

# STARTING UP ROMANIA

## ENTREPRENEURSHIP ECOSYSTEM DIAGNOSTIC

Marcio Cruz  
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Christopher Haley  
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**ROStartUp**  
Build the Ecosystem



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## EXECUTIVE SUMMARY

**Entrepreneurship flourishes in ecosystems.** Once an entrepreneur identifies a business opportunity and is willing to start a firm, she or he will also need the ability and knowledge to convert these promising ideas into goods and services and sell them. To do so, the entrepreneur needs resources, such as *infrastructure, physical capital, human capital, and knowledge*. These resources are aspects of the entrepreneurship ecosystem. Successful entrepreneurs must be able to access the resources they need, including by reallocating them from less successful competitors. Factors that influence their ability to do so—*access to capital, regulations, and social capital*—are also aspects of the ecosystem. In addition, entrepreneurs must also have *talent*, be surrounded by other *highly capable firms*, and have *access to markets* for their goods or services. An entrepreneurship ecosystem is the sum of these complementary factors available through institutions and individuals within a geographic area.

**To deliver more effective policies supporting innovative startups, understanding the complementary factors in entrepreneurship ecosystems is key.** The quality of an ecosystem determines entrepreneurship performance and the likelihood of creating economically impactful businesses. In most emerging countries, essential elements of institutions, networks and actors that enable entrepreneurship and innovation are missing, underdeveloped, or malfunctioning. The multiplicity of problems to be addressed and limited financial and human capacity make it difficult to design and implement policies that support entrepreneurship and innovation. Thus, having clarity on the challenges surrounding entrepreneurs, both nationally and locally, is essential for identifying priorities and defining a policy strategy.

**This report outlines three essential elements to inform a comprehensive strategy in support of entrepreneurship in Romania.** First, it offers a big picture of entrepreneurship performance and ecosystem pillars at the national level, benchmarked against Romania's peers. It will identify structural obstacles faced by entrepreneurs in order to define the key strategic objectives. Second, the report provides new evidence about startups in Romania. The findings highlight the importance of understanding the types of entrepreneurs and entrepreneurship activity in the national ecosystem, as well as the diversity of local ecosystems, to help refine the focus of policy. Third, it assesses the existing policy mix and ecosystem enablers supporting entrepreneurship. It is important to know what resources and policy instruments already support entrepreneurship, either via public programs or ecosystem enablers, that may also allocate public resources. Understanding the policy mix is particularly relevant for emerging and more advanced economies, that may have an array of institutions and instruments already in place and where there may be a greater need to optimize allocations.

**The analysis draws on numerous data sources, including important new evidence from organizations supporting entrepreneurship and a nationally representative survey focused on tech startups.** First, it combines several datasets, including the World Bank's Entrepreneurship database and Enterprise Surveys, to conduct an aggregated analysis with cross-country comparison. Second, it analyzes Romanian firms in the Romanian Business Registry, Lista Firme, PitchBook, and CrunchBase databases to analyze the geographic distribution and connectedness of startups. These data are also used as a sampling frame to build a new representative survey to compare average tech startups with high-potential startups. The analysis also aims to uncover regional variances in Romanian firms and ecosystems to surface data-driven policy recommendations. Third, the analysis reviews programs, policies, and institutions—both public sector initiatives and private ecosystem enablers—that support entrepreneurship to analyze the policy mix and the functionality of these programs.

**The report is organized in four chapters that together provide a comprehensive assessment of entrepreneurship and startup performance in Romania.** Chapter 1 examines the context of entrepreneurship in Romania through a cross-country comparison that covers key outcomes and structural pillars of the ecosystem. The analysis exploits both firm-level data and cross-country indicators. Chapter 2 spotlights the potential of subnational entrepreneurship ecosystems, with a focus on tech startups and high-potential startups. This chapter identifies potential subnational ecosystems and sheds light on the characteristics of average tech startups in Romania—and their similarities to and differences from high-potential startups from Romania. It also includes a connectedness analysis, which helps us understand the relationships between entities in the ecosystem and the regional interdependencies. Chapter 3 examines the characteristics of public programs and private ecosystem enablers supporting entrepreneurship in Romania. Chapter 4 presents the policy recommendations stemming from the analysis within the report and juxtaposes them with policy priorities identified by ecosystem stakeholders.

**The analysis supports three key messages for entrepreneurship policy strategies in Romania: (1) there is a lack of high-growth and innovative entrepreneurship, many firms are necessity driven, (2) human capital is not being used optimally, and (3) the government needs to improve the policy mix for innovation, entrepreneurship, and digitalization and its institutional capabilities to implement these programs.** First, entrepreneurship in Romania is characterized by high entry rates and low levels of scaling up and innovation compared to regional and global peers. Even among *digital and tech startups*, which is a sector of the economy that is known for being innovative and eager for high growth, there is a large share of firms whose founders lack the appropriate academic background, business experience, and international exposure. Most of these young firms are not innovating, nor do they have ambitions to significantly scale up to external markets in the next five years, or through acquisitions and IPOs in the long term. Thus, Romania's policy strategy should focus on improving the quality, rather than the quantity, of entrepreneurship. Second, Romania has a high flow of human capital from the educational system that is neither being absorbed by the private sector nor being attracted to entrepreneurship activity. Despite Romania's high share of science and engineering graduates, firms have limited use of research and development (R&D) personnel, low usage of digital technologies, and low levels of collaboration with public sector and academia. The supply of human and knowledge capital is disproportionately concentrated in Bucharest. Third, Romania needs to improve the policy mix and institutional capabilities. There are important gaps in support for entrepreneurs and early-stage startups and few instruments focus on the private sector. Additionally, many instruments lack robust evaluation mechanisms.

