

ECONOMY AND FINANCE

THE SECOND TRANSITION

Why Central Eastern Europe Needs Proactive Industrial and Innovation Policy Now

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The countries in Central Eastern Europe (CEE) have strongly industrialised economies and attained income levels comparable to Southern and Southwestern Europe. However, the gap in per capita income with respect to the technological leaders in Northern and Western Europe persists. A “second transition”, focusing on industrial and innovation policy, is necessary to reduce this gap.



Upcoming technological innovations and EU climate action plans will have a strong impact on CEE countries. They must use these changes to attract and foster higher value-added elements of the production process and strengthen domestic technological competencies within their countries.



Fostering these competencies will require active industry and innovation strategies that overcome the specific weaknesses of the current “dependent” growth model and bring productivity closer to the levels seen in Scandinavia or Germany.

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INTRODUCTION

Almost twenty years after joining the EU, the countries of Central Eastern Europe¹ have assumed an important role in the European division of labour. As industry-oriented “factory economies”, they are deeply integrated into the European economy. Overcoming the deep recession of the 1990s, they have caught up with South-Western and Southern Europe in terms of per capita income.² However, compared to the EU’s most advanced economies, the region has been less successful. The gap in per capita income between the Central Eastern European states and the Scandinavian states, Germany, and the Benelux countries has remained relatively constant in recent years – the great promise of an EU-wide convergence of living conditions has got stuck half-way.

Moreover, the industry-based growth model is forecasted to come under pressure in the coming years. The challenges faced by the European economy as a whole are considerably intensified in Central Eastern Europe: the region’s economies are very CO₂ intensive, less productive, and less automated than their Western European partner economies. In many technological areas, they are still less advanced.

Once again, the CEE states will have to adapt their economic policies and growth strategies to changing circumstances. The following document outlines the challenges facing the current CEE growth model and the questions to which answers must be found. At the same time, this paper is also a plea for actors from politics, trade unions, and civil society in this region to engage more intensively with economic policy issues and endeavour to formulate answers to the economic and technological challenges ahead.

1 The term “Central Eastern Europe” is abbreviated to CEE (Central and Eastern Europe) or CEE-EU. The term “Central Eastern Europe” is geopolitical and not used in a narrow geographic sense. In this context, it refers to the states in Central, Eastern, and South Eastern Europe that joined the EU after 2004. Moreover, the term “Western Europe” includes Germany, Austria, and Switzerland, which geographically belong to Central Europe

2 The economic slump at the beginning of the transition, with a decline of 20 to 50 % of GDP in Eastern and Central Europe, was roughly comparable to the slump in economic output that was caused by the Second World War (Csaba 2021: 413).

1

SUCCESSFUL INTEGRATION: THE INDUSTRIAL DIVISION OF LABOUR IN EUROPE

Generally speaking, Central Eastern Europe has experienced satisfactory economic development over the last thirty years. Per capita income in the CEE region has grown significantly and is now around 60 to 80 % of the German value (wiiw 2021: 10).³

Parallel to this development, Central Eastern Europe has become Germany's most important foreign trade partner and has overtaken South and Southwest Europe as an economic partner and investment area. Germany's foreign trade with CEE is markedly higher than Germany's trade with countries like China, France, or the USA.⁴

³ Historically, this is a relatively high value. Estimates by economic historians assume that the per capita income of East Central and Eastern Europe in the last two centuries was historically between 48 % (1820) and 41 % (1913) of the Western European value (Podkaminer 2015: 84). However, there have certainly been exceptions. For example, Bohemia was significantly more prosperous and industrial than large parts of Western Europe until 1945. In contrast, the current values for the EU's poorest member, Bulgaria, as well as for Croatia are still significantly lower than the figures given for the region as a whole.

The economic growth of the last thirty years was mainly due to a sustained increase in industrial production. Accordingly, the CEE countries are today characterised by a very high share of industry, especially manufacturing, in GDP.

⁴ More figures on Germany's foreign trade can be found in Destatis (2022).

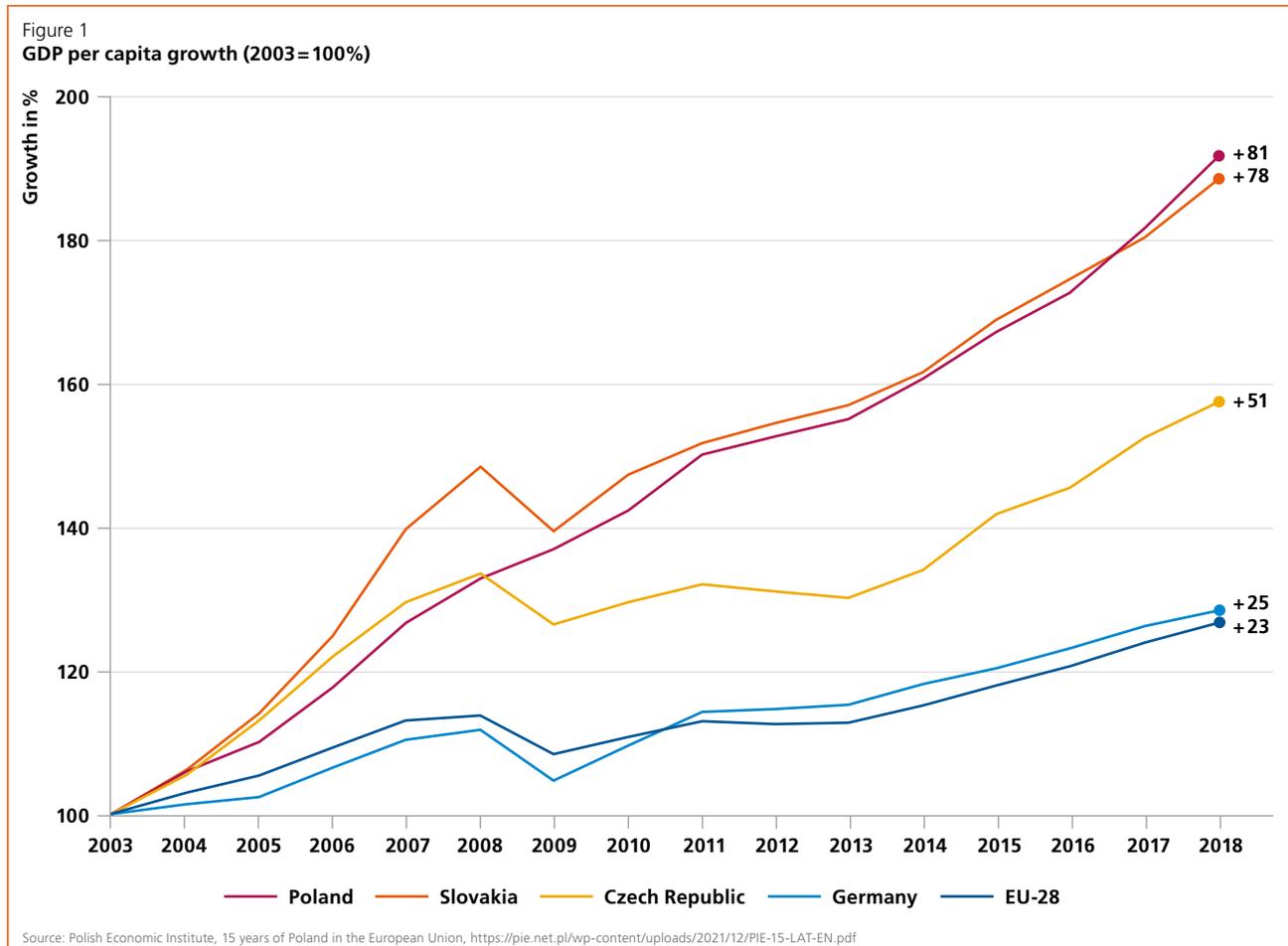


Table 1
Share of industry in GNP by per cent of gross value added (2019)

	Share (in %)
EU average	19.7
Eurozone	19.3
Central Eastern and Southern Eastern Europe	
Bulgaria	21.3
Czechia	29.2
Estonia	19.2
Croatia	19.2
Latvia	15.2
Lithuania	20.8
Hungary	24.1
Poland	25.1
Romania	24.1
Slovenia	26.7
Slovakia	24.5
Western Europe	
Germany	24.2
Austria	21.9
France	13.5
Italy	19.6
Netherlands	14.9

Source: Eurostat, [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Bruttowertsch%C3%B6pfung_zum_jeweiligen_Herstellungspreis,_2009_und_2019_\(%25-Anteil_an_der_Bruttowertsch%C3%B6pfung_insgesamt\)_FP2020.png](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Bruttowertsch%C3%B6pfung_zum_jeweiligen_Herstellungspreis,_2009_und_2019_(%25-Anteil_an_der_Bruttowertsch%C3%B6pfung_insgesamt)_FP2020.png)

The automotive sector has played and continues to play a very important role in this development. Due to large investments by Western European corporations, the CEE countries, and the Visegrád group in particular (Czech Republic, Slovakia, Hungary, and Poland), have become important produc-

tion sites for passenger car manufacturing. This sector now accounts for almost one-third of the value added in industrial manufacturing in the region, with particularly high shares in Slovakia (38.3%), the Czech Republic (27.7%), Hungary (25.7%) and Romania (23.4%) (2018 figures; wiiw 2021: 29).

