

COUNTRY BRIEFING LITHUANIA

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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About the authors

Vienna Institute for International Economic Studies (wiiw):

Zuzana Zavarová, Economist at wiiw

Alexandra Bykova, Economist and Deputy Head of Statistics Department and
Economist at wiiw

Richard Grieveson, Economist and Deputy Director of wiiw

Francesca Guadagno, Economist at wiiw

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 LITHUANIA

INNOVATION LANDSCAPE

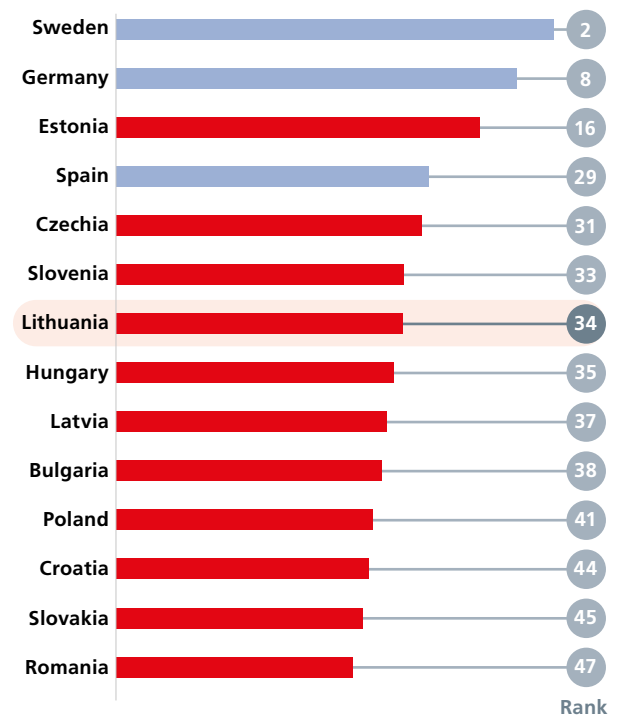
Lithuania is classified as a moderate innovator in the European Innovation Scoreboard, with a performance below the EU average. It ranks 34th in the Global Innovation Index, and fourth in the EU-CEE region (after Estonia, Czechia and Slovenia). Owing to steady improvements in several indicators, Lithuania is slowly catching up towards the EU average.

The Lithuanian innovation system can count on a high number of tertiary-educated graduates – particularly in STEM subjects, a high share of small and medium-sized enterprises (SMEs) undertaking product and process innovations, and advances in digitalisation. Like other Baltic countries, Lithuania shows relatively strong progress in this field, although it is still far behind Estonia. A thriving venture capital market and various policy initiatives in support of entrepreneurship promoted the growth of a dynamic start-up ecosystem. The sectors in which Lithuanian start-ups are most active are: business software and HR, fintech, cybertech, healthtech, advanced manufacturing and industry. The largest start-ups, with about 1,000 employees, are Vinted (an online marketplace for second-hand items), Nord Security (active in cybertech) and Wargaming (in the games industry).¹ The first two are ‘unicorns’, with valuations of about USD 5bn and USD 2bn respectively.

Despite having reached such important milestones, Lithuania’s innovation potential is not fully realised. Start-ups remain a marginal component of the economy and are poorly linked to the rest of the productive sector, which is much less sophisticated and innovative. This duality partly explains the low figures in terms of research and development (R&D) expenditures and R&D financed by business, the low shares of exports of medium and high-tech products and knowledge-intensive services, and the low number of patent applications.

Although Lithuania does not perform well in these indicators, its European Innovation Scoreboard profile points to a strong performance in trademark applications and non-R&D innovation expenditures, which suggest that less R&D-intensive forms of innovation are more appropriate for the country. There have also been growing policy efforts on

Global Innovation Index – Rank 34 out of 132 countries



Source: GI 2023.

cluster building over recent years. Although most clusters are still in nascent stages, some promising ones are emerging in the areas of smart food and photovoltaic technology.² A number of alliances between universities and firms are also well established, but are limited to a few sectors (such as laser technologies and biotechnology).

