw et al., 1992; Sala-i Martin, 1996).

Figure 1: Growth Rate from 1973-91 vs Log of GDP in 1973 (Maddison Historical Statistics)



Moreover, many countries within the Soviet sphere of influence experienced negative growth rates during this period, highlighting the stark contrast between communist and market-oriented economic systems. This divergence underscores the importance of institutional choices in shaping long-term economic trajectories.

3.3.2. The European Union

At the end of World War II, the European Union (EU) was in its infancy. It began as the Coal and Steel Community in 1951, with the primary objective of economically linking France and Germany to make future wars between them impossible. This experiment was remarkably successful. Not only did the EU expand geographically and economically, but the idea of war between its member states has become virtually inconceivable. As of this writing, the EU has a population of approximately 450 million people and produces about 17% of global GDP (or 21% prior to Brexit).

To understand the historical context, it is essential to look back to the end of WWII and con- sider the USSR. At that time, the Soviet Union was at the height of its power, having gained control over the Eastern Bloc and imposing communist institutions across a vast segment of the globe (see map/Figure 9 in the Appendix). When the USSR collapsed in 1991, it had a population of nearly 300 million and influenced approximately 400 million people in total, if one includes the populations of the Eastern Bloc countries. The Soviet Union went from being a dominant global power to complete disintegration. During the same period, the EU evolved from a modest agreement to facilitate coal and steel trade between France and Germany into a highly influential institutional body. The simultaneous rise of the EU and the fall of the USSR is undeniably one of the most remarkable stories in modern history.

The EU operates as an institutional enforcer. To join the EU, a country must conform to a set of guidelines or institutional frameworks that broadly align with the principles of liberal democracy. These requirements include, but are not limited to:

- **Democratic Governance**: A country must be democratic, ensuring political accountability and citizen participation.
- **Fiscal Responsibility**: Member states must maintain a balanced fiscal budget.

- **Macroeconomic Stability**: Low inflation is required to minimize future price instability, fostering a predictable investment environment.
- **Rule of Law and Property Protection**: The EU ensures robust legal protections for private property, incentivizing investment by securing profit streams.
- **Market-Oriented Policies**: The EU relies primarily on market mechanisms for resource al- location, in contrast to the Soviet system's persistent shortages and excess demands.
- **Intellectual Property Rights**: Patent and copyright protections within the EU encourage innovation—protections notably absent under Soviet rule.
- **Commitment to Free Trade**: EU membership requires alignment with the principles of free trade, promoting economic integration and growth.

The reasons why the EU fosters economic growth, while the Soviet system did not, are multifaceted and range from quantifiable economic metrics to more qualitative institutional dynamics. Below are some of the most critical contrasts:

- **Property Rights**: The EU enforces strong property rights, which incentivize investment by securing the returns on private assets. In contrast, communism fundamentally opposed private property.
- **Free Trade Zone**: The EU functions as a large free trade zone, providing access to a vast market that enables countries to capture the gains from trade, including comparative advantage, specialization, and increasing returns to scale.
- **Price Stability**: By enforcing low inflation, the EU minimizes the risk of future price instability, fostering a more predictable investment climate.
- **Market-Based Resource Allocation**: The EU primarily uses market mechanisms to equate supply and demand, whereas the Soviet system suffered from chronic shortages and surpluses due to centralized planning.
- **Intellectual Property Protection**: The EU promotes innovation through robust patent and copyright protections, in stark contrast to the Soviet Union's lack of intellectual property laws.
- **Rule of Law**: The EU enshrines the Rule of Law, placing checks on the arbitrary use of state power, thus safeguarding private investments from state expropriation.

While the list above outlines the primary mechanisms through which the EU fosters economic growth, it is not exhaustive. The EU is a complex and expansive institution with a myriad of rules and regulations. However, these key factors provide a concise summary of why the EU has historically experienced higher growth rates compared to the slower economic development under the Soviet system.

3.3.3. The Sudden Collapse of the USSR

It is crucial to briefly emphasize the abruptness of the USSR's collapse, as this suddenness underscores why it serves as an ideal natural experiment:

> "Virtually everyone professionally engaged in the study of politics and foreign policy believed in the permanence of communism; its worldwide collapse in the late 1980s was therefore almost totally unanticipated " (Fukuyama, 2006)

> "The disappearance of the Soviet Union was a remarkable affair, unparalleled in modern history. There was no foreign war, no bloody revolution, no natural catastrophe. A large industrial state – a military superpower – simply collapsed: its authority drained away, its institutions evaporated" (Judt, 2006)

Both quotes highlight the sudden and unpredictable nature of the collapse of the USSR, as well as the subsequent disintegration of Yugoslavia. Although I will not delve into the historical specifics, it is crucial to emphasize just how abrupt and unforeseen the collapse of the Soviet Union truly was. Countries that chose to join the EU embarked on rapid institutional transformations at an unprecedented pace in historical terms.

What makes this transition particularly compelling is that while institutional changes occurred swiftly, other variables that could plausibly influence economic growth remained relatively constant. This sudden shift provides a unique opportunity to treat the collapse as a natural experiment. The abrupt disintegration of the USSR created a distinct break in institutional trajectories, suggesting that institutions were the only significant causal factor that varied in a meaningful way. This natural experiment, therefore, allows us to isolate and analyze the impact of institutional quality on economic outcomes.

3.3.4. The PHARE Programme

Following the collapse of the USSR, many countries expressed a strong desire to join the European Union swiftly. In response, the EU established the PHARE

Programme. Initially designed to assist Poland and Hungary, the program was later expanded to include the Czech Republic (now Czechia), Estonia, Latvia, Lithuania, Slovakia (now the Slovak Republic), Slovenia, Bulgaria, and Romania. According to the EU, the PHARE Programme aimed to provide grant financing to help partner countries prepare for the obligations of EU membership.

The PHARE Programme was a unique response to an unprecedented situation. Before this, EU enlargement was a slow and methodical process, primarily involving Western European countries with relatively similar economic systems. The sudden collapse of the USSR, however, created a scenario where countries with vastly different economic systems and significantly lower living standards sought rapid integration into the EU. This required an innovative and expedited approach, which the PHARE Programme provided. Essentially, it was a comprehensive set of policies designed to transition communist economies to capitalist market systems aligned with EU standards.

To summarize this complex process, the PHARE Programme was, in essence, an "EU boot camp" designed for rapid and radical institutional transformation - a strategy often referred to as "shock therapy" due to its accelerated pace (Klein, 2007). This rapid transition becomes a critical component of the analysis because it creates a natural experiment. The sudden collapse of the USSR and the subsequent swift institutional transformation in some post-communist countries, but not others, allow for an isolated examination of the role of institutional quality in driving economic growth.

3.3.5. Convergent Paths

An effective way to summarize the historical context and seamlessly transition into the empirical analysis is to present the post-collapse version of Figure 1. This updated figure starkly contrasts with its pre-collapse counterpart, vividly illustrating the shift in economic dynamics before and after the collapse of the USSR. The narrative moves from stark divergence to pronounced convergence, clearly highlighting the turning point in growth trajectories.

Crucially, the convergence rates differ significantly across groups. For the countries that moved to join the EU, the path to convergence is notably steeper and more rapid. This observation not only emphasizes the pace of economic catch-up but also lays the groundwork for the empirical analysis by underscoring the divergent institutional paths taken.