**The report proposes a set of policy interventions, areas for experiments, and further studies that are needed to continue refining an evidence-based strategy supporting impactful entrepreneurship.** In addition to the key messages, the analysis on public programs and ecosystem enablers also shows that there is significant room to improve existing programs supporting entrepreneurs and innovative businesses. Thus, the recommendations focus on three key areas: (i) improving the institutional capabilities and optimizing public resources supporting business programs, (ii) improving the regulatory environment and facilitating access to finance for innovative entrepreneurs, and (iii) attracting more qualified entrepreneurs and building entrepreneurship capacity.

## TABLE OF ACRONYMS

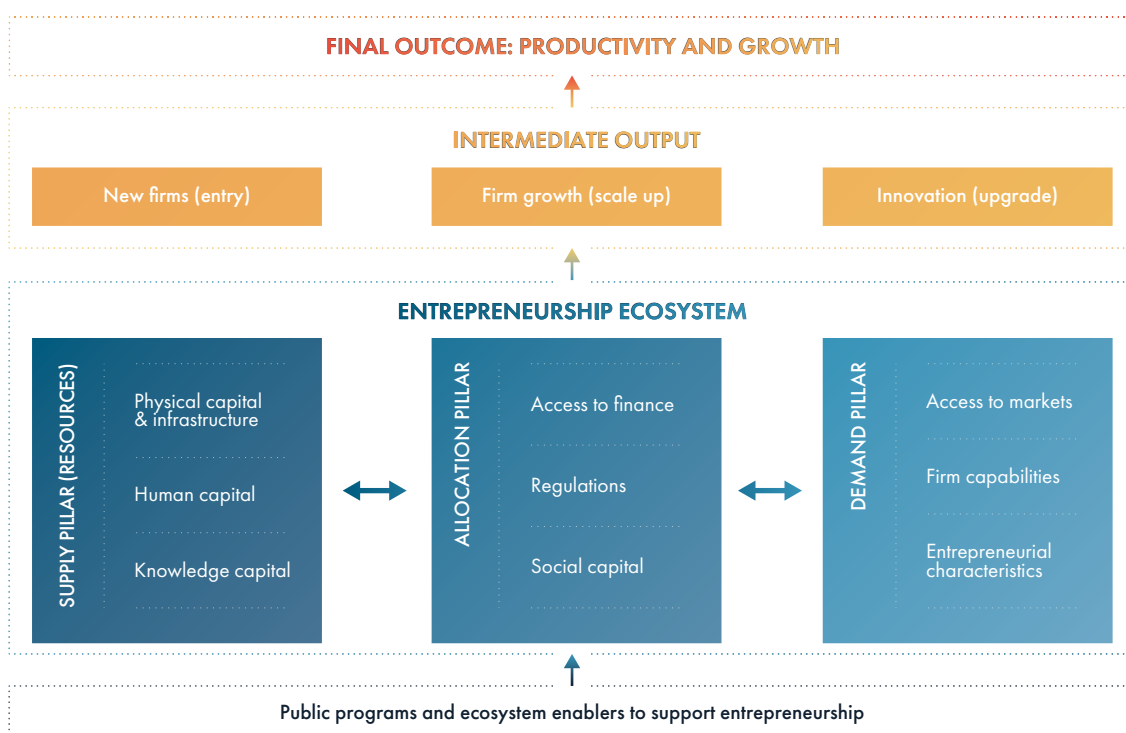
B2B	business-to-business
B2C	business-to-consumer
B2G	business-to-government
COVID-19	coronavirus disease 2019
EIF	European Investment Fund
EU	European Union
EU-27	the 27 European Union member states excluding the United Kingdom
GDP	gross domestic product
ICT	information and communications technology
IP	intellectual property
ISIC	International Standards of Industrial Classification
KPI	key performance indicator
MSMEs	micro, small, and medium enterprises
OECD	Organisation for Economic Co-Operation and Development
PMR	product market regulation
PPS	purchasing power standards
R&D	research and development
SMART	specific, measurable, attainable, relevant, and time-bound
SMEs	small and medium enterprises
SOE	state-owned enterprise
STEM	science, technology, engineering, and mathematics
STI	science, technology, and innovation
TTO	technology transfer office
VC	venture capital
VCs	venture capitalists

# OVERVIEW

**Entrepreneurship plays a critical role in economic growth and creating more and better jobs.** In most countries, many jobs created by micro, small, and medium enterprises (MSMEs) are concentrated in a small share of young firms that grow quickly in brief spurts. These impactful businesses operate in many sectors and tend to be more innovative, more connected to global value chains, and more likely to benefit from economies of agglomeration than other firms. Such high-potential startups are difficult to identify *ex ante*. Nevertheless, they are more likely to arise in dynamic ecosystems with complementary factors providing the conditions for: (i) high entry rates of (better-quality) firms, (ii) capacity of those firms to scale up, and (iii) the likelihood that they will promote innovation and technological upgrading.

**To deliver more effective policies supporting innovative startups, it is essential to understand the complementary factors in entrepreneurship ecosystems.** This report follows a methodology developed by the World Bank (2022) to assess entrepreneurship ecosystems. From the moment an entrepreneur sees an opportunity and decides to start a business, she or he requires the ability and knowledge to convert (new) ideas into (new) goods and services and market (sell) them. To do so, the entrepreneur needs resources (physical capital and infrastructure, human capital, and knowledge) that will be combined in the production process and sold as final goods or services. Successful entrepreneurs must be able to allocate the resources they need, which requires a functional financial system and institutional environment. The analysis takes into consideration these complementary factors linked to the performance of entrepreneurship at national and subnational levels (figure O.1).