Table 2
Car production by country (2019)

Country	Number cars
Germany	4,661,328
Spain	2,248,019
Czechia	1,427,563
Slovakia	1,107,902
France	1,665,787
United Kingdom	1,303,135
Italy	542,007
Romania	490,412
Hungary	498,158
Poland	434,700
Sweden	279,000
Portugal	282,142
Belgium	247,020
Austria	158,400
Netherlands	176,113
Slovenia	199,114
Finland	114,785

Source: Statista, <https://de.statista.com/statistik/daten/studie/163017/umfrage/produktion-von-pkw-in-verschiedenen-laendern-europas/> 27.6.22

This strong industrial development is also reflected in CEE's industrial and technological competitiveness. In the United Nations Industrial Development Organization's (UNIDO) global "Competitive Industrial Performance Index", the CEE countries are now in good positions: 16th (Czech Republic), 22nd (Poland), 26th (Slovakia), 27th (Hungary), and 30th (Slovenia). The Baltic countries, however, are clearly lagging behind (UNIDO 2020).

The same picture emerges when comparing only the economies of Europe: the CEE countries have attained middle ranks regarding industrial competitiveness within Europe.

This development is associated with increased technological complexity in CEE economies. In the MIT's "Economic Complexity Index", which assesses "the knowledge intensity of

Table 3

Regional Europe in the Competitive Industrial Performance Report (UNIDO 2020: 44)

Regional rank	Economy	Global rank	Rank in the 1 st dimension	Rank in the 2 nd dimension	Rank in the 3 rd dimension	Absolute change compared to 2012
1	Germany	1	5	6	3	0 ↔
2	Ireland	6	1	3	23	7 ↑
3	Switzerland	7	2	11	16	-1 ↓
4	Netherlands	10	6	28	13	-1 ↓
5	Italy	11	18	21	6	0 ↔
6	Belgium	12	4	24	19	0 ↔
7	France	13	21	22	7	-3 ↓
8	Austria	14	7	18	26	2 ↑
9	United Kingdom	15	29	35	9	-1 ↓
10	Czechia	16	13	5	28	2 ↑
11	Sweden	17	9	19	27	-2 ↓
12	Spain	18	31	31	12	1 ↑
13	Denmark	21	8	20	33	0 ↔
14	Poland	22	35	25	21	4 ↑
15	Finland	25	14	27	37	-2 ↓
16	Slovakia	26	16	10	41	3 ↑
17	Hungary	27	20	8	34	0 ↔
18	Slovenia	30	15	14	57	4 ↑
19	Romania	31	42	16	35	6 ↑
20	Russian Federation	32	61	74	15	-1 ↓
21	Portugal	33	34	45	42	3 ↑
22	Norway	36	25	76	47	-4 ↓
23	Lithuania	41	23	37	59	2 ↑
24	Luxembourg	46	10	75	81	5 ↑
25	Belarus	47	48	23	56	-7 ↓
26	Estonia	48	24	44	75	4 ↑
27	Greece	49	45	72	50	1 ↑
28	Bulgaria	54	50	46	61	4 ↑
29	Croatia	57	43	47	68	2 ↑
30	Latvia	58	40	53	80	6 ↑
31	Serbia	62	62	43	67	10 ↑
32	Ukraine	69	92	55	54	-13 ↓
33	Malta	71	36	49	107	-5 ↓
34	North Macedonia	77	59	40	96	12 ↑
35	Iceland	79	30	122	114	-4 ↓
36	Bosnia and Herzegovina	80	63	63	90	7 ↑
37	Republic of Moldova	111	112	69	126	8 ↑
38	Albania	118	103	143	125	-2 ↓
39	Montenegro	127	100	114	141	1 ↑

Source: UNIDO, Competitive Industrial Performance Report 2020, Geneva, 2021, p. 44, Regional Europe

an economy by considering the knowledge intensity of the products it exports”, the CEE countries have persistently climbed upwards and are now ranked 7th (Czech Republic), 12th (Slovenia), 14th (Hungary), 15th (Slovakia), 23rd (Poland), 24th (Romania), 27th (Estonia), 32nd (Lithuania), and 35th (Latvia) (OEC 2019).

This development reflects the successful integration of these countries into the value chains of Western European corporations, and German corporations in particular, over

the last thirty years. This integration has led to high capital investments by TNCs with a corresponding transfer of production technologies and a subsequent technological upgrading of exports.

However, overall labour productivity in the region still lags behind the EU average (see Table 4).

The labour market has improved continuously over the last thirty years and is now characterised by relatively low un-