It is essential to underscore the cumulative narrative as well. The figures collectively depict a dramatic shift in growth dynamics, driven by the institutional transformations undertaken by post- communist countries. This visual comparison powerfully illustrates the importance of institutions as a fundamental driver of economic growth. Notably, between Figure 1 and Figure 2, no other potential fundamental growth drivers- such as geography, culture, or human capital - underwent significant change. The only major shift was in institutions.

Building on this foundational insight, the remainder of the paper will explore the economic out- comes of these divergent paths. By closely examining the distinct institutional frameworks adopted by different groups of countries, the analysis aims to demonstrate that these varied institutional choices were the primary determinants of the observed differences in economic performance.

3.4. The Natural Experiment

3.4.1. The Groups

Before proceeding with the empirical analysis, I will first outline the countries included in the study and establish a general timeline for the natural experiment. The analysis is structured around four distinct groups:

Group 1: EU member countries

- Ireland, Finland, Sweden, UK, Spain, Netherlands, Austria, Belgium, Portugal, Greece, Italy, France, Denmark, and Luxembourg

Neither Finland nor Sweden were EU members in 1991, but since they were already in the process of joining and officially became members in 1995, they are more appropriately classified within this group. Therefore, I include them in the analysis. It can be shown that their inclusion or exclusion does not significantly alter the results.

Similarly, although the UK left the EU in 2020, it remains in Group 1, as the period during which it was not a member is relatively short and does not meaningfully impact the analysis.

Group 2: The PHARE countries

- Romania, Bulgaria, Lithuania, Latvia, Estonia, Poland, Slovak Republic, Czechia, Hungary, Slovenia

It is important to clarify a few distinctions within this group. Not all its members were part of the USSR (see map/Figure 9 in the appendix). In fact, only Latvia, Lithuania, and Estonia were officially part of the USSR, while the rest were classified as Soviet Satellite States. However, as I will demonstrate, institutional measures among these countries were quite similar. While there were certainly differences between the Satellite States and former USSR members, these differences were not substantial enough to warrant separate treatment in the main groupings for this analysis.

Additionally, Slovenia was not part of the USSR but emerged from the former Yugoslavia, which collapsed around the same time. Since including or excluding Slovenia does not alter the results, I have opted to include it in the analysis.

Group 3: The Non-members

- Armenia, Belarus, Georgia, Azerbaijan, Turkmenistan, Uzbekistan, Kazakhstan, Kyrgyz Re- public, Moldova, Tajikistan, Russian Federation, and Ukraine

Post-communist countries that did not join the PHARE programme and are not currently (writing in 2021) applying to join.

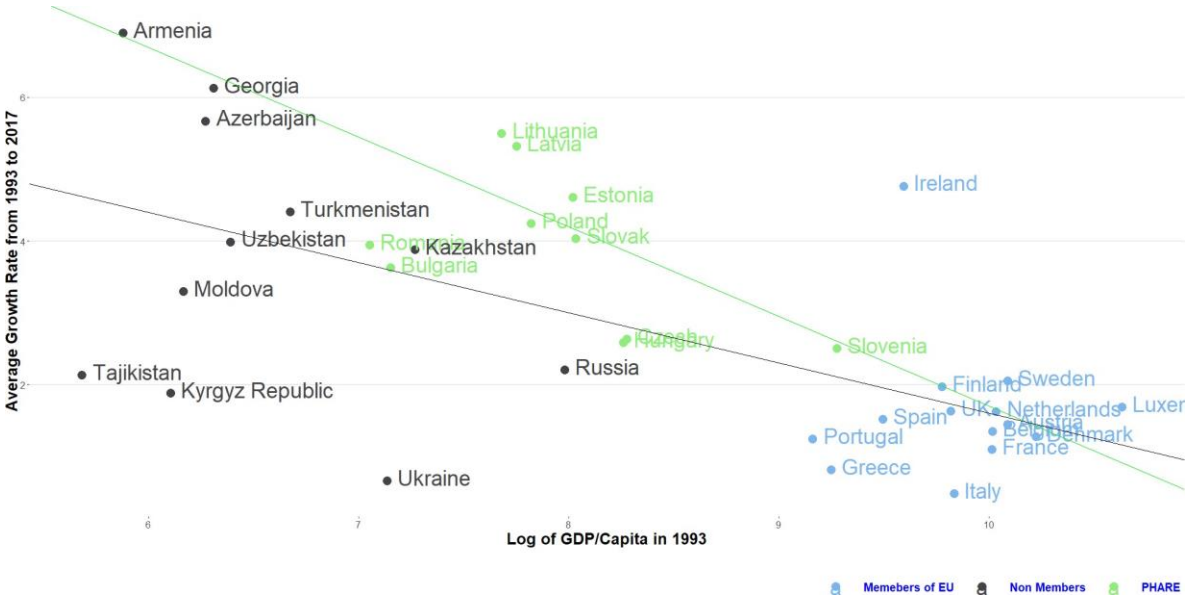
Group 4: Excluded from Analysis

- Albania, North Macedonia, Montenegro, Serbia, Turkiye, Cyprus, Croatia, and Malta

Group 4 consists of countries that are excluded from the analysis due to ambiguous classification. This group includes two distinct sets of countries:

Five countries that have applied for EU membership but have not yet been admitted (see the first five in the list). Three countries that became EU members during the period under investigation - since the collapse of the USSR - but are not post-Soviet states (the last three in the list). The ambiguity lies in how to appropriately categorize these countries, as their institutional trajectories and economic contexts do not align clearly with the other groups. Given this complexity, and to maintain analytical consistency, these countries will be excluded from further analysis.

Figure 2: Average Growth Rate vs the Log of GDP/Capita in 1993



3.4.2. Key Comparison: Non-Members vs. PHARE Countries

The core comparison in this analysis centers on two principal groups: the PHARE countries and the Non-members. In the context of this natural experiment, the PHARE countries are designated as the treatment group, while the Non-members serve as the control group.

The rationale behind this classification is rooted in the divergent institutional paths these groups pursued following the collapse of the USSR. The PHARE countries opted for rapid institutional transformation through integration into the EU, undergoing significant political and economic re- forms. Conversely, the Non-members maintained a more gradual or stagnant approach to institutional change, providing a natural baseline for comparison.

By treating the PHARE countries as the treatment group, the analysis aims to isolate the impact of adopting EU-aligned institutions on economic performance and convergence rates. The Nonmembers, serving as the control group, allow for a comparison against countries that did not experience the same institutional shift, thereby helping to attribute any observed differences in economic outcomes to institutional quality rather than other confounding variables.