**FIGURE O.1** Entrepreneurship Ecosystem: Conceptual Framework



**An entrepreneurship ecosystem is the sum of complementary factors within a geographic area (such as a city, region, or country) that are needed to start a business that can scale up and innovate.** Strong entrepreneurship ecosystems rest on three pillars (figure O.1). That is, they require (1) a sufficient supply of resources (physical, human, and knowledge capital), (2) a suitable set of demand factors (access to markets, firm capabilities, and entrepreneurial characteristics), (3) and an efficient set of allocation factors (access to finance, regulations, and social capital) that facilitate the optimal accumulation of resources to the most productive firms. In a functional ecosystem, entrepreneurs with potentially profitable projects and the capacity to execute them are more likely to find the resources they need, have access to markets for their products and services, interact with other firms with good capabilities, and face few barriers in terms of using resources (for example, better access to finance, regulatory environment, and a business-friendly culture). Three outcomes are likely to occur in such an ecosystem. One, more new firms will enter the market. Two, existing firms will grow. And three, innovation will accelerate.

**In most countries, essential elements of institutions, networks and actors that enable entrepreneurship and innovation are missing, underdeveloped, or malfunctioning.** The multiplicity of problems to be addressed and constraints on financial and human capacity make it difficult to design and implement policies that support entrepreneurship and innovation. In this context, figure O.1 provides a framework used across the chapters of this report to identify priority areas and reduce these multidimensional problems.

**Policy makers can maximize economic growth—and high-quality job creation—by addressing market failures in the entrepreneurship ecosystem.** The combination of supply, demand, and allocative factors within a healthy ecosystem results in the creation of high-paying jobs, increased exports, innovation, and productivity growth. Under this conceptual framework, entrepreneurship outputs are assessed in terms of firm dynamics—entry, growth (scaling up) and innovation (upgrading). Longer-term entrepreneurship outcomes are measured in terms of productivity and jobs, and potentially in terms of revenues, exports, and economic growth. Market failures may arise in any of the factors of the entrepreneurship ecosystem<sup>1</sup> in the supply, demand, or allocation pillars. Governments can influence an ecosystem directly through policy instruments and regulations or indirectly through ecosystem enablers that support entrepreneurship (bottom of figure O.1 in navy).

**This report focuses on startups and entrepreneurship with the potential for growth and innovation.** Table O.1 provides some examples of the heterogeneity of entrepreneurship and entrepreneurs. Three common variables used by policy makers for discussing or targeting interventions aiming to boost entrepreneurship are age (such as startups), sector, and size (such as microenterprises and small and medium enterprises [SMEs])—including changes in size over time (such as high-growth firms). These are not exclusive categories. Very often, the term *startup* is used to refer to a *special* subsample of new and young firms, looking to scale up quickly by intensively using digital technologies or new business models. This report refers to these firms as *tech startups*. Among startups, those that have garnered international attention in the private equity market, the report refers to as *high-potential startups*.

**TABLE O.1** Types of Entrepreneurial Firms

Type	Age	Size	Sector	Characteristics
Micro businesses	Any	< 5 employees	Any	Mostly subsistence/necessity potential entrepreneurs with potentially low growth prospects.
SMEs	Any	≥ 5 & <250 employees	Any	Heterogenous group of firms defined according to their size, either in terms of employees or revenue.
High-growth firms	> 3 years	Any	Any	firms that start with at least 10 employees and grow revenue or number of employees by more than 20 percent per annum for three years (OECD definition)
Startups	≤ 5 years	Any	Any	Heterogenous group of new firms.
Tech startups / High-potential startups	≤ 5 years	Any	Any, but likely digital	New businesses looking to scale quickly, using technology and new business models, mostly with an explicit high-growth intent driven by winner take all feature.

Source: World Bank Group.

Note: OECD = Organisation for Economic Co-Operation and Development; SMEs = small and medium enterprises.

1. Some of these failures can be government failures or inefficiencies created by interventions of the government itself (for example, distortive regulations).

**This report is organized in four chapters that provide a comprehensive assessment of the entrepreneurship ecosystems in Romania.** The analysis draws on numerous data sources, including new evidence from organizations supporting entrepreneurship and a nationally representative survey focused on tech startups. Chapter 1 of the report provides a big picture of entrepreneurship performance and the health of the ecosystem pillars at the national level that is benchmarked against Romania's peers. This information is important to define the key strategy objectives and structural obstacles faced by entrepreneurs in general. In chapter 2, the report provides new evidence about startups in Romania. The findings highlight the importance of understanding the type of entrepreneurs and entrepreneurship activity, as well as the diversity of local ecosystems to define the focus of the policy. In chapter 3, the report assesses the policy mix and functioning of public resources and enabling institutions supporting entrepreneurship. It is critical to know what resources and policy instruments are already available to support entrepreneurship, either by public programs or by entrepreneurship enablers, which may also allocate public resources. This is particularly relevant for emerging and more advanced economies, with an array of institutions and instruments already in place and more potential to improve allocation. Chapter 4 provides policy recommendations.

## OVERVIEW OF CHAPTER 1. THE ENTREPRENEURSHIP ECOSYSTEM IN ROMANIA

### KEY QUESTIONS

Chapter 1 examines the context of entrepreneurship in Romania through a cross-country comparison, following a conceptual framework that covers key outputs and structural pillars of the ecosystem. These pillars are the supply factors, the demand factors, and the barriers to the flow of resources that are critical for generating more and better firms. The analysis exploits both firm-level data and cross-country indicators.