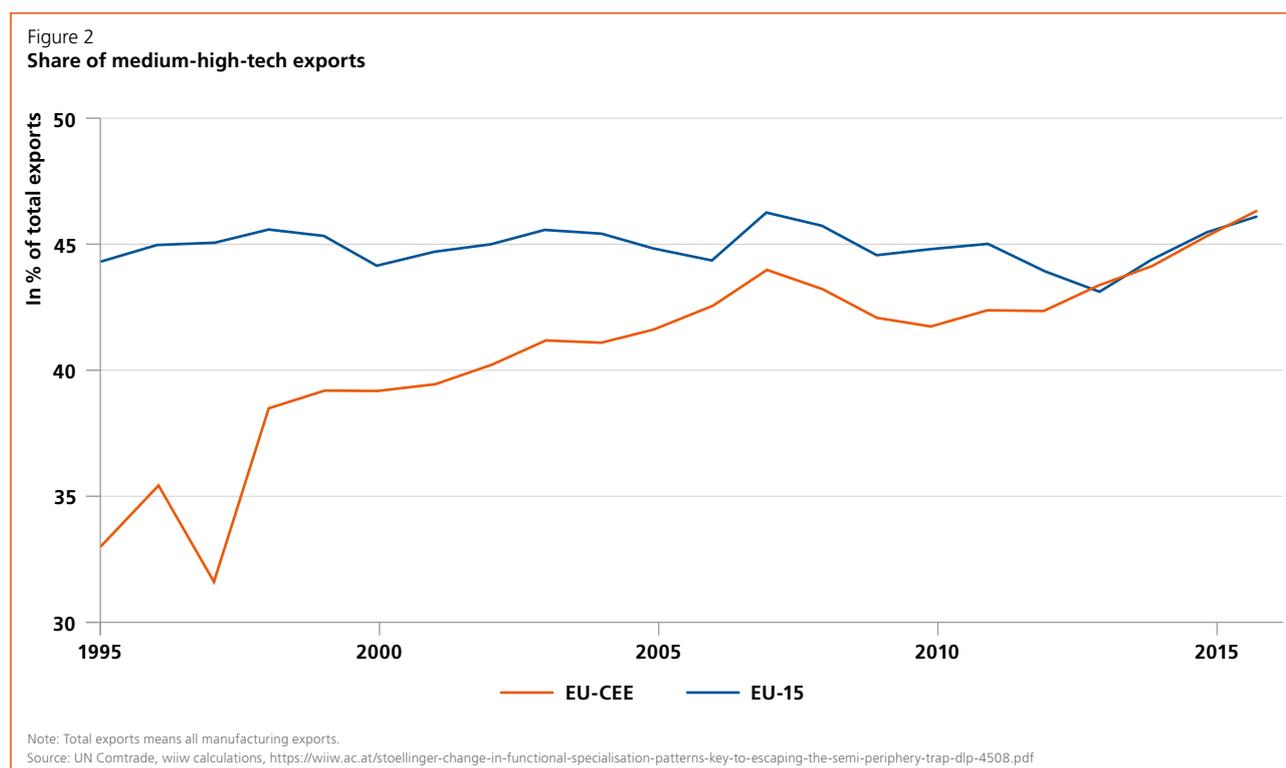
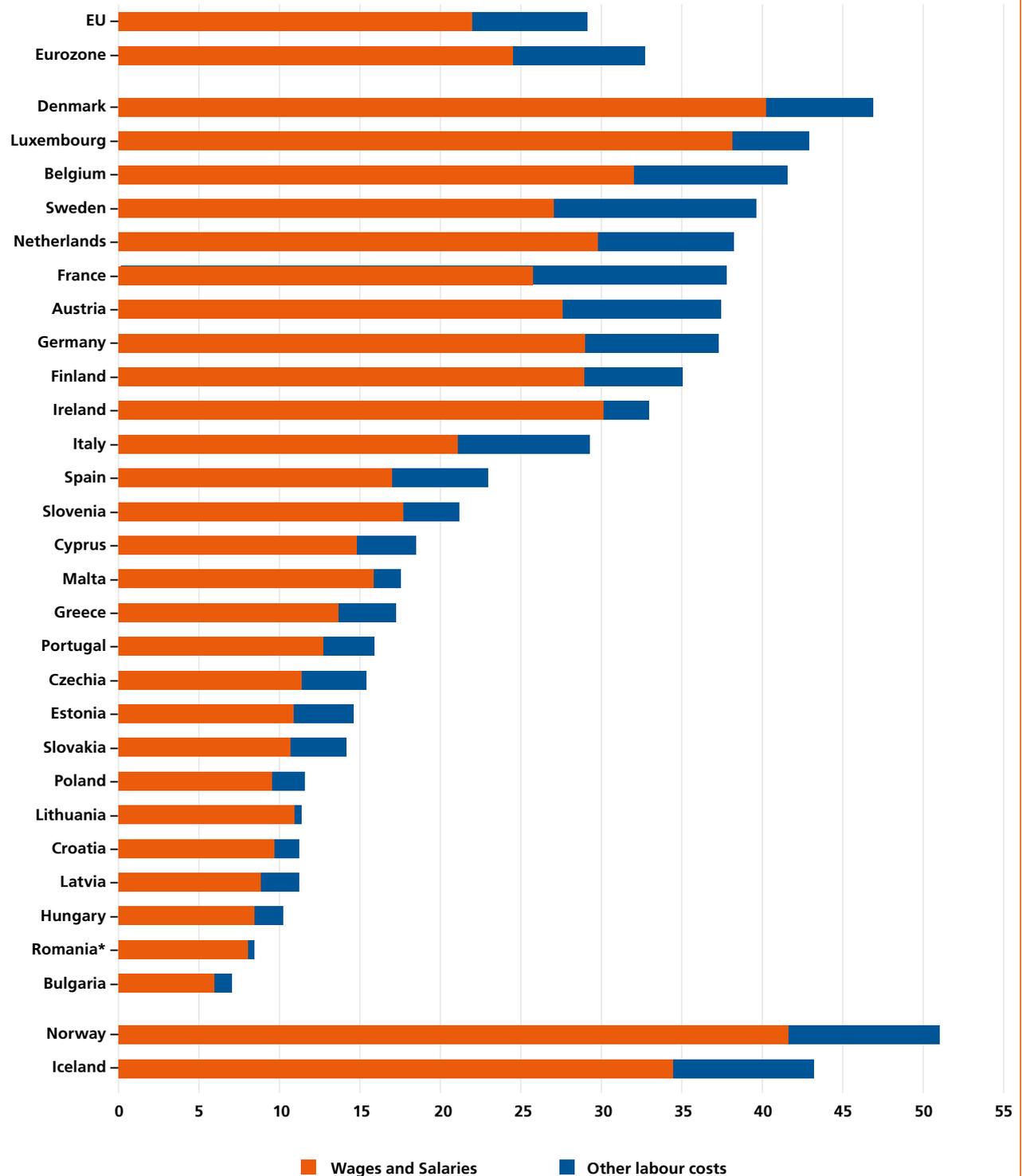


Table 4
Nominal labour productivity

Labour productivity per	Hour of labour		Employee	
	2005	2020	2005	2020
EU 27 countries (since 2020)	100.0	100.0	100.0	100.0
Bulgaria	37.6	48.8	37.0	50.8
Czechia	70.4	77.7	75.3	85.9
Estonia	50.7	72.5	60.4	80.8
Croatia (preliminary)	59.3	60.2	67.8	71.6
Latvia	42.3	59.9	52.8	70.1
Lithuania	49.1	69.9	55.7	81.9
Hungary	63.2	68.2	68.8	71.1
Poland	50.3	63.6	62.0	81.7
Romania	33.0	64.2	36.7	75.2
Slovenia	83.8	83.2	84.3	82.7
Slovakia	67.0	72.0	70.3	73.5

Source: Eurostat, <https://ec.europa.eu/eurostat/databrowser/view/tesem160/default/table?lang=de>

Figure 3
Hourly labour costs EU (2021)



* Romania: The estimates of the wage and salary / non-wage breakdown are not comparable with the periods prior to 2018 due to changes in national legislation.
 Note: whole economy (excluding agriculture and public administration); in enterprises with 10 or more employees. Provisional data.
 Source: Eurostat (online data code: lc_lci_lev), https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Hourly_labour_costs#Hourly_labour_costs_ranked_between_E2.82.AC7.0_and_E2.82.AC46.9_in_2021.

employment and generally rising wages. Overall, there has been a positive wage development in all CEE countries with a slow convergence towards Western European figures (wiiw 2019: 6). However, wages in the region are still significantly lower than in large parts of Western and Northern Europe (see Figure 3).

Energy production in CEE is still very dependent on hydrocarbons; the overall CO₂ intensity of production is very high (see Figure 5). Both energy efficiency and overall resource productivity are, despite considerable progress in the past thirty years, still below the values of the EU15 (wiiw 2021: 34 f.).

2

THE CURRENT GROWTH MODEL: DEPENDENT MARKET CAPITALISM AND THE "FACTORY ECONOMY"

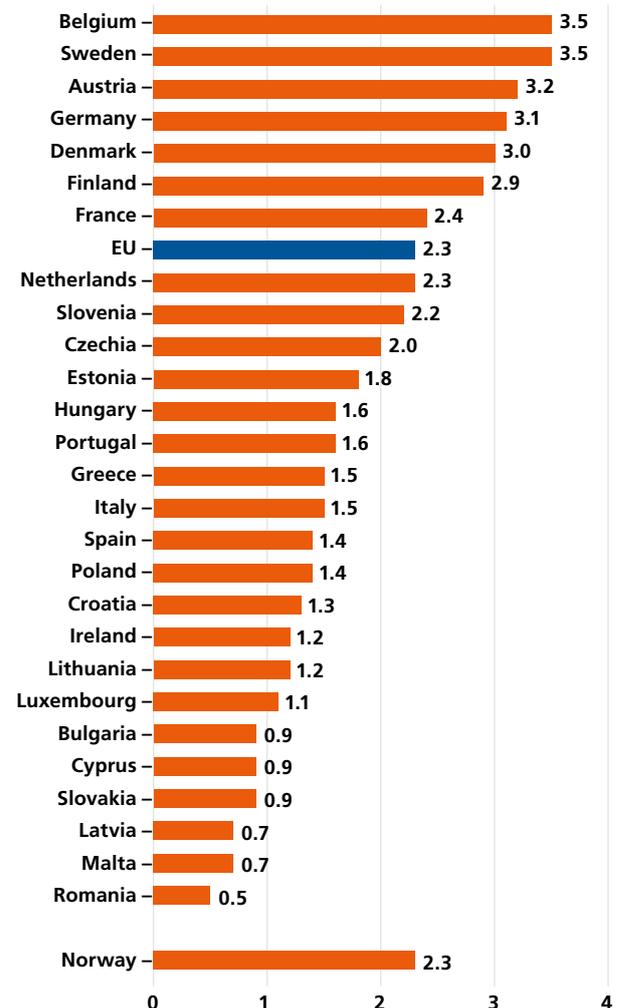
The central characteristic of the Central Eastern European growth model thus far has been its successful integration into the industrial value chains of transnational corporations. It is therefore characterised by a number of peculiarities that distinguish it from other successful growth models in Europe (the EU convergence process after Southern enlargement) and worldwide (the "East Asian miracle").