Figure 3: Key Dates and Outline of the Natural Experiment

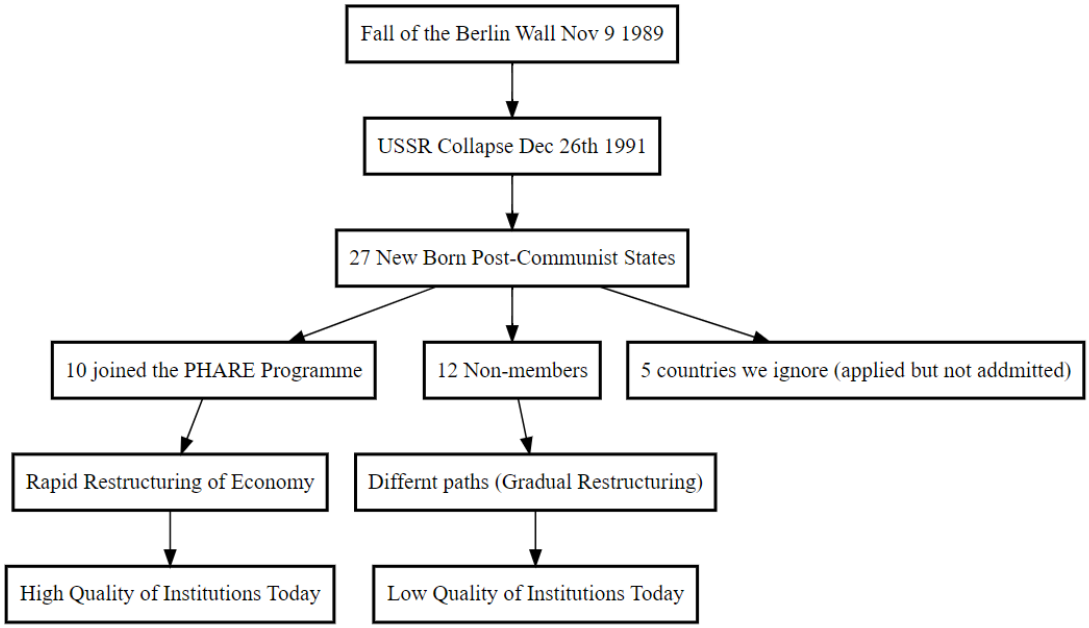


Figure 3 illustrates the basic framework of this natural experiment, visually mapping the divergent institutional trajectories and setting the stage for the empirical analysis.

4. Empirical Analysis

4.1. Convergence Analysis Beginning in 1994

4.1.1. Timing the Break

As demonstrated in previous research, see (Campos et al., 2019; Grassi, 2024), joining the EU has consistently led to positive economic outcomes. However, the precise timing of these benefits remains ambiguous. A simplistic interpretation would suggest that the benefits began in 2004, the year of formal EU accession for many post-communist countries. This assumption will be maintained in the next section to provide a clear analytical baseline.

However, there is substantial evidence and practical reasoning to suggest that the economic benefits likely began earlier - possibly when the application process started, or even when the prospect of EU membership first became a realistic possibility. The anticipation of membership itself could have triggered institutional reforms, increased

investor confidence, and enhanced economic stability, setting the stage for subsequent growth.

Before proceeding with an analysis that explores this broader timeframe, I will first present two figures that provide compelling evidence for considering the early 1990s as the starting point of this natural experiment. These figures illustrate the initial shifts in economic dynamics and institutional trajectories, highlighting how the transition toward EU integration - and the associated benefits - likely commenced well before formal accession. By visualizing these early patterns, the figures support the argument that the anticipation of EU membership, rather than the formal accession itself, served as a catalyst for economic transformation and growth.

In Figure 4, we observe a synthesis of the dynamics illustrated in Figure 1 and Figure 2. Specifically, I estimate the convergence rate to the EU members using data from (Maddison Project Database, 2018) for each year available, conducting the analysis separately for two groups: (1) the PHARE countries and EU members, and (2) the Non-members and EU members.

This methodology allows for a consistent comparison of convergence rates across groups. Notably, while the absolute convergence rate itself holds importance, its relative value is more telling. Changing the baseline affects the absolute rate, but the relative difference remains consistent. In essence, this comparison measures how quickly each group is "closing the gap" with EU members, akin to assessing their speed in a race by how rapidly they approach the same finish line.

A striking pattern emerges in the initial transition period from 1985 to 1992, where we observe very low - and in some cases, negative - growth rates, reflecting high rates of divergence. However, this trend reverses as the PHARE countries demonstrate robust growth from approximately 1993 to 2008, followed by mixed performance post-2008, likely influenced by the global financial crisis.

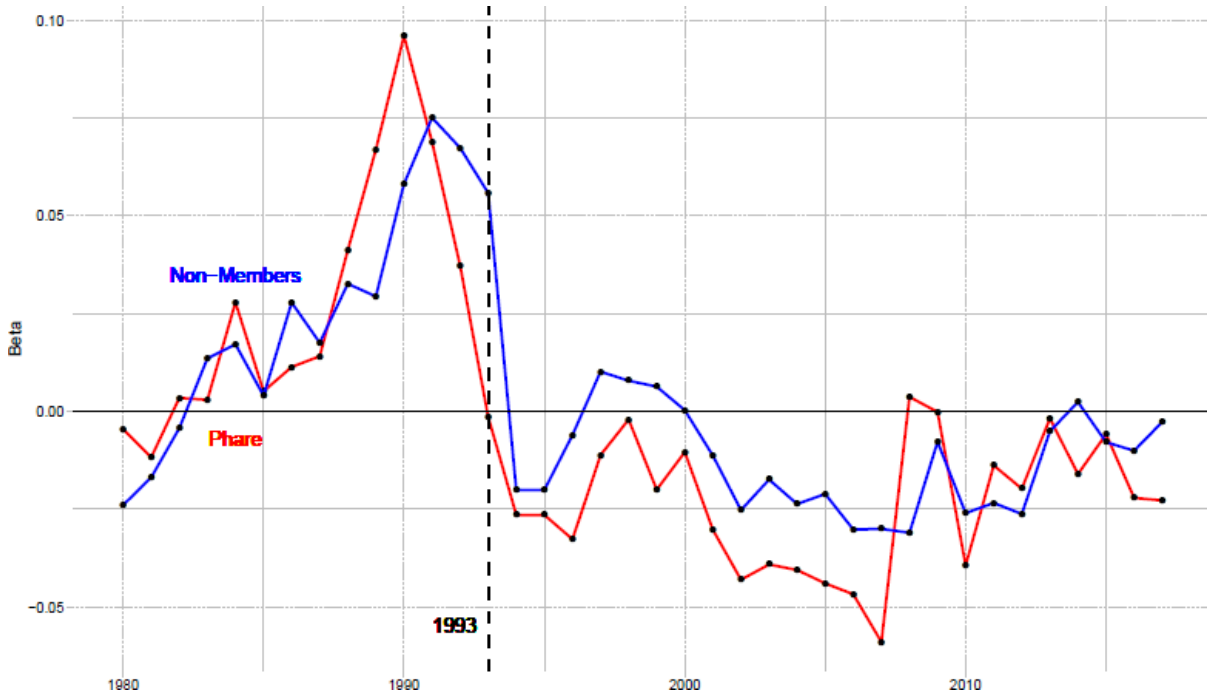
This observation is consistent with recent research on post-communist European countries, which identified "a period of 'real convergence' between 1999 and 2008, abruptly interrupted by the financial crisis of 2008", see Swain, p.1, as reviewed in (Morys, 2020). This pattern highlights the pivotal role of institutional alignment with the EU as a catalyst for economic convergence, while also revealing the susceptibility of

these economies to global economic shocks. Most crucially for our analysis, it underscores a significant shift in economic dynamics during the early 1990s.

Notably, the PHARE countries exhibited the strongest relative performance compared to other groups well before their official EU accession in 2004. This raises an important question: what could account for this early success?

The answer becomes evident in Figure 5. Using institutional quality measures from (Freedom House, 2025), the figure clearly illustrates a divergence in institutional trajectories following the col- lapse of the USSR. Specifically, the PHARE countries experienced significant institutional improvements soon after the collapse, whereas the Non-members saw only modest gains. In the figure, the blue line represents post-Soviet countries that later joined the PHARE program, while the purple line represents the Non-members.