Chapter 1 aims to address the following questions through a cross-country comparison:

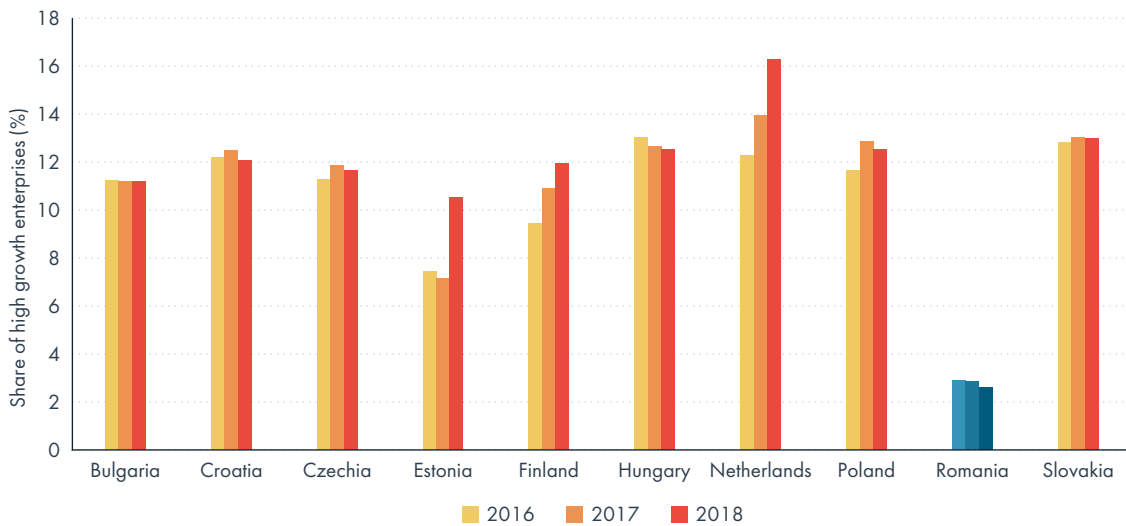
- How are entrepreneurship outputs performing in Romania, both in terms of quantity (number of new firms entering) and quality (number of firms scaling up and innovating)?
- What are the conditions of the entrepreneurship supply factors in Romania (that is, the infrastructure, human capital, and knowledge available for entrepreneurs)?
- What are the conditions of the entrepreneurship demand factors in Romania (that is, access to markets, capabilities of existent firms, and entrepreneurs entering the market)?
- What are the key barriers in Romania to allocation of resources towards higher quality entrepreneurship, with respect to access to finance, the regulatory environment, and culture?

**The share of high-quality firms, i.e., those achieving high growth and innovating, is smaller in Romania than in peer countries.** The entry rate of new firms in Romania is not the main constraint on entrepreneurship. As compared to other countries with similar per capita income, Romania has a high entry rate. However, there are few high-growth firms. The share of high-growth firms<sup>2</sup> in Romania has been stable, hovering around 3 percent between 2016 and 2018 (figure 0.2). This share is well below that in peer countries, which averages 11.4 percent. Low shares of high-growth firms are also observed in specific sectors (for example, manufacturing) and young firms, given that Romania also has few young high-growth firms (5 years or younger). Chapter 1 shows that there is a similar trend among firms that innovate. Only a small share of firms in Romania reports any type of

2. Using the OECD-Eurostat definition of high-growth firms as “[a]ll enterprises with average annualized growth greater than 20 percent per annum, over a three-year period, and with ten or more employees at the beginning of the observation period” where growth can be measured in number of employees or in turnover (OECD-Eurostat 2007; OECD 2010).

innovation—whether by product, process, or marketing and organization. This lag occurs not only in the average firm but is also observed across firm size groups; among large, medium, and small firms.

**FIGURE O.2** Share of High-Growth Firms among All Firms



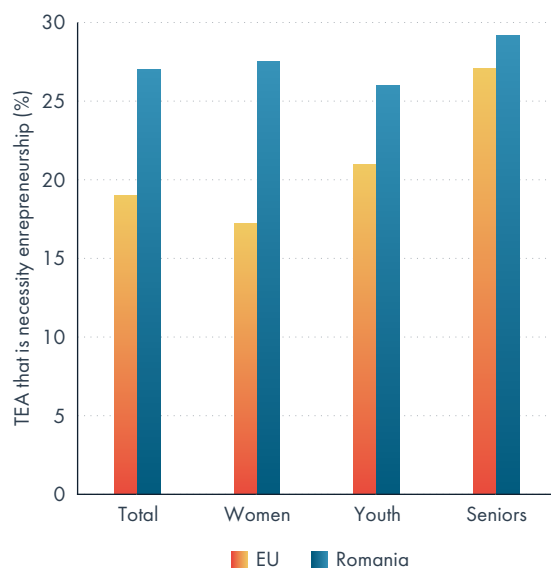
Source: Eurostat 2020.

Note: Based on the OECD-Eurostat definition of high-growth firms.

**Firm entry is driven by necessity rather than by opportunity.** Among several potential explanations for the lack of high growth and innovation among Romanian firms, there is the fact that many entrepreneurs are “necessity” rather than “opportunity” entrepreneurs. Three in ten businesses were created because the entrepreneurs did not have any other opportunities in the labor market. The share of entrepreneurs pushed by necessity has been higher than the European Union (EU) average across different demographic groups (figure 0.3). Thus, to improve entrepreneurship performance, Romania needs to improve the quality of entrepreneurship.

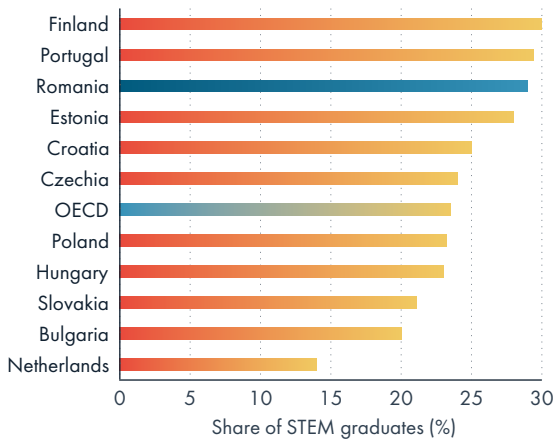
**The availability of human capital is an opportunity to improve the quality of entrepreneurship, but Romania needs to strengthen the link between the supply of knowledge and the demand from business.** Romania has a high share of graduates in science, technology, engineering, and mathematics (STEM), and many of them are women. Almost a third of graduates studied STEM fields (figure 0.4). Although the gender gap is still high—with three times more men than women—it is smaller in Romania than in most other EU Member States. Moreover, Romania shines with a high share of information and communications technology (ICT) specialists who are female (23 percent) compared to the significantly lower EU average (17 percent) (European Commission 2020b). However, high shares of STEM graduates are not resulting in a high share of research and development (R&D) personnel in businesses (figure 0.5), and many employers see the low-quality skills developed by the graduates to be a challenge.

