

The future of the EU's competitive position:

The role of Central Eastern European countries

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Abstract

The Draghi Report recommended actions to secure the long-term EU competitive position but did not discuss the challenges related to specific countries or regional groups, including those of Central and Eastern European (CEE) countries. While CEE economies remain focused on manufacturing, especially the automotive industry, they are gradually shifting from being the EU's manufacturing hub to developing higher value-added activities. However, income convergence has slowed, suggesting the need to rethink their growth model. Our research highlights growth opportunities and suggests ways to reduce barriers to innovation. Policy should focus on three areas: strengthening human capital, fostering innovation, and addressing energy intensity and its relatively high costs. Key actions include increasing labour market participation, ensuring access to start-up finance and risk capital, and reducing the region's reliance on brown energy, particularly through grid and generation investment and the development of greener businesses.

Keywords: Competitiveness, trade, innovation, Central Eastern Europe

JEL classification: F14, F15, O11, O47, O52

CONTENTS

1.	Introduction.....	9
2.	The structural factors behind the slowdown of the CESEE.....	10
3.	The growth potentials in CESEE: An illustration of sectors and products using the product space.....	13
4.	The role of innovation in transforming the CESEE.....	18
5.	Policy conclusions.....	21
	References.....	23

TABLES AND FIGURES

Table 1 / Recurrent growth potentials in the CEE region	16
Figure 1 / Decomposition of labour productivity growth (%).....	11
Figure 2 / Relative shares of energy sources in the five most energy-consuming sectors by country.....	11
Figure 3 / Industrial prices of electricity and gas in 2023 (in euro cents per kWh)	12
Figure 4 / A comparison of the product spaces of Czechia and Bulgaria in 2020.....	14
Figure 5 / Identifying growth potentials via the product space methodology.....	17
Figure 6 / R&D investments, % of firms, by share of investment dedicated to R&D	18
Figure 7 / Corporate investment in training (EUR per employee per year, PPP adjusted)	19
Figure 8 / The status of venture capitalists' investments.....	20
Box 1 / The key metrics of the product space: the intuition.....	13
Box 2 / How we identify products with growth potential using the product space framework	16

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1. INTRODUCTION

The Draghi Report (2024) reignited discussions on securing the EU's long-term competitiveness. The report, like other recent interventions on the topic (e.g. Arce and Sondermann 2024; European Investment Bank 2024; IMF 2024; McKinsey Global Institute 2024; Pinkus et al. 2024; Schnabel 2024) focuses on the European Union as a whole. Hence, it stops short of addressing the specific challenges individual countries or regional blocs face within the EU. In particular, Central Eastern Europe (CEE) has played a very dynamic role in the last two decades. Today, it faces new challenges as it seeks new sources of sustained economic growth.

Central, Eastern and South-Eastern (CESEE) EU Member States have first become the manufacturing arm of the EU and attracted large amounts of foreign direct investments (FDI) from Western Europe. Integration into global supply chains and joining the EU facilitated a swift transfer of modern technologies, allowing CESEE economies to tap larger export markets, and supported institution building. The manufacturing sector emerged as the backbone of economic activity, and CESEE economies became highly competitive, with market shares and export quality improving notably. In countries like Czechia, Hungary, and Slovakia, the quality of export products is at par with that of German exports. This helped them to gradually converge towards EU incomes, developing the service sector and higher value-added activities. This certainly has been an economic success story.

On the flip side, this growth model has brought about a high dependence on global value chains, with all its related risks, which became visible during the pandemic. Also, CESEE economies currently suffer from weak external demand, weighing on their growth performance. Finally, they are still “factory economies,” overspecialised in production with low value added.

Today, the convergence process has lost steam. Two-thirds of the convergence in GDP per capita was achieved in the first decade after the EU accession and only one-third in the more recent decade. FDI inflows, at 5.2% of GDP in the 2000s, slowed in the decade after the Global Financial Crisis (GFC). Such a slowdown in convergence was primarily due to structural rather than cyclical factors, suggesting that the CESEE growth model needs to be upgraded.

Our new papers that emerged from a joint research project of the European Investment Bank (EIB), the Oesterreichische Nationalbank (OeNB), and the Vienna Institute for International Economic Studies (wiiw), provide critical insights on the region's competitiveness and its prospects (Ferrazzi et al. 2025; Guadagno et al. 2024; Slačik 2024). The three papers highlight new growth opportunities in sectors aligned with existing specialisations and examine how barriers to implementing innovations could be reduced. They also provide several concrete policy recommendations to support the region's quest for a new growth potential.

2. THE STRUCTURAL FACTORS BEHIND THE SLOWDOWN OF THE CESEE

During the last decade, CESEE countries continued their convergence toward the EU average. CESEE incomes moved from 40% of the German average in 1997 to 70% in 2023. With a purchasing power of 80% of Germany's income, people in Slovenia and Czechia are now richer than people in Spain and at a comparable level with Italy. Yet, the catching-up process has slowed notably in recent years. Two-thirds of the catching-up occurred in the decade before the Global Financial Crisis (GFC) of 2008–09, and only one-third in the 15 years since. Our research shows that value-added growth declined in virtually all industries after the GFC.

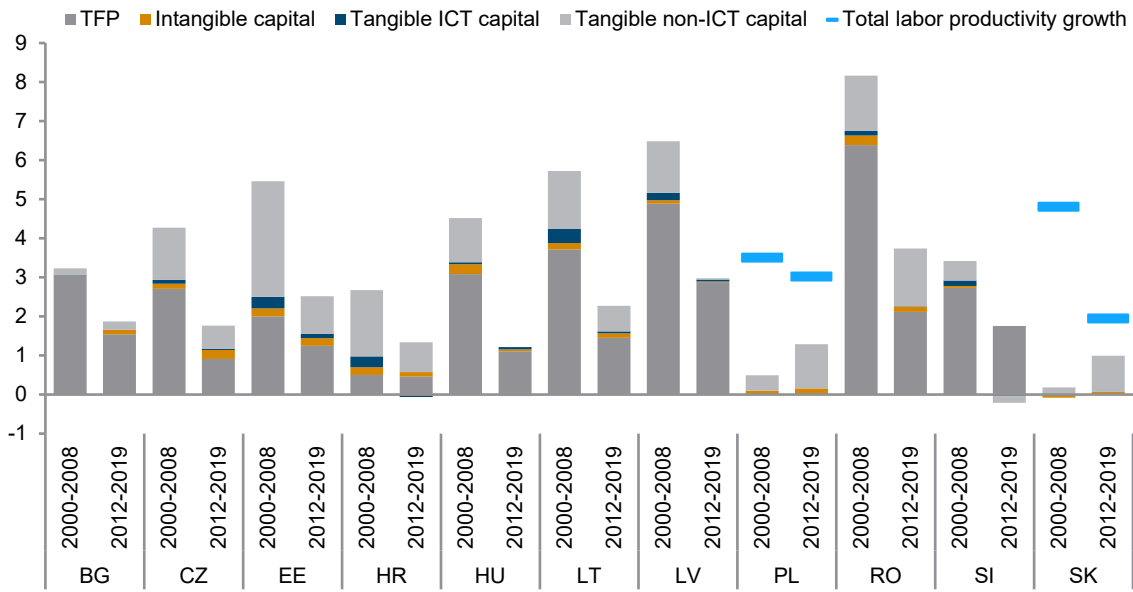
A variety of structural factors are behind this trend (Slačík 2024). Among these, total factor productivity (TFP), once the main driver of economic growth, is today the primary culprit behind the post-GFC slowdown. While the decline in TFP growth is a widespread phenomenon in both advanced and emerging economies, growth projections in the medium term are not optimistic. Moreover, a closer look at production factors suggests that, despite some improvement, a large gap in the capital stock remains compared to advanced economies.

