EU REGULAR ECONOMIC REPORT 11

World Bank Report
on the European Union

Central Europe National Innovation Systems Assessment

COUNTRY REPORT

ROMANIA

WORLD BANK GROUP

Central Europe National Innovation Systems Assessment

COUNTRY REPORT

ROMANIA

WORLD BANK GROUP

1818 H Street
NW Washington DC 20433
Telephone: 202-473-1000
Internet: www.worldbank.org

Cover design, layout design and typesetting:
Piotr Ruczynski, London, United Kingdom

Contents

Box

Figures

Abbreviations

4CEE	Four Central and Eastern Europe countries
AI	Artificial intelligence
BSS	Business services sector
EIB	European Investment Bank
EIF	European Investment Fund
FDI	Foreign direct investment
GDP	Gross domestic product
ICT	Information and communications technology
IP	Intellectual property
M&E	Monitoring and evaluation
MSMEs	Micro, small, and medium-sized enterprises
NRRP	National Recovery and Resilience Plan
PPS	Purchasing power standards
PRO	Public research organization
SME	S mall and medium-sized enterprise
STEM	Science, technology, engineering and mathematics
STI	Science, technology, and innovation
TTO	Technology Transfer Office
UEFISCDI	Romanian Executive Agency for Funding Higher Education, Research, Development and Innovation
VC	Venture capital

1.

Key messages[1]

MAIN FINDINGS

Romania's innovation ecosystem remains fragmented, under-resourced, and weakly coordinated. Institutional mandates overlap, and no single authority is responsible for innovative firms, limiting policy coherence and low and unpredictable funding. R&D is low relative to peers, and public funding for R&D has been characterized by a lack of continuity and predictability in financial support, with irregular and scattered calls for proposals. While the private sector is the largest funder and performer of R&D in the country, the share of private R&D in GDP is among the lowest in the EU. Public research institutes focus predominantly on publication-oriented research rather than commercialization, and compared to their peers, universities play a more limited role in Romania's national R&D system focusing mostly on teaching. Romania has suffered from an erosion of human capital in the research sector in the last several decades and currently has fewer researchers per capita than all peers. While Romania performs relatively well in science, technology, engineering and mathematics (STEM) education and human capital potential, this has not translated into a dynamic pipeline of innovative, high-growth firms. Similarly, while it has made large investments for constructing new research infrastructure, there is limited support available for operation, maintenance, and access to existing facilities. Collaboration between universities, research institutions, and industry is sporadic. The public sector plays a limited enabling role: programs are often risk-averse, complex to access, and focused on compliance rather than outcomes. Venture capital activity has expanded but remains shallow, and most start-ups rely on self-financing. Regional disparities persist, with Bucharest-Ilfov concentrating most ecosystem resources. Overall, the ecosystem lacks the institutional agility, coordination, and financial depth necessary to stimulate sustained innovation and scale competitive firms.

MAIN RECOMMENDATIONS

The recommendations in this country profile seek to enhance the effectiveness of public spending on science, technology, and innovation (STI), overcoming systemic challenges and advancing Romania towards a more robust, knowledge-based and innovation-driven economy. These suggestions aim to address the market and system failures identified through an analysis of the national innovation system framework (see Box 2.1 in Section 2), which assesses innovation demand and supply, as well as the elements enabling the accumulation of capital, knowledge and technology. The recommendations are designed to enhance research and firm capabilities, foster academy-business collaboration, and improve

1 This report was prepared as a country summary for the EU Regular Economic Report 11 led by Lukasz Marek Marc, with contributions from Nathalie Picarelli, Lucero Burga, Cristina Maria Serbanica, Juan Rogers.

innovation policy governance. A key emphasis is placed on promoting coherence and complementarity among various policy instruments and fostering consistency and predictability in funding and policy frameworks, which is crucial for stimulating long-term STI investments.

- Introducign multi-annual, program-based budgeting for core R&I instruments. Key innovation, collaboration, and human-capital programs should operate on 5–7 year envelopes with midterm reviews, with regular calls for proposals, allowing agencies to plan calls, build pipelines, and adjust design based on performance (including rigorous evaluation) rather than annual budget shocks. More funding should support firm-level R&D, foster research-industry collaboration, and support startups

- Improving implementation capacity by creating a firm-focused innovation agency — focusing on firm-level R&D and industry-research collaboration, and a one stop "Ecosystem Hub" — coordinating startup ecosystem, building capabilities of startup enablers, and advocating for innovative firms. Both should have a strong private-sector representation in the governance bodies.

- Activating and empowering the National Committee for Science, Technology, and Innovation to resolve fragmentation. The committee should approve a single national innovation implementation plan, align ministry programs and EU funds, and publish annual "joined up" progress reports to reduce overlaps and signal credible commitment.

- Strengthening firms and startups capabilities (e.g. managerial and innovation skills) by investing in high-quality business support institutions and startup enablers — providing startups and established firms with managerial, financial, and market-development skills needed to translate R&D into productivity gains and competitive, export-ready businesses.

- Reforming regulations e.g. clarifying intellectual property rights, streamlining insolvency and exit procedures to support both new and distressed firms

- Improving entrepreneurship education, induce entrepreneurial mindset, encourage industry-academia secondments (practitioners teaching at the university, academic staff embedded in firms).

2.

Introduction to the Romanian innovation system

ANALYTICAL FRAMEWORK

This note analyses Romania's innovation ecosystem, assessing it against a version of the national innovation system framework developed by the World Bank (Box 2.1). This framework broadens the definition of innovation policy from a narrow focus on R&D and invention to encompass the full spectrum of firm-level capabilities—including quality upgrading, organizational change, and the capacity to absorb external technologies, as well as the governance and policy context in which innovation occurs. The note evaluates Romania's systemic dimensions using the framework shown in Figure B2.1.1 in Box 2.1 as a guide:

- Section 3 explores the elements behind the demand for innovation (right-hand column in Figure B2.1.1), including the current state of firm capabilities, and the incentives and dynamics that affect entrepreneurship efforts.
- Section 4 evaluates innovation supply—including the education and training system and collaboration between academia and industry (left-hand column in Figure B2.1.1).
- Section 5 studies the factors that enable the allocation and accumulation of capital, knowledge and technology (middle column in Figure B2.1.1). These include access to finance (both risk capital and banking), the regulatory and legal environment, the current public policy mix to support innovation, and the entrepreneurial culture.
- Section 6 assesses the governance setup for overseeing the innovation system.
- Section 7 concludes with detailed policy recommendations.

While here we are assessing individual dimensions, overall performance depends on their interaction. Weaknesses or misalignments in any dimension can limit returns to investments in other dimensions.

BOX 2.1 An extended national innovation systems framework

Following Maloney and Cusolito (2018), the national productivity system framework extends the traditional national innovation system framework by integrating the accumulation and interaction of physical, human, and knowledge capital as drivers of productivity growth. Based on this framework, we have assessed the innovation system against the broader concept in which outcomes depend on how effectively the different dimensions, including multiple actors, interact.

At the center are *firms* which adopt, adapt, and create technologies. Their incentives and capabilities ultimately shape whether knowledge translates into productivity gains. Supporting them are *public research organizations and universities,* which generate basic research, train human capital, and provide spillovers to the private sector. *Government and policy institutions* also play a crucial role by setting regulations, incentives, and governance structures that can either foster or constrain innovation. A range of *intermediaries*—including technology transfer offices, venture capital providers, incubators, and business associations—reduce information frictions and help connect firms with sources of knowledge and finance. *Consumers*, in turn, influence firm behavior through their demand for higher quality, greener, or more advanced products.