Figure 4: Yearly Convergence Coefficients of Non-Members vs. PHARE Countries



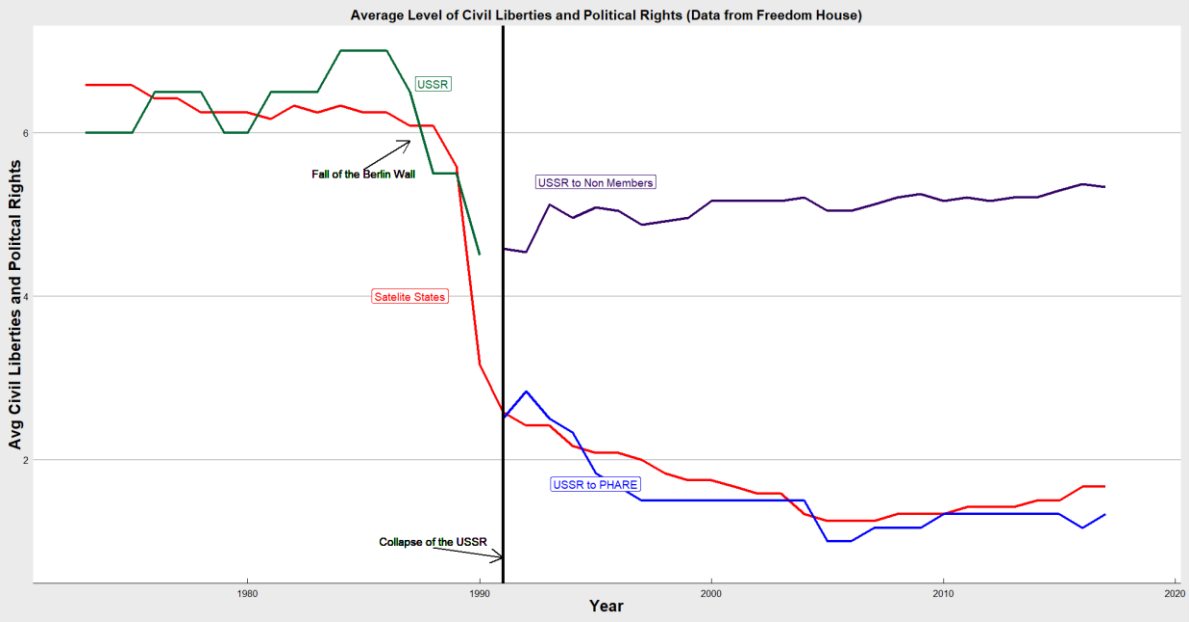
It is important to note that in Freedom House's scoring system, lower scores indicate better institutional quality. The PHARE countries' scores declined more sharply, reflecting substantial enhancements in political rights and civil liberties. In contrast, the Non-members improved institutionally, but to a much lesser extent.

Taken together, these findings show that economic growth between the two groups began to diverge in the early 1990s, driven by variation in the underlying causal mechanisms that also emerged during this period. This sets the stage for an analysis focused on convergence rates during this pivotal phase leading up to formal EU accession.

4.1.2. Panel Findings

As previously noted, the use of synthetic controls is not feasible in this context due to the lack of a sufficiently balanced panel before 1991. Although I previously utilized the Maddison data, the panel remains highly unbalanced, requiring extensive averaging across countries within each group to generate the plot in Figure 4. Conducting the same analysis at the individual country level is impractical due to the limited availability of pre-1991 data. Since synthetic controls rely on a robust pre-treatment baseline to construct a credible counterfactual, this approach is not viable in this case. As a result, an alternative empirical strategy is necessary, with panel regression serving as the primary method of analysis.

Figure 5: Trends in Civil Liberties and Political Rights by Group Over Time



To establish causality - specifically, that improvements in institutions drove better economic outcomes - the first crucial step is to control for all time-invariant differences

across countries that could influence GDP per capita. This is achieved by incorporating fixed effects into the panel regression model.

While fixed effects are not a perfect solution, they provide a robust control for factors such as geography and culture, which are known to impact long-term GDP per capita but are generally stable over the timeframe in question. By accounting for these unchanging characteristics, the fixed effects model isolates the impact of institutional changes on economic performance, thereby strengthening the causal inference.

Human capital is included as a control variable to account for the possibility that differences in educational attainment and workforce skills influence the observed convergence patterns. Addition- ally, exports as a share of GDP are used to control for time-variant geographic effects, particularly to assess whether the results are driven by trade expansion linked to proximity to key markets.

If the PHARE countries experienced growth due to lower transaction costs in an expanding global market, then their export share of GDP should consistently increase throughout the sample period. More importantly, this increase would be expected to occur at a significantly faster rate com- pared to the Non-members. In other words, if the PHARE countries possessed a geographic competitive advantage - enabling them to capitalize on global market opportunities more effectively than the Non-members - this advantage would manifest as a disproportionate rise in exports as a percentage of GDP over time.

We estimate the following equation:

$$g_{i,t,t-1} = \alpha_i + \beta_c \log(y_{i,t-1}) + \beta_T \delta_{PHARE} \log(y_{i,t-1}) + yX_{i,t-1} + e_t \qquad (2)$$

Where:

- $y_{i,t-1}$- GDP/Capita of country i at time t-1
- $g_{i,t,t-1}$- is growth per capita for country i from t-1 to t
- β - convergence trends (PHARE, Non-Members)
- δPHARE and δnonEU are dummy variables indicating the group
- $X_{i,t-1}$ - is a matrix of variables to condition on, in this case Human Capital and Trade as a % of GDP

- α_i - the fixed effect of country i

Table 1: Panel Regression with Fixed Effect

	Dependent variable:	
	$g_{i,t,t-1}$ (t = 1993:2023)	
	(1)	(2)
$\log(y_{i,t-1})$	-0.0515	-0.579
	(0.36)	(0.493)
$\delta_{PHARE} \log(y_{i,t-1})$	-1.473**	-3.414**
	(0.61)	(1.213)
δPHARE·Trade as a % of $GDP_{i,t-1}$		0.062*
		(0.024)
δPHARE·Human $Capital_{i,t-1}$		4.548
		(5.279)
Observations	656	436
R^2	0.015	0.048
Adjusted R^2	-0.031	0.002

*Note: *p<0.1; **p<0.05; ***p<0.01*

The regression is conducted using only two groups: the Non-members and the PHARE countries. In a cross-sectional analysis, including the EU members makes sense as it allows for the estimation of the convergence rate. However, in a panel regression, the interpretation of the coefficient changes. It reflects the growth trajectory and the smoothness of convergence rather than an absolute convergence rate. This distinction is important as it provides insights into the stability of growth paths. For a more detailed discussion on how this approach captures growth stability, refer to Appendix B.

The results are straightforward. Since we are examining convergence, we are looking for a statistically significant negative coefficient. The first coefficient represents convergence among the Nonmembers, while the second represents convergence among the PHARE countries. The findings indicate that convergence is insignificant among the Non-members but significant among the PHARE countries. Simply put, the PHARE countries experienced better convergence outcomes.