In capitalism research, Central Eastern Europe has been assigned its own model, termed the "dependent market economy" type by Nölke and Vlieghart (2009). This model is characterised by a high degree of control by foreign capital in both the production and financial sectors, a functionally subordinate role of domestic enterprises, and a concentration on production functions with little influence on corporate management and decision-making, which continue to reside with corporate headquarters in Western Europe. Technological autonomy is low; innovation occurs primarily through intra-firm transfer within transnational corporations. This model differs from both the Southern European and East Asian models primarily in the central role of foreign investors and the low importance of national (private or state-owned) enterprises, especially in the highly productive segments of the economy. The comparative advantage in the dependent market economies is based on a relatively low remuneration of labour and the production of standardised industrial goods (Nölke / Vlieghart 2009: 680, Podkaminer 2015: 98).

All in all, this specialisation has led to the emergence of strongly industrial "factory economies", which are complementary to the Western and Northern European "headquarters economies". While the latter concentrate on the technological and marketing competencies, the CEE economies specialise in manufacturing processes with lower level technology and know-how requirements. This has a significant impact on the per capita income of the respective economies. In the globalised economy, the distribution of value-added runs along a U-shaped "smiling curve": profits are highest at the beginning, in development and design, and at the end, in sales and marketing. They are lowest in the middle of the curve, in industrial production. This is precisely the area in which the functional specialisation of the factory economies in the CEE countries has taken place (wiiw 2021: 14 ff.).

An important aspect of the division of labour between the Western European "headquarters economies" and the Central Eastern European "factory economies" and a central weakness of the development model of "dependent market capitalism" is the low level of expenditure on research and development (R&D) in CEE. Despite the high share of industrial production, R&D expenditure in the CEE countries is still below the EU average.

Figure 4
R&D expenditure EU (2020) (as % of GDP)



Source: Eurostat, <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20211129-2>

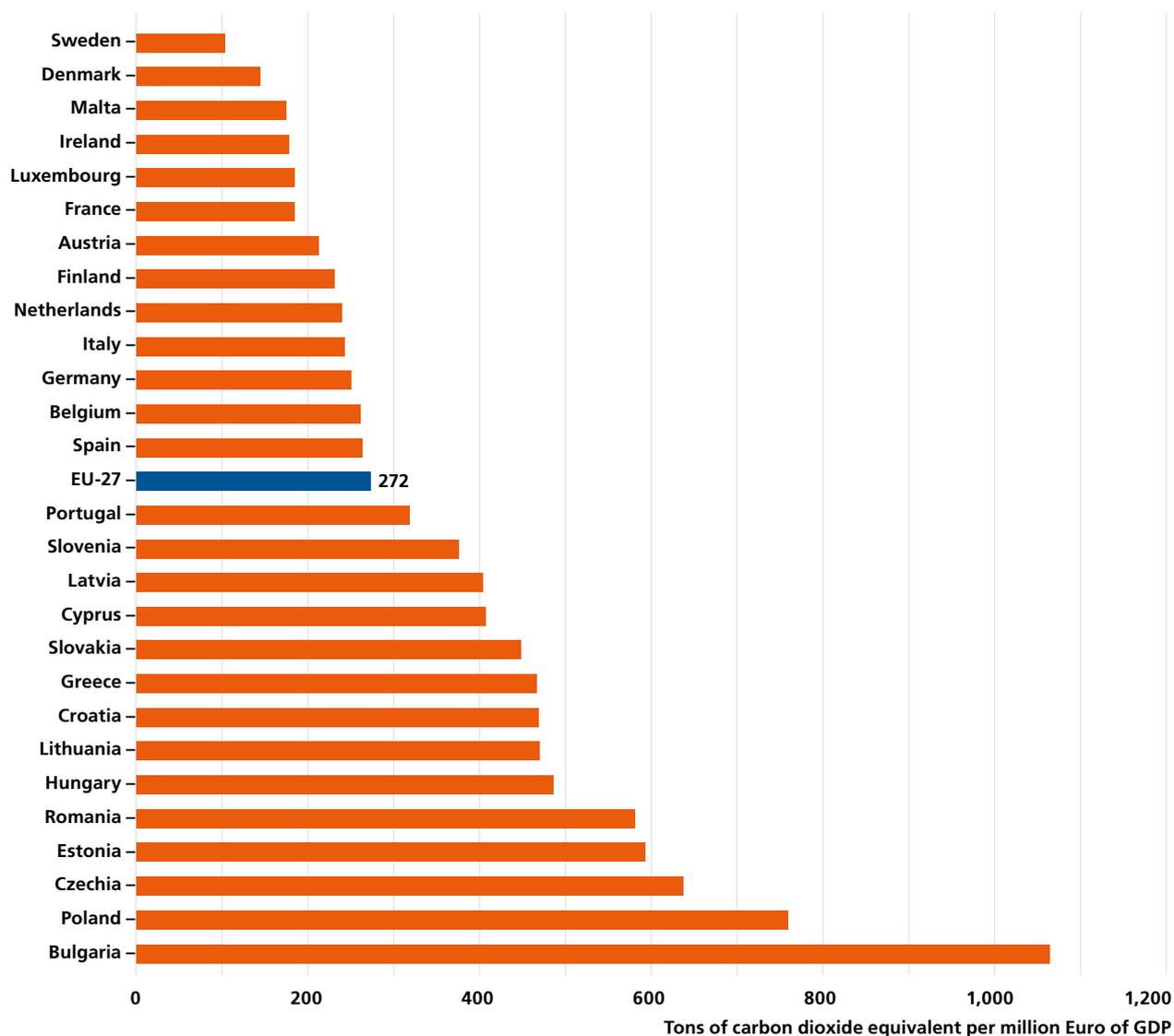
CHALLENGES FOR THIS GROWTH MODEL

The “dependent”, but not unsuccessful growth model in the CEE countries will likely come under considerable pressure in the coming years due to forecasted changes in technology and demographics.

In a study commissioned by the FES, the Vienna Institute for International Economic Studies (wiiw) names four “megatrends” that are particularly relevant in this regard (wiiw 2021):

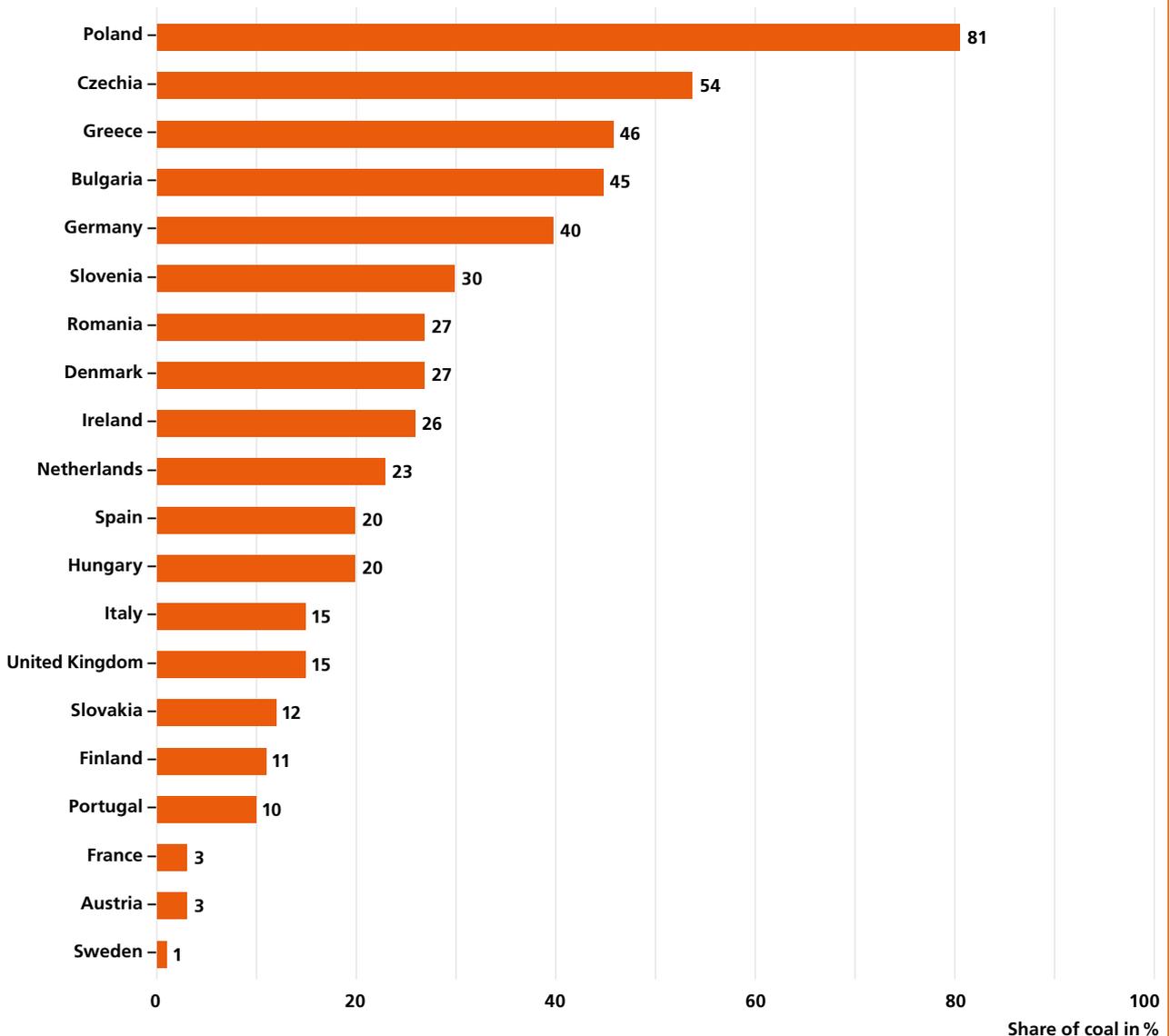
- 1) The technological change in the automotive sector with the transition to electric vehicles will have a stark impact on automotive manufacturing;
- 2) Digitalisation will continue to advance in the coming years and, via platforms and machine-to-machine communication (Industry 4.0), strongly affect the sectors that play a major role in CEE economies. The region certainly has some potential in this area, but it lags significantly behind other EU countries in terms of breadth and expertise.
- 3) Demographic change in CEE caused by a dramatic drop in birth rates after the fall of communism will lead to a shortage of workers in the coming years. Currently, CEE countries have some of the lowest unemployment rates in the EU.
- 4) The Green Transition and efforts to move to CO₂ neutrality will be problematic for these countries. The region has a comparatively high CO₂ output and dependence on fossil fuels in energy production. Climate neutrality endeavours will be very expensive in the region; however, failure to adapt could cause lasting damage to the export-oriented growth model.

