

# COUNTRY BRIEFING BULGARIA

Vienna Institute for International Economic Studies

## Toward Innovation-driven Growth

Innovation Systems and Policies in EU Member States of Central Eastern Europe

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Please find all the publications of the programme under its webpage:

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## EXECUTIVE SUMMARY

The EU member states of Central Eastern Europe (EU-CEE) – Poland, Czechia, Slovakia, Hungary, Slovenia, Croatia, Romania, Bulgaria, Estonia, Lithuania and Latvia – have undergone an impressive economic catch-up process since the early 2000s. However, the previously successful model of adopting labour-intensive production steps as an 'extended workbench' for Western corporations is increasingly reaching its limits, as we demonstrated in a previous study (Grieveson et al., 2021). The fundamental problem is that the key technological competencies and the segments of production with the highest added value are situated in the 'headquarter economies' of Western Europe. In contrast, the EU-CEE countries continue to specialise in labour-intensive production. Coupled with major structural changes such as decarbonisation and digitalisation, this growth model must therefore be replaced by a new one, more strongly driven by innovation. Only then will these countries be able to catch up with Western Europe in terms of productivity and living standards.

In a follow-up study (Zavarská et al., 2023), we investigated how a customised industrial policy could help EU-CEE countries to escape their 'middle-income trap'. The main finding: industrial policy needs to be stepped up in the region, all the more so at a time when countries around the world are rediscovering its significance. In this necessary effort to climb the technological ladder, there is much for EU-CEE to learn from the East Asian tiger states. They share a similar starting-point, namely the dominance of multinational corporations and a highly export-oriented nature, which the East Asian tigers have successfully leveraged to their advantage. With a highly successful industrial policy, these countries have managed to take the technological lead in some areas and create world-class companies, for instance in electronics or semiconductors.

Having established the need for a new growth model and made the case for industrial policy, we turn to innovation, the other 'missing piece' that will be required to achieve the next stage of convergence in EU-CEE. We explore how these countries could establish innovation systems at the national level, enabling them to catch up technologically and economically with the front-runners in Western Europe.

In this endeavour, EU-CEE countries face several challenges. For one, they do not spend enough on research and development (R&D), which undermines their innovation

activities. R&D expenditure is, however, slowly rising, particularly in Poland, Czechia and Croatia. Nevertheless, all countries in the region fall far short of the official EU target of 3% of GDP for R&D. Only Slovenia and Czechia record R&D expenditure of 2% of GDP, while Slovakia, Bulgaria, Latvia and Romania are below 1%. Although some countries excel in exporting medium and high-tech products, in many cases this is driven by foreign direct investment (FDI) and historical industrial strengths, rather than contemporary domestic innovation. As a result, high-level technological expertise mainly resides within large multinational companies that maintain extensive production sites in these countries, while R&D is carried out primarily in their Western European headquarters. This means that cutting-edge expertise and technology are only available on the 'islands' of the production plants of these companies in the EU-CEE countries. Because of this isolated existence, local companies, especially small and medium-sized ones, struggle to benefit from cutting-edge technology. Exports of innovative services are currently very limited.

Although the region has quite a high share of graduates in science, technology, engineering and maths (STEM subjects), the education system struggles to achieve quality and universities are underfunded. The region has a long way to go in green innovation, hampering its competitiveness in this crucial area of the EU's envisaged 'twin' (digital and green) transformation. By contrast, the region appears better positioned for the digital transformation. In particular, there are a number of emerging innovative enterprises in EU-CEE countries in digital technologies. However, many of them lack strong connections to the broader innovation system and tend to operate as isolated success stories.

Reflecting these challenges, the innovation performance of the region is not particularly promising, although there are some positive developments. With the exception of Estonia, all EU member states in Central Eastern Europe are below the EU average and outside the global top 30. However, the innovation performance is generally in line with the economic development of each country, albeit with some exceptions. Estonia clearly outperforms, while Poland, Slovakia and Romania underperform.

From the policy side, despite recent progress, an overarching problem is the lack of co-ordination and financial

support for innovation and R&D activities by national governments. The disconnect between FDI policies and innovation policies further complicates the implementation of strategies to enhance industrial innovation and upgrade EU-CEE's position in value chains. Although EU membership provides opportunities for collaboration and learning, the current innovation policy approach of the EU, which is focused more heavily on the needs of advanced countries, hinders active participation by EU-CEE countries. Only a few EU-CEE countries utilise their national policy space to engage more actively in EU initiatives.