In the second regression, trade as a percentage of GDP and human capital were included as interaction terms, as both variables are potentially endogenous. Their individual significance is less relevant, given the uncertainty surrounding the underlying

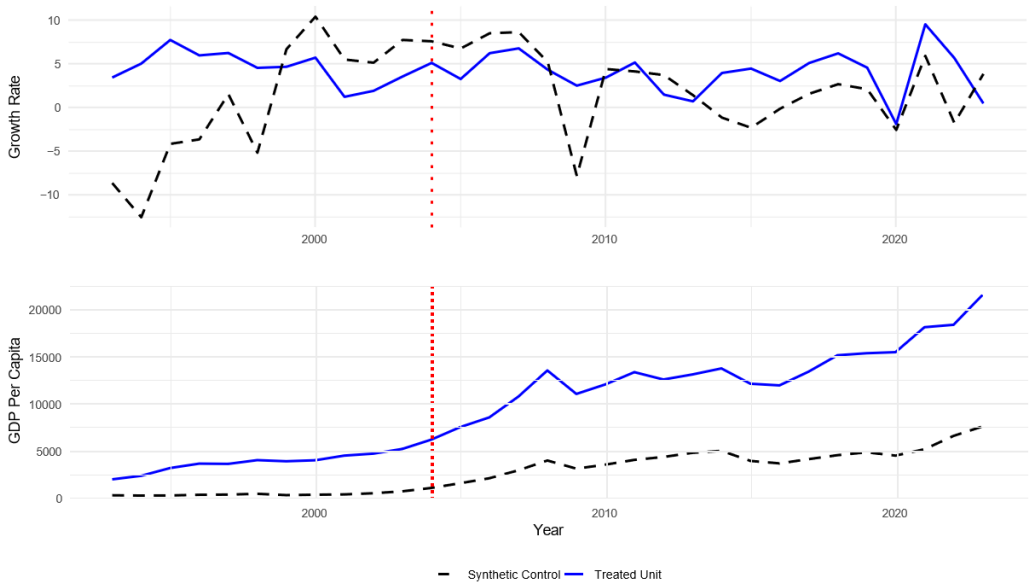
factors that may drive their effects. What is more important is that when transitioning from Non-members to PHARE countries, neither variable exhibits a significant effect. While trade as a percentage of GDP is marginally significant, human capital is not, further reinforcing the conclusion that differences in human capital do not explain the observed convergence patterns. Although trade plays an important role, the key finding is that the convergence rate increases for PHARE countries once trade is controlled for, indicating that trade alone cannot account for their superior economic outcomes.

4.2. Synthetic Control Models Using Post-Soviet Counterfactuals

Despite the aforementioned critique that the pivotal change likely occurred in the early 1990s, the method of synthetic controls, as outlined in (Abadie and Gardeazabal, 2003), remains highly suit- able for this analysis. It provides a robust framework for constructing an appropriate control group, addressing a common limitation in existing research.

One of the key criticisms of previous studies is that the selection of control groups could be im- proved by ensuring they are as similar as possible to the treatment group. In this context, the Nonmembers offer an ideal comparison group. Prior to the collapse of the USSR, these countries shared remarkable similarities with the PHARE countries in terms of historical, cultural, and institutional backgrounds. It is difficult to find another set of countries that were as closely matched in their pre- treatment characteristics.

Figure 6: Poland: Synthetic Control vs. Treated Units



Therefore, leveraging synthetic controls with the Non-members as the control group allows for a more credible counterfactual analysis, enhancing the validity of the causal inferences drawn from this natural experiment.

I will not present all 20 country-specific plots; however, below are the key results for Poland, which closely reflect the average outcome observed across the other countries. I selected two different dependent variables: GDP Growth Rates, and GDP per Capita. Visually, the main findings are clear: growth rates were consistently higher for the treated units than for the synthetic control. However, the financial crisis produced some anomalies.

Table 2: PHARE vs Non-members differences in Economic Growth and GDP Per Capita

Country	Average Difference in Growth Since 2012	GDP Per Capita Adjusted by Difference in 2004
Poland	2.93	8855.78
Estonia	1.18	15765.45
Bulgaria	1.80	6075.21
Czechia	0.92	14357.91
Hungary	2.49	5875.24
Lithuania	0.26	14865.26
Latvia	0.64	10199.51
Romania	1.85	7611.72
Slovak Republic	1.45	8390.53
Slovenia	1.62	9806.98

Table 2 presents the main results. I used three different dependent variables with the predictor variables being: Natural Resource Rents, Inflation, Foreign Direct Investment, and Institutional Quality.

The most straightforward metric is in column one, which shows the average difference in growth rates since 2012. I chose 2012 as the starting point to bypass the major downturns caused by the financial crisis, allowing us to focus on the more recent effects of EU membership. Notably, the results remain largely consistent even when considering the entire time frame. Across the board, we observe that the PHARE countries consistently grow at a significantly higher rate than the synthetic control. Column two further reinforces the finding that EU membership led to significantly better eco- nomic outcomes. Crucially, the results have been adjusted to account for the fact that in 2004, the PHARE countries were already wealthier than the non-member countries. To correct for this, I subtracted the 2004 difference from the 2023 difference, ensuring that the comparison accounts for initial disparities in wealth. Even after this adjustment, the treated units remain substantially higher than their synthetic controls, providing strong evidence that EU membership resulted in significantly improved economic outcomes.

4.3. Case Study: The Baltic States vs. Moldova, Ukraine, and Belarus

To establish a more robust result, a meaningful comparison can be made by examining the Baltics (Estonia, Lithuania, and Latvia) alongside Belarus, Ukraine, and Moldova. These six countries are particularly useful for controlling for unobserved differences between the PHARE countries and the Non-members, which could otherwise influence the results.

One key reason for selecting these countries is to account for the potential institutional differences between the former Satellite States and the member countries of the USSR. It can be argued that the Satellite States did not undergo the same level of institutional transformation as the USSR itself, resulting in less entrenched Soviet communist systems. Consequently, the Satellite States may have had a relative advantage when the USSR collapsed compared to countries that were integral members of the USSR. This raises the possibility that the better performance of the PHARE countries was due to the overrepresentation of Satellite States in the PHARE group, while the

Non-member group consisted primarily of former USSR member countries. By focusing on these six countries - all of which were part of the USSR - this analysis effectively controls for this potential confounding factor.

Additionally, this approach minimizes geographic differences that might otherwise confound the results. Many Non-member countries, particularly those in Central Asia, have vastly different geo- graphic features compared to the PHARE countries, such as being highly mountainous or landlocked (e.g., Kyrgyzstan). In contrast, the six countries under consideration share similar geographic characteristics. Only Belarus is landlocked, but it remains relatively close to the sea with access to navigable waterways. Moreover, none of these countries are notably mountainous. Therefore, it would be difficult to argue that any of these six countries possess a significant geographic advantage over the others. Importantly, as discussed, the key distinction between these countries lies in their strategic importance to Russia. Russia has historically sought to maintain access to a warm-water port, particularly one facing the Mediterranean Sea, making Ukraine, Moldova, and Belarus geopolitically valuable. In contrast, the Baltic states hold less strategic significance, as Russia already has access to a northern port via St. Petersburg.

In this context, the orientation of a country's closest port serves as an instrumental variable. It influenced institutional trajectories by shaping Russia's geopolitical interests, yet it is not directly correlated with geographic quality. What matters for economic growth is proximity to trading ports, not whether a port faces north or south. Thus, port orientation is not a significant direct factor in determining growth outcomes.