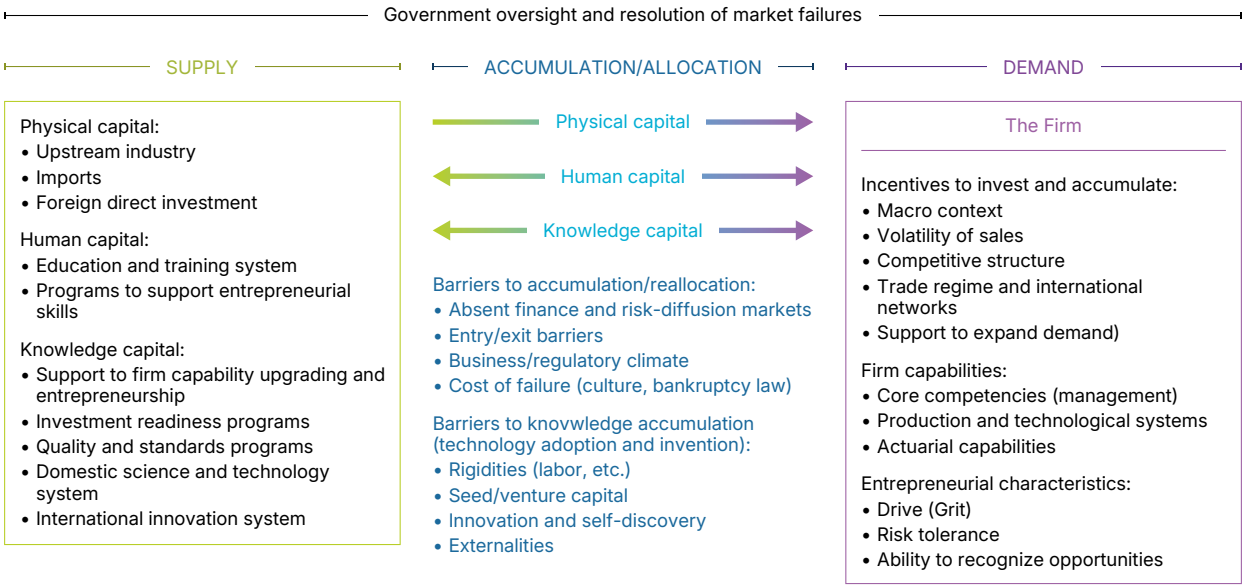
The framework identifies several essential functions that an effective innovation system must perform (Figure B2.1.1). On the supply side, *knowledge creation and research* take place in universities, laboratories, and firms engaged in new technology development. Equally important is the *diffusion and absorption of global frontier technologies into local firms,* which often accounts for the bulk of productivity growth in developing and middle-income economies. This depends on enabling factors. *Financing mechanisms*—including venture capital, bank credit, public grants, and procurement—provide the resources needed to sustain innovation. *Skills formation,* through education, training, and managerial development, ensures that firms are able to absorb and apply new knowledge. *Collaboration and networks* link firms to each other, to research institutions, and to global value chains, enhancing learning and technology transfer. Finally, *entrepreneurship* drives entry, experimentation, and the scaling up of innovative firms.

Underlying this framework is the idea that productivity and innovation do not result simply from increasing research and development spending, but from the effective functioning of a whole system of interactions. Bottlenecks can emerge in any part of the system: from weak managerial skills and poor financing channels to rigid labor markets or insufficient mechanisms for technology diffusion (see the middle column in Figure B2.1.1). Overcoming them requires policies that are diagnostic and systemic, tailored to identify which elements of the innovation system are binding in a given context, rather than assuming a one-size-fits-all approach.

The policy implications are clear. Countries must move away from linear "science-push" strategies that focus narrowly on subsidizing R&D, and instead recognize the complementarities across the system, such as the interaction between finance, skills, and networks. Effective reform requires targeting systemic bottlenecks with coordinated interventions, as well as considering sequencing, since in catching-up economies, technology diffusion and adoption are often more urgent priorities than frontier invention.

Source: Cusolito and Maloney (2018), Productivity Revisited: Shifting Paradigms in Analysis and Policy. Washington, DC: World Bank.

FIGURE B2.1.1 A national innovation system framework contains many elements



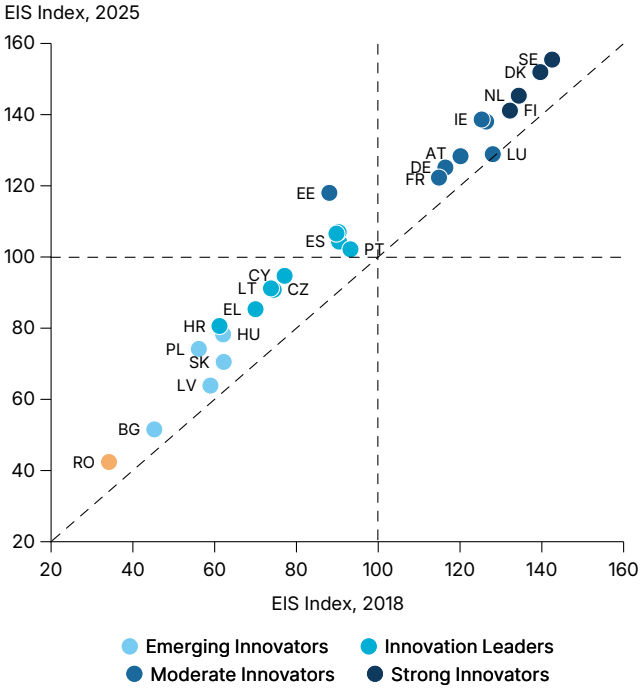
Source: Cusolito and Maloney (2018).

INNOVATION CONTEXT

Romania has made steady progress in bringing income levels closer to the EU average, but its growth model remains constrained by a low productivity growth. Romania's GDP per capita in purchasing power standards (PPS) reached 79% of the EU average in 2024. Nevertheless, the economy still lags behind the most dynamic peers in the Central and Eastern European region when it comes to productivity and value-added structure. The economy's structure remains dominated by low-technology manufacturing and services, which together limit productivity spillovers and innovation diffusion. Manufacturing's share of value added in Romania has declined markedly over the past two decades. It accounted for around 11.4% of gross domestic product (GDP) in 2024, down from historical levels of close to 20–21% in the early 2000s. This contraction contrasts sharply with the experience of several advanced converging peers—such as Czechia (around 20%), Poland (15%), and Hungary (16%)—where manufacturing continues to play a much larger role in economic output. The services sector dominates Romania's economy, accounting for roughly 62% of GDP in 2024, but much of it remains concentrated in low-productivity, non-tradable activities such as retail, transport, and construction. While these sectors have supported job creation, their limited tradability and innovation intensity have constrained productivity growth. Knowledge-intensive, export-oriented services—particularly in information and communications technology (ICT) and professional business services—have increased in recent years and while they still represent a relatively small share of output (4% of value added in 2022), this is in line with EU averages.

High-productivity activities are concentrated in a few urban centers, highlighting stark regional disparities. The Bucharest-Ilfov region—home to a third of total value added—shows GDP levels over two and a half times the national average, while several northeastern and southern counties remain below 60% of the EU average in GDP per capita (PPS) This concentration of high-productivity activity reflects a dual economy: one centered on capital-intensive urban services and foreign-owned manufacturing clusters, and the other reliant on low-value-added agriculture, retail, and public employment.

FIGURE 2.1 **Romania comes last among European Member States for innovation capacity**



Source: European Commission (2025). European Innovation Scoreboard 2025.

Romania ranks last among EU Member States on overall innovation performance (Figure 2.1). According to the European Innovation Scoreboard 2025, Romania is positioned at the bottom of the six emerging innovators (Hungary, Poland, Slovakia, Latvia, Bulgaria, and Romania), performing below 70% of the EU average (European Commission, 2025). The innovation gap between Romania and other countries has not significantly narrowed over the past decade, with Romania's innovation performance declining between 2012 and 2020, and showing limited improvement from 2020 to 2025. Examining specific components of the European Innovation Scoreboard reveals systemic weaknesses across the board. Romania ranks last or near-last in most categories. One notable area of improvement has been digitalization, where Romania has improved from third-from-last to mid-range, benefiting from strong broadband penetration among enterprises. However, this digital infrastructure has not yet translated into broader innovation outcomes or productivity gains across the economy.