## IRELAND AND SINGAPORE AS ROLE MODELS

In this context, Ireland and Singapore can serve as an inspiration for EU-CEE, as they each successfully transitioned from an FDI-dominated to a more balanced innovation system, in which domestic firms actively contribute to the generation of innovations. Like the EU-CEE countries, their early economic growth was mainly driven by large multinational enterprises (MNEs) – similar to the 'extended workbench' model in EU-CEE. Later in their development stage, however, Ireland and Singapore changed their growth strategies. One notable element was the focus on a highly selective investment promotion approach (called 'innovation by invitation' in Ireland), which involved specifically attracting investments that corresponded to the country's own industrial strengths and potential. Additionally, a systematic and highly focused approach was taken to connect foreign companies with local firms and suppliers to establish industrial clusters in promising niches. Incentives were also created to encourage foreign companies already operating in the country to carry out more R&D locally, thus bringing in more added value.

A critical factor here was well-trained skilled labour. Both Ireland and Singapore have made great efforts to orient vocational training and, above all, university education in STEM subjects as closely as possible to the needs of their own economies. Other success factors included significant government funding of R&D through grants and tax breaks, the strengthening of scientific research at universities, the creation of government research funding agencies, the networking of university and commercial research, good framework conditions for start-ups, and easier immigration of highly qualified people from abroad.

## POLICY RECOMMENDATIONS

Considering the specific innovation landscape of EU-CEE countries and building on the success stories from other parts of the world, this study articulates a series of recommendations aimed at guiding the EU-CEE region's next growth phase, advocating for a transition from imitation to innovation.

### 1. FACILITATE EFFECTIVE CO-ORDINATION OF THE INNOVATION SYSTEM

- Encourage the establishment of a long-term innovation strategy that provides stability and planning security and is not subject to the electoral cycle. This is linked to the creation of a central innovation agency to co-ordinate the various elements of a coherent innovation policy at the national level.
- Improve the utilisation of EU funds and provide more money at the national level for the promotion of innovation. From a converging country's perspective, the reality that EU-CEE can lean on EU finances is a substantial advantage, which needs to be leveraged more strongly.
- Improve the public administration and its institutions. In addition to expanding the pool of innovation policy experts within the public sector, this includes a shift towards a culture of evidence-based policy making, establishing and strengthening in-house capacities to analyse different policies and their interactions.

### 2. ENABLE COMPANIES TO CLIMB UP THE TECHNOLOGICAL LADDER

- Strengthen the innovative potential of domestic companies, helping them to upgrade and grow. Key strategies in this direction involve fostering local supplier development, offering targeted R&D incentives, as well as promoting clusters. Avoiding an arbitrary over-emphasis on high-tech sectors is also crucial, ensuring that innovation policies are locally relevant for realistic and effective outcomes in the region.
- Select FDI in a targeted way and focus on areas that align with the country's traditional industrial strengths in order to build upon them. Create incentives for foreign MNEs operating in the country to conduct more R&D locally, thereby bringing additional value.
- Connect MNEs operating in the country with local companies so that the latter can benefit from their technological expertise and know-how. Eventually, industrial clusters should emerge that reflect the country's strengths and specialisations.
- Identify and develop promising industrial niches. Facilitate a targeted specialisation of the economy in the most promising areas that offer the greatest comparative advantage. The EU-wide approach, known as 'smart specialisation', can be especially useful, as it seeks to achieve intelligent, inclusive and sustainable growth within the given economic conditions.
- Move away from tax incentives as the main instrument to stimulate R&D spending by companies towards more direct grants, especially in EU-CEE countries with fewer fiscal constraints.

### 3. STRENGTHEN UNIVERSITIES AND RESEARCH INSTITUTIONS

- Increase the exchange and improve networking between science and business. This includes making collaboration between universities and industry a prerequisite for certain types of funding, reviewing the regulatory frameworks governing publicly funded institutions, and establishing and actively using technology transfer offices, as well as participating in EU-wide initiatives that encourage the commercial application of research.
- Promote international partnerships and create opportunities for the cross-border mobility of researchers. There are various means of stimulating such partnerships, such as making research collaboration grants more widely available, negotiating various fellowship programmes (also within the EU-CEE region), and simplifying work permits and visa procedures for international researchers.
- Stimulate internationally outstanding scientific excellence. This should, however, be relevant to the local economy and its industrial base and take their needs into account.