Labour productivity is still lower than in the rest of the EU, with value-added per hour worked ranging from just 22% of the EU average in Bulgaria to 67% in Slovenia as of 2019. Our research also shows that labour productivity growth in CEE has been slowing in recent years compared to the previous decade (Slačík 2024). While this is not necessarily a CESEE-specific phenomenon, as labour productivity growth has declined globally and in the EU, the decline in CESEE has been more pronounced. Hence, this is one of the reasons why the catching-up process has also slowed down. Data also demonstrate that a reduced contribution by TFP was the key driver of the decline in labour productivity in most CESEE countries. In some of them (e.g. Croatia, Estonia and Latvia), insufficient investment in tangible non-ICT capital contributed noticeably to the decline in labour productivity growth (Figure 1). Low innovativeness remains a crucial weakness of the region, limiting its growth convergence possibilities and pointing to the need to switch to a new growth model (Ferrazzi et al. 2024; Zavorská et al. 2024).

The economic structure of the CESEE economies inevitably contributes to explaining these patterns. The region's competitive advantage remains anchored in its manufacturing sector. Countries like Czechia, Poland, Slovakia, and Hungary are ranked among the top 30 industrial performers globally (based on UNIDO's Competitive Industrial Performance Index, CIP). Within manufacturing, the automotive sector is critical, with one million employees in the region and a contribution of 20% of value added in Czechia and Slovakia (Delanote et al. 2022). Since Hungary and Poland are increasingly turning into leading producers of batteries for electric vehicles in Europe, the relative importance of the automotive sector for these economies might further increase in the medium term (Guadagno et al. 2024; Slačík 2024). Meanwhile, there has been significant growth in the economic value added and exports of IT and modern services (i.e., computer programming, consultancy, and information services). These sectors have become key drivers of growth in Bulgaria, Croatia, Estonia, Latvia, and Romania and hold future growth potential in the remaining six countries of the region (Guadagno et al. 2024). Despite these positive developments, the region remains specialised in lower value-added activities of these value chains, with limited functional upgrading towards more complex activities, upstream, such as research and development (R&D), or downstream, such as sales and logistics, or marketing, which are more prominent in Northern and Western Europe (Stöllinger 2021). This makes the CEE countries

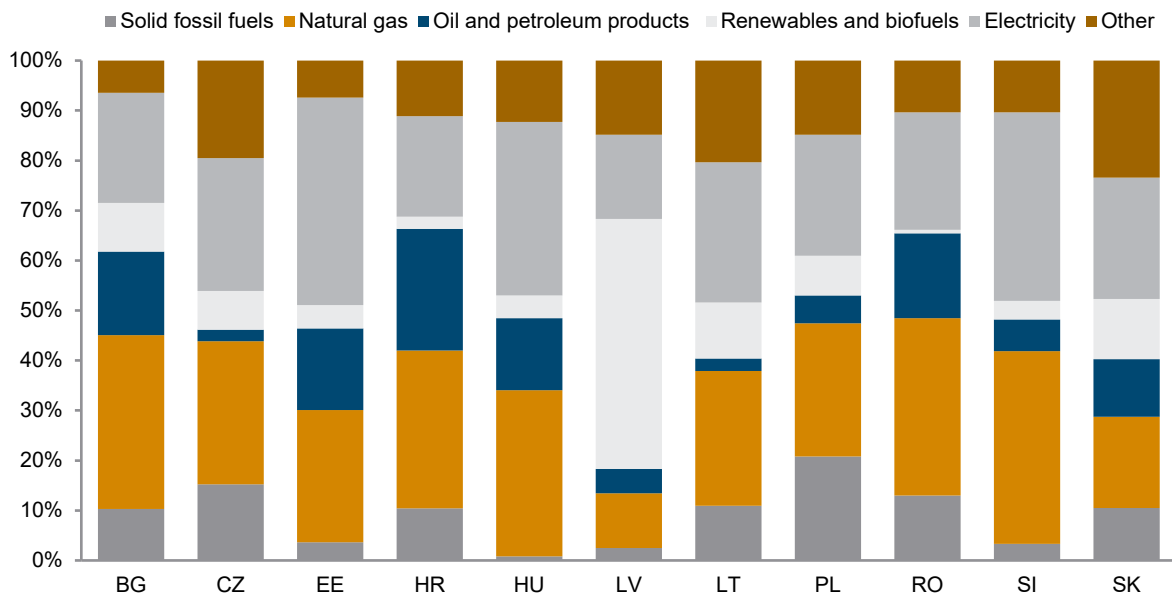
“factory economies” (overspecialised in production) with the “headquarter economies” (in Western Europe, for instance) partially steering the pace of the technological change in the region (Bykova et al. 2023; Grieveson et al. 2021; Guadagno et al. 2023; Zavorská et al. 2023, 2024).

Figure 1 / Decomposition of labour productivity growth (%)



Source: Luiss EUKLEMS – INTANProd database.