Table 3: Baltics Growth vs. Ukraine, Moldova, and Belarus

	Dependent variable:
	$g_{i,t,t-1}$ (t = 1993:2023)
$\delta_{Baltics}$	2.234**
	(1.040)
Constant	1.733**
	(0.736)
Observations	186
R^2	0.024
Adjusted R^2	0.019

Note: *p<0.1; **p<0.05; ***p<0.01

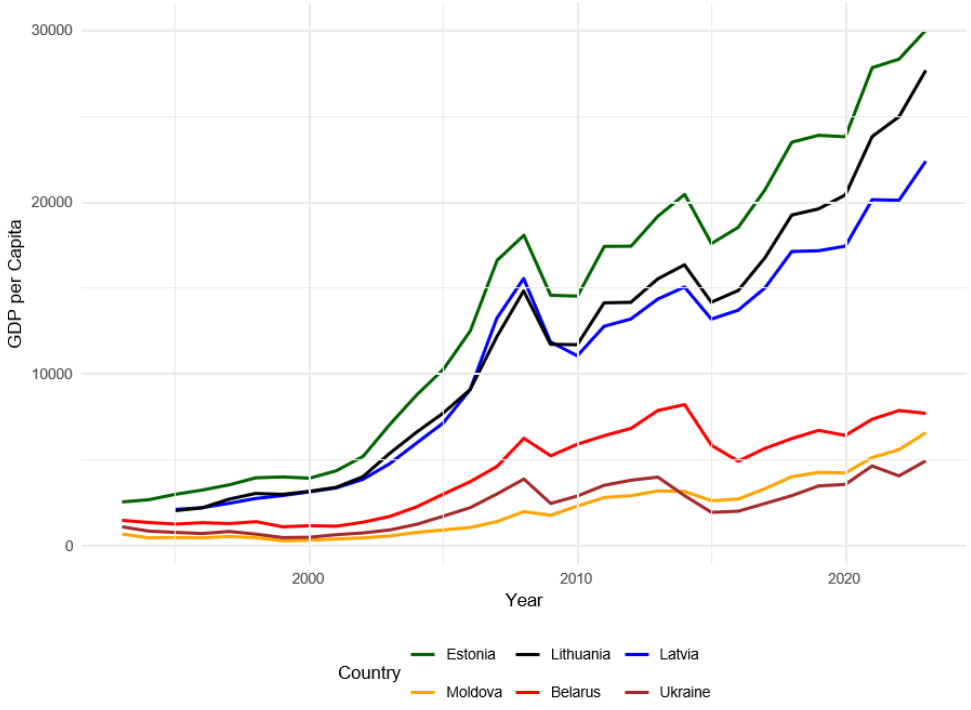
In summary, these countries shared the same post-Soviet institutional framework, comparable initial GDP per capita, and similar geographic characteristics. Leveraging these commonalities, I conducted a pooled panel regression of growth rates using δBaltics, which is coded as 1 for Latvia, Lithuania, and Estonia and 0 for Belarus, Moldova, and Ukraine. This approach is straightforward, as most of the relevant control variables are effectively accounted for by the inherent similarities among these countries, minimizing the need for additional controls.

The results indicate that the Baltic countries experienced an average annual growth rate 2.23% higher than their counterparts, a difference that is clearly visible in Figure 7. This growth disparity can only be plausibly explained by institutional differences.

4.4. Comparative Case Study: Poland vs. Ukraine

If one were to compare two countries - one from each group - Poland and Ukraine would be the logical choice. While they may not be as directly comparable as East and West Germany or North and South Korea, they share significant cultural, historical, and geographical similarities.

Figure 7: Baltics vs. Ukraine, Moldova, and Belarus

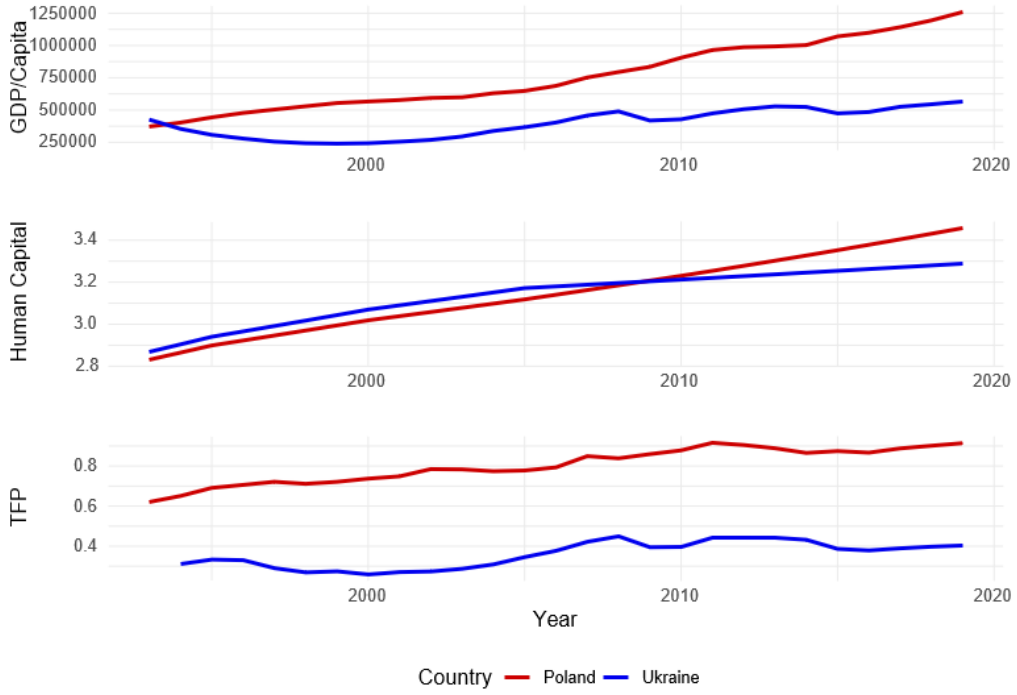


According to the Maddison Project Database, in 1973, Ukraine was approximately 104% wealthier than Poland (Maddison Project Database, 2018). Today, however, Ukraine has a GDP per capita of $17,630, ranking 95th in the world, while Poland's GDP per capita stands at $46,450, placing it 45th globally (Worldometer, 2025). This means that, on average, Poland is close to 3 times richer per person than Ukraine - a staggering gap for two countries with similar geography, culture, history, and even levels of human capital. Given that the difference in economic outcomes must be attributable to one of the "Fundamental Causes of Growth", the only plausible explanation for these divergent paths is institutional quality. It is also important to note that this analysis was conducted before Russia's invasion of Ukraine in 2022.

This comparison also underscores the inadequacy of human capital as a primary explanation for GDP per capita disparities. Ukraine entered the post-communist era with a higher level of human capital than Poland, and Poland did not surpass Ukraine in this regard until 2009. Figure 8 illustrates the stark divergence in GDP per capita over time, alongside human capital levels and Total Factor Productivity (TFP). Although Poland had become significantly wealthier by 2008, it was only then that this wealth translated into higher human capital levels. As discussed earlier, in the case of these countries, human capital lags behind economic growth, strongly suggesting that it is endogenous to the process rather than a fundamental driver. Consequently, we can rule out differences in human capital as the cause of these economic disparities.

Turning to geography as a potential determinant, I examine three key geographic factors identified by Jeffrey Sachs: tropical climate, access to an ocean port, and proximity to major global trading centers (Rotterdam, New York, and Tokyo) (Sachs, 2003). Neither country has a tropical climate, ruling out this factor. Both have access to ocean ports. Regarding proximity to a major trading hub, Kyiv is 1,993 km from Rotterdam, while Warsaw is 1,229 km away - a difference that is trivial in the context of the economic geography literature. Geography alone cannot explain why Poland is 3 times wealthier per person than Ukraine.