### 4. DEVELOP HUMAN CAPITAL

- In order to have enough well-trained specialists available for an innovation-based growth model, vocational training and university education need to be expanded, especially in the STEM subjects of science, technology, engineering and mathematics.
- Talented workers from abroad should be recruited in a targeted manner, and skilled citizens who have emigrated should be enticed with special incentives to return home. It is well known that the EU-CEE countries are grappling with a pronounced 'brain drain' and, consequently, a significant shortage of skilled labour. This situation is often linked to challenging living conditions, ranging from expensive housing to a lack of childcare and inadequate healthcare. This also necessitates a new social policy to improve living conditions.
- Vocational training and apprenticeships should be made more attractive so that young, talented people follow these pathways, especially in technical and scientific fields. EU-CEE countries can build on the presence of MNEs to advance apprenticeship and internship programmes, career exploration programmes, and mentorship initiatives to ensure that students get hands-on experience from a relatively early age. The aim is to also ensure a more balanced talent distribution, so that high-achieving students are more drawn to, and can excel in, vocational pathways.

### 5. IMPROVE ACCESS TO FUNDING FOR INNOVATIVE COMPANIES

- In order to offer innovative companies better access to suitable financing from the outset, a legal framework and market conditions that reward innovation and risk-taking need to be cultivated. In particular, simplifying regulations, encouraging new fund creation, and promoting regional funds for smaller markets can be useful. Governments should cautiously explore co-investment mechanisms, avoiding disruption to private funding.

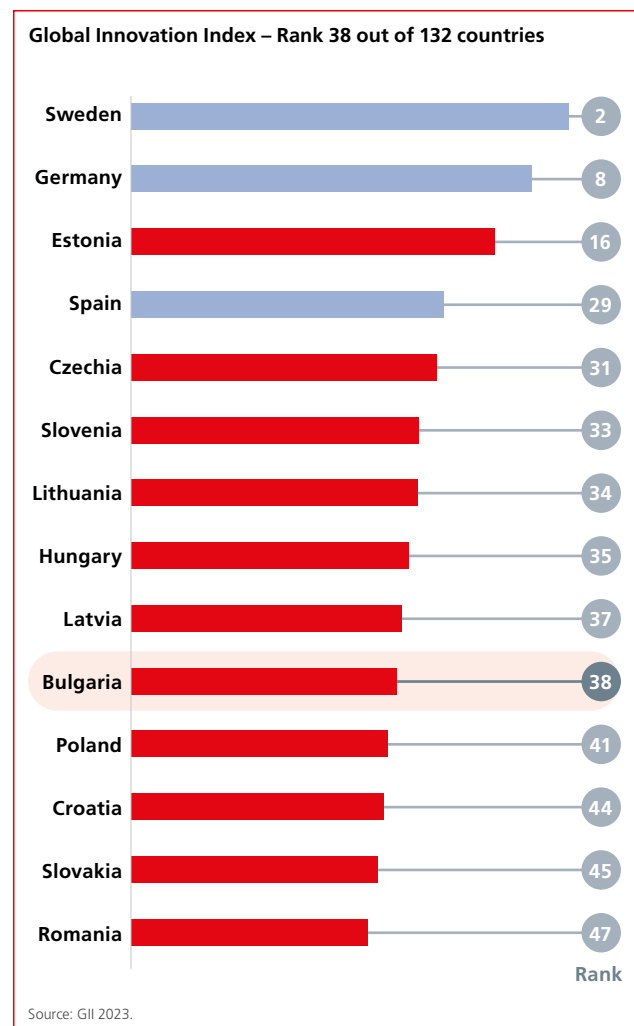
# COUNTRY BRIEFING BULGARIA

## INNOVATION LANDSCAPE

Bulgaria’s innovation performance is average by EU-CEE standards, according to the Global Innovation Index. This outcome is actually rather positive, given that it is the poorest EU member state. Furthermore, Bulgaria outperforms all its neighbouring countries and those in the Western Balkans. However, it is still among the worst-performing EU countries, and has seen its ranking decline since 2021.

The country scores particularly strongly in ICT access and ICT services exports. The ICT sector has a long tradition in Bulgaria, dating back to the communist era, and the software industry stands out as its best-performing sector. According to the Bulgarian Association of Software Companies, the share of the software sector in GDP has increased nearly threefold during the last 10 years. Another key strength is intellectual assets, and especially design and trademark applications, in which Bulgaria performs better than the EU average. However, severe deficiencies in institutions, market sophistication, and human capital and research hinder innovation progress. Prolonged bureaucratic procedures and regulatory challenges, such as frequent legislative changes and a weak rule of law, create difficulties and unpredictability in doing business in Bulgaria. Correspondingly, the investment climate in the country is weak. After Hungary, Bulgaria is the most corrupt EU country, according to the Corruption Perceptions Index 2023. The ageing population and ‘brain drain’ remain major challenges to the country’s innovation capabilities.