Concerning the ‘megatrends’ of the twin transition, as highlighted above, Lithuania has made impressive advancements in digitalisation, also partly because of recent policy initiatives and the contribution of its digitally oriented start-ups. As for the green transition, the country is still lagging behind: its performance in environmental-related technologies has been deteriorating since 2022. Nevertheless, the earmarking of 37.4% of the Recovery and Resilience Facility for the green transition, together with a few additional policy initiatives, is a welcome step in the right direction.

¹ Startup Lithuania database: <https://www.startuplithuania.com/startup/> (accessed 5.12.2023).

² According to the European Secretariat for Cluster Analysis.

National Innovation System Indicators				
Priority areas	Indicator	Lithuania	EU	EU-CEE
Education system	Tertiary education graduates in STEM, share in % (UNESCO)	25.8	24	24.2
	Spending on tertiary education per student, in EUR at PPP (Eurostat)	6,390	7,990	6,600
	PISA scales in reading, maths and science (GII)	480	484	480
Technological capacities of enterprises	R&D (GERD) financed by business, share in % (Eurostat)	36.1	57.7	43.5
	R&D expenditures (GERD) in % of GDP (Eurostat)	1.1	2.3	1.3
	SMEs with product innovations, share in % (EIS)	30.5	27.0	22.8
	SMEs with business process innovations, share in % (EIS)	44.8	41.6	32.4
	Finance for start-ups and scale-ups, average perception scores from 0 to 10 (GII)	5.9	4.3	4.5
Collaborations and linkages	Innovative SMEs collaborating with others, share in % (EIS)	14.4	11.7	10.1
	University-industry R&D collaborations, average perception scores from 0 to 7 (GII)	4.4	4.2	3.8
Innovation outcomes	Granted patents per million inhabitants (WIPO)	72	586	86
	Exports of medium and high-technology products, in % of total product exports (EIS)	35.8	61.2	49.5
	Knowledge-intensive services exports, in % of total services exports (EIS)	31.8	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	Innovation Agency Lithuania	The Innovation Agency Lithuania is the result of the merger of several public business support and innovation promotion agencies, forming a single innovation agency since April 2022, with more than 300 employees. It administers several innovation, digitalisation and other business support measures. It is headquartered in the capital, Vilnius, and operates also through regional offices in 13 Lithuanian cities.
Programmes for human capital development	Yes	Modernisation of VET National Reskilling/Upskilling Programme Skills for SMEs	<p>Important for skill development is the ongoing modernisation of the VET offer. A rationalisation of existing programmes was undertaken to improve the relevance of VET, align it to labour market needs and ultimately improve the employability of VET-educated workers. Programmes were also made modular, in order to make them more flexible and attractive.</p> <p>The 'National Reskilling/Upskilling Programme' is undertaken by Invest Lithuania. It aims to reskill the workforce via the acquisition of certain digital skills (pre-defined by the government). The programme is only available to firms in three sectors: ICT, engineering and life sciences.</p> <p>The 'Skills for SMEs' programme has just been launched to provide financial support to SMEs to upskill and retrain employees with a particular focus on digital skills. The programme is supported by EU funds.</p>