Figure 5
EU greenhouse gas emissions per unit of GDP (2019)



Source: German Environment Agency, <https://www.umweltbundesamt.de/daten/klima/treibhausgas-emissionen-in-der-europaeischen-union#emissionen-in-relation-zum-bruttoinlandsprodukt-bip>

Figure 6
Share of coal in EU electricity production (2020)



Source: Statista, <https://de.statista.com/infografik/19391/kohleanteil-an-der-stromerzeugung-in-europa/>

The EU's decision to phase out coal is of particular importance in this context. Especially the most strongly industrialised CEE economies still have a very high share of coal in electricity generation (see Figure 6).

Hence, the ecological challenges of this growth model should not be underestimated. A recent study by the German Federal Environment Agency identifies eight "high-impact industries" that will be "very strongly" or "strongly" affected by ecological structural change. All industries listed in the study play an important role in the CEE economies today: Construction, energy supply, chemicals, pharmaceuticals, vehicle manufacturing, food industry, and agriculture (Federal Environment Agency 2022).

As a consequence of technological change and ecological and economic constraints, a further evolution of the economic division of labour in Europe is expected. Digitalisation is shifting growing shares of value creation to the service

sector. Factors such as market proximity are losing importance, as digital goods tend to be globally producible and tradable. Digitalisation and changes in production processes will also profoundly impact the labour market. They will significantly change the structure of labour demand as well as the balance of power between capital, labour, and politics. The impending structural change also has considerable spatial or geographic dimensions. The concern is that these changes will further intensify the existing tendency to split CEE economies (and societies) into profitable (urban) centres and a (rural/deindustrialised) periphery disconnected from economic and cultural development. Industrial and (coal) mining regions that have so far benefited from the factory growth model are in danger of becoming victims of rapid structural change.

The aforementioned study by the Vienna Institute for International Economic Studies summarises a number of challenges arising from the growth strategy pursued so far.

“Perhaps the most concerning finding in this paper is that EU-CEE has an extreme level of specialisation in industrial production, way above what would be predicted given its development level, and that there are few signs of diversification. EU-CEE lacks activity in the more profitable and secure headquarters, R&D, and post-production functions. We identify this as a type of trap that leaves the region exposed to competition from lower-cost locations. Realistically, the functional specialisation trap cannot be broken, or at least not quickly and decisively.” (wiiw 2021: 51)

CEE countries are thus faced with the challenge of modifying the growth model of the last decades and adapting it to the changing framework. Moreover, the countries will undertake this task under the dual conditions of having relatively dependent economies and of lacking technologically advanced domestic large-scale enterprises (Ryc 2017). However, the effects of the “megatrends” identified by the wiiw are by no means only negative for Central Eastern Europe. The Corona crisis and the Ukraine war have triggered a debate about re-strengthening European manufacturing and technology capacities so as to increase the resilience of the European economies to external geopolitical or trade policy shocks. This will certainly also lead to industrial “near-shoring” processes to reinforce manufacturing capacities in Europe. Here, the CEE region has a number of comparative advantages. Technological disruption also offers entry opportunities for “newcomers” from CEE. The challenge for policymakers will be to apply these trends to break out of the current specialisation trap and significantly increase the overall productivity of the region’s economies. To do this, however, CEE policymakers will have to get involved in a sphere that has not played a very important role in the 30 years since the fall of communism: Active industrial and innovation policy.

3

THE SHAPE OF THINGS TO COME: INDUSTRIAL AND TECHNOLOGICAL CHANGE

As a whole, European industry faces considerable challenges to which the response adds up to a large-scale modernisation and transformation programme. A paper by the “Economic Forum” of Germany’s Social Democratic Party (SPD) speaks of “probably the most profound, comprehensive and rapid transformation since the beginning of industrialisation” (Wirtschaftsforum der SPD 2021: 7).

The list of factors challenging the existing economic, technological, and industrial arrangements is long and presented in myriad ways by different sources. Broadly speaking, the disruptive factors can be divided into five categories:

- “Game-changer technologies”: The German Government’s “Strategy for Industry 2030” [*Industriestrategie 2030*] classifies under this term innovations with particularly profound effects, including artificial intelligence, automation in connection with further advancing digitalisation (Industry 4.0), biotechnologies (bionics, genetic engineering), new materials, nanotechnologies and quantum computing (BMW 2019: 8).
- Consequences of digitalisation: A central element here is the growth of the platform economy with its enormous potential for scaling and the creation of global monopolies or oligopolies in the data economy (Brynjolfsson / McAfee 2014). However, other technological developments can also be included in this area, such as the development of autonomous vehicles and data-driven logistics.
- Ecological challenges and consequences of climate policies: Here, the need for rapid decarbonisation of production is mentioned first and foremost, as well as the need to quickly create a “green hydrogen” economy and a resource-conserving circular economy. The upcoming changes in mobility related to the large-scale introduction of electric vehicles are also relevant.
- Demographic changes: In Europe’s ageing societies, the tightening of labour supply will exert considerable pressure on enterprises, welfare systems, and the economy.
- Consequences of globalisation and a new geography of the world economy: Landesmann / Stöllinger (2020) refer to the “emerging markets challenge”, especially for in-

dustries in the low and medium technology sector. However, this pressure from new industrial nations, above all China, but also other states in East Asia, is also felt by the technologically leading European countries. With its “Made in China 2025” strategy, China has formulated an ambition to establish itself in key high-tech sectors. The aim of achieving or preserving technological sovereignty, especially in core areas of the “digital economy”, is increasingly becoming a motif of industrial and innovation policy in the EU, the USA, and other industrialised countries. The SPD Economic Forum counts cloud technologies, digital infrastructure and services, AI, quantum computing, chip production, software development and battery cell technologies among these core areas (Wirtschaftsforum der SPD 2021).

