

INTERNATIONAL MONETARY FUND

REGIONAL ECONOMIC OUTLOOK NOTES

EUROPE

Accelerating Europe's Income
Convergence through Integration

2024
DEC



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Accelerating Europe's Income Convergence through Integration¹

Per capita income levels in Europe are on average a third lower than in the United States. Narrowing Europe's income gap requires closing the productivity gap between the European and global frontier (see November 2024 REO Note: "[Europe's Declining Productivity Growth: Diagnoses and Remedies](#)") and faster convergence within Europe. The early 2000s demonstrate that convergence is possible. The prospect of joining the EU, followed by actual membership, put the necessary conditions in place: effective integration and structural reforms opened economies and improved their connectedness, benefitting both pre- and post-2004 enlargement member states (MS). Due to EU accession, the average regional GDP per capita in new MS increased by around 30 percent after 15 years, with larger gains for poorer regions. Productivity catch-up, driven by innovation and higher educational attainment, along with substantial capital investment, primarily through foreign direct investment (FDI), contributed about equally. More recently, momentum slowed and productivity levels across Europe flatlined. Further EU enlargement and deepening of the single market could unlock new sources of growth. Based on the estimated effects of EU enlargement in this note, the income gap between Europe and the United States could be reduced by up to 10 percentage points through a new enlargement round. If paired with deeper integration to reduce the remaining barriers within the EU, the benefits could be magnified.

Income in Europe remains stuck below the United States.

European per capita income levels remain well below those in the United States. In the early 2000s, the income gap between Europe—defined here as current EU members and accession candidates²—and the United States narrowed by almost 10 percentage points but has remained at around a third since then. Convergence nearly stalled after 2011 with European growth only slightly above US growth. The pre-2004 enlargement EU member states ("old MS") are 20 years behind the per capita income trajectory of the United States (Figure 2.1). The post-2004 enlargement EU member states' ("new MS") average income per capita is comparable to that of the U.S. when the Iron Curtain fell, and those of accession candidates more than half a century behind. Put differently, today the average income per capita of old MS, new MS, and current accession candidates stand at 80, 57, and 41 percent, respectively. These are enormous gaps, but also opportunities for catching up. In fact, new MS accounted for almost all the income gap catch-up between 1998 and 2011 (Figure 2.2). Narrowing Europe's income gap further requires convergence within Europe and closing the gap between Europe and the global frontier (see November 2024 REO Note: "[Europe's Declining Productivity Growth: Diagnoses and Remedies](#)").

New momentum on economic integration could unlock new sources of growth. First and foremost, EU accession could help accession candidates catch up with current EU member states. Enlarging the single market would also contribute toward closing the gap between the EU's technology frontier and the global frontier. This is because *all* member states would gain access to a wider set of production factors and new consumers, allowing firms to realize economies of scale. At the same time, the free movement of labor and capital would contribute to a more efficient allocation of resources across regions (Lejour and others 2001). Finally, the growth effect could be even more powerful if paired with a further deepening of the EU's single market through the reduction of remaining

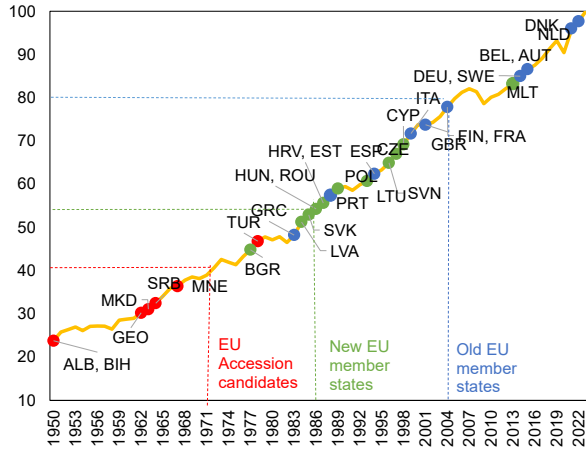
¹ This note was prepared by Robert C. M. Beyer (lead), Claire Li, Gohar Minasyan, and Tianxiao Zheng, under the guidance of Sebastian Weber and under the supervision of Stephan Danninger and Helge Berger. Agnesa Zalezakova provided outstanding administrative support.

² Current EU members are the pre-2004 enlargement EU members (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and Sweden) and the 13 countries that joined the EU later (Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia, Bulgaria, Romania, and Croatia). The 10 accession candidates are Albania, Bosnia and Herzegovina, Kosovo, North Macedonia, Moldova, Montenegro, Serbia, Türkiye, Ukraine, and Georgia. Other European countries (including the United Kingdom) are not considered in this note's empirical analyses. The findings are broadly robust to including the United Kingdom.

obstacles, which would help European firms to scale up and benefit from the free flow of goods, services, and factors of production.

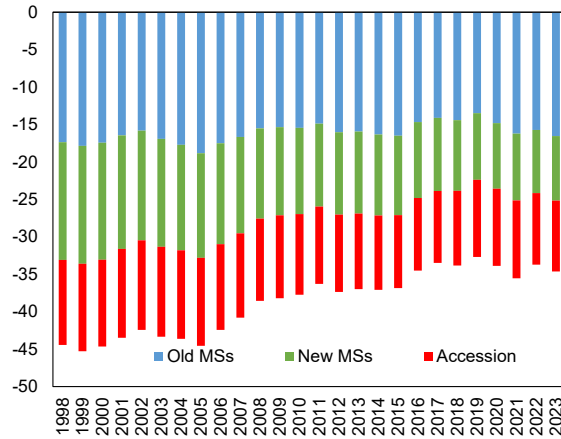
This note takes a renewed look at Europe's growth performance and the role of EU accession for new and old MS. First, comparing two convergence measures in Europe and the rest of the world, it finds strong convergence effects within the EU, with new MS growing faster than old MS. Second, it uses causal inference by employing a synthetic difference-in-difference estimator (SDIDE) to show that EU membership increased regional GDP per capita in new MS by about 30 percent, after 15 years, broadly equally through productivity catch-up and capital deepening. Third, exploring different regional characteristics, it reveals varied benefits across regions. Those with better access to markets and finance, a more educated labor force, and already better integrated through value chains, registered higher growth and productivity gains. Fourth, applying the SDIDE to old MS, it documents that they also benefitted from enlargement. Finally, the note presents simulation results suggesting that a successful accession of the EU's current candidate countries could reduce the income gap between Europe and the United States by up to 10 percentage points.

Figure 2.1. GDP per Capita in 2023
 (Historic US GDP per capita equivalent, 2023 US GDP per capita =100)



Source: World Economic Outlook, and IMF staff calculations.
 Note: The 2023 GDP per capita level is lower than the 1950 US level in three accession candidates (KOS, MDA, UKR).

Figure 2.2. GDP per Capita Gap to US
 (Percent contribution of old and new EU members and accession countries)

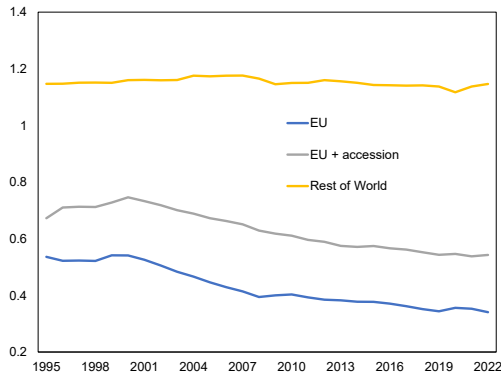


Source: European Commission and IMF staff calculations.
 Note: Due to data availability, accession countries include only ALB, MKD, MNE, SRB, and TUR.

Convergence in Europe is faster than elsewhere, but uneven.

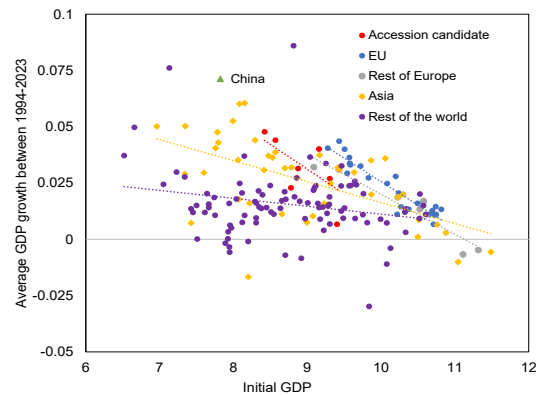
Economic growth theory suggests a natural process of income convergence. When outputs (such as goods and services) and inputs into the production process (such as workers and capital) are free to move across borders, poorer regions are expected to gain by exploiting comparative advantages and adopting existing technologies from richer regions. So-called sigma and beta convergences measure this process (see Annex 2.1 for details). The former implies that the variation of *income levels* across countries or regions declines over time. The latter implies that the *growth rate of income* falls as income levels increase, and, hence, the incomes of poorer and richer countries/regions converge over time.