**FIGURE O.3** Entrepreneurship by Necessity



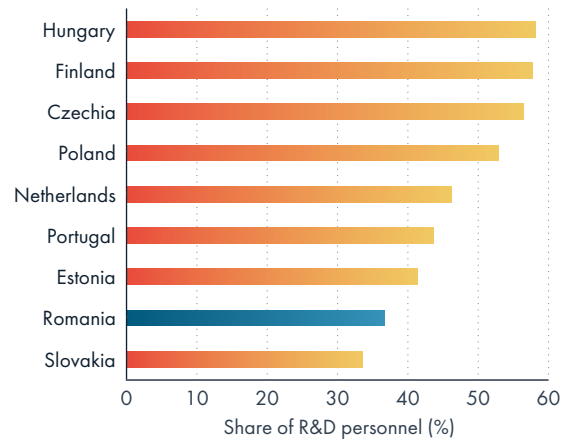
Source: Global Economic Monitor.

Note: Proportion of total entrepreneurial activity (TEA), between 2015 and 2019. Youth (18–30 years old); Seniors (50–64 years old).

**FIGURE O.4** Share of Tertiary Graduates that Study STEM, by Country/Region

Source: UNESCO 2019.

Note: OECD = Organisation for Economic Co-operation and Development, STEM = science, technology, engineering, and mathematics..

**FIGURE O.5** Share of Personnel Engaged in R&D, by Country

Source: UNESCO 2019.

Note: R&D = research and development.

**Entrepreneurship can drive demand for knowledge that would improve the collaboration between research institutions and businesses in Romania.** Collaboration on R&D and business innovation is low. Romanian universities have not developed strong linkages with the business sector, and the level of collaboration between innovative firms and other organizations is low. Such linkages matter not only for ensuring the translation of research and new ideas into real-world innovations but also for ensuring the relevance of university teaching and research. Knowledge-exchange activities are now legally allowed as part of a higher education institution's mission, but Romanian companies may not be proactively establishing linkages with universities given the low levels of R&D and limited technological specialization and knowledge intensity.

**Improvement in entrepreneurship quality will also require more market opportunities for young and small businesses, both domestically and abroad.** Barriers are preventing smaller firms from participating in public procurement. Public sector can create an important market for many startups and play a role in stimulating innovation. While recent reforms have improved awareness, current public procurement processes and platforms are still perceived as difficult to access for startups and other small firms. According to the most recent data available (2019), SMEs bid on 35 percent of public procurement contracts but are awarded only 5 percent of them. Regarding access to external markets, Romania has fewer exporters than peer countries and uses a smaller proportion of imports in its exports. Only 17 percent of Romanian firms export more than 1 percent of their sales (compared to 29 percent of Slovakian firms). The use of e-commerce remains low, but uptake of e-commerce platforms has accelerated during the COVID-19 pandemic. Romania saw the share of firms selling online rise to 19 percent in 2020 from 9 percent in 2018. However, there remains vast unrealized potential: less than 20 percent of firms received even 1 percent of their revenue via online sales.

**Access to finance for startups and innovative firms remains a challenge.** Romanian public sector financing mechanisms are not tailored for small firms and startups because they tend to favor post-revenue firms, which may have the effect of supporting incumbents over new entrants. Moreover, equity and debt financing for research and development remain below the EU average (European Commission 2017).

**Romania's regulatory environment is not optimized for entrepreneurs and startups.** This includes reforms to Romania's company formation process, supporting distressed businesses, improving the ease of exiting a business, investing into startups, and intellectual property (IP) protections. This is because policymakers do not clearly distinguish between startups and SMEs and thus the former remain underserved by the existing regulatory environment (and policy mix).

**Though entrepreneurship is accorded reasonably high social status, increasingly considered a desirable career choice, and widely promoted by the media, Romania ranks low on indicators of social capital.** Low social capital,



which has been observed by the EU (European Commission 2017), is also evident in the ecosystem where stakeholders reported siloed networks and limited collaboration and connectedness between stakeholders, reinforcing the perception of ecosystem fragmentation. There also appears to be a limited “give back” mentality in Romania.

## OVERVIEW OF CHAPTER 2. STARTUPS AND LOCAL ENTREPRENEURSHIP ECOSYSTEMS

### KEY QUESTIONS

Chapter 2 analyzes the subnational landscape of businesses and assesses the potential of Romania’s local entrepreneurship ecosystems with a focus on tech startups. First, it provides an overall perspective on the distribution of firms and entrepreneurship performance at the subnational level. Second, the chapter identifies the potential of local entrepreneurship ecosystems through agglomerations of firms in technology-intensive sectors in terms of the quality of the firms and the diversity of their economic activities. Third, it analyzes the results of the World Bank Group Romania Startup Survey—a new nationally representative dataset collected for this report. Finally, the chapter uses network analysis to identify the connectedness of key actors of the entrepreneurship ecosystem in Romania.

Chapter 2 aims to address the following questions:

- How is economic activity distributed regionally within Romania?
- Where are the more technology-intensive regional ecosystems in Romania?
- What are the key characteristics of tech startups in Romania?
- What are the key obstacles reported by tech startups in Romania?
- How does connectedness play out among Romania’s ecosystems?

**When it comes to economic activity, the geographic distribution of firms and sectoral specialization in Romania reflects significant regional disparity in human and knowledge capital.** There is a large concentration of firms in the Bucharest-Ilfov region. Bucharest-Ilfov also has the highest rate of new firms entering the market, the highest share of young firms, the highest share of high-growth firms, the most educated workforce, the highest concentration of capital working on science and technology, and the most R&D personnel and researchers. The disparity between the regional distribution of firms in the country can also be observed through the concentration of human capital by sector in each region. Digital and knowledge-intensive activities, in services, as well high-tech manufacturing enterprises, in industry, are disproportionately concentrated in Bucharest-Ilfov.