To sustain convergence, Romania needs to shift its growth model toward innovation-driven and export-diversified sectors, strengthening human capital, and closing persistent regional gaps in productivity and access to economic opportunity. The existing model is contributing to an economic structure that is biased toward lower productivity sectors, weak spillovers from digital/green innovations, and a firm capability base that struggles to absorb and scale advanced technologies. While the legal and policy framework (including the NRRP) provides a platform, the real economy still needs stronger linkages between funding, firm capability development, and technology adoption if the twin green and digital transition is to support productivity and convergence.

3.

Demand in the innovation system

FIRMS' CAPABILITIES

The population of formal businesses in Romania is predominantly composed of micro, small, and medium-sized enterprises (MSMEs) operating within the services sector. In 2023, official business registry data (ONRC) recorded about 800,000 formal MSMEs, with micro businesses—those employing 0–9 people—making up the vast majority, at 91.5%. Despite the dominance of MSMEs by number, large firms (comprising 0.3% of firms) continue to play a significant role, providing 34% of total employment in the country (INS, 2024). Most Romanian firms are concentrated in the services sector—which includes a notable share of knowledge-intensive services—as well as substantial representation in retail, construction, tourism, and wholesale. Modern economic activities, such as digital businesses and high-tech manufacturing, account for a smaller share of firms.

Firm demographics reveal a youthful and regionally concentrated entrepreneurial landscape. Nearly 30% of registered firms are less than ten years old (WBES, 2023). The Bucharest-Ilfov region stands out as the primary hub for formal businesses, hosting close to 25% of all firms (INS, 2024). This is followed by the North-West and Centre regions. Notably, both Bucharest-Ilfov and North-West not only have the highest absolute number of firms, but also the greatest density of firms per capita, indicating that these regions are leading centers for entrepreneurial activity, even after adjusting for population size. This regional concentration underscores the dual nature of Romania's economy, where high-productivity entrepreneurial activity is clustered in a few dynamic urban regions, while other areas lag behind on opportunity and firm creation.

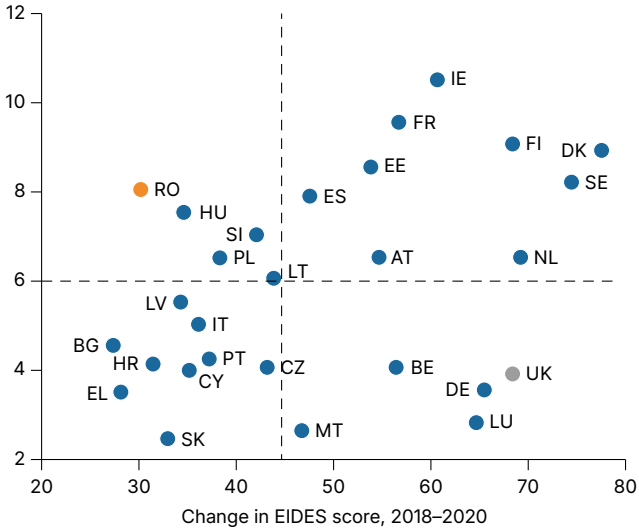
Romania continues to face substantial obstacles in making entrepreneurship dynamic, i.e. high-growth, opportunity driven and innovative. Three in ten businesses were created because the entrepreneurs did not have any other opportunities in the labor market ("necessity entrepreneurs") rather than because of growth potential ("opportunity entrepreneurs") (World Bank, 2022). Moreover, the country ranked 26 out of the 27 EU countries on the 2020 European Index of Digital Entrepreneurship Systems (EIDES)—EU wide indicator that assesses digital entrepreneurship among mostly startups and scaleups-, and remains in the "laggards" group (upper left quadrant) despite modest improvements from 2018 to 2020 (Figure 3.1). The weaknesses are pervasive across all eight dimensions measured—from "culture and informal institutions" and "market conditions", to "finance" and

"networking and support" (Brătianu et al., 2021). More recent data reinforces this diagnosis: in 2023 the Total Early-Stage Entrepreneurial Activity[2] rate stood at just 5.9% (ranking 38th of 46 in Global Entrepreneurship Monitoring, GEM), and only 4.9% of adults were women entrepreneurs (GEM, 2024). Moreover,

Romanian firms face persistent capability gaps that hinder productivity growth, innovation, and technology absorption. The World Bank's *Romania Country Private Sector Diagnostic* identifies low managerial sophistication, limited adoption of structured performance monitoring, and scarce formal training as key bottlenecks to competitiveness (IFC & World Bank, 2023). E.g. despite Romania's relatively strong ICT sector and high share of science and engineering graduates, firms have limited use of R&D personnel, low adoption of digital technologies beyond basic connectivity, and weak collaboration with universities and research institutes. This skills gap, combined with weak managerial capabilities and limited absorption capacity, prevents Romanian firms from using available talent effectively and translating research into commercial innovation.

FIGURE 3.1 **Romania performs poorly for digital entrepreneurship systems**

EIDES scores versus change in score 2018–20.



Source: EIDES, 2021.

Although top managers in Romania have long trajectories of professional experience, firms still invest little in employee training. Strategic planning tends to be weak, and the use of key performance indicators (KPIs) is limited—a pattern consistent with findings from the World Management Survey (WMS) and the Enterprise Surveys. For instance, only 28% of Romanian manufacturing firms systematically track production and performance data, compared to nearly 50% in Poland and over 60% in Germany (World Management Survey, 2020). Similarly, fewer than 30% of firms in Romania provide their workforce with structured managerial or technical training, among the lowest shares in the EU (World Bank, 2024). This limited investment in workforce development weakens firms' capacity to innovate, absorb new technologies, and manage risks effectively in a rapidly changing economic environment (World Bank, 2024).

Managerial quality plays a key role in explaining the large variability in firm productivity. The most productive 10% of firms in Romania are five times more productive than the median, indicating weak diffusion of best practices (OECD 2023). In addition, managerial skills are closely correlated with the educational attainment of non-managerial staff, underlining that capability gaps are systemic rather than confined to leadership levels. According to the 2023 World Bank Enterprise Survey, the Management Practices Index for Romanian firms stands at 45.1, well below the Europe and Central Asia average of 52 and the high-income country average of 53 (World Bank, 2024). This gap reflects significant disparities across firms: foreign-owned and export-oriented enterprises tend to use structured management systems and digital tools, while domestically oriented SMEs—particularly in services—continue to lag behind. Evidence also points to limited learning-by-doing. Older firms are not necessarily better managed, suggesting a lack of competitive pressures and weak market selection mechanisms (OECD, 2023; IFC & World Bank, 2023). The cumulative effect is a corporate landscape dominated by small, domestically focused enterprises with limited absorptive capacity for new technologies and management methods—conditions that are slowing down Romania's digital and green transitions. Strengthening managerial capabilities is therefore essential for boosting productivity and innovation in Romania's private sector.

Romania faces a significant gap in advancing the digital and green transitions within its firms, despite institutional commitments and EU-supported programs. According to the Digital Decade Country Report (2025), while the country boasts strong fixed-connectivity

2 Percentage of 18–64 population who are either a nascent entrepreneur or owner-manager of a new business.

infrastructure, the digitalization of enterprises—especially SMEs—still trails the EU average, and uptake of advanced digital technologies remains low. About 14% of Romanian SMEs apply AI tools (upcoming firm-level technology adoption survey results).