Although Bulgaria’s ICT sector demonstrates strong performance, it mostly digitalises foreign economies, with over 85% of software industry revenue stemming from exports. 2022 saw the birth of the first ever Bulgarian ‘unicorn’, Payhawk, an internationally active fintech start-up valued at over USD 1bn. However, most Bulgarian companies face challenges in adopting ICT solutions, partly because of the dominance of small and medium-sized enterprises (SMEs) in the domestic economy. Local SMEs exhibit a markedly low level of innovation, hindered by constraints in human and financial resources. They contribute nearly half of Bulgaria’s turnover, above the EU average of 34.1%. The role of industrial clusters is insignificant; entrepreneurs misunderstand their basic characteristics and purpose as innovative organisational networks, and there are gaps in the legislative framework and insufficient monitoring mechanisms.



Bulgaria has a notably low innovation capacity concerning megatrends. The country is ranked second to last in the European Commission’s Digital Economy and Society Index 2022. More than 70% of enterprises in the country have made only small or no investments in digital technologies. Less than 30% of SMEs have reached at least a basic level of digital intensity. Furthermore, Bulgaria has the lowest score in the EU’s Eco-Innovation Index, at 48% of the EU average. Bulgaria reaches only 35% of the EU level on eco-innovation outputs, and just 17.3% of the EU average for resource efficiency outcomes. In the circular economy component of the Eco-Innovation Index, Bulgaria ranks particularly weakly for business operations, at 36% of the EU average.

National Innovation System Indicators				
Priority areas	Indicator	Bulgaria	EU	EU-CEE
Education system	Tertiary education graduates in STEM, share in % (UNESCO)	19.5	24	24.2
	Spending on tertiary education per student, in EUR at PPP (Eurostat)	4,170	7,990	6,600
	PISA scales in reading, maths and science (GII)	427	484	480
Technological capacities of enterprises	R&D (GERD) financed by business, share in % (Eurostat)	32.9	57.7	43.5
	R&D expenditures (GERD) in % of GDP (Eurostat)	0.8	2.3	1.3
	SMEs with product innovations, share in % (EIS)	22.2	27.0	22.8
	SMEs with business process innovations, share in % (EIS)	24.5	41.6	32.4
	Finance for start-ups and scale-ups, average perception scores from 0 to 10 (GII)	5.0	4.3	4.5
Collaborations and linkages	Innovative SMEs collaborating with others, share in % (EIS)	7.3	11.7	10.1
	University-industry R&D collaborations, average perception scores from 0 to 7 (GII)	3.9	4.2	3.8
Innovation outcomes	Granted patents per million inhabitants (WIPO)	63	586	86
	Exports of medium and high-technology products, in % of total product exports (EIS)	35.1	61.2	49.5
	Knowledge-intensive services exports, in % of total services exports (EIS)	56.6	63.6	48.6

Sources: EIS 2023; Eurostat; GII 2023; UNESCO; WIPO; World Bank, WDI.  
Note: data for EU and EU-CEE are simple averages, except for EIS and Eurostat, with original data for EU.  
Data for 2021 or the most recent available year; more details on the methodology and data availability to be found in the Annex.

Mapping innovation policy initiatives			
	Yes/No	Name of the initiative/programme	Comments
Innovation agency	Yes	Ministry of Innovation and Growth	Former Agency for Science and Innovation closed (replaced by Ministry of Innovation and Growth).
Programmes for human capital development	Yes	Human Resources Development Programme 2021–2027	Co-financed by the European Social Fund and the national budget.
Programmes for human capital attraction and retention (e. g. reverse brain drain)	Yes	National programme 'Stefan Stambolov Fund'	State funding for master's degree up to BGN 200,000 per year to study in the most elite universities in the world if, after graduation, students return to work in Bulgaria for at least three years.
Start-up programmes (incubators, dedicated financing, etc.)	Yes	Operational programmes 'Innovation and competitiveness', 'Human resource development', 'Initiative for SMEs'	Over 95 incubators; funding applications difficult and time-consuming.
Venture capital programmes	No		
Cluster programmes	Yes	EU operational programme 'Innovation and competitiveness' (OPIC)	Completed.
Technology-specific policies	Yes	Innovation Strategy for Intelligent Specialization 2021–2027	Transforms Bulgaria into an innovative, smart, green, digital and connected country.
Tax incentive schemes	No		Low corporate tax rate for all (10%).
Others	Yes	Institute for Computer Science, Artificial Intelligence and Technology (INSAIT) Innovation vouchers to support academia-industry collaboration	First in SEE, co-financed by Bulgarian government, Bulgarian business, Amazon, Google, DeepMind, SiteGround. As a part of operational programme 'Research, innovation and digitalisation for intelligent transformation', until the end of 2023.