Programmes for human capital attraction and retention (e.g. reverse brain drain)	Yes	Startup Visa Create Lithuania	<p>Under the 'Startup Visa' programme, visas are made available for non-EU entrepreneurs who want to open a business in Lithuania and for prospective employees of Lithuanian start-ups.</p> <p>Over the past 10 years, the 'Create Lithuania' programme has invited professionals with internationally acquired experience to spend 12 months in public-sector bodies. The programme allows the public sector to benefit from the experience of these highly qualified professionals while enabling them to contribute to the advancement of their country and experience working for government bodies. So far, 282 projects have been implemented in roughly 50 entities, 236 professionals have returned to Lithuania and about 40% of the participants have remained in the public sector.</p>
Start-up programmes (incubators, dedicated financing, etc.)	Yes	Startup Lithuania A variety of programmes and financial instruments offered via INVEGA	<p>Startup Lithuania promotes the national start-up ecosystem, facilitating the linkages between entrepreneurs, venture capital funds, accelerators and the government. It supports the ecosystem by keeping stakeholders informed of relevant news, maintaining a database of start-ups, organising networking events, and cultivating an entrepreneurship culture.</p> <p>Through INVEGA, the national investment institution of Lithuania, the government provides a wide range of grants, soft loans, guarantees and venture capital financial instruments (see also below). A programme that matches the funds raised through crowdfunding is added to the offer of INVEGA. Training, mentoring services, pre-accelerator and accelerator programmes are also provided. These instruments are partly funded by the national budget and EU funds, showing the high level of commitment of the Lithuanian government.</p> <p>Given the high number of start-ups currently active in the country (estimated at 877 by the Startups Database maintained by Startup Lithuania), the incentives offered seem to have been able to create a certain level of dynamism in the local start-up ecosystem.</p>
Venture capital programmes	Yes	Various programmes under INVEGA	<p>Several venture capital financial instruments are currently active. Some of these are fully financed via EU funds, others fully by national budgets, and others mix the two sources.</p>
Cluster programmes	Yes	InoLink KlasterLT	<p>The InoLink project and the KlasterLT initiative, co-ordinated by the Lithuanian Innovation Agency, promote the integration of firms into clusters, increase the maturity of existing clusters, and promote their international co-operation. Activities include expert consultations, partner searching and networking events, offering targeted support to SMEs as well as foreign enterprises to integrate into Lithuanian clusters. Efforts are also made to align these clusters with smart specialisation priorities.</p> <p>According to the OECD (2021)*, however, most of the created clusters still lack endogenous strength for innovation.</p>
Technology-specific policies	No		
Tax incentive schemes	Yes	R&D incentive in corporate income tax code	<p>A variety of R&D tax incentives are offered, including triple deduction of R&D costs from income, shorter depreciation period for R&D assets and tax incentives for R&D commercialisation.</p>
Innovations vouchers	Yes	Inno-vouchers	<p>Support for innovative firms and institutions to acquire services from science and study institutions.</p>

* OECD (2021), 'Improving effectiveness of Lithuania's innovation policy', OECD Science, Technology and Industry Policy Papers, No. 123, OECD Publishing, Paris.

COUNTRY-SPECIFIC POLICY PRIORITIES AND RECOMMENDATIONS

- **Improve linkages between start-ups and the rest of the economy.** Existing companies in more traditional sectors could benefit significantly from increased learning opportunities with local start-ups in terms of digital skills and practices, business models, entrepreneurial culture and mindset, and identification of promising market niches. In this regard, increased efforts in cluster building could be envisaged. Grants for collaborative research that could also include technology transfer mechanisms from start-ups to larger firms could also benefit the Lithuanian innovation system. Study tours and programmes for temporary job mobility might also be creatively used to create social ties and learning opportunities.
- **Help larger established firms to contribute more to the innovation performance of the country.** Beyond the spill-overs that stronger linkages with start-ups can unleash, more tangible initiatives are needed to make established firms more innovative. Advisory and mentoring services, currently tailored primarily to start-ups, could also be adapted to larger existing firms, for example by providing technical assistance on how to improve the quality and sustainability of current productions, digitalise businesses, structure a research project, and find new market niches. Similarly, the upskilling and reskilling programmes currently available to a handful of high-tech sectors could be also made available to more traditional sectors and focused on new skills, related for example to the digital and green transitions.
- **Find new approaches and creative solutions to stimulate non-R&D innovations.** As innovation policies are generally aimed at stimulating R&D expenditures, new approaches and policy instruments need to be designed to promote local non-R&D innovations. This type of innovation seems particularly appropriate to the Lithuanian innovation system. In this area, the government will first need to understand where the potential for these innovations currently lies and the barriers that firms face. This could be done, for example, by initiating a dialogue with the business sector of the sort foreseen by the smart specialisation approach (the Entrepreneurial Development Process, EDP). In a second step, targeted policies should be designed to remove the obstacles to innovation and incentivise the generation of new non-R&D innovations, including via grants and new financial instruments.

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1056 Budapest | Fővám tér 2–3.

Email: budapest@fes.de

Responsible for content and editing:

Dr. Ernst Hillebrand

ernst.hillebrand@fes.de

Orders/Contact: budapest@fes.de

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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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