Addressing these gaps requires capability-building programs that combine managerial training, digital upskilling, and peer-learning networks, particularly for SMEs. Grants or financial instruments for technology adoption and innovation should be paired with skills training. International experience shows that such interventions can generate significant productivity gains when linked to competition policy and export-linkage initiatives (Cirera et al., 2024)—areas that remain underdeveloped in Romania.

START-UPS AND ENTREPRENEURIAL SUPPORT

Few young firms in Romania pursue ambitious innovation or scale-up, with most focusing on incremental improvements for domestic markets rather than breakthrough technologies or export growth. Few young firms are pursuing significant innovation or scale-up ambitions, preferring incremental improvements and domestic market focus. Among tech startups[3], 67.5% did not consider themselves innovative. Some 21.4% reported developing an innovation, and only 12.5% expected to do it in the future. Less than 20% were developing new-to-market technologies or processes for national or international markets. Most of the firms that are innovating are providing innovative products or technologies; some are also innovating in terms of the business models. 26% of these firms had applied for a patent, copyright or trademark, and 39% of firms are planning to do so. This could potentially be an indicator of limited knowledge creation and innovation, or of limited awareness of the IP systems (World Bank 2022a).

Romania has produced three unicorns[4], but ecosystem depth remains limited. UiPath (exited in 2021), eMAG, and MultiversX represent notable successes, demonstrating Romania's capacity to produce globally competitive firms. However, the pipeline of potential future unicorns remains thin. Romania ranks 42nd globally and 5th in Central and Eastern Europe (CEE) for start-up ecosystem value, trailing Poland, Czechia, Estonia, and Hungary (Dealroom, 2023). The concentration of successful start-ups in narrow verticals—primarily software (SaaS), fintech, and IT services—limits the breadth of innovation across traditional manufacturing, green technologies, and emerging sectors..

The World Bank Group's analysis of Romania's existing policies shows that decision-makers don't make clear distinctions between startups and SMEs, leaving startups underserved despite their potential (World Bank 2022b). Startups differ from other companies and SMEs in several ways—they tend to be young, highly innovative, often use emerging technologies, operate in new sectors, and are still working to create scalable business models. There are key differences between a startup trying to grow in a new industry and an established SME with little interest in expansion in a traditional sector; even if they're similar in size, their core traits and resources are quite different. For instance, because startups face high technical or market risks, they often need risk financing like seed or venture capital—options that aren't suitable for established firms lacking growth ambition. Therefore, it's best to treat startups as a specialized category within SMEs with unique needs, which calls for tailored policies, programs, and tools (World Bank 2022b).

An increasing number of accelerators, incubators, and related innovation enablers are supporting the ecosystem, but their overall depth remains limited. There is an increasing number of active accelerators, incubator programs and VCs across the country, concentrated mainly in main agglomerations such as Bucharest, Cluj-Napoca, and Iași. Major players include Techcelerator, InnovX-BCR, Spherik Accelerator, Rubik Hub, ROCA X, and Orange Fab,

3 Start-ups refer to only highly scalable innovative companies.

4 A global unicorn is a privately held start-up company valued at over US$1 billion anywhere in the world.

offering mentorship, early-stage investment, and networking opportunities. A World Bank (2024ba) diagnostic of Romania's entrepreneurship ecosystem mapped 81 start-up enablers and found that most are strongest in community-building and investor access, but weak in alumni management, impact evaluation, and international connectivity. Funding for the enablers themselves is scarce and fragmented, with many programs dependent on time-limited EU or donor financing, as well as volunteer work, rather than sustainable public funding or complemented by private partnerships. Similarly, administrative complexity, overlapping instruments, and limited visibility of program outcomes are systemic weaknesses across Romania's innovation policy mix, as discussed in Section 5 (European Commission, 2024).

Romania's early-stage financing environment remains shallow, with insufficient pre-seed and seed-stage instruments to bridge the gap between ideation and commercialization. Of 50 national and EU-supported firms' support instruments reviewed by the World Bank, only 21 were open to start-ups and 9 targeted pre-seed ventures (RoStartup, 2021). Romanian firms' investment expectations are among the most pessimistic in the EU, reflecting tight financing conditions and limited venture-capital depth. Consequently, while accelerators can support validation and networks, financing constraints at later stages can still hinder scaling and international expansion (EIB, 2025; EIB, 2024). The situation improved towards the end of 2025, with the launch of Innovation Romania Holding Fund with the technology transfer, accelerator, and co-investment windows of up to 100 m euro.[5]

The imbalance between domestic and diaspora entrepreneurship further illustrates these structural constraints. In 2024, Romanian-founded start-ups headquartered domestically raised approximately €100 million across 48 rounds, whereas those founded by Romanians abroad attracted around €9.8 billion across 10 major rounds (Activize.tech, 2024). This disparity indicates that global capital and scaling networks remain largely external to Romania. International organizations consistently emphasize the need for more robust university-to-start-up pipelines, impact measurement systems, and internationalization mechanisms, as well as more coherent governance of the numerous EU-funded programs that underpin the accelerator landscape (OECD, 2023; European Commission, 2024; World Bank, 2024).

5 https://www.eif.org/products/all/innovation-romania-holding-fund

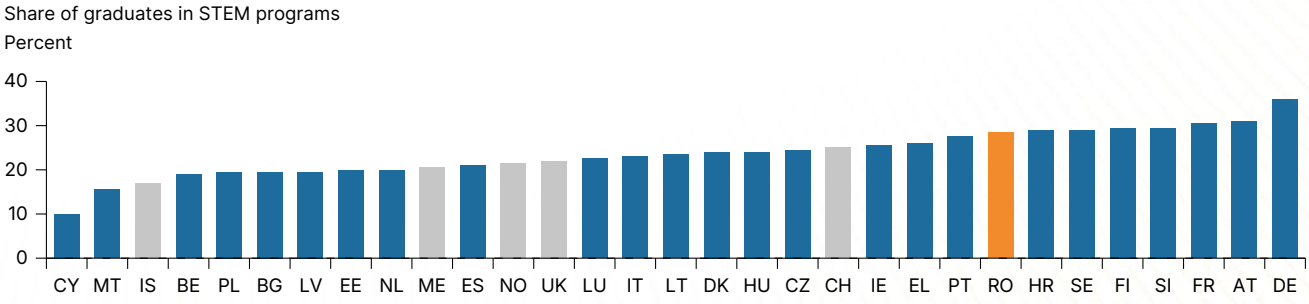
4.

Supply in the innovation system

HUMAN CAPITAL AND UNIVERSITIES

Romania's high share of STEM graduates and strong women representation in sciences has not translated into corresponding innovation outcomes, reflecting deeper systemic issues in education quality and labor market alignment. While the share of population with tertiary education in total population is significantly low (EIS 2025), almost a third of graduates in Romania pursue science and engineering disciplines, with many of them women. Remarkably, Romania led the EU in 2021 for women in STEM, with 42.5% of tertiary-level STEM graduates being women—higher than Poland (41.5%) and Greece (40.9%). While more recent national figures are not yet published, this strong gender representation in STEM remains a positive trend. Overall, Romania maintains a relatively high proportion of graduates in STEM (28%) disciplines compared to EU peers (Figure 4.1). However, this apparent advantage has not translated into higher rates of R&D employment or innovation activity, suggesting fundamental disconnects between educational outputs and labor market needs.

FIGURE 4.1 Romania's share of graduates in STEM programs is relatively high, 2022/23



Source: UNESCO.

Employment outcomes for recent graduates remain weak, particularly compared to regional peers. In 2024, Romania recorded an employment rate of 75.0% for recent tertiary graduates (aged 20–34), the third-lowest in the EU after Italy (69.6%) and Greece (73.2%), and well below the EU average of 82.3% (Eurostat, 2024). This reflects multiple challenges: weak demand for high-skilled labor outside Bucharest-Ilfov, skills mismatches between what universities teach and what employers need, and persistent emigration of graduates

seeking better opportunities abroad. The gap is particularly pronounced for STEM graduates, where despite high supply, many Romanian firms report difficulty finding qualified personnel—pointing to quality concerns rather than quantity issues.