Against the backdrop of these trends, both the EU and its individual member states have again turned to industrial policy. The notion of an active industrial policy, which was an essential pillar of the economic policy of many European states in the post-war period (“*les trentes glorieuses*” from the 1950s to 1970s), suffered a loss of importance starting in the 1980s. These subsequent decades were marked by the dominance of liberal and neoliberal ideas in economic policy (Cherif / Engler / Hasanov 2020). The paradigm shift observed in recent times has motives and objectives that differ considerably from country to country (Economist 2022). Nevertheless, a worldwide renaissance of industrial policy can be observed: “It seems that for some years now, industrial policy has been largely rehabilitated among the major economic powers— if not at the discursive level, then at least in practice” (Aussilloux, Vincent, et al. 2020: 457).

In Germany, the concept of an “ecological industrial policy”, pursued by the Federal Ministry of Economics under then Minister Sigmar Gabriel, had a lasting effect on the rehabilitation of the idea of industrial policy. In this formulation, the Ministry sought to link the ideas of ecological renewal and resource efficiency in industrial production with considerations for the long-term global competitiveness of the German industry. Germany, according to the core argument, must become a worldwide technology leader in eco-technologies to be able to secure a strong international position of its export industries in the future (Machnig 2011, Mikfeld 2012).

THE SPECIFIC TASKS OF ECONOMIC POLICY IN CENTRAL EASTERN EUROPE

The need for an active industrial policy is particularly acute in the CEE-EU countries. Their economies are characterised by a combination of a high share of industrial production and a comparatively low level of technological sovereignty. Due to the specialisation in “contract manufacturing” for the Western and Northern European “headquarter economies”, technological competence and decision-making powers are limited. Innovation within the subcontracting firms and the local manufacturing sites of foreign investors take place only to a limited extent, as research and development capacities remain concentrated in the headquarters of the transnational corporations (wiiw 2021). Of the one thousand European companies with the highest R&D expenditures, only six come from CEE: one company from the Czech Republic, two from Poland, two from Slovenia, and one from Hungary. None of these six companies ranks among the top 200 on the “EU-Industrial R&D Scoreboard 2020” (European Commission 2020).

However, it is precisely the technological competitiveness of domestic firms that is the key to a successful national “upgrading strategy”. Because this point is so important, we quote here at length from an IMF working paper on this topic:

“We argue that the key to long-run sustained growth to reach the advanced country status and then keep up with the frontier growth is to promote technology and innovation at each stage of development. And the way to create technology and generate innovation is to produce sophisticated products. In fact, doing so and competing with other firms requires R&D and innovation in the first place. [...] And it is not only producing sophisticated products, but also producing it by domestic firms. This is the second key element. Only then creating own technology would be possible. Creating and growing domestic innovators should be the focus of Technology and Innovation Policy. (Cherif / Hasanov 2019: 45)

It is unlikely that market forces alone can alter the existing specialisation patterns. Instead, proactive industrial policy measures are needed to attract or develop knowledge-intensive segments of the industrial production chain. However, any industrial modernisation agenda in CEE is subject to reservations and limitations. They result from the political-economic order, industrial specialisation patterns, the economic and structural policies pursued so far, and the limited availability of political instruments. The decisive factor here is the membership in the EU with its open markets for goods, services and labour and the narrow margins for national industrial policies created by the EU competition rules. The CEE countries simply lack many of the economic and political instruments that have enabled the leading economies of East Asia to first catch up to and then join the club of highly productive and innovative economies (World Bank 1993; Wade 1990; Chang 2002;

Ryc 2017; Cherif / Hasanov 2019).⁵ The fact that the key industrial resources in the CEE countries are controlled by or dependent on foreign companies has a significant impact on the dynamics of industrial and technological development.

Under these specific circumstances, the state would have to play a particularly active role in R&D promotion and innovation policy. However, the institutional, financial and structural prerequisites for this are often lacking in CEE. The economic strategy pursued after 1990 was fundamentally neoliberal (Ther 2014). State intervention in the economy was seen as generally harmful, and the corresponding institutional resources were not created. Similar to the German reunification process, the technological and research potentials that had existed at the end of state socialism were not nurtured or fell to new Western owners who had little interest in maintaining these capacities. The technological competence gains of CEE companies that can be observed since the 2000s are essentially based on technology transfer from the “headquarter economies” and not on endogenous technological innovations. Additionally, the rigid corset of EU competition rules gives the CEE countries little leeway for an active technology and industrial policy. Moreover, the allocation and investment dynamics within the European single market favour the reinforcement of existing clusters and specialisation patterns and the concentration of know-how. These clusters also syphon human capital from the peripheries to the higher income regions of Europe (Landesmann / Stöckinger: 17).

All these factors combined constitute a major obstacle to national industrial policy creation in the CEE countries. Nevertheless, to safeguard the level of economic development and living standards that have been achieved, these countries have no choice but to engage in intensified industrial policy efforts: “Innovation-led growth” will remain the central driver of economic development in the coming years and decades (Aghien et al. 2021). In addition, the challenge posed by the rising powerhouses in global trade is of growing importance for the region: “The structural development issue is closely connected to the emergence of major new players in the global trade arena – first and foremost China – because the greater overlap in economic structure between the CEE and Southern EU

⁵ In their paper on industrial policy, Cherif and Hasanov distinguish between three “success levels” of industrial and technology policy: the ambitious “moonshot approach” of East Asia, the “leapfrog approach” which incorporates active industrial policy and state intervention, and the passive “snail crawl approach”, based on neoclassical economic policy assumptions fixated on structures and institutions. The problem for the states in CEE is that, as EU members bound by the EU competition rules, they essentially only have the instruments of this “snail crawl” approach to industrial development at their disposal: “We argue that a standard growth recipe such as improving business environment, institutions, and infrastructure, preserving macro-stability, investing in education, and minimising government interventions is not sufficient to sustain high long-term growth and to a large extent, constitutes the lowest gear of true industrial policy, or the snail crawl approach” (Cherif/Hasanov: 7).

member states and emerging economies exposes them to fiercer competition” (Landesmann / Stöllinger 2020: 17). The CEE countries must try to break out of the existing specialisation trap of middle-income factory economies, strengthen their own technological capacities, and develop the instruments of a true entrepreneurial state (wiiw 2021: 51ff).

4

STRENGTHENING INNOVATION SYSTEMS IN CENTRAL EASTERN EUROPE

With the acceleration of technological change since the 1980s, innovation capacity in firms and national economies has moved to the centre of interest in the economic policy debate. Early concepts of innovation policy assigned government action limited function, namely to correct “market failures” in the field of technology development by private enterprises. Since the 1990s, a more systemic approach has increasingly attracted attention. The OECD played an important role here, emphasising the importance of information flows within national innovation systems and the key role of state and public actors (OECD 1997).

The understanding of the decisive factors contributing to the innovation capacities of economies has evolved further in recent years. Simple technology promotion approaches like those that guided action in the context of the Cold War have been replaced by a more complex understanding of innovation capacities focused on the interplay of different groups of factors: basic research, application-oriented and university research, firm-driven R&D efforts, public policies, institutions and regulations, public and private funding opportunities, education and vocational training policies, and so on (Edler / Fagerberg 2017).

With time, a broader understanding of the scope of application of innovations, from invention and implementation to deep diffusion into the economy and society, has emerged. Driven by digitalisation, the importance and speed of technological innovation have increased steadily in non-industrial sectors of the economy as well. In the “second machine age” and with innovations in artificial intelligence, the substitution of human physical labour – which was at the core of the first machine age – is no longer the primary focus. Instead, the substitution of human intellectual labour is the new centre of attention (Brynjolfsson / McAfee 2014). At the same time, a mission-oriented understanding of innovation (as a contribution to solving socially defined challenges such as combating climate change) has moved the debate further in the direction of a holistic understanding of innovation, focusing not only on technological change but also on changes in individual and collective human behaviour (Edler / Fagerberg 2017).

Throughout this development, the leading technology nations have built up complex innovation systems that complement and support the R&D efforts of private companies. In

Germany, with its strong industry, about 30 % of national R&D efforts are financed by the public sector; in other countries, this share is significantly higher (Innovitalia 2021; French Treasury 2018).

Schematically, the innovation systems that have been created over the last decades can be divided into various fields of action and tasks:

- To promote and support the creation of new tech companies and start-ups/spin-offs through administrative and financial support;
- To support the innovation capacities of existing companies through knowledge and know-how transfer and the promotion of industrial and technological clusters with the active involvement of companies and research institutions;
- To support “pre-competitive” technological research involving private companies as well as research institutions;
- To support “competitive” R&D efforts within private companies through financial and fiscal instruments;
- To support internationalisation efforts of research institutions and small and medium-sized enterprises (SMEs);
- To strengthen human capital resources;
- To mobilise financial resources for innovation and innovative companies; and,
- To support scientific “basic research” within specialised research institutions and universities.