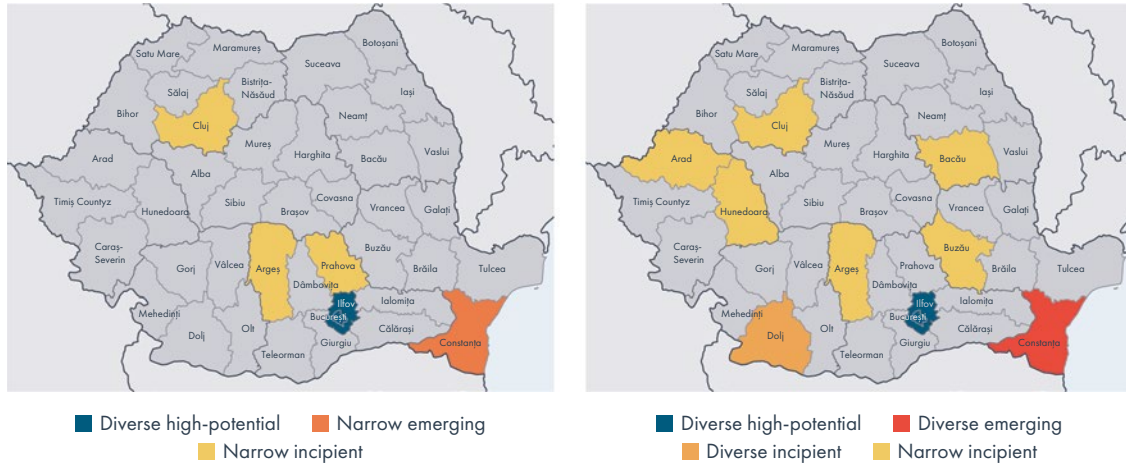
**More technology-intensive regional ecosystems are agglomerated around a few large metropolitan areas.** (See figure 0.6.) Digital services firms are defined as those providing mostly digital content.<sup>3</sup> Examples of digital services are transactional technologies that facilitate market transactions by lowering information asymmetries (such as e-commerce platforms or blockchain), informational technologies that exploit the exponential growth of data and or reduce the cost of computing (such as cloud computing, big data analytics, or machine learning), and operational technologies that combine data with physical automation (such as smart robots, 3D printing, or the Internet of Things) (Hallward-Driemeier et al. 2020). Knowledge-intensive services enterprises (Miles et al. 1995) are those whose employment structures are heavily weighted towards professional and technical expertise. Examples of these firms are engineering services, research and experimental development, and specialized health services.

3. The definition of digital businesses used in this work is adapted from Barefoot et al. 2018.

**FIGURE O.6** Distribution of Technology-Intensive Ecosystems

a. Digital business solutions

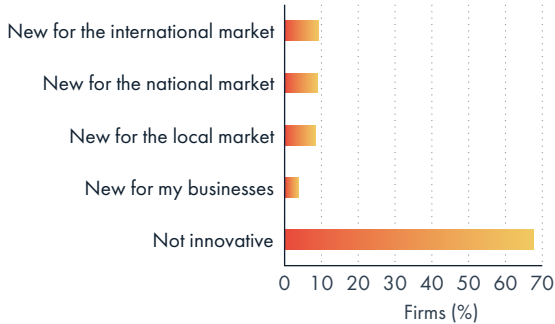
b. Knowledge-intensive services



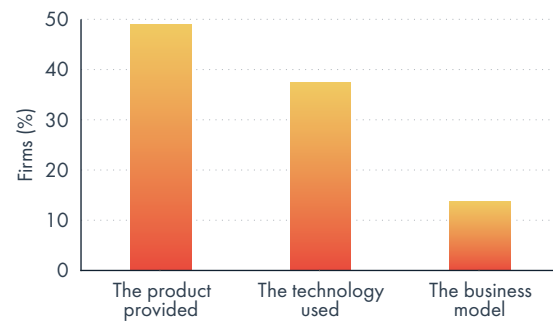
Source: World Bank Group using data from the Romanian Business Registry 2019.

**Most tech startups do not consider themselves innovative.** Among tech startups, 67.5 percent did not consider themselves innovative. Some 21.4 percent reported developing an innovation, and only 12.5 percent expected to do it in the future. Less than 20 percent were developing new-to-market technologies or processes for national or international markets (figure 0.7). Most of the firms that are innovating are providing innovative products or technologies; some are also innovating in terms of the business models (figure 0.8). Twenty-six percent of these firms had applied for a patent, copyright or trademark, and 39 percent 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.

**FIGURE O.7** Prevalence of Product/Service Innovation (Tech Startups)



**FIGURE O.8** Type of Innovation Provided (Tech Startups)

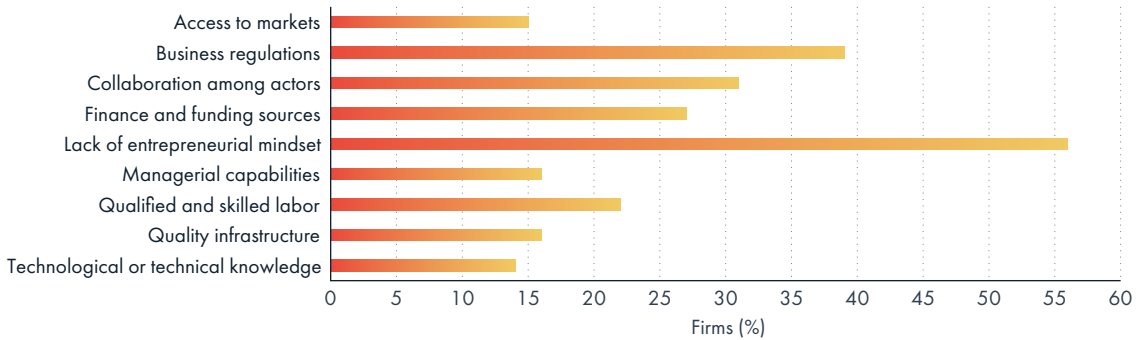


**High-potential startups rely more on venture capital (VC).** Personal savings or resources are the main source of funding for the initial development stages of both tech startups and high-potential startups, although some high-potential startups have angel investment or VC. High-potential startups typically expected to use VC for subsequent growth. Among tech startups, most of the funding after the initial stage was expected to continue to come from personal resources. In contrast, among high-potential startups, most of the funding after the initial stage was expected to come from angel investors and venture capitalists (VCs) and, to a smaller degree, from personal resources.