The disconnect between STEM supply and R&D employment also highlights weak absorptive capacity in the business sector. Romania has approximately 4 R&D personnel for every 1,000 employees—one of the lowest levels of EU comparators (OECD, 2021). More concerning, only 36% of all R&D personnel work in businesses, with the majority employed in government and higher education sectors. This compares unfavorably with Finland (where 19 in every 1,000 employees are in R&D, and with higher business-sector concentration), and even Bulgaria and Poland. The imbalance suggests that Romanian enterprises either cannot or do not wish to employ research-intensive staff, reflecting limited technological capabilities, weak innovation strategies, and management practices that do not value R&D investments.

Romania's research base remains structurally weak relative to regional and EU peers. The country has fewer researchers per capita than all comparator economies, and the total number of researchers has declined sharply since the mid-1990s. This trend reflects persistent stagnation in the public research workforce: the number of researchers employed in higher education institutions and public research organizations has fallen slightly since 2014. Structural challenges—including uncompetitive salaries and weak career incentives in the research and innovation system—continue to undermine the ability of public research institutions to attract and retain talent (European Commission, 2022). Romania also produces relatively few doctoral graduates per capita, exceeding only Poland among peer countries, which further constrains the pipeline of future researchers and limits the system's capacity to replenish human capital. Together, these dynamics point to a shrinking and aging research base that weakens Romania's innovation potential and long-term knowledge creation capacity (World Bank, 2023).

Brain drain and regional disparities erode Romania's human capital advantage further. Significant numbers of Romanian graduates—particularly in ICT and engineering—pursue opportunities abroad, attracted by the higher salaries, better career prospects, and more dynamic ecosystems in Western Europe and North America. Eurostat data shows that Romania has one of the highest rates of tertiary-educated emigrants in the EU relative to population size. This outflow is compounded by stark regional disparities: while Bucharest-Ilfov, Cluj, Iasi, and Timisoara, concentrates universities, research institutes, and high-tech firms, peripheral regions face chronic shortages of qualified personnel, limited innovation infrastructure, and weak links between education and local economies. These patterns reinforce internal migration pressures, reduce the national average for knowledge diffusion, and limit the potential for regionally balanced innovation systems.

R&D AND INDUSTRY COLLABORATION

Romania's R&D intensity remains among the lowest in the EU. In 2023, Romania's gross domestic expenditure on R&D (GERD) stood at 0.52% of GDP—the lowest level in the European Union and far below the EU average of 2.27% (Eurostat, 2023). This represents a modest increase from around 0.3% in 2015, but still reflects chronic underinvestment in research and development activities. Government budget allocations paint an even starker picture: in 2024, Romania allocated only €19.1 per inhabitant for R&D—the lowest in the EU—compared to the EU average of €284.7 (Eurostat, 2025). This funding gap is compounded by ad hoc annual budgeting: because instrument budgets are set only after the yearly national budget is approved, implementers lack multi-year visibility and cannot run predictable, regular calls—resulting in fragmented support and occasional "surprise" calls that catch intended beneficiaries unprepared (World Bank, 2023). The funding and implementation weaknesses severely limits the capacity of universities, research institutes, and businesses to conduct frontier research, develop new technologies, and build innovation capabilities.

Romania also invests less in R&I than its regional peers over time: A key driver is persistently low public effort: government budget appropriations for R&D (GBARD) as a share of GDP are the lowest among EU member states and have been declining since 2014.

EU funds have not fully compensated for these gaps: Romania allocates the lowest share of structural funds to R&I investment in the EU (2.7%), and during the 2014–2020 programming period it executed only 58% of planned spending under the National RDI Strategy 2014–2020, as under-allocation led to cancellations or one-off calls for several planned instruments (World Bank, 2023). Although businesses finance a majority of national R&D spending, the absolute volume remains small and concentrated in a few large firms (notably in ICT and automotive), producing a dual structure in which a narrow group of R&D-intensive firms coexists with a long tail of SMEs that invest minimally in research and innovation.

A significant share of gross domestic R&D expenditure goes to R&D infrastructure, yet firm-level utilization remains limited and knowledge spillovers weak. A large share of public R&D expenditure has been concentrated in a small number of flagship infrastructure projects, yet firm-level utilization remains limited and knowledge spillovers weak. A prominent example is the ELI-NP research infrastructure in Măgurele (often referenced as a cornerstone of the wider Măgurele science-park ecosystem), where Romania — together with the European Commission — co-invested approximately €320 million in 2019, equivalent to around 30 percent of gross domestic R&D expenditure that year, to develop the country's largest research and innovation infrastructure complex (Bănică, 2019). While the project hosts world-class basic research facilities, few incentives were embedded to foster systematic public–private collaboration, technology transfer, or firm access. More broadly, the effectiveness of Romania's research infrastructures is constrained by persistent operational bottlenecks, including insufficient funding for day-to-day operation (staffing, utilities, consumables, and user access), low participation in European and national research infrastructure consortia — resulting in limited shared use — and complex or unclear State aid rules governing commercial utilization. Together, these factors weaken firms' ability to leverage public research assets for growth and innovation, reinforcing the disconnect between public R&D investment and private-sector dynamism (World Bank, 2023; European Commission, 2022).

Romania has shown recent improvement in patent applications to the European Patent Office though starting from a very low base in patenting activity. In 2024, Romania submitted 63 applications for European patents, representing a 50% increase on 2023, with medical technology (11 applications) and IT-related areas (8 applications) the leading fields (European Patent Office, 2025). The strongest Romanian applicant was Stefan cel Mare University of Suceava, marking the second consecutive year this institution has led national filings. While this growth is encouraging, it starts from a very low base: Romania's patenting intensity per capita remains among the lowest in Europe. Romania joined the Unitary Patent System on September 1, 2024, which should simplify patent protection across 18 EU Member States and potentially stimulate further applications by reducing administrative burdens and costs for Romanian inventors and firms.

University-industry collaboration remains among the weakest in Europe, constraining knowledge transfer and commercialization. According to the European Innovation Scoreboard 2025, only 6% of Romanian SMEs collaborate with universities or public research organizations, compared to the EU average of 13% (European Commission, 2025). These weak links are reinforced by structural features of the higher education system: universities lack strong Technology Transfer Offices (TTOs), most institutions have minimal permanent staff dedicated to commercialization, and academic career progression depends almost exclusively on publications rather than applied research or industry engagement. The result is that even where universities produce high-quality research — often funded by EU programs — commercial translation remains sporadic and heavily dependent on individual initiatives rather than institutional support.

Isolated initiatives demonstrate potential but lack systemic integration. Public funded projects, selective research centers, and individual collaborations between frontier firms and universities do exist. However, these remain "islands of excellence" rather than embedded features of the innovation system. Without broader reforms to funding mechanisms (introducing performance-based allocations), professionalization of TTOs, and programs to build absorptive capacity in SMEs, the contribution of Romania's research base to enterprise innovation and productivity growth will remain limited. The challenge is not just funding levels but institutional design: creating incentives, capabilities, and intermediaries that enable sustained collaboration and knowledge transfer across the science-industry divide.

5.