The mix of instruments and their application differs considerably between countries, although certain convergence phenomena can be observed. For example, in 2020, after a long period of concentrating on technology-oriented project funding, Germany created a fiscal instrument to support innovation efforts in companies. Conversely, France, which had heavily relied on fiscal incentives for a long time, has continuously expanded its sector-oriented funding instruments over the past 15 years (French Treasury 2018).

INNOVATION PERFORMANCE AND CAPACITY

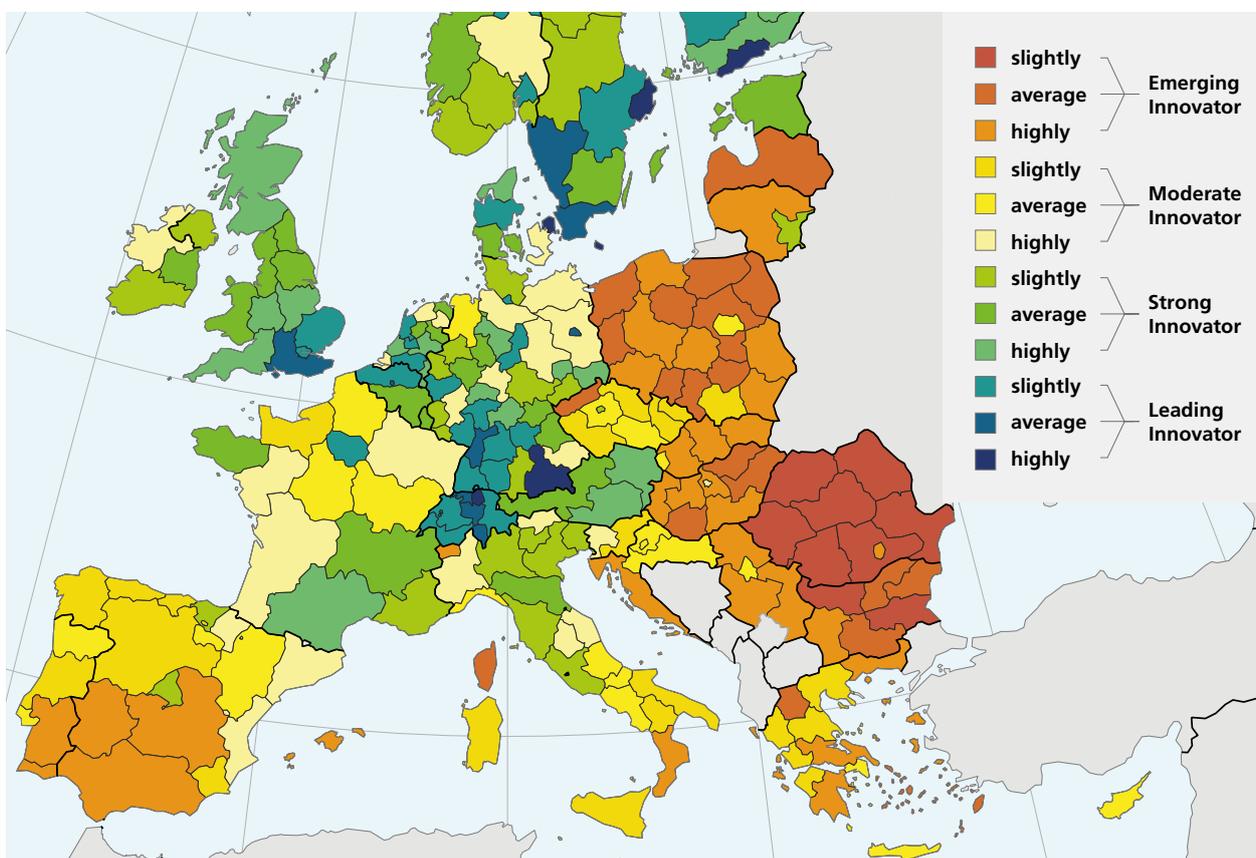
Where do the countries of Central Eastern Europe stand today in terms of innovation performance and innovative capacity? An examination of the relevant indices and scoreboards clearly signals a need for additional action.

The EU's "European Innovation Scoreboard" (EIS) provides a comparative analysis of innovation performance in EU countries and assesses the relative strengths and weaknesses of national innovation systems. Countries and regions are ranked into categories. A distinction is made between four groups: leading, strong, moderate, and emerging innovators, which, in turn, are divided into three levels. Despite all the economic progress made by the CEE countries, it shows a very asymmetrical performance of the national innovation systems within the European Union. While the "innovation leaders" are concentrated among the EU-15 countries (not least in Scandinavia), the CEE countries all rank below the EU average as "moderate innovators" (Czech Republic, Estonia, Lithuania, Slovenia) or weak innovators (euphemistically called "emerging innovators"). Notably, the two largest economies in the region, Poland and Romania, fall in this last category (European Commission 2021a).

The picture does not improve when focusing on regions instead of nation-states. In a comparison of the innovation capabilities of 240 regions in the EU, not a single region in CEE was ranked in the "innovation leader" category. Only one region each in the Czech Republic (Prague), Lithuania (Vilnius and environs), and Estonia (as a region itself) made it into the group of "strong innovators". The capital regions of all other states, where company headquarters and scientific institutions tend to be concentrated, do not make it above the below-average status of "moderate innovators" (European Commission 2021b; see Figure 7 below).

To overcome this weakness, policymakers cannot rely simply on the beneficial power of competition or the miracles of the market forces. Economic theory assumes that companies that are relatively far away from the "technological frontier" tend to reduce their R&D efforts, while the technology leaders fight for their top positions through sustained innovation efforts (Aghien et al. 2021: 57 ff). Under these conditions, a successful catching up through internal R&D efforts by CEE companies alone should not be expected. Rather, it will require active government support and public spending. However, as has already been pointed out, in large parts of the EU-CEE, the share of R&D expenditure in GDP is low or very low (see Figure 4).

Figure 7
Innovative capacity of European regions



Source: European Commission, Regional Innovation Scoreboard 2021, p.5,
<https://op.europa.eu/en/publication-detail/-/publication/b76f4287-0b94-11ec-adb1-01aa75ed71a1/language-en/format-PDF/source-242412276>

The weakness of innovation efforts in bigger companies is neither compensated nor mitigated by the existence of a highly innovative segment of small and medium enterprises (SMEs). Also, the SMEs in Central Eastern Europe lag significantly behind their competitors from the “old EU” regarding innovation performance. A slightly more positive picture only emerges for some regions in the four Visegrád countries (European Commission 2021b: 60–64).

In the EU’s Digital Economy and Society Index (DESI), the CEE countries tend to figure in the lower half of the rankings, although they sometimes occupy higher places with some indicators – especially with regard to the quality of human resources. The share of people with “advanced skills” in the IT sector is well within the range of the EU average. CEE also ranks relatively well in the share of ICT (Information and Communication Technology) graduates: three of the top 10 EU countries in this category come from the region (Romania, Czech Republic, and Hungary). However, the economies as a whole still lag far behind in the level of digitalisation. In the EU “Digital Intensity Index”, which measures the use of different digital technologies by enterprises, seven of the ten weakest countries come from the CEE region; only Slovenia and Croatia are above the EU average (European Commission 2022: 49 ff.).⁶

In another EU innovation scoreboard, the “Eco-Innovation Index”, which measures progress in the ecological transformation of European societies, all but two CEE countries are in the lower range. Only the Czech Republic and Slovakia are in the middle range of the “average eco-1 performers”. If we look at the narrower area of scientific and technical innovations (“knowledge outputs generated by business and researchers related to eco-innovation”), the picture does not improve: Only the three smaller countries (Estonia, Latvia, and Slovenia) are ranked above the median in the Europe-wide comparison. Of the ten countries at the bottom of this category, only the very last, Malta, is not a CEE country (European Commission 2021).

INNOVATION POLICY

Given this situation, there is a clear need for the CEE countries to strengthen their technological and scientific capacities. The goal must be to transition to a knowledge-driven growth model that can rely on efficient national innovation systems. This type of development can be undertaken no matter the size of the country or an economy, as is shown by the excellent positions that countries like Switzerland and Austria have achieved in international rankings of innovative strength and technological competence.