Figure 2 / Relative shares of energy sources in the five most energy-consuming sectors by country

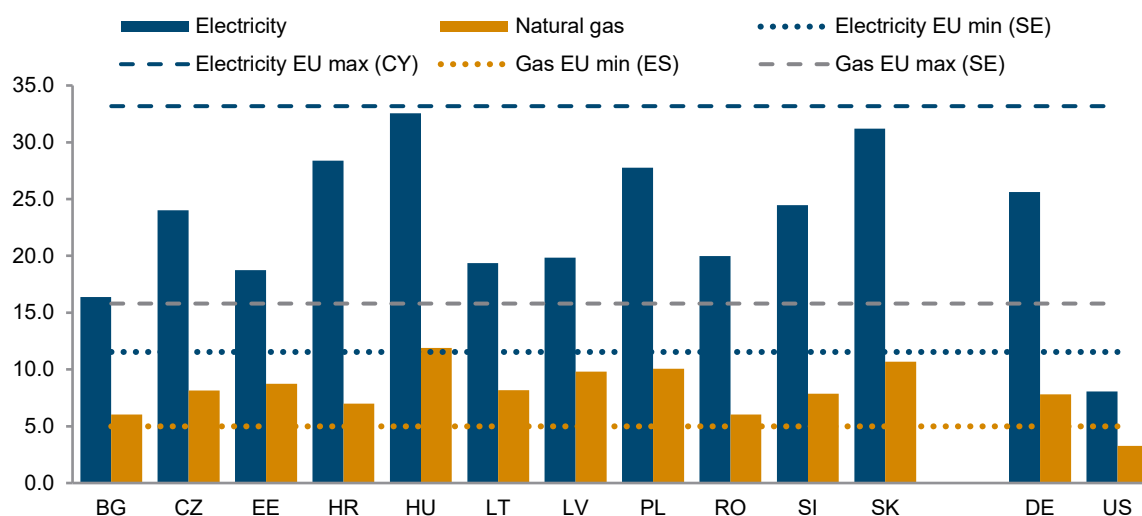


Source: Eurostat.

The CEE's overspecialisation on production also explains the relatively high energy intensity of GDP. Some industries – especially the chemical industry, production of non-metallic minerals, and the food industry – consume substantial amounts of energy. Our analysis also shows that those higher needs are also met to a great extent by fossil fuels—accounting for 40% of energy consumption in Slovakia and Czechia and 65% in Romania (Figure 2).

To couple this issue, firms in CESEE have to deal with rather expensive energy, which tends to be high EU-wide as well as in global comparison. High energy costs pose reportedly one of the key obstacles to firms' investments (Slačík 2024) and the region's competitiveness (Figure 3). As we just showed, firms are also more sensitive to energy costs than elsewhere, as output in CESEE continues to be very energy-intensive despite substantial improvements in recent decades. To compound these challenges, fossil-fuel-based energy is likely to become more expensive in the near future, thus further hurting the region's competitiveness and reinforcing its geopolitical vulnerabilities, which are already heightened due to its deep integration into global value chains. To remain competitive in the future, the CESEE region will need to overcome the challenges of reducing the energy intensity of their economies and making energy cheaper and greener at the same time (see also Chapter 5).

Figure 3 / Industrial prices of electricity and gas in 2023 (in euro cents per kWh)



Note: Prices include all taxes and levies.

Source: Eurostat, U.S. Energy Information Administration.

3. THE GROWTH POTENTIALS IN CESEE: AN ILLUSTRATION OF SECTORS AND PRODUCTS USING THE PRODUCT SPACE

The discussion on the challenges of the present growth model of the CESEE region warrants crucial questions regarding the region's future growth potential, including in terms of sectors and market niches. One of the objectives of this research is, therefore, to identify the products that have the potential to help these economies build new capabilities and spur technological upgrading.¹ Indeed, product upgrading will be crucial for the region as it needs to evolve its growth model towards higher-value-added and knowledge-intensive products and services.

We use the concept of the “product space,” looking at the knowledge, inputs and skills needed for producing products similar to the products already exported by the countries in the region (Hausmann and Klinger 2007; Hidalgo et al. 2007; for a summary of the basic concepts, see Box 1). In particular, we examine the portfolio of goods exported by CEE countries and identify potential areas for diversification and upgrading on a country-by-country basis. Following the product space literature, our research pinpoints products similar to those that each CEE country already exports but are not yet exported with a comparative advantage. Among these similar products, more complex products offer particularly promising diversification opportunities (see Box 2 for details).

BOX 1 / THE KEY METRICS OF THE PRODUCT SPACE: THE INTUITION

A product space depicts all products exported in the world. The product space of a specific country is constructed by accounting for the products that the country is exporting successfully (i.e. with a revealed comparative advantage). In this space, ‘similar’ products are placed next to each other, while products that do not share many characteristics are placed far away. Methodologically, the degree of similarity between two products is proxied by the probability of producing one of them for a country that already produces the other. To determine whether a certain export product is ‘compatible’ with the export structure of a country, this literature looks at how similar (related) a certain product is to the products already exported by the country. But all products are not alike, as some require more knowledge and capabilities (i.e. are more ‘complex’) than others.

More complex products offer more advantages in terms of economic growth. The level of complexity of products is captured by an indicator of product complexity. By accounting for the degree of complexity of the products that a country can export competitively, a measure of country-level complexity – referred to as the economic complexity index – provides an indication of how complex a country is.