Innovation system enablers

ACCESS TO FINANCE

Access to finance, measured by the share of domestic credit to the private sector, remains low by EU standards, constraining firm growth and innovation finance. While Romania has made progress on financial deepening since EU accession, credit to the private sector as a percentage of GDP remains below EU averages. The Romanian banking sector included 34 credit institutions as of end-2024, with significant EU support through the European Investment Fund (EIF) and European Investment Bank (EIB). In 2024, the EIF provided guarantees totaling €477.75 million to seven Romanian banks,[6] aimed at catalyzing a minimum of €700 million in funding for SMEs (EIF, 2024). This builds on €1 billion in guarantees provided in 2023, demonstrating sustained EU efforts to address financing gapsHowever, the sector lacks geographical diversity and, more importantly, access for all stages of a company's growth. Bank loans are accessed by 39% of Romanian SMEs, compared to 49% for the EU-28 average, indicating both supply- and demand-side constraints (World Bank, 2022). Interest rates in Romania are among the highest in the region—nearly twice the OECD average—which reflects both risk premiums and limited competition in certain segments. Evidence from the World Bank Enterprise Surveys (World Bank, 2024) indicates that access to finance continues to be cited by Romanian firms as a major constraint to investment, with smaller firms and those in non-traditional sectors disproportionately affected. The establishment of the IDB at the end of 2023 has also been an intervention to consolidate public guarantees and increase efficiency and impact.

Access to finance remains a significant bottleneck particularly for innovation-intensive investments, as SMEs and start-ups typically require different sources of financing. While traditional SMEs are often financed through commercial bank lending, entrepreneurs with novel and unverifiable technologies struggle to receive funding from commercial banks because it is difficult to conduct due diligence and estimate the returns from risky projects. Banks rarely recognize intangibles—such as software, data, or intellectual property—as collateral, making it exceptionally difficult for innovative young firms to access traditional debt financing. Moreover, the assets of innovative young firms often consist of intangibles such as patents, user-networks and branding, which are much harder to value and borrow against than tangible assets such as machinery. Based on available data on pre-seed and seed rounds, it is estimated that earlier-stage start-ups face a financing gap of between €50,000 and €200,000. Hence, start-ups typically self-finance (including borrowing from friends and family), seek grant funding, or raise investments from accelerators, angel investors, and venture capital (VC) funds.

6 UniCredit Bank, Alpha Bank, Libra Internet Bank, BRD Groupe Société Générale, Patria Bank, Intesa Sanpaolo Bank, and Garanti BBVA.

Start-up financing is growing in maturity, but remains concentrated at early stages with pronounced gaps in growth capital. Romanian venture capital reached €130.7 million in 2024, marking four consecutive years above €100 million, but remains shallow at approximately 0.04–0.05% of GDP, well below the EU average and significantly behind peers. Early-stage financing (pre-seed, seed, and Series A) is relatively well-served by local funds (Early Game Ventures, Catalyst Romania, Gapminder Ventures) and angel networks (Tech Angels, Transylvania Angels Network, Growceanu). However, growth-stage finance (Series B+) remains critically scarce, with most larger rounds requiring international investors. These gaps in the "financing ladder" force promising scale-ups either to relocate abroad or to cap their growth ambitions, limiting domestic value capture from successful start-ups (EIB 2024).

Like other ecosystem enablers, most VCs are in Bucharest, Cluj, and Iasi, limiting access to entrepreneurs from other regions. Evidence from elsewhere, including the United States, suggests that there is a strong geographic dimension to angel and VC investments, with investors preferring to invest in firms that are closer to them, presumably because it enables easier contact and closer scrutiny. A Bloomberg CityLab report tracked VC investment and start-up activity across cities in the United States and found that VC investment is extremely concentrated in specific regions; other regions show very little investment activity (Florida, 2016).

EU-backed instruments and public guarantee schemes provide important but insufficient support. Pan-European financing instruments from the EIB and EIF have provided €2.1 billion of financing to Romanian financial intermediaries to support SME lending (European Investment Bank, 2024). The Romanian Fund of Funds (FoF), capitalized through EU structural funds, has seeded multiple local VC funds. The Romanian Development Bank is planning to launch guarantees for innovative firms in 2026 and equity in 2028.

The shallow depth of financial intermediation reflects both banking sector constraints and weak demand for innovation finance. Banks' reluctance to lend to innovative firms stems from asymmetric information, difficulty in valuing intangibles, and limited track records for technology-intensive SMEs. On the demand side, many Romanian firms underinvest in innovation due to weak managerial capabilities, limited awareness of financing options, and risk aversion. The result is a dual constraint: firms that could absorb financing for technology upgrading struggle to access it, while many firms that could access credit lack the organizational capacity to deploy it effectively for productivity-enhancing investments.

REGULATORY AND LEGAL ENVIRONMENT

Romania's restrictive regulatory framework has not been conducive to competition. Until Romania joined the EU in January 2007, EU accession remained an anchor for reforms, providing momentum for the privatization and restructuring of state-owned enterprises (SOEs), and for regulatory and judiciary reforms. While EU accession led to substantial de jure reforms, these were often subsequently reversed or only weakly implemented (World Bank, 2018). The restrictiveness of Romania's regulatory environment is driven by state control and additional barriers to entrepreneurship. According to the product market regulation (PMR) indicators, Romanian markets are more restrictive than those of newer EU Member States.

The regulatory framework continues to impose high administrative burdens on entrepreneurs. Firms report spending 15% of senior management time on regulatory compliance—above regional peers—and facing lengthy procedures to obtain construction and operating permits (averaging 74 and 38 days, respectively). Although only a small share of firms cites licenses and permits as their top business obstacle, these inefficiencies weigh particularly heavily on start-ups and SMEs. Complex approval systems and restrictive legal frameworks still make it difficult to establish and structure new businesses, including limiting the use of instruments such as employee stock options, which remain cumbersome under current legislation (World Bank, 2024).

Investing in Romanian start-ups is also difficult due to regulatory uncertainties. Regulations that stimulate investments in start-ups are critical because these types of firms typically do not qualify for debt financing from commercial banks (see Section 5). Fundraising can also be particularly onerous: many entrepreneurs report that it can become a full-time activity, diverting precious attention away from building their business. Romania has regulations for VC funding, but it lacks clear regulations to stimulate seed funding mechanisms, which include angel investment and other forms of finance (including "alternative finance" such as crowdfunding). This unclear status within the Romanian regulatory environment and the legal uncertainties may dissuade investors, especially those based overseas, from making the sorts of investments that could turn ordinary tech start-ups into high-potential start-ups, which often receive equity financing from angel investors, VC funds, or crowdfunding platforms.

Moreover, Romania's insolvency framework makes it difficult for firms to "fail fast." An insolvency framework is critical for building a conducive environment that allows start-ups to "fail fast" so they can apply lessons to new entrepreneurial ventures. However, evidence from the Business Pulse Surveys shows that Romania's insolvency framework and costs of bankruptcy are sub-optimal. This merits additional attention because firm closure is a natural and expected way in which resources are reallocated in a healthy entrepreneurship ecosystem.

POLICY MIX

Romania's policy mix for science, technology, and innovation (STI) lacks coherent strategic coordination. Multiple ministries and agencies manage overlapping STI programs with limited coordination: the Ministry of Education and Research and its National Research Authority, the Ministry of Economy, Enterpreneurship and Tourism, the Ministry of Investment and EU funds, the Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI), and the regional development agencies. The National Committee for Science, Technology, and Innovation has been mostly inactive, having met only twice since its establishment in 2023. This fragmentation results in stop-start funding cycles tied to annual budget processes or EU programming periods, administrative complexity, and weak accountability.

The 2023 Policy Mix Report discusses briefly the planned RDI Investments for 2022–2027 programming period (i.e. most investments were not decided at the time of writing the report). The key finding here is that a significant increase in R&I investments has been announced for the 2021–2027 programming period. Much of this planned spending increase was from the announced budget of over EU 12 billion of the new National Plan for RDI 2022–2027 (PN4), which would amount to an increase of 720% from actual spending from the previous national plan (2014–2020). This large budget is likely driven by Romania's target of 1% of GDP of government spending for R&I. However, as of 2026 the significant increase in R&I spending has not materialized and it appears extremely unlikely that all of this spending will occur. The NRRP, OP Smart Growth (PCIDIF), Regional OPs, OP Health, and OP Just Transition are expected to add an additional EUR 1.3 billion EUR in funding for innovation activities over the previous cycle.