Figure 2.3. Sigma Convergence
(Standard deviation of (log) real GDP per capita PPP)



Source: World Economic Outlook and IMF staff calculations.
Note: See Annex 2.1 for methodology.

Figure 2.4. Beta Convergence
(y-axis = Percent, x-axis = log real GDP per capita PPP)

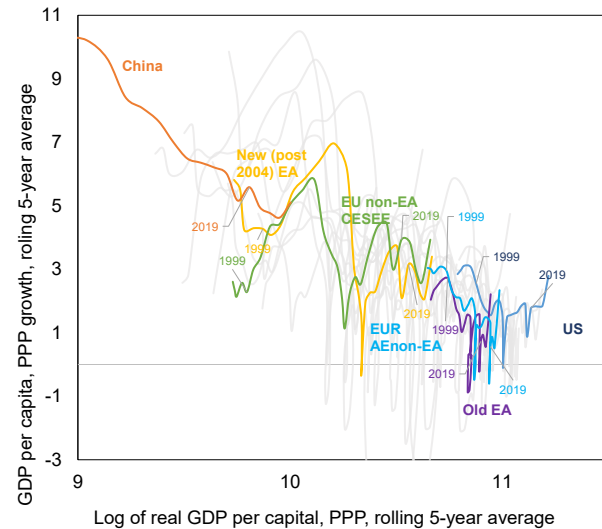


Source: World Economic Outlook and IMF staff calculations.
Note: See Annex 2.1 for methodology.

Convergence in Europe, while uneven, has been faster than elsewhere on average:

- Sigma convergence is unfolding within the EU (Figure 2.3), with the fastest progress recorded immediately after the 2004 enlargement round. Subsequent progress has been more incremental and disrupted by crises (the global financial crisis and the COVID-19 pandemic). Adding accession countries increases the variation in (log) income levels by about 20 percent and confirms the (slowing) convergence over time. At the global level, (log) income variation is three times that across EU countries and shows convergence at a significantly lower speed.
- Beta convergence confirms these patterns (Figure 2.4). The negative relationship between the initial GDP level and income growth is strong and highly statistically significant in the EU. A 10 percent lower initial income level is associated with a 0.2 percentage point higher annual growth rate. Most accession candidate countries follow a similar relationship. As reference, for Asia—and even more so for the rest of the world—the slope is flatter, implying significantly slower catch-up. Consistent with convergence, growth in European countries has come down as incomes increased (Figure 2.5). Notably, in Europe’s advanced economies, growth has been below that of the United States at the same level of income.

Figure 2.5. Country Group Performance Across Time
(Percent)



Source: World Economic Outlook and IMF staff calculations.

Integration through EU accession has accelerated the catch-up of new member states.

Convergence was driven by significant returns from EU integration. The single market is at the core of EU integration. By bringing down barriers to trade and factor movements and harmonizing existing rules, the single market aims to facilitate freedom of movement of goods, services, people, and capital. This distinguishes EU membership from simple free trade agreements and has been labelled as “deep” integration, with potentially larger benefits through efficiency and scale economy gains across a wide range of dimensions (Brou and Ruota 2011,

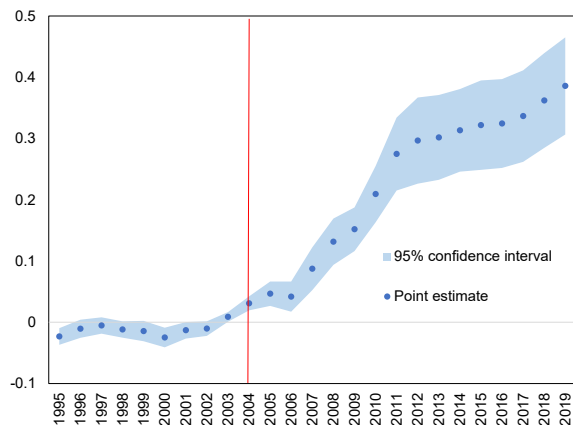
Campos and others 2019, Baldwin and Wyplosz 2012). In addition, new MS also benefit from significant fiscal transfers through the EU budget, particularly through the EU's cohesion policy.

As new members join the EU (Box 2.1), they not only gain access to the single market but also contribute to its expansion. The expansion in 2004 gave the ten new MS access to a market on average more than 50 times their own size. At the same time, it expanded the population of the EU by 75 million, marking the largest single expansion and a sizable increase in the single market accessible to old MS.

To make a causal inference about the impact of EU accession, an SDIDE is applied to regional data at Nomenclature of territorial units for statistics 2 (NUTS2) level (Arkhangelsky and others 2021, see Annex 2.2. on the methodology). Using regional rather than country-level data has the advantages that it increases the reliability of estimates through a larger sample size and allows for a more granular analysis. The GDP data covers the period from 1990 to 2022 and includes 220 regions in old MS, 63 regions in new MS, and 53 global comparator regions.³ The SDIDE weighs the untreated regions in the so-called donor pool to match pre-treatment trends of treated regions (that is, those that joined) and employs bootstrapping techniques for statistical inference. It is more flexible than standard difference-in-difference procedures by permitting a violation of parallel trends in aggregate data, and more flexible than standard synthetic controls by allowing for a constant level of differences between treated and untreated groups, consecutive treatment, and straightforward statistical inference. It controls for the external environment if it affects the treatment and donor group in the same way. The 2004 enlargement round presents an excellent opportunity for quantifying the impact of EU accession, given the presence of long pre- and post-accession periods in the data and no concurrent major shocks affecting either the treatment or donor group around the accession date.⁴

The benefits from EU accession and related economic transformation are large and have been growing over time. Before the 2004 accession, the estimation procedure matched for a decade changes in GDP per capita between those regions that joined and those already in the EU (the baseline synthetic control group), suggesting that the methodology is effectively isolating accession effects starting in 2004. During the 15 years after accession, regions in new MS gained 23 percent in GDP per capita, on average, with the gain exceeding 10 percent after 5 years and

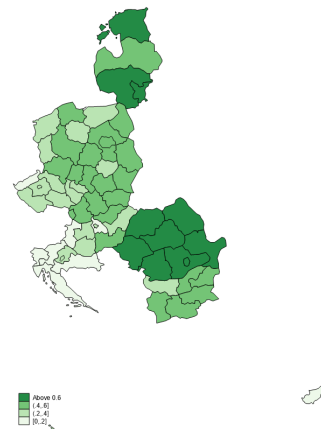
Figure 2.6. 2004 EU Accession Effect on New MS
(Log) difference of GDP per capita to control group



Source: IMF staff calculations.

Note: See Annex 2.2 for methodology. Control group includes old MS (excl. UK).

Figure 2.7. Accession Return to New MS Regions
(Log) difference of GDP per capita to control group



Source: IMF staff calculations.

Note: Impact after 9 years for Croatia and 15 years for the others, UK).

³ The global comparator donor pool includes regions from Australia, Canada, Korea, New Zealand, Norway, and the United States. The GDP data for global regions starts later. Other data series employed in the note also start later and are missing for some regions. For more details on the data, see Beyer, Li, and Weber (forthcoming).

⁴ The quantification of the early gains of the 2007 enlargement round, on the other hand, is impacted by the Global Financial Crisis that hit part of the donor pool harder than the new member regions. Consequently, the treatment effect is somewhat larger when Bulgaria and Romania are included.