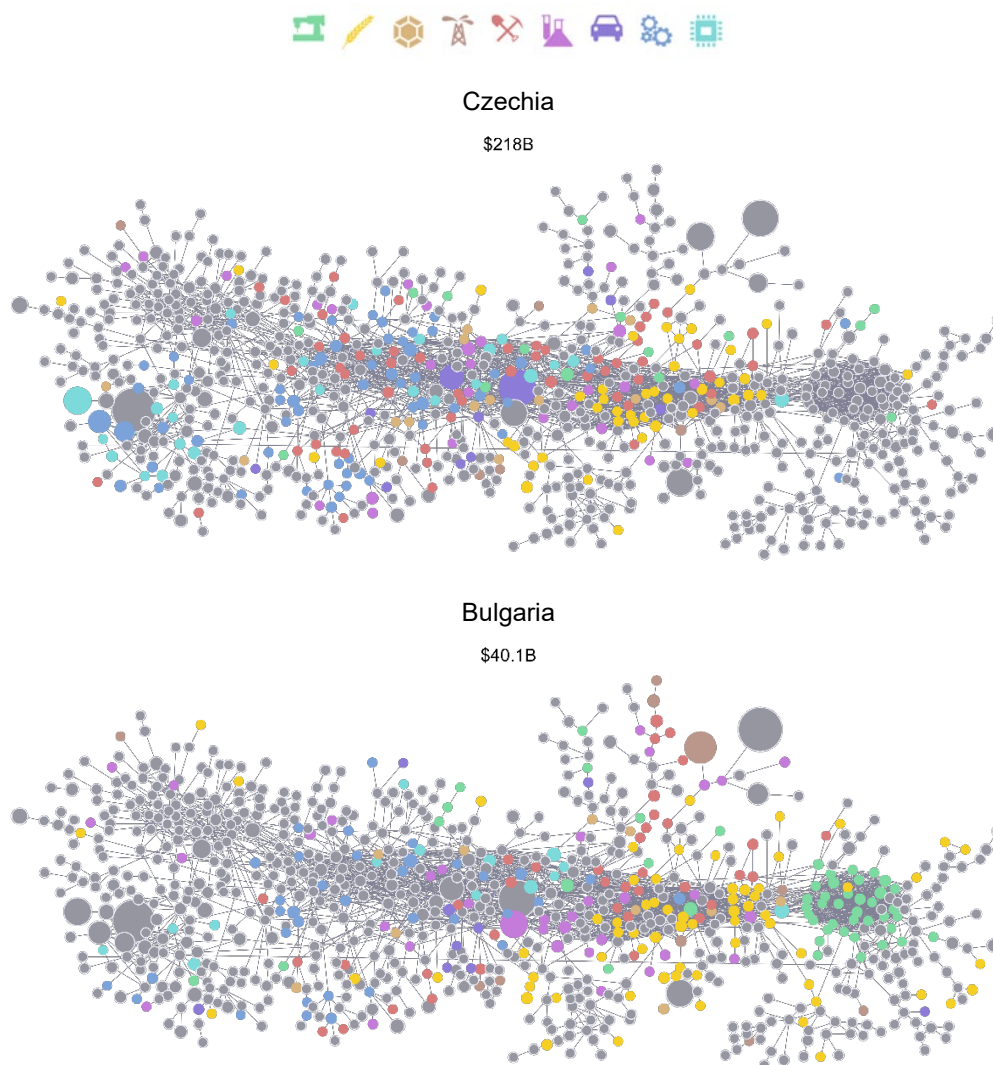
In the typical representation of the product space, trade relations form a network where each dot is a product, and all products are linked based on their degree of similarity. Product groups tend to cluster (e.g. all textile products are placed next to each other, all electronics are clustered, and so on). The core of the product space is more densely populated than the peripheral parts, owing to the higher connectedness of these products. The core of the product space also contains the most complex products.

Source: Guadagno et al. (2024).

¹ Services are not included in this analysis.

Our analysis of the product spaces of the 11 CESEE economies shows that CESEE countries exhibit significant differences in their export patterns, leading to varied diversification opportunities. Figure 4 illustrates this for Czechia (top) and Bulgaria (bottom), the most and least complex economies in the region. Each point represents a product category: grey points indicate products exported by the country without a comparative advantage or not being exported at all, while coloured points indicate those that are exported with comparative advantage, with different colours representing different sectors. Bulgaria's economy is still specialised in sectors such as textiles (the green dots on the right of the product space), an area where Czechia's economy lost competitiveness. Conversely, Czechia is more active in the central part of the product space, where more sophisticated products are located. These include cars and parts of motor vehicles (the two larger purple dots in the middle of the product space), as well as a variety of products within machinery and electronics.

Figure 4 / A comparison of the product spaces of Czechia and Bulgaria in 2020



Note : 4-digit HS products. The size of the bubbles reflects the world export volume of the HS 4-digit product category.
Source : Guadagno et al (2024).

The key characteristics of the product spaces of the other CESEE economies can be summarised as follows:

1. Visegrád group: Hungary, Slovakia, and Slovenia have similar specialisations. They are competitively exporting automotive products and a few more complex products. Similarly to Czechia, they have abandoned lower-tech products, such as textiles. Poland is slightly different from the other Visegrád economies: its product space is particularly dense around least complex products, such as textiles and agriculture. Just a few complex products, most notably computers, are exported with a comparative advantage.
2. While not belonging to the Visegrád group, Romania shares several commonalities with this group of countries: cars and parts of motor vehicles are part of its export basket, together with a few more complex products. However, Romania still maintains a comparative advantage in less complex products such as textiles, agricultural products and metals.
3. The product spaces of the Baltic countries are reminiscent of dual economies, as strong specialisations in less complex products coexist with comparative advantages in some more complex products.
4. The Croatian product space is very dense around agricultural and other resource-intensive products. On the other hand, the core of the product space is not very dense, suggesting that it is not easy for Croatia to diversify into higher-complexity products.

Building on the analysis of the product spaces of the CESEE economies, we identify 102 products that could help the ten CESEE countries diversify and upgrade (for the details on how we identify these products, see Box 2). Of these, 42 are unique to one of the economies.² The other products emerge as opportunities for two or more countries. The most commonly identified products are listed in Table 1, together with the countries for which these products are identified as growth potential. Most of these products with growth potential lie in the Machinery and Equipment and Chemicals sectors. Considering the similarities in the production structures of these economies and the high level of aggregation of our analysis, it is not surprising that some product categories emerge for virtually all countries in the region. On the one hand, it can be argued that each country can and should find specific market niches to target within these broadly defined product categories. From a policy perspective, this finding implies that each country must deploy a battery of indicators to identify profitable and realistic niches within these broadly defined product categories. This is what smart specialisation strategies aim for. On the other hand, it should be considered that these products are more realistic targets for some countries and more ambitious targets for others, implying varying chances of success and risk profiles.

² For example, “radars” only emerge as an opportunity for Estonia, while “batteries” only emerges for Romania.