The design and delivery of entrepreneurship programs reveal persistent gaps and structural weaknesses. Instruments overwhelmingly favor grants over risk-sharing mechanisms, target research institutes and post-revenue firms over startups, and prioritize physical infrastructure over capability-building. Few programs address critical bottlenecks such as management capacity upgrading, technology transfer acceleration, or growth-stage financing. Moreover, eligibility criteria and application procedures are often complex, creating barriers for smaller firms and early-stage startups. Evaluations consistently find that while infrastructure programs achieve high absorption rates, their impact on firm-level innovation, productivity, and scaling remains limited due to weak integration with business demand and insufficient support for complementary capabilities.

ENTREPRENEURIAL CULTURE

Romania's entrepreneurial culture combines high entrepreneurial intentions with persistent barriers to scaling and risk-taking. According to the Global Entrepreneurship Monitor (2023), entrepreneurial intentions among 18–64-year-olds in Romania are higher than in many EU peers, with 29% stating intent to start a business within three years. Entrepreneurship is generally accorded reasonably high social status, and successful entrepreneurs, such as those behind UiPath, serve as visible role models. However, necessity-driven entrepreneurship remains prevalent, and most new firms stay small, domestically focused, and concentrated in traditional services or low-tech manufacturing. The stigma around business failure persists: weak insolvency frameworks, slow bankruptcy procedures, and cultural aversion to risk discourage serial entrepreneurship and limit the learning that comes from repeated venture attempts.

A limited "give back" culture constrains ecosystem maturation and reduces spillovers from successful entrepreneurs. Unlike ecosystems in Poland or Estonia where successful founders systematically reinvest capital and expertise into subsequent ventures, Romania's ecosystem shows thinner networks of mentorship, angel investing, and entrepreneurial reinvestment. Many successful Romanian entrepreneurs relocate abroad or focus on international markets without maintaining strong ties to the domestic ecosystem. Diaspora engagement remains ad hoc rather than structured, limiting the potential for returning talent, capital, and know-how to strengthen local capabilities. This reduces the multiplier effects from frontier successes and slows the accumulation of entrepreneurial experience and networks that underpin mature innovation ecosystems.

Weak social capital and limited collaboration across ecosystem actors reinforce fragmentation. Romania ranks low on indicators of institutional trust and civic participation, which is reflected in the innovation ecosystem through siloed networks and limited collaboration between start-ups, corporates, universities, and research institutions (European Commission, 2017). Stakeholders frequently report fragmented relationships, limited information sharing, and insufficient mechanisms for collective action. Technology transfer offices remain weak, university-industry collaboration is rare, and corporate engagement with start-ups is nascent. Without stronger horizontal linkages and collaborative platforms, the ecosystem struggles to achieve the network effects and knowledge spillovers that drive innovation in more mature systems.

6.

Government strategic oversight

Romania's strategic framework for innovation remains fragmented, with multiple overlapping strategies and implementing agencies. The country operates under several concurrent frameworks, including the National Recovery and Resilience Plan (NRRP), the National Research, Development and Innovation Strategy 2022–2027, the Smart Specialisation Strategy (RIS3), and sector-specific strategies for digitalization and green transition. While these set priorities in areas such as ICT, clean energy, advanced manufacturing, and health, implementation is divided across ministries and mechanisms for cross-government coordination are limited. The absence of a dedicated innovation agency with program-level authority means that strategic priorities are often diluted in execution, accountability is diffuse, and monitoring systems remain weak.

Institutional capacity constraints weaken program delivery and reduce effectiveness. Unlike peer countries with dedicated innovation agencies (e.g. Poland's National Center for Research and Development, Estonia's Enterprise Estonia), Romania lacks a specialized institution with a clear mandate to design, implement, and evaluate innovation programs. Responsibilities are spread across line ministries with narrow mandates and limited technical capacity, resulting in duplication, weak strategic coherence, and limited dialogue with the private sector. The absence of standardized program design templates, clear key performance indicators (KPIs), and centralized M&E systems means that lessons from past interventions are rarely incorporated into future programming. This institutional thinness reinforces short-termism and reduces the predictability that firms need for planning long-term innovation investments.

Moreover, Romania continues to lack a single policymaking authority dedicated to start-ups, including tech and high-potential firms. Existing institutions—most notably the Romanian Executive Agency for Funding Higher Education, Research, Development and Innovation (UEFISCDI)—originate from the education and research sphere, and their academic culture shapes their approach. While UEFISCDI remains essential for transforming Romania's R&D ecosystem, policies that foster entrepreneurial ecosystems require specialized expertise, agility, and risk tolerance—features that differ markedly from those of traditional R&D or SME-support institutions. The World Bank's 2022 functional review of public entrepreneurship programs found that most instruments remain risk-averse, targeting "safer," more established, and already profitable firms over nascent, innovation-driven ventures. To bridge this gap, Romania needs a dedicated institution designed to support start-ups and scale-ups—one with the governance, capabilities, and operational flexibility to work

hand-in-hand with ecosystem enablers, investors, and policy circles, and with the technological sophistication to manage risk, not merely avoid it. At the time of writing this report, establishment of the RoStartup Hub and of an innovation agency was discussed.

Programs are poorly targeted at start-ups, in terms of catering to their size, profitability, technology readiness levels, and so on. For example, among the programs that focus on the private sector, many simultaneously target several firm sizes and life cycles, with little specialization. Experience indicates that each of these business activity segments requires special skills to serve them; even firms at different start-up phases have different needs. Thus, the policies needed to support high-potential start-ups (such as small start-ups with high-growth ambitions working in emerging technology) may be very different from the policies needed to support established SMEs. Small support programs with wide-ranging offerings are highly unlikely to have the capabilities required. Policymakers therefore need to differentiate between start-ups and other firms, including other SMEs. As described in the introduction, start-ups may be considered a special subset of SMEs. Among other differences, their capacity building and financing needs differ from those of established SMEs. Tech start-ups and high-potential start-ups, in turn, are special subsets of start-ups, and also require specialized attention.

Recent external commitments and EU processes provide opportunities for institutional reform but require domestic follow-through. Romania's NRRP, with total resources of approximately €21.4 billion in grants and loans, includes significant allocations for digitalization, green transition, and innovation infrastructure. However, absorption rates for EU funds have historically been low (see above), and implementation capacity remains a binding constraint. Romania is engaged in processes for accession to the Organisation for Economic Co-operation and Development (OECD), which provide external benchmarks for governance quality, STI policy coherence, and institutional capacity. These processes create windows for reform, but without sustained political commitment and institutional consolidation, external pressures alone will not overcome entrenched governance weaknesses.

7.

Conclusions and recommendations

To address Romania's persistent challenges in scaling innovative firms, the report recommends a comprehensive set of reforms designed to recalibrate and modernize the policy mix for start-ups and high-growth companies, facilitate entrepreneurship through targeted regulatory and financial changes, and build institutional capacity by establishing an Entrepreneurship hub and a dedicated innovation agency. The reforms are described in details in previous World Bank reports (World Bank, 2022a, 2022b, 2023, 2024b) These measures, alongside strategic investments in human capital and ecosystem enablers, aim to foster sustained innovation-led growth by differentiating support for start-ups from traditional SMEs, improving coordination across stakeholders, and creating a more conducive environment for risk-taking and business expansion.

1. **Introduce multi-annual, program-based budgeting for core R&I instruments to overcome volatility.** Key innovation, collaboration, and human-capital programs should operate on 5–7 year funding envelopes with midterm reviews, enabling regular calls for proposals that allow agencies to plan strategically, build applicant pipelines, and iteratively adjust program design based on rigorous performance and impact evaluations rather than reacting to unpredictable annual budget shocks. Multi-annual budgeting provides private sector firms with predictable funding horizons essential for long-term R&D planning, pipeline development, and scaling investments.