So far, no CEE country has created a system resembling the complex and efficient systems of innovation promotion as can be found in the advanced countries of Northern and Western Europe. Efforts to develop national industrial and innovation policies exist in various CEE countries, but they are so far limited in their effectiveness. The comparatively low level of R&D (given income levels), the allocation of most R&D expenditure directly to multinational companies, and the underdevelopment of national innovation systems mean that functional modernisation still remains a major challenge. The institutional, financial, and structural prerequisites for strong innovation policies are still weak. Like industrial policy, the promotion of innovation is subject to specific limitations in the CEE countries: “Technological innovation takes place within a specific industrial structure and national context [...] Which path a country takes is determined largely by institutional factors” (OECD 1997: 13). Beyond low R&D intensity in large companies based in the CEE, other limiting factors can be observed as well:

- Financial resources for technology policy such as fiscal incentives, direct subsidies for R&D, investments in education and science, advisory services, and active cluster policies are not available in CEE countries to the same extent as in wealthier countries in the EU.
- The financial environment for R&D efforts, the creation of new companies and start-ups/spin-offs is much less developed than in Northern and Western Europe (venture and risk capital, loans, state subsidies, and credit lines).
- The (considerable) EU funds are still largely used for infrastructure investments and are focused to a high degree on ecological modernisation (Landesmann / Stöllinger 2020: 19 ff.).
- The EU’s open labour markets carry the risk of permanent brain drain from CEE countries to Western countries. The loss of human capital has been dramatic in the past and has led to the weakening of the social and economic tissue of CEE countries (especially in the health sector, but also in other areas). This process also threatens to undermine the effects of education and training efforts in the future.
- The EU’s most important R&D funding programme to date, Horizon 2020, has not changed these imbalances, as it showed a “clear bias in favour of the most advanced EU member states” (Landesmann / Stöllinger 2020: 13).

In view of these structural limitations, it will not be easy for policymakers in CEE to overcome the existing weakness in innovation. It will require extra effort by an active state. Yet, policymakers will not be able to avoid this effort if they want to maintain economic growth and ensure further convergence of living conditions and income levels with the core economies of the EU.

⁶ Yet, the CEE countries do not necessarily lag behind weaker Western or Southern European countries such as Italy when it comes to the conditions for digital economy start-ups, as measured in Cisco’s “Digital Readiness Index”. Here, many EU states, with the exception of Scandinavia, are relatively far behind the global leaders. Estonia figures even among the top ten countries in this area (Cisco Digital Readiness Index 2019).

5

CONSEQUENCES FOR THE REGION'S ECONOMIC AND TECHNOLOGY POLICY

In principle, there is little dispute about what the countries of Central Eastern Europe have to achieve. They must create a competitive economic and institutional “ecosystem” that enables the countries’ domestic enterprises to make the transition to an innovation-driven and highly productive phase of development and, combined with an expansion of value-added service sectors, opens up the opportunity to catch up with neighbouring Western countries in terms of per capita income.

The key elements of this upgrading strategy include: Efficient education and training systems; the promotion of automation and robotisation; the promotion of R&D, innovation, and investment in digitalisation through tax and incentive systems; the creation and maintenance of an efficient research landscape; and the creation of a high-quality digital infrastructure. In many of these areas, the starting conditions in the CEE countries are not so bad. There are digital pioneers like Estonia to which the other states in the region can orient themselves. The education systems in the CEE countries continue to perform well, especially in the STEM area (science, technology, engineering, and mathematics), as the 2019 PISA test once again showed. Moreover, individual sectors, such as banking, are ahead of the average Western standards of digitalisation (wiiw 2021: 39 ff).

THE POLITICAL TASK FOR THE LEFT AND THE TRADE UNIONS

The problem is not limited to economic policy. The population of CEE rightly expects politicians to take the goal of further convergence of living conditions with Western or Northern European levels seriously. They expect politics to manage the upcoming disruptions (which will be further accentuated by the EU’s energy and climate policies) in a way that does not lead to a deterioration of living standards and employment rates. In the past thirty years, most CEE countries have had passive policies in industrial, technology, and innovation fields. The zeitgeist of the Washington Consensus of the 1990s, the “market-creating” spirit of the EU integration and the dominance of neoliberal and neoclassical ideas in economic theory have all played their part in this development. However, this passivity must be overcome.

In fact, all countries in the region have formulated at least rudimentary strategies for innovation policy and industrial development (OECD 2022). Increased (and by no means unsuccessful) efforts to promote research and development and to create incentives to attract more knowledge-intensive production processes to these countries are prevalent in the Visegrád countries in particular. Nevertheless, these efforts must be strengthened and reinforced.

This issue has an additional political and electoral dimension. Given the disruptions caused by the war in Ukraine and the related threat of a phase of prolonged stagflation in Europe, economic policy competence will become much more important in the coming years. However, in the recent past, the forces of the political left and centre-left have focused more on cultural and socio-political issues, combined with a growing emphasis on climate change and environmental problems. This, as a rule, has not won elections. On the contrary, a large proportion of the PES⁷ member parties in CEE currently lingers at 5 to 20 % of voter support. To overcome this, these parties would probably have to take economic policy issues much more seriously than they did in recent years. From an ideological perspective, such an exercise will not be easy. The idea of promoting “domestic” entrepreneurs and businesses and fostering national industry and innovation systems is not necessarily in the ideological DNA of post-modern leftist parties.

Of course, there are alternative methods of tackling this challenge. Policymakers in CEE can try to rely on the economic actors alone to make the necessary adjustments. This would mean settling into the “middle-income region” designation, which will continue to be characterised by a certain gap in income and living conditions between CEE and the most prosperous and technologically advanced parts of Europe (above all, Scandinavia, Germany, Austria, and the Benelux countries). Historically, this would not be new for CEE. The question is, however, whether all competitors will be satisfied with such an attitude. For example, the government in Poland, led by the right-wing Law and Justice Party (PiS), has presented an industrial policy programme that is by no means ill-conceived.⁸ PiS leader Jarosław Kaczyński called

⁷ Party of European Socialists.

⁸ Polityka Przemysłowa Polski, 9.6.2021, <https://www.gov.pl/attachment/555c07a8-4d95-49af-9ec1-282fafdbcac5>, accessed 14.7.2022

the notion of Poland as a low-wage country a “post-colonial idea” and declared achieving Germany’s standard of living a central task of Polish politics (Dziennik Gazeta Prawna 2019). Similar rhetoric, along with genuine efforts to attract high technology and R&D investments, can be observed in Orbán’s Hungary and Babiš’s and Fiala’s Czech Republic.

In view of this contest, the progressive and liberal forces urgently need to come up with their own narrative that gives the voters of the region an idea of how they want to improve living conditions and secure further growth in the years to come, which will be marked by considerable economic, social and technological disruptions.

This narrative will not be possible without concepts of active economic, industrial, and innovation policy.

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THE SECOND TRANSITION

Why Central Eastern Europe Needs Proactive Industrial and Innovation Policy Now



The states of Central Eastern Europe (CEE) have successfully integrated themselves into the European division of labour as industry-oriented “factory economies”. Per capita income has risen significantly and is now on par with Southern and parts of Western Europe. However, per capita income is still lower and stagnating compared to the leading economies of Northern and Western Europe. Further convergence would require a renewal of CEE’s growth model. Technological change, especially digitalisation, the transition to electromobility, the constraints linked to the EU climate targets, and demographic changes will pressure the region’s economies to adapt. As a result, policymakers will have to respond to these challenges with a proactive industrial and innovation policy. At the moment, public spending on research and development (R&D) is comparatively low and private sector R&D efforts are rather small. Domestic companies with strong R&D efforts are very rare in the region.



An active industrial policy aimed at strengthening the innovative power of domestic companies and attracting higher value-added parts of the production process is needed. It is important to increase R&D expenditures in both state and private sectors. An essential aspect of the modernisation strategy must be the strengthening of national innovation systems that enhance innovative capacity across the economy. This would require an increased financial commitment from the government and the creation of a network of institutions ranging from basic scientific research to the support of entrepreneurial research and development efforts to the creation of financing schemes for innovation and start-up promotion.



Politicians and trade unions in the region must focus on how to increase productivity, strengthen technological competence, and adapt to upcoming technological and political challenges if they want to keep up with the expectations of the population and continue on the path to further convergence of living conditions between the Eastern and Western parts of the EU.

Further information on the topic can be found here:
<https://eastern-europegrowth.fes.de/>