Table 1 / Recurrent growth potentials in the CEE region

Name	HU	SK	SI	PL	RO	EE	LT	LV	BG	HR
Phenols, phenol-alcohols	x		x			x		x	x	x
Pickling preparations for metal surfaces		x	x			x	x	x	x	x
Prepared culture media for micro-organisms	x	x	x	x		x	x	x		x
Polyamides	x	x				x	x	x	x	x
Ion-exchangers based on polymers	x	x	x				x	x		x
Rubberised textile fabrics						x	x	x	x	x
Calendering or other rolling machines, other than for metals or glass	x	x		x	x			x	x	
Forklift trucks	x	x	x	x		x	x	x		x
Machines for working materials by laser and similar means	x		x			x			x	x
Machining centers for working metal	x	x	x			x				x
Other machine tools for planing and cutting metals	x	x	x	x	x	x	x		x	x
Tools for hand working, pneumatic, hydraulic motors	x	x		x	x			x		
Machines for assembling electric lamps	x		x	x		x	x	x	x	
Machinery for working rubber or plastics	x			x	x	x	x	x	x	
Machines n.e.c.	x	x	x			x	x	x		x
Electric soldering machines	x			x	x	x	x	x	x	x
Parts of motor vehicles						x	x	x	x	x
Microscopes, other than optical	x	x	x			x	x			x
Instruments for physical or chemical analysis	x	x	x	x			x	x	x	x

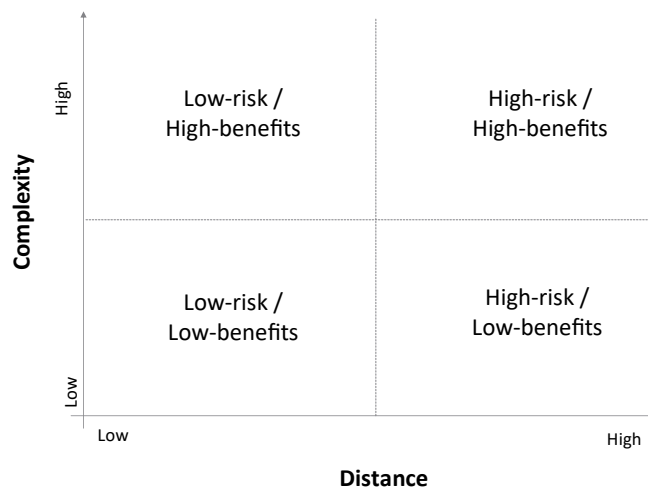
Source: Guadagno et al (2024).

BOX 2 / HOW WE IDENTIFY PRODUCTS WITH GROWTH POTENTIAL USING THE PRODUCT SPACE FRAMEWORK

Some authors (e.g. Balland et al. 2019) have built on the key concepts of the product space to identify the export diversification opportunities available to countries. By intersecting distances (between exported and new products) and products' complexity (Figure 5), four potential diversification strategies can be outlined:

1. A high-risk/high-benefits strategy (top-right quadrant of Figure 5), according to which a country accepts the risks inherent to moving towards different (distant) products to upgrade;
2. A low-risk/high-benefits strategy (top-left quadrant) that allows countries to diversify into products which are both close and complex;
3. A low-risk/low-benefits strategy (bottom-left quadrant) that would lead countries to diversify into both closer and uncomplex products and
4. A high-risk/low-benefits strategy (bottom-right quadrant) that leads countries to diversify into both distant and uncomplex products.

Of these strategies, those in the two upper quadrants are growth-enhancing but differ in their degree of riskiness, as the first strategy requires developing products that are distant from the country's export basket.

Figure 5 / Identifying growth potentials via the product space methodology

Source: Authors based on Balland et al. (2019).

Building on these insights, we identify products that are not too distant (different) from the export baskets of the CESEE economies while being more complex than the products already exported by the country. To select these products, we apply the following four 'filters':

- › RCAs: We take all products without a comparative advantage that the country exports or that were not exported by the country in 2020.
- › Sectoral focus: We exclude natural resources and manufacturing industries based on the processing of natural resources. Services are excluded.
- › Market size: We focus on products with world export values above USD 1 billion.
- › Product complexity greater than economic complexity: We aim to identify growth potentials with an upgrading potential (i.e. that can boost the country's economic complexity).

After applying these filters, we design viable upgrading strategies based on the key characteristics of the CESEE economies. In particular, we identify three groups of countries:

- › Group 1: Countries at high levels of economic complexity (Czechia) – The country is diversified and has capabilities in many complex products. Because further exploring the product space would not lead to upgrading, no growth potentials can be identified via the product space for Czechia.
- › Group 2: Countries at medium levels of economic complexity (Hungary, Slovenia, and Slovakia) – These countries have some capabilities in complex products, although further diversification and upgrading could be achieved.
- › Group 3: Countries at low levels of complexity (Romania and Poland, the Baltic countries, Croatia and Bulgaria) – These countries are still specialised in uncomplex products and are not sufficiently diversified. Hence, two sets of products are listed: i) 'safe bets', i.e. products that allow for upgrading while being close to the country's export basket and ii) 'strategic bets', i.e. products that have great upgrading potential but entail higher risks.

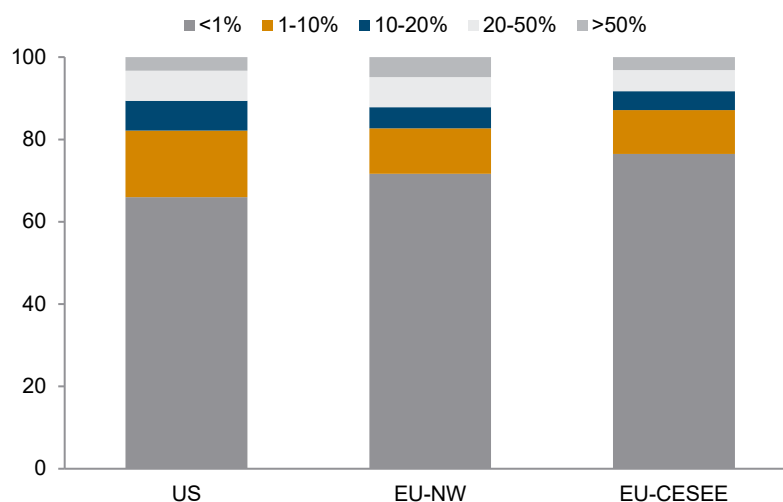
Source: Guadagno et al. (2024).

4. THE ROLE OF INNOVATION IN TRANSFORMING THE CESEE

As this discussion has hinted, a crucial challenge for the CEE region, if it wants to upgrade its growth model, lies in investing in innovation, improving the cooperation between businesses and universities and commercialising new technologies (Ferrazzi et al. 2025). On the one hand, CESEE economies have become significantly more innovative over the past decade. For example, businesses are employing twice the number of R&D personnel than a decade earlier. The share of investments dedicated to intellectual property has seen a gradual uptick, moving from 10% to 12% (Ferrazzi et al. 2025). Moreover, businesses are gravitating increasingly toward the higher value-added segments of production, with numerous foreign companies in the manufacturing sector relocating product development to CESEE. And advanced services are increasing their role.