Figure 8: Economic Indicators in Poland and Ukraine



Source: Penn World Table version 10.01

Furthermore, cultural factors provide no satisfactory explanation for the economic divergence. It is implausible that two countries with such similar cultural attributes, including shared religious traditions, would experience such different economic trajectories if culture were the primary driver of growth.

Examining TFP growth (depicted in the bottom panel of Figure 8), we observe a stark divergence. Poland's TFP experiences sustained growth, while Ukraine remains stagnant at persistently low levels. This pattern aligns with the broader narrative of this paper: Poland's accession to the European Union triggered rapid improvements in TFP, which subsequently fueled economic growth. Crucially, this surge in TFP was driven by institutional reforms and enhanced governance quality.

5. Conclusion

The collapse of the USSR represents one of the most unique large-scale institutional transitions in modern history, offering an unparalleled natural experiment in economic development. The post-Soviet states faced a stark choice: embrace institutional transformation through integration with Western Europe, primarily via EU accession, or persist in a trajectory of weak governance and economic stagnation. The

divergence in outcomes between those that rapidly adopted EU institutions and those that did not underscores the fundamental role institutions play in economic growth and poverty reduction.

The evidence presented in this study strongly supports the notion that institutional quality is the key determinant of long-run economic success. Countries that underwent the "shock therapy" of EU-aligned institutional reforms not only experienced significantly higher rates of convergence with Western Europe but also achieved more stable and sustainable growth paths. In contrast, those that remained outside of this transition, often burdened by corruption, weak property rights, and political instability, failed to realize comparable economic gains. The stark contrast between Poland and Ukraine encapsulates this phenomenon - two countries with similar cultural and historical back-grounds that diverged dramatically due to their institutional choices.

Moreover, this study demonstrates that institutional adoption is not just about formal policy changes; it represents a wholesale transformation in governance, rule of law, market orientation, and property rights that enables long-term economic prosperity. The findings suggest that overcoming poverty is less about geographic endowments, cultural predispositions, or even human capital accumulation alone, but rather about the presence of strong and accountable institutions that incentivize investment, innovation, and economic participation.

This research contributes to the broader discourse on development by highlighting that institutional transitions, while rare, can be transformative when implemented at scale. The case of the post-Soviet bloc illustrates that with the right institutional framework, countries can rapidly escape poverty and move toward economic parity with more developed nations. The challenge for policymakers and international organizations is to create the conditions that allow for such transitions elsewhere, ensuring that political will and institutional support align to replicate the success of the EU integration model in other regions.

Ultimately, the experience of post-Soviet states suggests that the path out of poverty lies in largescale institutional adoption, where functioning markets, legal accountability, and economic openness provide the necessary foundation for sustained growth. While the historical circumstances of the USSR's collapse were unique, the

lessons drawn from its aftermath are broadly applicable: institutional reform is the single most powerful lever for economic transformation, and without it, convergence with wealthier nations remains elusive.

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Images

Figure 9: Post-Soviet Countries

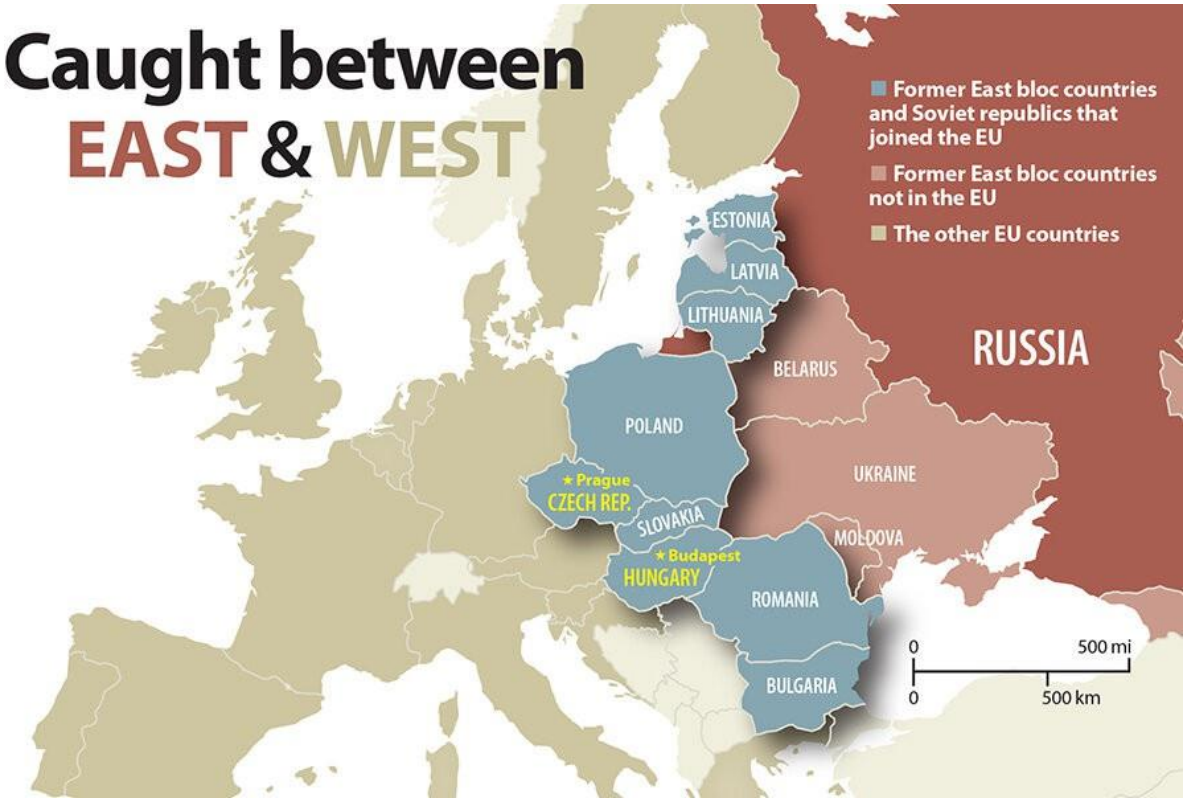
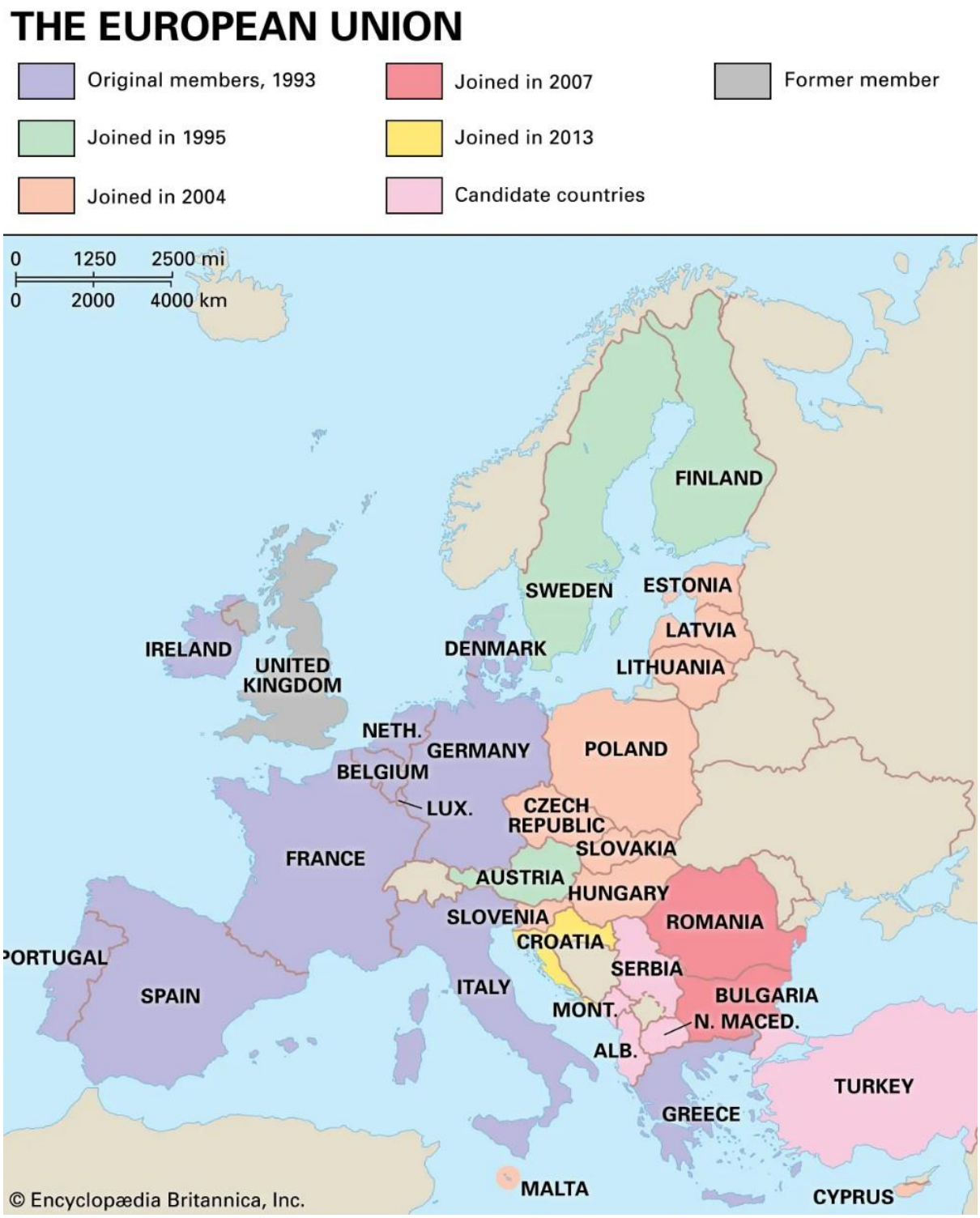