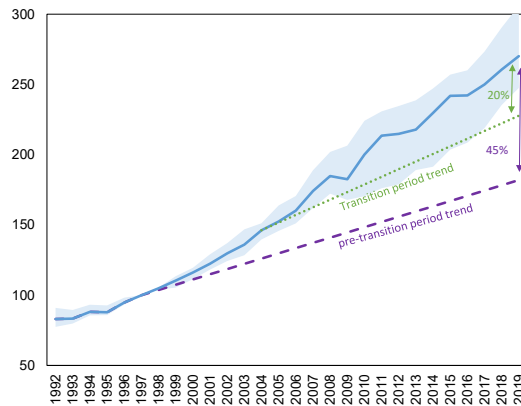
30 percent after 15 years (Figure 2.6). The gain is equivalent to a 1.7 percentage points higher GDP growth rate per year, everything else equal, considerably accelerating convergence within Europe. All regions benefitted, with the largest gains found in the Baltics and Romania (Figure 2.7).⁵ As reference, the estimated gain from the 2004 enlargement round is lower than the difference of actual GDP growth from a pre-transition period trend (45 percent), but larger than from a transition period trend (20 percent), when reforms were already being implemented to join the EU (Figure 2.8).

The gains from the 2004 EU accession round were very similar until the European Debt Crisis, irrespective of whether the control group is sourced from old MS regions (baseline), global regions, or old MS regions unaffected by the European Debt Crisis. In the long term, they are smaller in the latter case, mostly reflecting the recession in Greece (and some weight on Greek regions in the baseline donor pool). However, the gains relative to old MS (baseline) and global regions are nearly identical, suggesting that the downward bias from gains in old MS (see further below) and the upward bias from the recession in Greece are offsetting each other.⁶

Compared to the existing literature, which largely focuses on—not strictly comparable—country level effects, this estimate is at the upper end of the range. In part, this reflects that those earlier studies looked at shorter time periods and earlier accession rounds—possibly missing longer-run effects and placing a bigger weight on earlier enlargements when room for reform catch-up was smaller and the market expansion for new members was more limited because the EU was smaller compared to the size of the new members joining.⁷

Figure 2.8. Average GDP per Capita of Regions in New MS

(Index, 1997=100)



Sources: IMF staff calculation.

Note: Transition period trend based on period between 1997 and 2004. Pre-transition trend from 1992 to 1997. Shaded area shows interquartile range.

Productivity gains and capital accumulation have been the main channels.

EU accession and the related economic transformation have raised incomes in new MS in broadly equal parts through more investment and higher productivity. To quantify the channels through which EU accession has boosted growth, the SDIDE is applied to the level of output and the capital and labor stock sub-components of the traditional Cobb-Douglas production function, which is used to decompose the income gains:

$$\Delta y = \Delta tfp + \alpha \Delta k + (1 - \alpha) \Delta l, \tag{1}$$

where small letters denote logs, Δ denotes difference, y stands for output, l for employment, k for capital, tfp for the unobservable total factor productivity (TFP), and α for the capital share.

⁵ Region specific gains are based on separate estimations for each region and include regions in countries that joined after 2004.

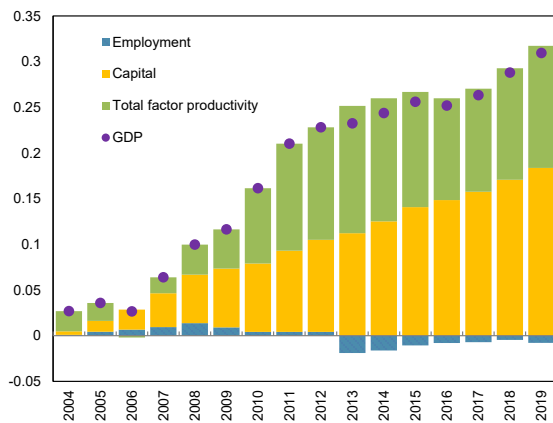
⁶ See Annex 2.3 for more details.

⁷ Estimates at the country level range from 5-30 percent (see Boltho and Eichengreen, 2008; Badinger, 2005; Grassi 2024; Chupilkin, Kóczán, and Plekhanov 2024). Campos and others (2019) using traditional synthetic control methods arrive at an estimate of about 15 percent on average after accession for those countries joining in 2004. Grassi with a similar method finds about 25 percent most of which coming from TFP. Grassi find no robust effect on old members from the expansion. Another study quantifies the effect of lost income per capita of Norway for opting not to join the EU at about 10 percent (Campos and others 2022).

New MS have seen a gradual and continuous increase in the capital stock following the 2004 accession (Figure 2.9). Compared to a control group that showed the same changes of the capital stock for almost a decade prior, the level started to diverge in the year of accession and has continued diverging, culminating in a 35 percent difference after 15 years. With an approximate capital share of 0.57,⁸ this has added slightly more than 15 percent to GDP in new MS. A large fraction of this capital has come through FDI, especially in the years prior to the Global Financial Crisis. Net FDI inflows averaged around 3.6 percent of GDP in new MS between 2004 and 2007. Another source for financing investments has been transfers from the EU budget, including from cohesion funds.

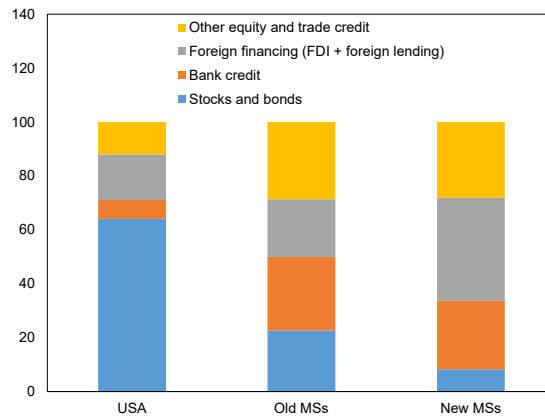
The share of external financing for non-financial corporations (NFCs) in new MS has been significantly higher than in old MS or the United States (Figure 2.10). However, the capital gap in the old MS remains large, and with lower FDI inflows in more recent years, maintaining momentum may require stronger mobilization of resources through the domestic financial system or a deeper capital markets union.

Figure 2.9. Factor Contributions to Convergence
(Log) difference of GDP per capita to control group



Source: IMF staff calculations.

Figure 2.10. Structure of NFC Liabilities in 2022
(Percent)



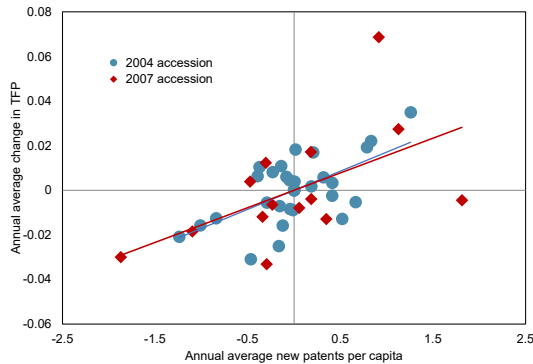
Source: Eurostat, Haver Analytics, and IMF staff calculations.

Increased productivity accounted for the other part of the income gains from EU accession (Figure 2.9). The contribution of (unobservable) TFP is derived as residual by subtracting the estimated employment and capital contributions from the estimated overall output effects (following equation 1). Because the overall estimate for the effect of EU accession on real GDP is 31 percent and the estimated combined effect of capital stock and employment contribution is 18 percent, the TFP contribution is 13 percent. The contribution of productivity expanded rapidly following the accession but stayed constant in the latter years, which may, in part, reflect a slowdown in the structural reform momentum.

There is some evidence suggesting that the post-accession increase in TFP came with increased knowledge accumulation. Regional data on new patents show that there is a positive correlation between patents and TFP gains in the post-accession period (Figure 2.11). The relationship holds for regions that joined in the 2004 and 2007 enlargement rounds as well as when controlling for country fixed effects to account for level differences in TFP and the number of patents. EU accession is also associated with higher educational attainments. Figure 2.12 indicates that education levels improved in new MS, lifting the share of the population with tertiary education by 2 percentage points compared to the control group within 10 years of joining the EU. This likely contributed to higher GDP through a more skilled labor force (and would be captured in TFP in the growth decomposition). The stagnation over the last decade could have contributed to the slowdown in productivity growth.

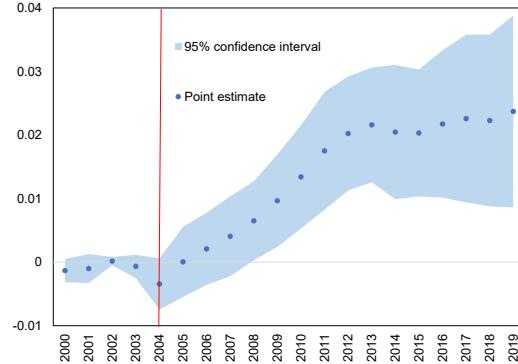
⁸ Calibrated as the average country level for new member states over the last two decades since 2004.