Despite these positive trends, the region still lags behind their EU peers (see also Zavorská et al. 2024). Businesses in the region invest less in R&D (Figure 6) and training (Figure 7) and engage in fewer collaborations with local universities. Out of the top 2500 R&D spenders in the world, only eight are in CEE (out of which five are in Poland). Overall investment levels in Western Europe and CEE are similar, but intellectual property investments are significantly lower (5.8% of GDP in the US, 4.4% on average in the EU, 3.1% in Southern Europe, 2.9% in CEE, during 2010-2022; McKinsey, 2024; Zavorska et al., 2024).

Figure 6 / R&D investments, % of firms, by share of investment dedicated to R&D

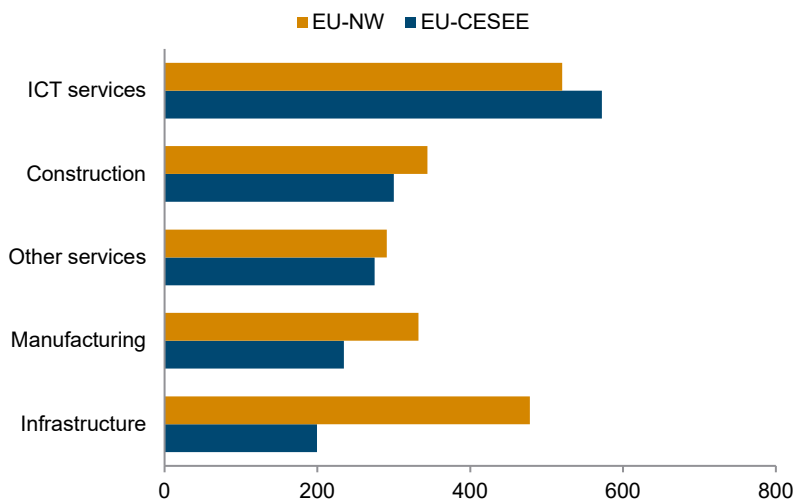


Note: The dark blue bars show the share of firms dedicating less than 1% of their investment expenditures to R&D, and in lighter shades of blue, the share of firms dedicating relatively more of their investment to R&D, on average, over 2015-22. Source: EIB Investment Survey, 2016-23.

Innovation clearly benefits from the large presence of foreign-owned firms, which are often operating in the most innovation-intensive sectors. However, foreign-owned firms do not appear significantly more innovative than domestically owned ones once controlling for their larger size and sectoral concentration in research-intensive manufacturing. Only firms established through greenfield investments show substantially higher productivity compared to their domestic peers. On average, those taken over in M&A transactions were already more productive than their domestic peers before the take-over.

Regarding the commercialisation of new technologies, the cooperation between universities and businesses is key: universities excel at fundamental research and pioneering technologies, while businesses excel at adapting new ideas to market needs. As surveys suggest, universities in the CEE region tend to cooperate less with businesses than their peers in the West and North of the EU. Some benefits can be reached by further supporting the cooperation between universities and businesses. Differences are substantial in manufacturing.

Figure 7 / Corporate investment in training (EUR per employee per year, PPP adjusted)



Source: EIB Investment Survey, 2016-23.

Shortage of skilled labour, exacerbated by emigration and population ageing, and a lack of risk capital are the main barriers to innovation. The shortage of skilled staff is driven by low public R&D investment, inadequate lifelong learning opportunities, and emigration. The overall number of graduates has declined by over 20% in the last decade, mainly due to demographics, and emigration has slowed labour force growth in the region since the 1990s (Astrov et al. 2022). The number of CESEE migrants in the West and North of the EU increased from 1.7mn in 2000 to 6.5mn in 2020. Emigration has slowed labour force growth and is likely to continue, driven by higher salaries, political stability, and differences in mentality, culture, and lifestyle. This suggests that emigration could be lowered through a broad range of policies, including investments in social infrastructure (see also Chapter 5).

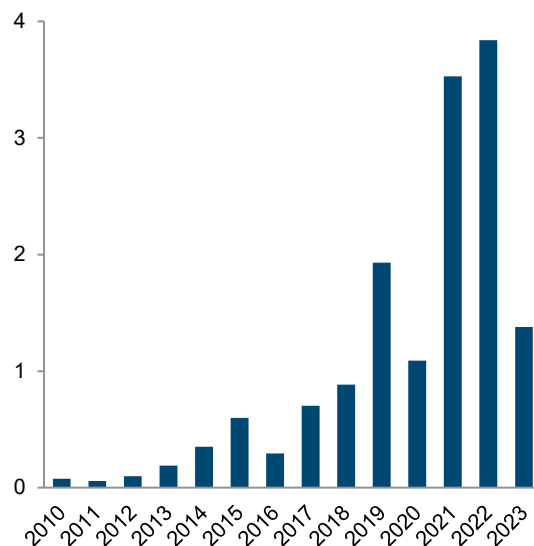
The shortage of risk capital, as highlighted in the Draghi Report, is a challenge throughout the EU and stems from a combination of small market scale, poor liquidity, and limited diversification opportunities³—factors that are interdependent and that need to be tackled simultaneously. In this regard, despite slowdowns in 2016, 2020, and 2023, venture capitalists' investments have grown significantly in CESEE countries over the past decade (Figure 8 – Panel a). The average size of venture capitalists' deals in CESEE has also steadily increased, despite remaining smaller than in North-West Europe and Southern Europe. While the share of venture capitalists' investments in CESEE countries as a share of the EU doubled in recent years, the region remains relatively marginal as a destination for

³ Europe is one of the wealthiest areas in the world, but it suffers from "lazy money" (IMF, 2024), which is not invested in riskier assets: in the US only one-third of the total financial assets sits in banks, while two-thirds in the euro area.

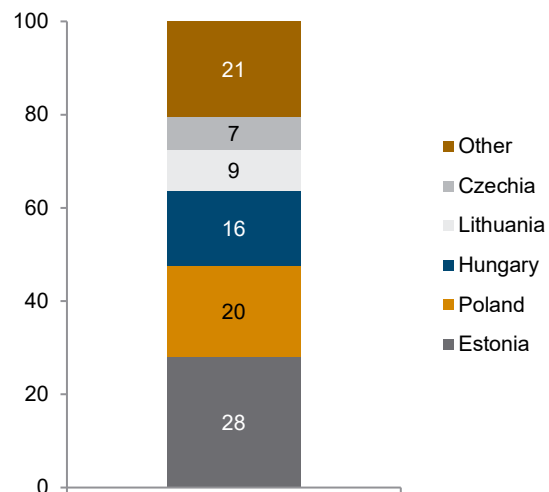
venture capital (5% of total EU VC funds are invested in CESEE countries). Only Poland and Estonia rank among the top ten promising European countries for VC investments in the latest European Investment Fund survey (EIF, 2023). Estonia dominates CESEE VC investments, accounting for 28% of the region's total between 2013 and 2023 (influenced by two VC investments rounds in the ride-hailing platform Bolt), followed by Poland (20%) and Hungary (16%) (Figure 8 – Panel b). Addressing the shortage of risk capital could involve continued development of markets through public funds, such as investments in venture capital, and removing barriers to the capital markets union to channel savings into more sophisticated investments across the continent.