Figure 10: The European Union



Comparing the Volatility of Convergence Rates

An important addition to the findings thus far is that the Non-members convergence and growth rates are much more volatile. To illustrate the higher volatility of the Non-members it is worth doing a little bit of algebra. If we start with a standard convergence equation for just a single country we have (thus we can ignore the i subscript):

$$g_t = \alpha + \beta log(y_{t-1}) + e_t \quad (3)$$

We can replace the growth rate by using the following:

$$g_t \approx log(y_t) - log(y_{t-1}) \quad (4)$$

Thus obtaining:

$$log(y_t) - log(y_{t-1}) = \alpha + \beta\, log(yt-1) + et \quad (5)$$

Rearranging:

$$log(yt) = \alpha + (\beta + 1)\, log(yt-1) + et \quad (6)$$

Finally equate $\beta + 1 = \theta$ we get:

$$log(yt) = \alpha + \theta\, log(yt-1) + et \quad (7)$$

This is a AR(1) process which we can estimate for each country using OLS. It should be noted that $0 \leq \theta \leq 1$ to be stationary (it should be noted that all the β terms are multiplied by 100 to make percentages, but they should be thought as being between 0 and 1 in absolute value). This can give us two things. The first is an estimated steady state (SS). If we set yt = yt−1 we get a steady state of:

$$SS = \frac{\alpha}{1-\theta} \quad (8)$$

and a variance of:

$$\sigma_{SS}^2 = \frac{\sigma_e^2}{1-\theta^2}$$

We can calculate the average SS and the variance using the average α and θ for each group. Doing so we get an estimated SS for the PHARE countries of 10.04, given this is a log it implies a SS of roughly 23,000$ and a variance of 0.17. Meanwhile, for the Non-members we have a SS of 3,165$ and a variance of .44 (nearly 4 times the variance of the PHARE countries.

It should be noted that these predictions in a sense are meaningless given technological progress or endogenous growth. Basically, we know steady states don't really exist. However, assuming the existence of a steady state for the sake of comparison is perfectly fine. All that really matters is we are comparing the groups under the same assumption, even if the assumption is not particularly useful for predictive purposes.

In some sense, this illustrates the already discussed fact that there is much more volatility in growth rates among the Non-members. The higher volatility in the Non-members growth rates draws the estimated convergence coefficient close to zero. While the growth rates of the PHARE countries follow a pattern predicted by economic theory the growth rates of the Non-members are unpredictability fluctuating; they are close to a random walk. It can be concluded that the PHARE countries are converging, at a relatively fast rate, to a high estimated long-run GDP/capita. Further- more, While the Non-members are growing they are not doing so consistently or predictably when compared to the PHARE countries.

Figure 11: Summary Statistics for AR(1) Regression

group	country	intercept	Theta	Steady State	Exp(SS)	std error resid	sigma^2
PHARE	Poland	0.6	0.96	15	3269017	0.1303	0.01698
PHARE	Hungary	1.785	0.817	9.7540984	17224.7	0.1726	0.02979
PHARE	Czech	1.43	0.86	10.214286	27290.3	0.2016	0.04064
PHARE	Estonia	3.61	0.622	9.5502646	14048.4	0.33	0.1089
PHARE	Latvia	3.01	0.686	9.5859873	14559.3	0.2975	0.08851
PHARE	Lithuania	2.64	0.73	9.7777778	17637.4	0.3235	0.10465
PHARE	Slovak	1.47	0.865	10.888889	53577.7	0.2222	0.04937
PHARE	Slovenia	4.3	0.57	10	22026.5	0.173	0.02993
PHARE	Bulgaria	0.74	0.93	10.571429	39004.4	0.246	0.06052
PHARE	Romania	0.4998	0.965	14.28	1591202	0.2683	0.07198
Non Members	Armenia	1.62	0.814	8.7096774	6061.29	0.2742	0.07519
Non Members	Azerbaijan	1.615	0.81	8.5	4914.77	0.554	0.30692
Non Members	Kazakhstan	0.979	0.904	10.197917	26847.2	0.3232	0.10446
Non Members	Georgia	0.803	0.932	11.808824	134433	0.2726	0.07431
Non Members	Moldova	0.44	0.96	11	59874.1	0.249	0.062
Non Members	Russia	1.71	0.8	8.55	5166.75	0.3225	0.10401
Non Members	Tajikistan	1.48	0.755	6.0408163	420.236	0.4399	0.19351
Non Members	Turkmenistan	0.153	0.99	15.3	4412712	0.5455	0.29757
Non Members	Ukraine	3.18	0.567	7.3441109	1547.06	0.3963	0.15705
Non Members	Uzbekistan	-0.32	0.99	-32	1.3E-14	0.2144	0.04597
Non Members	Kyrgyz Republic	1.747	0.73	6.4703704	645.723	0.3197	0.10221
Non Members	Belarus	2.13	0.755	8.6938776	5966.27	0.344	0.11834