Figure 2.11. Patents and TFP
(Deviation from country mean)



Source: ESPON database, European Commission, and IMF staff calculation.
Note: Regional data on new patents are only available through 2012.

Figure 2.12. Education Effect
(Difference of population share to control group)



Source: IMF staff calculations.
Note: See Annex 2.2 for methodology.

There is little evidence that EU accession notably accelerated outward migration and the impact of emigration on GDP has been negligible. There is a very small negative employment effect on GDP shown in Figure 2.9, but this effect reflects developments in many factors, including the employment rate, labor force participation, demographics, and migration. While a detailed analysis is beyond the scope of this note, it is noteworthy that even though around a million people left the new MS between 2004 and 2007, there is no sign that emigration accelerated due to EU accession. Instead, previous emigration trends—very similar to countries that did *not* join the EU—continued.¹⁰

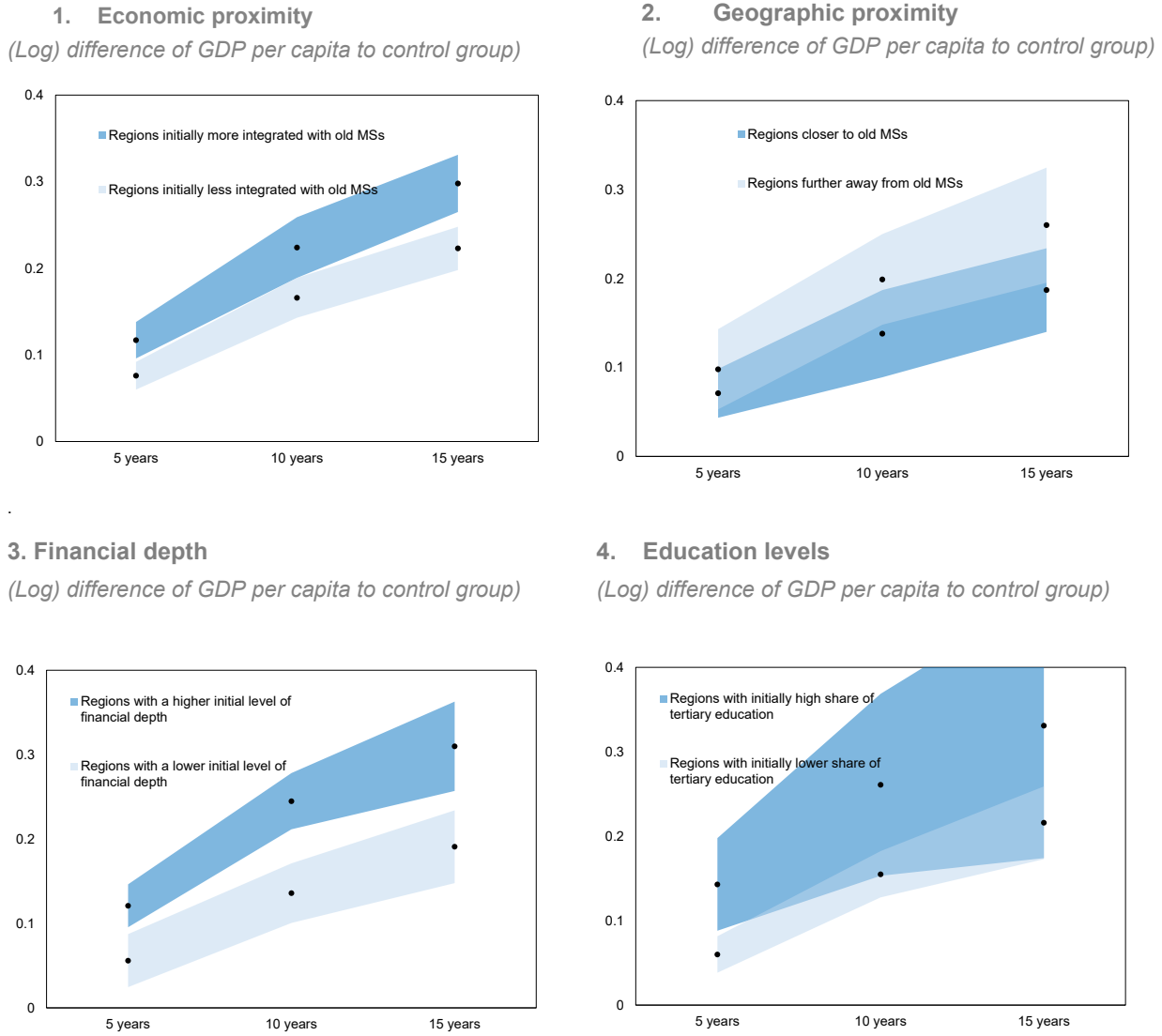
Gains across new member states are shared but some benefitted more than others.

Gains from accession are broadly shared by regions in new MS, but some regions’ pre-conditions allowed them to gain more from market expansion than others. This can provide important lessons for the design of policies for future accession rounds. Key stylized facts include:

- **Economic proximity to old MS paid off.** A measure of proximity between regions based on actual economic linkages in 2000 (Amendolagine and others 2024) using cross-regional input-output information reveals that regions initially better integrated with the old EU member regions gained more from EU accession (Figure 2.13.1). Dividing regions by median economic integration shows a nearly 10 percentage point difference in benefits over 15 years, with more integrated regions experiencing larger gains. This goes well beyond *geographical proximity* to old MS, which did not impact the gains independently. This is true when distinguishing regions bordering old MS from other regions and when splitting regions into those closer and further away based on geographical distance (Figure 2.13.2).
- Regions with **better access to long-term finance** benefitted more from EU accession (Figure 2.13.3). A measure of regional financial access is constructed using the average firms’ long-term debt to sales ratio in each region based on Orbis firm-level data. New MS regions with higher initial financial depth increased income per capita two-fold compared to those with financial depth below the median.

¹⁰ Different phasing in of rules on labor mobility (for example, Schengen) make clear cut migration changes stemming from accession less evident. Overall, emigration is estimated to have had a positive impact on GDP in the old MS and the combined EU25 (European Commission 2018). Estimated GDP losses reported in the literature from emigration in new MS during these years (D’Auria, Mc Morrow, and Pichelmann 2018) are much smaller than the GDP gains we identify from accession and are not based on comparison to trends in other countries.

Figure 2.13. Initial Conditions and Accession Gains



Source: IMF staff calculations.

Note: The median is used as the cut-off point to divide the sample. The dots show the estimated average accession gains over 5, 10 and 15 years. The shaded areas show 95 percent confidence band.

- *Capital city regions*¹¹ gained more than other areas from EU accession, on average, but the variation of gains across capital regions was large. *Service sector-oriented* regions gained more than manufacturing regions, which is consistent with a higher pay-off for capital regions, and regions with initially *higher education levels* are associated with faster income growth in new MS following accession (Figure 2.13.4). Nevertheless, initially poorer regions gained more than richer ones (Box 2.2).

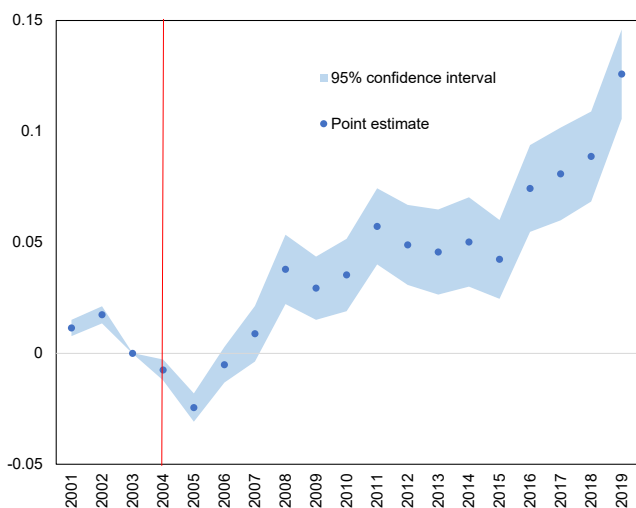
¹¹ Capital city region refers to a NUTS2-region that includes the capital city of the country.