Figure 8 / The status of venture capitalists' investments

Panel a: Venture capital investments in CESEE
(USD bn)



Panel b: Share of venture capital investment by country
(% of CESEE total)



Note: The data have not been reviewed by PitchBook analysts. In Panel b, other countries include Croatia (6%), Bulgaria (4%), Romania, Slovakia and Latvia (3% each) and Slovenia (2%).

Source: Authors' calculations based on Pitchbook data.

Still, the outlook for boosting innovative capacity in CEE seems promising: an increasing number of businesses are relocating product testing and development to the region. Prague hosts several innovative companies in IT, Artificial Intelligence and robotics (for instance, Avast). The city has a vibrant startup scene with many incubators and accelerators. Brno is home to a thriving innovation ecosystem, particularly in IT, life sciences, and engineering. However, in an international comparison, the region is not a hub for innovation clusters. For example, the World Intellectual Property Organization only ranks a single CEE cluster, Warsaw (at 90th position), among its top 100 clusters in its 2023 Science and Technology Cluster Ranking. The region may find it more challenging to attract basic research activities for breakthrough innovations, which rely on a robust ecosystem of solid universities, highly skilled personnel, R&D-active firms, and sufficient risk capital—elements that are more difficult to build in a short time. As a result, closing the innovation gap with Northern and Western Europe will require a coherent strategy with the right level of commitment and resources (see also Zavaršká et al. 2024).

5. POLICY CONCLUSIONS

Since joining the EU, the CESEE region has made considerable progress in terms of economic convergence, fostering structural change and integrating within the most strategic EU value chains. The region has also strengthened its innovation profile, and several CESEE economies now count with diversified economies, vibrant start-up ecosystems, and businesses gravitating toward higher value-added segments of production or diversifying into modern services.

Despite these positive trends, the convergence process has slowed down and several challenges persist. To support sustainable economic growth and competitiveness, our studies find that policy should focus on three main lines: strengthening human capital, fostering innovation, and addressing the comparably high energy costs and energy intensity of the CESEE economies.

Strengthening human capital requires activating dormant labour pools through greater inclusion, particularly by enhancing female labour market participation. Innovation thrives in a diverse and inclusive environment. Therefore, maintaining an open stance towards qualified immigration is essential. The recent immigration from Ukraine to the CESEE region presents a unique opportunity to bolster the talent pool (Ferrazzi et al. 2025; Slačik 2024). Governments can make it easier for immigrants to put their skills to use through local language education, by providing support services to help families settle into the community, by increasing the number of foreign-language schools for expats, and by offering foreign-language programmes at universities (Ferrazzi et al. 2025).

Whether temporary or permanent, emigration will continue to depress the labour force in the region. Younger and more educated individuals appear more willing to migrate, mainly attracted by higher salaries in other EU countries. Meanwhile, emigration can benefit the region when returning emigrants bring back skills and networks they can apply domestically (Ferrazzi et al. 2024). In this regard, investments in social infrastructure would not only be beneficial in themselves but also help reduce the net outward migration of skilled workers (European Commission 2022). Indeed, enhancing cultural, health, and transport infrastructure can make the region more attractive to both returnees and potential new residents. These investments not only help retain talent but also attract new, skilled individuals who are crucial for fostering innovation.

Additionally, upgrading skills by increasing the uptake of STEM subjects is crucial to maintaining global competitiveness. Although the region has quite a high share of graduates in STEM subjects, a gap with more advanced EU countries remains, and the education system struggles to achieve quality (Zavarská et al. 2024). Moreover, occupations in STEM fields are projected to outgrow those in the rest of the economy significantly. To couple this issue, workers with STEM skills are particularly prone to migrate to more advanced countries. These problems are particularly accentuated in some countries of the region, such as Bulgaria, Czechia, Latvia and Slovakia (Slacik 2024). Among the various initiatives in this area, CESEE economies could strengthen research outputs through systematic, independent evaluations and invest in professional development of academic staff to improve the quality of university education (Ferrazzi et al. 2025).

Strengthening collaboration between academia and business, enhancing management expertise, and ensuring access to start-up finance and risk capital are essential for building a robust innovation ecosystem. This would go a long way to encourage firms to explore new specialisations, upgrade and evolve their production capabilities, and pursue more sophisticated products, even when this entails taking strategic risks. Indeed, by enhancing collaboration between academia and business, governments could achieve a variety of important objectives, such as encouraging knowledge flows between academia and industry, supporting the growth of science-based industries, and bringing university curricula closer to industry needs (Zavarskà et al. 2024). In this respect, the “University-business cooperation in Europe” survey results⁴ are quite clear: bureaucratic procedures are to be slimmed down, and more funding needs to be provided to make these cooperations more successful. The success factors are also interesting: aside from funding, the most important are prior relationships, shared goals, and trust. Prior relationships and trust might be fostered through networking events. Shared goals might require rewarding research cooperation more on the side of universities – that is, ensuring that academic evaluation and professional success depend not only on publications (Ferrazzi et al. 2025).

As discussed in this policy note, the CESEE region has widely benefited from FDI inflows: beyond creating new industries and jobs, foreign-owned firms can stimulate innovation by providing finance, transferring technology, but also managerial and organisational know-how via their own local activities (Ferrazzi et al. 2024; Zavarskà et al. 2024). Management skills and expertise can prove strategically important, particularly when foreign companies prepare to undertake research and experimental development activities far from the companies’ headquarters. Indeed, these activities are often conducted close to companies’ headquarters due to the challenges in monitoring them. The transfer of expatriate management to ensure the monitoring of research and experimental development is expensive and might only be justified in large, strategic export markets with large pools of skilled staff, such as India, China, and the US (Ferrazzi et al. 2025). For these reasons, enhancing management expertise could prove vital to fostering functional upgrading in the CESEE region.