**The two biggest obstacles for entrepreneurship reported by startups were business regulations and the lack of an entrepreneurial mindset.** (See figure 0.9.) Regulations, which were identified as an issue in every Romanian region, included labor regulations and administrative issues such as permits and taxes. In addition, respondents identified that the lack of collaboration among actors could also be an obstacle, which means that entrepreneurship

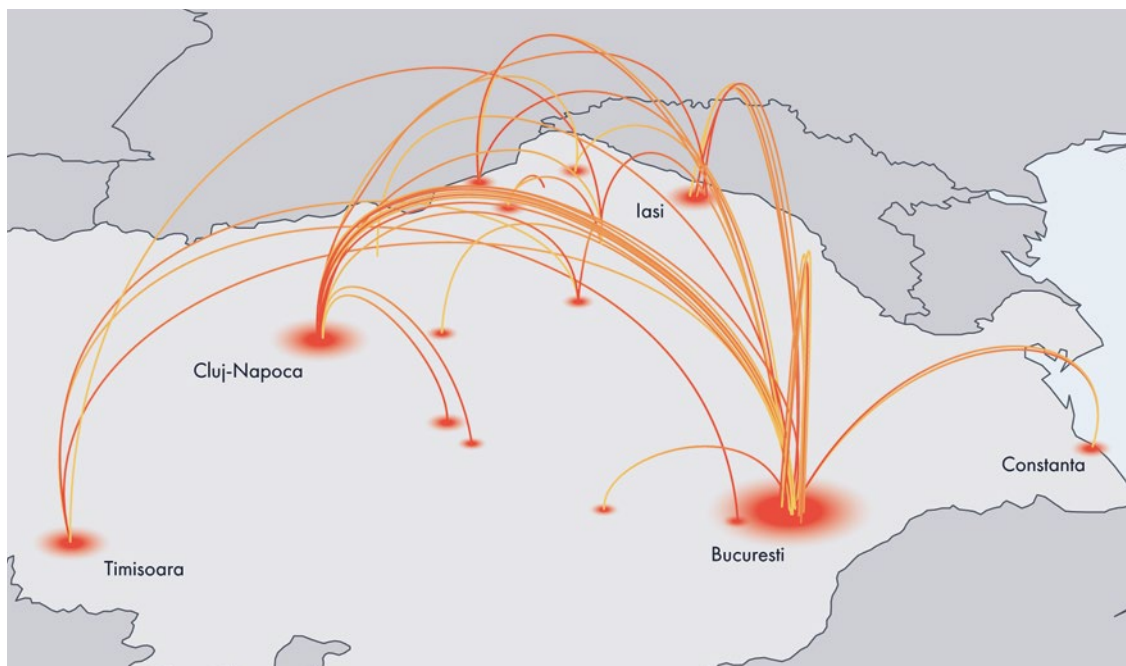
ecosystems have poor internal connections. Respondents reported existing technological or technical knowledge—as well as infrastructure quality and managerial capabilities—as generally favorable.

**FIGURE O.9** Obstacles to Entrepreneurship (Tech Startups)



**The data on connectedness reinforces the importance of the Bucharest-Ifov ecosystem for knowledge connections among Romanian ecosystems.** Including a geographic dimension in the network (by geo-localizing all the entities) shows that the most predominant connections are between Bucharest, Cluj, Iasi, Timisoara, and Constanta (figure O.10). These local ecosystems rely on each other, mostly in terms of human and social capital and finance. However, most of the local startups relate to Bucharest’s universities, accelerators, and funders. The data also show that firms rely little on their local ecosystems, except for Bucharest and Cluj-Napoca. Therefore, improving the Bucharest ecosystem could generate important externalities to other local ecosystems in the country, regardless of their economic activity. Additionally, more attention to all other regions is needed to strengthen ecosystem support structures across Romania.

**FIGURE O.10** Local Ecosystems Connectedness



Source: World Bank Group Romanian Startup Survey 2020.

Note: The links represent the connections between the entities in the Romanian startup ecosystem. The weight of the lines represents the importance of these links (the number of connections between the cities).