Old member states benefitted from enlargement.

Old MS benefitted notably from EU expansion, even if the gains were smaller than for the new MS. Using global comparator regions as the donor pool in the estimation, regions in old MS gained 10 percent higher income per capita after 15 years, on average (Figure 2.14).¹² While lower in income terms than for new MS, it is proportionally higher than the relative gain in market size accessible for old MS brought about by the 2004 enlargement—which was only 1/16th of the corresponding value for new MS.¹³ Mirroring the results for new MS, the larger market size favored those regions that were initially more economically integrated with regions in new MS.¹⁴

While regions in Germany and Austria, which are well integrated with Central and Eastern Europe, gained the most from EU enlargement, many regions further away benefitted as well (Figure 2.15). Apparent losses for regions in Greece and Italy mostly reflect the repercussions of the European Debt Crisis and other post-2004 country-specific developments that make potential benefits from market expansion associated with EU enlargement more difficult to identify.

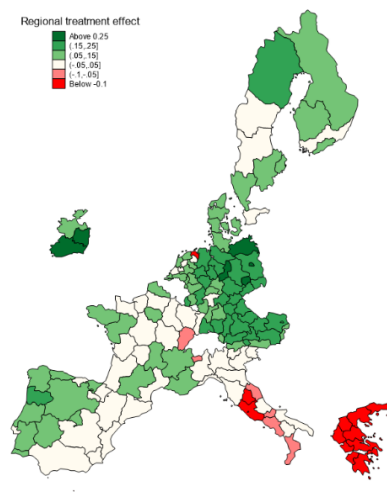
Figure 2.14. 2004 EU Accession Effect on Old MS
(Log) difference of GDP per capita to control group



Source: IMF staff calculations.

Note: Control group includes global comparator OECD countries depending on data availability. Countries strongly impacted by the European Debt Crisis (GRC, ITA, ESP, PRT, and IRL) are excluded.

Figure 2.15. Region-Specific Return from Accession



Source: IMF staff calculations.

Note: Gain from 2004 EU enlargement round after 15 years.

¹² Here Portugal, Ireland, Italy, Greece, and Spain are excluded due to the European Debt Crisis. While the impact is only marginally lower after 15 years when only excluding Greece, the other excluded countries drag down the gains during the euro area debt crisis period.

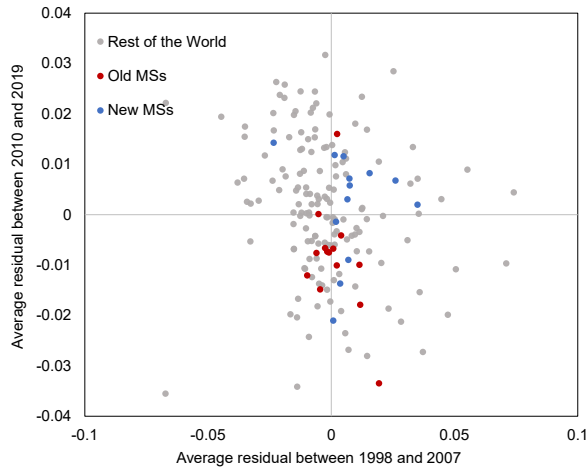
¹³ Measured by population the market expansion for old members corresponded to three times their size, compared to 50 times for new MS.

¹⁴ The gains after 15 years are correlated with initial economic integration but not with geographic distance.

Growth returns from accession transition reforms are diminishing.

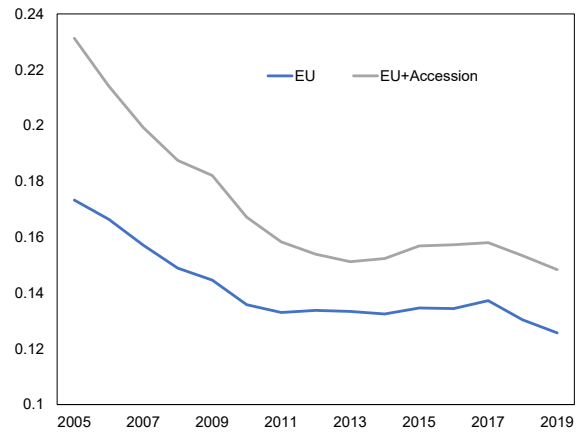
Following impressive gains from EU integration, convergence to the global frontier has slowed over time for new MS and has even dialed back for old MS. Figure 2.16 shows the residual from a pooled cross-country beta convergence regression¹⁵ for the 10 years in the immediate pre- and post-enlargement period 1998–2007 (x-axis) and an equally long period before the COVID-19 pandemic (2010–2019). Compared to the average convergence globally, growth overperformed in most of Europe during the first period, with a positive average residual of 0.46 percentage points. In the later period, this continues to hold true for most new MS, but at a much slower rate (residual of 0.14 percentage points). At the same time, the majority of old MS grew more slowly than what global convergence would suggest given their income level (residual of -0.88 percentage point), falling behind the global frontier.

Figure 2.16. Country Performance Across Time
(y-axis = Percent, x-axis = Percent)



Source: World Economic Outlook, IMF, and staff calculations

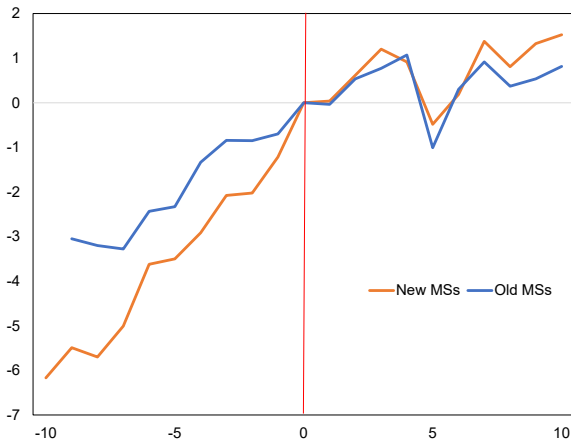
Figure 2.17. Sigma Convergence in EU TFP
(Standard Deviation)



Source: Penn World Table, and IMF staff calculations.

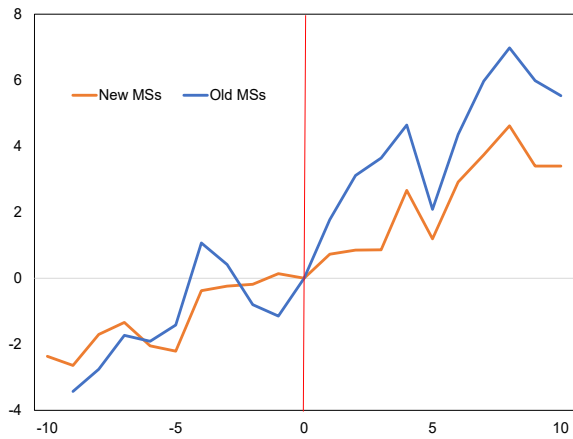
Note: See Annex 2.1 for methodology.

Figure 2.18. MS GVC Integration with EU
(Percent of GDP difference relative to accession year)



Source: OECD TiVA 2023 and IMF staff calculation.

Figure 2.19 MS GVC Integration with Non-EU
(Percent of GDP difference relative to accession year)



Source: OECD TiVA 2023 and IMF staff calculation.

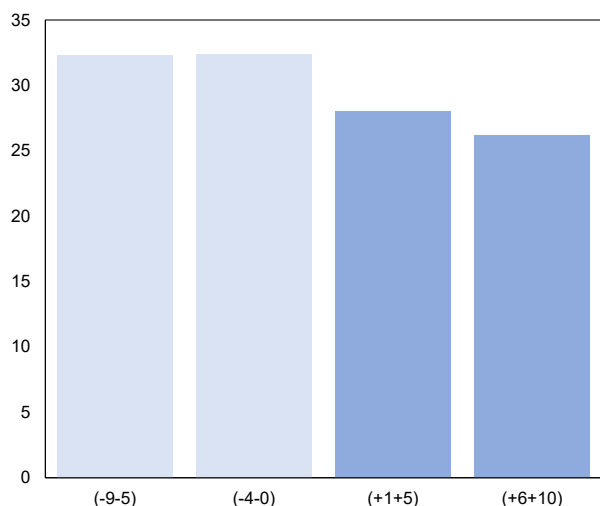
¹⁵ The regression coefficients are given by: $\Delta \log Y_{it} = \text{constant} - 0.03 * \log Y_{it-1} + \varepsilon_{it}$, with country and time fixed effects included, based on a sample including 188 countries over the period 1994 to 2019.