## COUNTRY-SPECIFIC POLICY PRIORITIES AND RECOMMENDATIONS

- **Improve the innovation potential of the domestic research system, encouraging university-industry collaborations.** The collaboration between universities and businesses is marked by only sporadic knowledge and technology transfer. The weak regulatory environment and the lack of incentives impede collaboration between industry, universities and other public research organisations. To enhance co-operation, a new, well-defined legal framework is essential. This framework should regulate the fundamental principles, rules and scope of intellectual property management policies within scientific organisations and facilitate the transfer of knowledge to the industry. Additionally, the creation of tax incentives for enterprises, alongside other financial tools, is necessary to support collaborative efforts.
- **Develop more assertive policies aimed at retaining, attracting and getting back talent from abroad.** Bulgaria's population is shrinking at one of the fastest rates in the world, resulting in a significant loss of demographic and intellectual capital. Retaining, attracting and getting back talent from abroad are recognised as priorities at the political level. However, the current policies are lacking in substance. The policy measures are limited mostly to information provision through campaigns, portals and consultation services to attract and get back high-skilled individuals. What is absent are proactive steps to establish incentives, facilitate the return process and provide support for effective integration. This could be achieved through competitive salaries, bonuses, housing provisions, fringe benefits, student credits that need not be repaid if the students choose to remain in Bulgaria, language courses, anti-discrimination policies, and improving the quality of public services such as healthcare, childcare and public transport. A good example is the national programme 'Stefan Stambolov Fund', which allows Bulgarian students to receive state funding for studying at prestigious international universities if they commit to returning to work in Bulgaria for a minimum of three years afterwards.
- **Increase expenditures dedicated to investments in R&D, with EU funds complementing stronger national innovation efforts.** In 2022, research and development (R&D) expenditures in Bulgaria amounted to only 0.75% of GDP, well below the EU average of 2.2%. Some 40% of the funding came from foreign sources, followed by domestic enterprises at 34.7%, and the state budget at 24.6%. Furthermore, public funds are allocated on an annual basis, hindering the implementation of sustainable long-term strategic programmes and making funding for scientific research inadequate and unpredictable. To address this, increasing public spending on R&D, providing fiscal incentives for enterprises investing in R&D, and implementing a new comprehensive policy for the advancement of scientific research, innovation and technology would be beneficial.
- **Empower a single innovation agency with implementing a long-term strategy, and as free as possible from political interference.** The former Agency for Science and Innovation has been closed and replaced by the Ministry of Innovation and Growth. Although the establishment of such a ministry underscores the country's commitment to innovation, it also exposes the innovation strategy to significant political fluctuations, particularly given Bulgaria's record of changing governments four times in two years. Establishing a single innovation agency, insulated from political influences, would provide the required stability and sovereignty for the effective implementation of a long-term strategy. A diminished connection to politics could also reduce the likelihood of corruption within the agency.



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## **Toward Innovation-driven Growth: Innovation Systems and Policies in EU Member States of Central Eastern Europe**

This country briefing contains a short summary of a much broader study that deals with the perspectives of innovation policies in Central Eastern and Southern Eastern Europe.

Twenty years after EU enlargement, the economies of Central and South Eastern Europe have become important components of Europe's industrial production system. Now, these countries are faced with the task of taking a new step towards a more sustainable and productive growth model.

This step can only be taken if the countries succeed in becoming innovating economies with national companies that are strong in research, development and innovation. To succeed, the countries have to develop not only strong industrial policies, but also policies that aim at creating solid national innovation systems. The study analyses the region's potential and uses the examples of Ireland and Singapore to describe successful innovation strategies. It is authored by a team from the Vienna Institute for International Economic Studies.

It is part of a series of FES studies on the growth model in EU-CEE and its prospects which have been published in recent years.

The full study can be found here:  
<http://library.fes.de/pdf-files/bueros/budapest/21198.pdf>



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