2. **Improve implementation capacity and decrease fragmentation by creating a firm-focused innovation agency and a one stop shop for startups.** Romania is the largest EU country without an innovation agency, with multiple ministries operating often overlapping an non-coordinated support schemes. By centralizing programs supporting firm-level R&D and industry-research collaboration, standardizing the rules, lowering administrative burden, and leveraging private sector governance, Romania can ensure that programs respond to actual market needs and are efficiently implemented. The innovation agency, currently planned to be launched in 2026, should be complemented by a one stop "ROStartup Ecosystem Hub"—an entity focusing specifically on startups by coordinating the startup ecosystem, building capabilities of startup enablers, and advocating for innovative firms. Both entities should recruit staff with private sector experience, to align their operations with the market orientation, efficiency and pace that firms require.

3. **Activating and empowering Romania's National Committee for Science, Technology, and Innovation is critical to resolving the deep institutional fragmentation that undermines national R&I policy coherence.** Currently, multiple ministries and Regional

Development agencies operate in parallel, often overlapping and uncoordinated programs, resulting in firms and researchers' confusion and suboptimal leverage of funds. The Committee, established in 2023, has mostly multi-stakeholder composition and appropriate objectives, but remains largely inactive, having met only twice since its establishment (as of early 2026). The Committee should approve a single national innovation implementation plan, include the Ministry of Economy, Entrepreneurship and Tourism as one of its members, align ministry programs and EU funds, and publish annual "joined up" progress reports to reduce overlaps and signal credible commitment.

4. **Channel more funding toward firm-level R&D, research-industry collaboration, and ecosystem-building for innovative firms to address its critically weak innovation performance and low private-sector engagement.** The country ranks last in the European Innovation Scoreboard due to chronically low public R&I investment and private R&D spending well below the 1% GDP target, compounded by fragmented governance, unpredictable annual budgets, and a policy mix that favors public institutions over industry-led initiatives. Weak public-private linkages and inadequate technology transfer capabilities leave public research under-commercialized, while small-budgeted, administratively burdensome instruments fail to support high-risk startups or collaborative value-chain innovation, exacerbating brain drain and digital skills gaps. Redirecting resources to scalable firm-focused grants, collaborative firm-led R&D programs (competence centers, matchmaking), and startup enablers would leverage private investment, strengthen technology diffusion, and build a self-sustaining ecosystem of ambitious, export-oriented innovators.

5. **Strengthen firm and startup capabilities through high-quality business support institutions and ecosystem enablers to bridge Romania's skills and capabilities gaps and enabling R&D translation into competitive growth.** Most Romanian startups and SMEs lack managerial, financial, and market-development expertise needed to commercialize innovations and scale internationally, while the ecosystem suffers from few, uneven-quality accelerators, incubators, and scarce business support institutions. For the startup ecosystem, investing in high-quality business support institutions and startup enablers would help provide startups and established firms with managerial, financial, and market-development skills needed to translate R&D into productivity gains and competitive, export-ready businesses.

6. **Reform regulations so that they enable entrepreneurship and investment.** Romania's business environment still discourages firm growth and scaling despite strong entry rates. Most entrepreneurship is necessity-driven, with relatively few tech or high-growth startups. Cultural and institutional barriers—including stigma around business failure—limit serial entrepreneurship and risk-taking. Priority reform areas are the following:

    - Digitize company formation and streamline insolvency and exit procedures to support both new and distressed firms.
    - Clarify IP ownership and commercialization rules, particularly for IP emerging from universities and publicly funded research. Current regulations are ambiguous and discourage collaboration.
    - Improve career incentives for researchers for commercialization
    - Improve access to public procurement opportunities, including innovative public procurement, by simplifying procedures and enabling innovative firms to participate more easily.

7. **Improving entrepreneurship education through mindset development and structured industry-academia exchanges is essential to equip Romania's graduates and researchers with practical skills for innovation-driven ventures.** Entrepreneurship education remains fragmented, outdated, and poorly connected to real-world practice. Many academics have limited private-sector experience, weakening the relevance of entrepreneurial training and technology transfer. Current university curricula emphasize

theoretical knowledge over actionable entrepreneurial competencies, contributing to low startup ambition and weak firm innovation despite a strong STEM graduate base. Reforms should prioritize embedding an entrepreneurial mindset via experiential learning — practitioners teaching entrepreneurship modules at universities, academic staff undertaking secondments in innovative firms, and joint industry-academia projects that expose students to real-world opportunity identification, validation, and scaling challenges

References

Bănică, A. (2019). *Măgurele Science Park: Romania's flagship research infrastructure investment.* [Report/Article].

Dealroom. 2023. "CEE Startup Ecosystem Rankings.. Amsterdam.

European Commission. (2022). PSF *country review of the Romanian research and innovation system: Final report.* Publications Office of the European Union.

European Commission. (2024). *2024 Country Report—Romania* (SWD(2024) 623 final).

European Commission. 2025. *European Innovation Scoreboard 2025.* Brussels: European Commission. *https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european-innovation-scoreboard_en*

European Investment Bank. (2025). EIB *Investment Survey 2024: Country overview—Romania* (ISBN 978-92-861-5835-3).

European Investment Bank. (2024). *The scale-up gap: Financial market constraints holding back innovative firms in the European Union.* European Investment Bank.

European Patent Office. 2025. *Patent Index 2024.* Munich. *Referenced in Agerpres (2025), "Romania files 50% more applications with European Patent Office in 2024." https://agerpres.ro/english/2025/03/25/romania-files-50-more-applications-with-european-patent-office-in-2024--1434109*

Eurostat. 2022. "Tertiary education statistics - graduates by field". Luxembourg: Eurostat.

Eurostat. 2023. "R&D expenditure statistics - gross domestic expenditure on R&D (GERD). Luxembourg: Eurostat. *https://ec.europa.eu/eurostat/statistics-explained/index.php?title=R&D_expenditure*

Eurostat. 2024. "Employment rates of recent graduates". Luxembourg: Eurostat. *https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Employment_rates_of_recent_graduates*

Eurostat. 2025. "Government budget allocations for R&D (GBARD) - 2024 data". Luxembourg: Eurostat. *https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20250729-2*

Florida, R. (2016, February 23). *A closer look at the geography of venture capital in the U.S.* Bloomberg CityLab.

IFC & World Bank, 2023. *Creating Markets in Romania: Raising Romania's Private Sector Potential. Country Private Sector Diagnostic.* Washington, D.C: The World Bank Group. https://www.ifc.org/content/dam/ifc/doc/2023/romania-country-private-sector-diagnostic-en.pdf

INS (2025). *Small and Medium Enterprises in the Romanian Economy.* Bucharest: National Institute of Statistics. https://insse.ro/cms/en/content/small-and-medium-enterprises-romanian-economy-3.

Invest Europe. 2023. *European Private Equity Activity Statistics 2022.* Brussels: Invest Europe.

OECD. 2021. OECD *Science, Technology and Innovation Outlook 2021.* Paris: OECD Publishing.

ROStartup. (2021). *Romanian startup ecosystem strategy white paper: Consultation edition.* ROStartup.

World Bank. (2022a). *Starting up Romania: The entrepreneurial ecosystem.* World Bank Group. https://www.worldbank.org

World Bank (2022b). *Scaling Up Romania: A Policymaker's Toolkit.* World Bank.

World Bank. (2023). *Recommendations and inputs for recalibration of the policy mix and for removal of procedural bottlenecks.* World Bank Group.

World Bank. 2024. *Enterprise Surveys: Romania 2023.* Washington, D.C: The World Bank Group. *https://www.enterprisesurveys.org/*

World Bank 2024b Enabling the Enablers: Building the Capabilities of Romanian Startup Support Organizations


WORLD BANK GROUP