The primary reason for the growth slowdown is weak productivity growth. Much of the TFP contribution to income gains in new MS has been realized in the years after accession and progress has stalled since 2013 (Figure 2.17). This pattern of initial improvement and subsequent stagnation in TFP mirrors the flattening out of the education level increase post-accession (Figure 2.12). With TFP catch-up initially strong in the immediate post-accession years and then almost halting since the early 2010s, TFP sigma convergence has also almost stopped. Hence, diminishing returns to EU integration driven by stalling productivity convergence within Europe contributed to the growth slowdown in Europe overall.

Faltering productivity growth is consistent with reform and EU integration momentum that is largely concentrated around the accession but levels off thereafter. As internal obstacles to the free flow of goods, services, and factors lowered, value chain integration between EU member states was very strong around the time of accession. The effect was especially strong for new MS (Figure 2.18 and 2.19). Following the impressive momentum, global value chain (GVC) integration within the EU failed to reignite in the five years following the Global Financial Crisis (GFC) dip.

Figure 2.20. Economic Complexity

(Average rank: Lower=better)

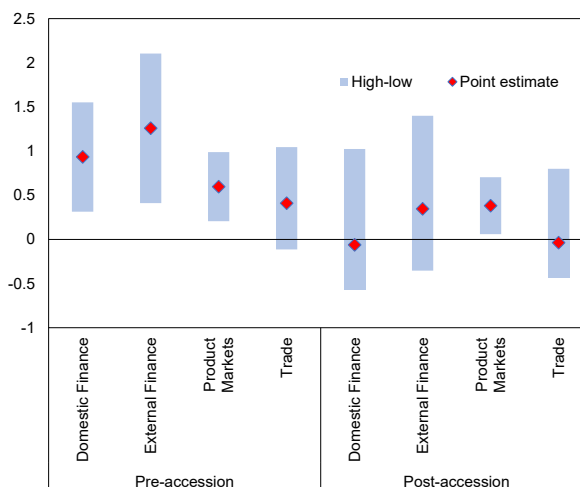


Source: Harvard Growth Lab and IMF staff calculations.

Note: The economic complexity index ranks countries based on the diversification and complexity of the export basket. Eleven countries are included in the sample, including eight countries (Cyprus, Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, and Slovakia) that joined the EU in 2004, two countries (Bulgaria, Romania) that joined the EU in 2007, and Croatia, which joined the EU in 2013.

Figure 2.21. Reform Momentum Around Accession

(Index change over time compared to world)¹⁶



Source: IMF Structural Reform Database and staff calculations

¹⁶ The reform indices are from the [IMF structural reform database](#). The domestic finance reform index captures credit controls, interest rate controls, bank entry barriers, banking supervision, privatization, and security market development. The external finance reform index captures current account restrictions and capital flow restrictions, including FDI, portfolio, bonds, money market instruments and bank credit. The product market reform index captures liberalization in telecommunications and electricity sectors. The trade reform index captures tariffs and restrictions on current account transactions.

This parallels the increases in economic complexity of new MS, where most gains were achieved in the first five years post accession, with limited further gains thereafter (Figure 2.20).¹⁷ A comparison of structural reform progress in countries joining the EU with the rest of the world shows that in the 10 years pre-accession, progress in these countries was significantly faster than the world average in the areas of domestic finance, external finance, product markets, and trade (Figure 2.21). However, in the 10 years post-accession only product market reforms continued at a pace significantly faster than the world average. More generally, and affecting all MS, financial integration slowed, reflecting a retrenchment in cross-border exposures following the global financial crisis, while progress on the EU's capital markets and banking union has been slow for years.

EU enlargement could lift incomes, magnified through deeper integration.

The experience of past EU enlargements suggests that a further EU expansion could lead to economic gains for both the next generation of accession countries and the current EU-27. Based on the strong assumption that the accession returns to new and old MS would be similar to estimates for the 2004 accession round, full EU membership for all 10 current accession countries—which would entail a larger market expansion for old MS than the 2004 enlargement round—could lift the combined new EU-37 GDP per capita by up to 14 percent after 15 years.¹⁸

Under this scenario Europe's convergence to the global frontier would re-accelerate. The current baseline projections for the EU-27, the accession candidates, and the United States suggest nearly no closing of the income gap between Europe and the United States, with a divergence of old EU MS counteracting slow convergence of new MS and accession countries (Figure 2.22). In the accession scenario, the gap could close by 10 percentage points. Gains from EU enlargement would offset the divergence of existing MS and considerably accelerate the convergence of the others.

But these gains are based on strong assumptions and should not be taken for granted. First, accession countries will need to implement important reforms to their economic and broader institutional setups to overcome gaps larger than those between old and new MS in 2004. In principle, reforms strengthening institutions and governance, reducing trade barriers, advancing financial and product market reforms, and aligning national laws and regulations with EU standards will benefit economic outcomes in these countries even in the absence of EU accession. But the added prospect of getting full access to the EU single market and the potential additional gains from it should provide important incentives to follow through with these reforms and, where needed, help social acceptance for reforms.¹⁹ In this context, it would also play a role whether the EU maintained major support programs as during past enlargement episodes, and to what degree these programs would be conditional on reforms being implemented. Second, it is unclear whether the current external environment is as conducive as it was in the mid-2000s. On the one hand, increased geo-fragmentation and protectionism may limit global gains from trade, reduce incomes, and lower production levels, including in new MS. On the other hand, these fragmentation trends may cause more FDI in new MS and near-shoring as old MS diversify source markets to within the EU and non-EU members shift production to EU members to overcome trade barriers in accessing the enlarged EU market.²⁰ Third, policy formulation and implementation in an enlarged EU could become more complicated, potentially requiring a rethinking of the current decision-making processes.

¹⁷ These findings are supported by Chupilkin, Kóczán, and Plekhanov (2024) who employ a country-level synthetic control method to document that exports to GDP in new MS peaked 10 years after accession and remained constant thereafter relative to a control group.

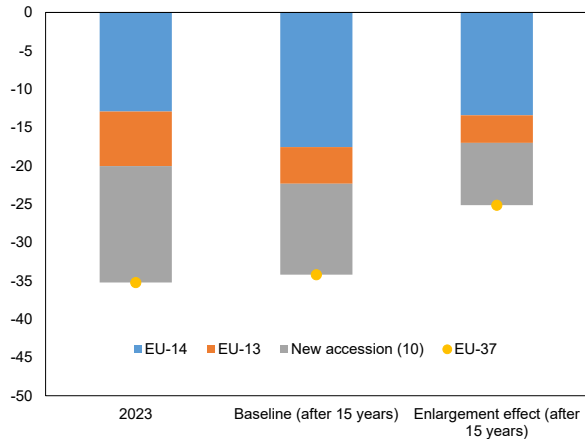
¹⁸ The calculation of the estimated GDP per capita gain from enlargement of all accession countries is based on an increase of 10 percent for existing EU members and 30 percent for new EU members from their current GDP per capita levels. The overall gain for an EU-36 without Türkiye, by far the largest accession country, would be around 11 percent. However, without Türkiye the market expansion for old MS would be much smaller than in 2004 and would hence likely result in smaller gains. If the gains of old members are reduced to reflect the smaller market size expansion (by their market expansion now relative to 2004, which would only be two-fifths), the aggregate gains for an EU-36 would decline to only 6 percent.

¹⁹ See Chapter 3 in October 2024 *World Economic Outlook* on how to increase the social acceptability of structural reform.

²⁰ The strategic partnerships of the EU and Serbia on sustainable raw materials, battery value chains, and electric vehicles point to this.