As far as the lack of risk finance is concerned, it is worth stressing that this issue affects competitiveness throughout the whole EU, as evidenced recently also in the Draghi Report (Draghi 2024). Still, it is an even greater obstacle to investment for small companies in CESEE countries. The key issues are small scale, poor liquidity, and few diversification opportunities. These problems are typical for small jurisdictions such as those in the CESEE region. Unfortunately, they also tend to influence each other, so they must be tackled together. For example, liquid equity markets attract early-stage investors because they provide an opportunity to exit. When the market is small, fixed investment costs – such as those needed to understand the regulatory framework – can deter investors and prevent its growth. Development banks can play an essential role in substituting for absent private markets and in supporting their development. In the medium term, further integration of EU capital markets and predictable, transparent, and growth-friendly economic policies are also necessary.

Our studies also discussed that the CESEE region has to cope with high costs of energy and high energy-intensity, which hamper its competitiveness but also have the potential to slow down the digital transition, as modern digital technologies, particularly AI, consume large amounts of energy (Slacik 2024). In this context, CESEE governments should make every effort to render energy cheaper for firms

⁴ Source: University-business cooperation in Europe: University Perspective. Country studies, available at [University-Business Cooperation in Europe \(ub-cooperation.eu\)](https://ub-cooperation.eu). Data are from 2017 and aggregated using GDP weights.

in their countries in the medium term. To address this challenge, policymakers should promote a holistic strategy, aiming at transforming energy production, grid and generation investment and developing greener businesses and innovative activities, with an eye to resilience and economic security of the supply chain. This could possibly require optimising tax and subsidy policies and addressing deficiencies and inefficiencies of the (incomplete European) energy market (Draghi 2024). Moreover, improving investment conditions would attract foreign capital and encourage greenfield investments that align with the EU green transition goals, preserving the region's competitiveness in the EU production model.

REFERENCES

- Arce, Ó, D. Sondermann, Low for long? Reasons for the recent decline in productivity, European Central Bank, May 2024.
- Astrov, V., R. Grieveson, D. Hanzl-Weiss, S. Leitner, I. Mara and H. Vidovic, "How do Economies in EU-CEE Cope with Labour Shortages?," wiiw Research Report, No. 463, Vienna, November 2022.
- Bykova, A., R. Dobrinsky, R. Grieveson, M. Grodzicki, D. Hanzl-Weiss, G. Hunya, N. Korpar, S. Leitner, B. Moshhammer, O. Sankot, B. C. Ströhm, M. Tverdostup and Z. Zavorská (2023), 'Industrial Policy for a New Growth Model: A Toolbox for EU-CEE Countries', Joint study of the Friedrich-Ebert-Stiftung and the Vienna Institute for International Economic Studies (wiiw).
- Grieveson, R., A. Bykova, D. Hanzl-Weiss, G. Hunya, N. Korpar, L. Podkaminer, R. Stehrer and R. Stöllinger (2021), 'Avoiding a Trap and Embracing the Megatrends: Proposals for a New Growth Model in EU-CEE', wiiw Research Reports, No. 458, The Vienna Institute for International Economic Studies (wiiw), Vienna, November.
- Delanote, J., M. Ferrazzi, D. Hanzl-Weiß, A. Kolev, A. Locci, S. Petti, D. Rückert, J. Schanz, T. Slacik, M. Stanimirovic, R. Stehrer, C. Weiss, M. Wuggenig, M. Ghodsi, Recharging the batteries: How the electric vehicle revolution is affecting Central, Eastern and South-Eastern Europe, Joint publication of the EIB Economics Department, the Vienna Institute for International Economic Studies (wiiw) and the Austrian National Bank (OeNB), March 2022.
- Draghi, M., The future of European competitiveness – A competitiveness strategy for Europe, 2024.
- European Commission (2022), Intra-EU mobility after the pandemic, Special Eurobarometer 528.
- European Investment Bank, Dynamics of productive investment and gaps between the United States and EU countries, EIB Working Paper 2024/01, January 2024.
- Ferrazzi, M., J. Schanz, M. Wolski, Strengthening CESEE Growth and Competitiveness: The Role of Innovation. The state of innovation, obstacles, and how to overcome them, EIB Working Paper 2025/01, January 2025.
- Guadagno, F., D. Hanzl-Weiss, R. Stehrer, Where are the Growth Potentials in CESEE? An Illustration of Sectors and Products Using the Product Space, wiiw Research Report No. 474, July 2024.
- Guadagno, F., M Landesmann, and Zavorská, Z (eds) (2023). Trends and drivers of global value chains and the role of MNEs in the recent wave of globalisation. Twin Seeds Work Package 1. Available at <https://twinseeds.eu/wp-content/uploads/2023/09/WP1-report-FINAL.pdf>
- Hausmann, R. and B. Klinger (2007), 'Structural Transformation and Patterns of Comparative Advantage in the Product Space' CID Working Paper No. 128, Centre for International Development (CID), Harvard University, Cambridge, MA.
- Hidalgo, C., B. Klinger, A. Barabási and R. Hausmann (2007), 'The product space conditions the development of nations', *Science*, 317(5837), 482-487.

IMF, A Strategy for European Competitiveness, Remarks by Kristalina Georgieva, IMF Managing Director, to the Eurogroup on a Strategy for European Competitiveness, Luxembourg, June 20, 2024.

McKinsey Global Institute, Investment: Taking the pulse of European competitiveness, June 20, 2024.

Pinkus, D., J. Pisani-Ferry, S. Tagliapietra, R. Veugelers, G. Zachmann, J. Zettelmeyer, Economic Governance and EMU Scrutiny Unit (EGOV), Directorate-General for Internal Policies, Coordination for EU Competitiveness, March 2024.

Schnabel, I., From Laggards to leader? Closing the euro area's technological gap, Inaugural lecture of the EMU Lab, European University Institute, February 16th, 2024.

Slacik, T., Still in the Fast Lane? How can EU-CEE Countries Get its Groove Back? wiiw Research Report No. 475, September 2024.

Stöllinger, R. (2021), Testing the smile curve: Functional specialisation in GVCs and value creation, Structural Change and Economic Dynamics, 56, pp. 93-116.

Zavarská, Z., A. Bykova, R. Grieveson, D. Hanzl-Weiss and O. Sankot (2023), 'Industrial policies for a new growth model: a toolbox for EU-CEE countries', wiiw Research Reports, No. 469, The Vienna Institute for International Economic Studies (wiiw), Vienna, July.

Zavarska, Z., Bykova, A., Grieveson, R. and Guadagno, F. (2024). Toward Innovation-driven Growth: Innovation Systems and Policies in EU Member States of Central Eastern Europe, Friedrich-Ebert-Stiftung (FES).

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