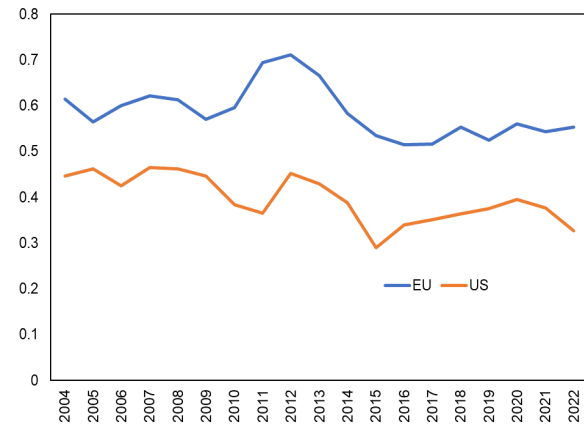
Gains from a larger single market could be amplified by a further deepening of the single market to lower the remaining barriers within the EU. Despite economic and political integration, country-specific factors still matter in the EU. How much? A simple metric is the fraction of regional variation in income per capita growth that is explained by being part of a given country. While this fraction has declined since 2004, it remains substantial and above a comparable metric for the United States (Figure 2.23). The November 2024 REO Note: [“Europe’s Declining Productivity Growth: Diagnoses and Remedies”](#) demonstrates that this is importantly also related to remaining trade barriers for goods and services.

Figure 2.22. Income Gap with the US
(Difference between GDP per capita in Europe and the US in percent of US level)



Source: World Economic Outlook and IMF staff calculations.
Note: The simulated GDP per capita gain from enlargement of all 10 accession countries is based on an increase of 10 percent for existing EU members and 30 percent for new EU members from their current GDP per capita levels 15 years after hypothetical accession.

Figure 2.23. The Role of Borders in the EU and the US
(Fraction of regional Income per capita growth variation explained by country (state) fixed effects)



Source: European Commission, OECD, and IMF staff calculation.
Note: The y-axis shows the three-year moving average of the partial r-squared obtained from an OLS regression of regional GDP per capita growth on previous year GDP per capita level with and without country (state) fixed effects for the EU (US).

The analysis of the determinants of gains from past EU accession (Figures 2.13 and Table 2.4.1 in the Annex) suggests that reducing the remaining barriers through deeper integration can help magnify the effects from EU accession for both new and old MS. Better access to long-term financing goes along with higher gains from EU enlargement for new MS (Table 2.3 column 1). It can account for up to ¼ in the observed variation of gains from EU accession.²¹ Unsurprisingly, most of this is reflecting fragmented national financial systems, with country fixed effects turning the effect statistically insignificant (column 2). Deep integration through production networks and access to markets transcends borders (columns 3–5)²² and provides for higher gains from enlargement for old and new MS alike. Bringing down the remaining borders in finance and economic networks along those dimensions could increase the income gain from enlargement. The November 2024 REO Note: [“Europe’s Declining Productivity Growth: Diagnoses and Remedies”](#) provides more details on which policies can help achieve this.

²¹ The r-squared increases by around 0.25 when adding the initial financial depth as explanatory variable.

²² Initial market access (measured as GDP weighted distance to other regions) and initial economic integration to old members are both highly statistically significant when included in the same regression, thus implying different independent benefits.

References

- Amendolagine, V., F. Prota, and L. Serlenga. 2024. "The impact of European Cohesion Policy: a spatial perspective." *Journal of Economic Geography* 24(4): 477–494.
- Arkhangelsky, D., S. Athey, D. A. Hirshberg, G. W. Imbens., and S. Wager. 2021. "Synthetic difference-in-differences." *American Economic Review* 111(12): 4088–4118.
- Badinger, H. 2005. "Growth effects of economic integration: evidence from the EU member states" *Review of World Economics* 141: 50–78.
- Baldwin, R. and C. Wyplosz. 2022. *The Economics of European Integration*. New York: McGraw Hill.
- Beyer, R., C. Y Li, and S. Weber. Forthcoming. Reassessing Regional Economic Benefits 20 years after the 2004 EU Enlargement. IMF Working Paper, International Monetary Fund, Washington, DC.
- Boltho, A. and B. Eichengreen. 2008. "The economic impact of European integration." CEPR Discussion Paper No. 6820, Center for Economic and Policy Research, Washington, DC.
- Brou, D. and M. Ruta. 2011. "Economic integration, political integration or both?" *Journal of the European Economic Association* 9(6): 1143–1167.
- Campos, N. F., F. Coricelli, and L. Moretti. 2019. "Institutional integration and economic growth in Europe." *Journal of Monetary Economics*, 103 88–104.
- Chupilkin, M., Z. Kóczán, and A. Plekhanov. 2024. "20 years of EU membership." Office of the Chief Economist, European Bank for Reconstruction and Development, London.
- Clarke, D., Pailaňir, D., Athey, S., & Imbens, G. (2023). Synthetic difference in differences estimation (No. 159070). IZA Discussion Paper.
- Cuaresma, J. C., G. Doppelhofer, and M. Feldkircher. 2014. "The determinants of economic growth in European regions." *Regional Studies* 48(1): 44–67.
- D'Auria, F., K. Mc Morrow, and K. Pichelmann. 2008. "Economic impact of migration flows following the 2004 eu enlargement process-a model based analysis." Economic Papers 349, European Commission, Brussels.
- Grassi, B. 2024. "The EU Miracle: When 75 Million Reach High Income." IGIER Working Paper No. 709, Innocenzo Gasparini Institute for Economic Research, Milan.
- Ignatov, A. 2024. "European highways and the geographic diffusion of economic activities from agglomerations to less urbanised areas." *Empirica* 51(2): 351–377.
- Lejour, A., R. A. De Mooij, and R. Nahuis. 2001. "EU enlargement: Economic implications for countries and industries." CESifo Working Paper No. 585, Center for Economic Studies, Munich

Box 2.1. EU Enlargement and Accession Process

Since the establishment of the European Economic Community, the precursor to the EU, by the six founding members in 1957, seven rounds of enlargement raised the number of current members to 28 then 27.¹ The process of joining the EU has four main steps: application, candidacy, accession negotiations, and treaty ratification. All European countries can apply for EU membership conditional on fulfilling the Copenhagen Summit (June 1993) criteria for EU membership, requiring stability of institutions guaranteeing democracy, rule of law, human rights, respect for and protection of minorities, and a functioning market economy.

Excluding the six original founding members, it has taken on average about nine years to join the EU, about four of which are spent in the negotiation phase. Candidate countries receive financial and technical assistance throughout the accession process. The [Instrument for Pre-Accession Assistance](#) (IPA) is the key means by which the EU has been supporting reforms in the accession candidates since 2007. IPA's current budget for 2021-27 is EUR 14.2 billion, which is equivalent to 0.2 percent of the projected cumulative GDP of the seven countries it covers (1.3 percent excluding Türkiye).

In the accession process, candidate countries align national laws, regulations, and institutional structures with EU standards and requirements through negotiating adjustments on a wide range of so-called chapters. The chapters of the EU *acquis* cover free movement of goods, services, workers, and capital, public procurement, company and intellectual property law, taxation, protection of justice, freedom and security, rules on various policies including social and employment policy, competition policy, financial services, and sectoral issues including agriculture, food, transport, energy and others.

^{1/} The founding members were Belgium, France, Germany, Italy, Luxembourg, and the Netherlands. The following enlargements included: Denmark, Ireland, the UK (all 1973), Greece (1981), Spain, Portugal (both 1986), Austria, Finland, Sweden (all 1995), Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia (all 2004), Bulgaria, Romania (both 2007), and Croatia (2013). The UK exited the EU (2020).

Box 2.2. Regional Convergence after EU Accession

We find strong support that new member regions converged after EU accession. Table 2.1 reports regression results for income gains following EU accession in new MS. Column (1) shows that the initial GDP level is negatively correlated with the gain from accession and column (2) shows that this result is even stronger when controlling for capital regions and the level of tertiary education. However, poorer regions within a country may be failing to catch up with richer regions in the same country. This is the case if overall convergence at the regional level is achieved mostly through convergence between countries (see also Cuaresma and others 2012). Column (3) suggests that convergence is indeed strongly driven by between-country convergence, as the coefficient on the initial level of GDP turns statistically insignificant after controlling for country fixed effects (though it remains negative). The result that EU accession may have had limited contribution to within-country income convergence in the past could have implications for the future design of regional policies and support measures.

Table 2.2.1. Convergence of New Member Regions after EU Accession

Dependent variable	(1)	(2)	(3)
	GDP per capita gain		
Initial GDP per capita	-0.361** (0.154)	-0.615*** (0.172)	-0.141 (0.292)
Constant	YES	YES	YES
Controls	NO	YES	YES
Country FE	NO	NO	YES
R-squared	0.130	0.250	0.895
NUTS-2 regions	63	52	52

Standard error in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Annex 2.1

Sigma convergence is measured by the standard deviation of the logarithm of real per capita GDP across a specific group of countries. There is sigma convergence if income dispersion declines over time.

Beta convergence is observed when the growth rate of real per capita GDP is negatively related to the starting level of real per capita GDP. It implies that poorer economies eventually catch up with richer ones. Therefore, the estimated coefficient β from the below equation is expected to be negative and statistically significantly different from zero:

$$\Delta \log Y_{it} = \alpha + \beta \log Y_{it-1} + u_{it},$$

where the growth rate of country i at time t is measured by the log difference of real GDP per capita, $\Delta \log Y_{it}$. The right-hand side is the (log) level of real GDP per capita in the previous period, $\log Y_{it-1}$, and a random disturbance, u_{it} , with mean zero and constant variance, uncorrelated with $\log Y_{it-1}$. Figure 2.4 plots the average real per capita GDP growth rate over the period versus the per capita GDP level in the initial period. The estimated results of the fitted lines shown in figure 2.4 are presented in Table 2.1.1.

Table 2.1.1 Beta regression results

	Accession candidates	EU	Europe	Asia	World
β	-.018 (.011)	-.021*** (.002)	-.0145*** (.002)	-.010*** (.002)	-.005*** (.001)
Constant	.187	.232	.165	.115	.061
R^2	0.300	0.875	0.669	0.342	0.092
N of countries (observations)	9	26	40	44	183
Standard error in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$					

Annex 2.2

Methodology

Arkhangelsky and others (2021) develop a *synthetic difference-in-differences estimator* to quantify causal effects with panel data. It builds on both usual difference-in-differences and synthetic control methods and allows quantifying the treatment effect of an event if there are repeated observations on treated and untreated units over time. It combines the advantages of a usual difference-in-difference analysis (namely level differences and statistical inference) with the advantages of a synthetic control analysis (in which untreated units are weighted to construct a comparable control unit). In short, the SDIDE weighs the untreated regions in the comparison (donor) pool to match pre-treatment trends of treated regions (those that joined the EU) and employs bootstrapping techniques to facilitate statistical inference.

Clarke and others (2023) provide a computational implementation of this estimator for STATA and detailed discussions of the estimation, inference, and visualization of results. The estimation of the average gain from accession, A_{it} , proceeds as follows:

$$(\hat{\tau}^{SDIDE}, \hat{\mu}, \hat{\alpha}, \hat{\beta}) = \arg \min_{\tau, \mu, \alpha, \beta} \left\{ \sum_{i=1}^N \sum_{t=1}^T (Y_{it} - \mu - \alpha_i - \beta_t - A_{it}\tau)^2 \hat{\omega}_i^{SDIDE} \hat{\varphi}_t^{SDIDE} \right\},$$

where the estimand is the gain—generated from a two-way fixed effect regression—with optimally chosen weights $\hat{\omega}_i^{SDIDE}$ and $\hat{\varphi}_t^{SDIDE}$. The presence of unit-fixed effects implies that the estimator matches those regions who joined and control units on pre-treatment trends. For details about the estimation of the weights and the bootstrap approach to establish statistical significance refer to Clarke and others (2023).

Data

We use an unbalanced panel data set covering 220 regions in old MS, 63 regions in new MS, and 53 comparator regions outside of the EU, with the earliest data going back to 1990 and the latest data being for 2022. Table 2.2.1. summarizes the variables used in this note and their data sources.

Table 2.2.1. Determinants of Gain from EU Accession

Variable	Definition	Source
GDP per capita	At current prices at PPS	European Commission
Geographic proximity	Proportional to the geographical proximity between main cities of regions	Amendolagine and others (2024)
Economic proximity	Proportional to the value of bilateral value-added trades between regions in 2000	Amendolagine and others (2024)
Share of manufacturing in GVA (%)	Annual average	Eurostat
Share of population with tertiary education (%)	Annual average	Eurostat
Financial depth with a broad measure of debt	The change between 2019 and 2004	Orbis
Market access index	The change between 2019 and 2004	Ignatov (2024)
New patent applications per thousand population	Annual average	ESPON database

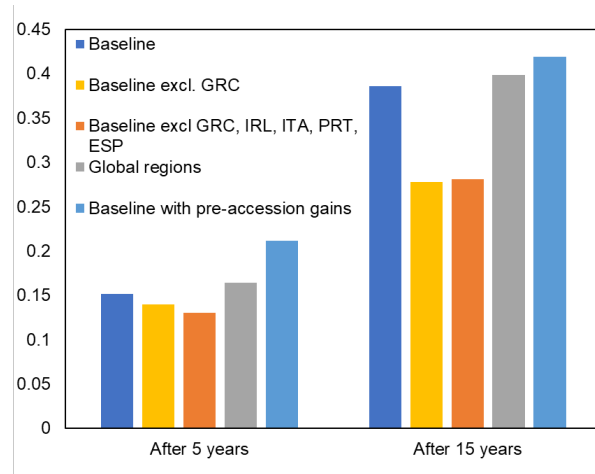
Annex 2.3

The selection of the most appropriate donor pool is subject to trade-offs. Global regions are arguably the least impacted by the treatment, but the available pre-accession sample for global regions is shorter and smaller. In addition, global regions differ structurally more from new MS regions than old MS regions. The data for old MS regions allow for a longer pre-treatment period and much better matching of treated and untreated regions. However, since old MS regions benefitted from the EU enlargement, gains for new MS are downward biased when using old MS regions as the donor pool. But some old MS have been strongly impacted by the European Debt Crisis, which introduces an upward bias in the long-run gains of new MS.

Figure 2.3.1. shows the gains of new MS from the 2004 accession for four different donor pools: all old MS regions (baseline), old MS regions without Greece, old MS regions without countries strongly impacted by the European Debt Crisis, and global regions. After five years, the gains are remarkably similar for all of them (four left most bars). After 15 years, the gains relative to old MS and global regions are very close to each other, while they are smaller when excluding Greece or all countries strongly impacted by the European Debt Crisis. This suggests that the downward bias from gains of old MS and the upward bias from the recession in Greece are of similar magnitude. Indeed, the difference between the gains relative to all old MS and relative to old MS without Greece (or all crisis countries) is around 10 percent, the same as the gains estimated for old MS unaffected by the European Debt Crisis above. All old MS regions are used as the baseline donor pool since they allow for the best matching in the pre-treatment period and because gains after 5 and 15 years are very similar to those estimated with a global donor pool.

Figure 2.3.1. also shows the gains when accounting for additional gains from pre-accession reforms during the transition period by shifting the treatment year to 2000 (the year in which the EU passed Agenda 2000, an important initiative aimed at facilitating future enlargements). As expected, there are additional gains, with the gains 5 years after accession increasing from below 15 percent to over 20 percent. However, the additional gains diminish over time and are insignificant 15 years after accession.

Figure 2.3.1. New MS gains from 2004 EU accession
(Log) difference of GDP per capita to control group)



Sources: IMF staff calculation.
Note: See Annex 2.2 for methodology.

Annex 2.4

Table 2.4.1. Determinants of Gain from EU Accession

	<i>Financial Depth</i>		<i>Connectivity</i>			<i>All</i>
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	GDP per capita gain					
Initial GDP per capita	-0.590** (0.169)	-0.140 (0.324)	-0.794*** (0.110)	-0.674 (0.534)	-0.912* (0.388)	-0.930* (0.386)
Initial financial depth	0.372** (0.155)	-0.0661 (0.138)				0.0612 (0.0808)
Geographic proximity			-0.0845 (0.0587)	-0.00184 (0.0552)	0.0524 (0.0380)	0.0446 (0.0437)
Initial market access			0.469*** (0.0963)	0.341** (0.104)	0.385** (0.110)	0.439* (0.185)
Initial economic proximity					0.190** (0.0574)	0.182** (0.0473)
Constant	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES
Country FE	NO	YES	NO	YES	YES	YES
R-squared	0.496	0.873	0.567	0.900	0.920	0.918
NUTS-2 regions	49	49	32	32	31	30

Standard error in parenthesis. *** p<0.01, ** p<0.05, * p<0.1