## OVERVIEW OF CHAPTER 3. SUPPORTING ENTREPRENEURSHIP PROGRAMS

### KEY QUESTIONS

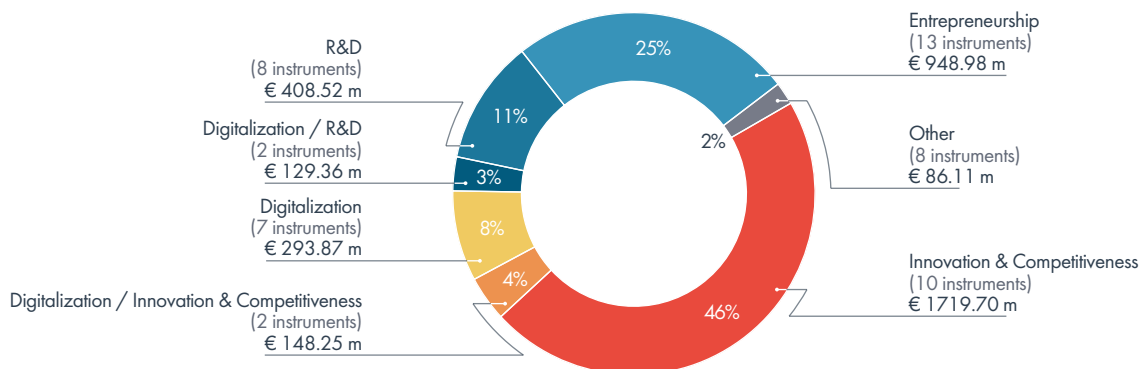
Chapter 3 assesses the support for entrepreneurship and innovation in Romania. The first part of the chapter focuses on public programs supporting entrepreneurship and innovation. It examines the offer of 50 public programs, the resources allocated to them, and the consistency of this policy mix with policy priorities. The functional analysis assesses how well these public programs are managed across 27 dimensions associated with best practices in design, implementation, and governance. The second part of the chapter focuses on mapping and describing the services and resources provided by ecosystem enablers, that is, non-government institutions supporting entrepreneurship and startups in Romania.

This chapter aims to address the following questions:

- What is the current policy mix of public programs for entrepreneurship and innovation?
- Are the public programs targeting innovative and high-growth entrepreneurship in Romania?
- Are the public programs following best practices in design, implementation, and governance?
- Who oversees public programs for entrepreneurship and innovation?
- What are the characteristics of entrepreneurship ecosystem enablers in Romania, and how are they allocating resources to support entrepreneurship?

The total budget allocation for programs supporting science, technology, and innovation is over €3.6 billion, with almost €1 billion focusing on entrepreneurship but only a little over one-quarter of the policy mix has entrepreneurship as its core objective. The mapping exercise (Figure O.11),<sup>4</sup> which was conducted in collaboration

**FIGURE O.11** Distribution of Estimated STI Public Budget Allocation in Romania by Top-level Objective, 2014–20, in € Million and %



Note: Policy mapping of 50 instruments (2014–20), of which 11 were affiliated with digitalization, 13 with entrepreneurship, 12 with innovation and competitiveness, and 10 with R&D. Mostly from European Structural and Investment Funds (ESIF) and national funds; R&D = research and development; STI = science, technology, and innovation.

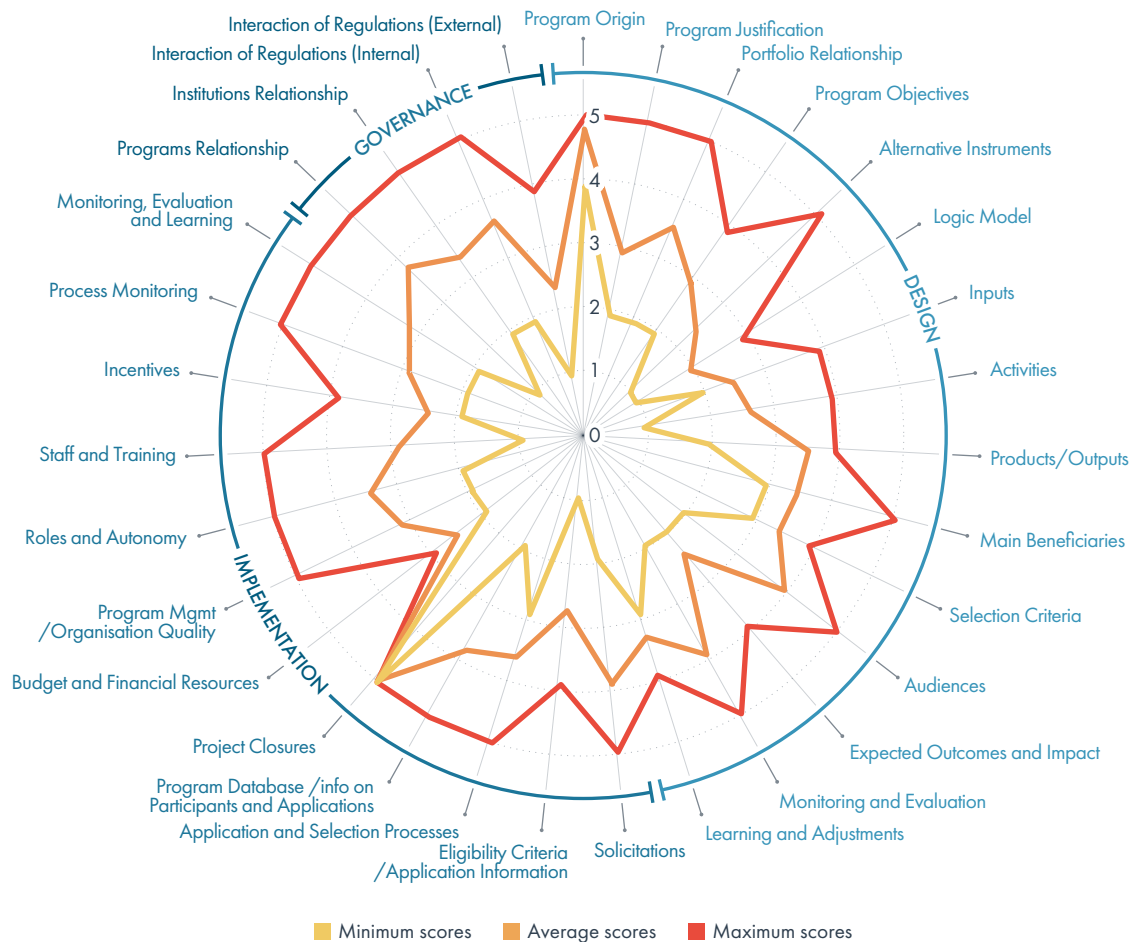
4. The initial stage of the review was to compile a list of relevant programs involving public resources; this list explicitly included subnational (regional), national, and supra-national (European Commission) programs, provided that the program was at least partially administered within Romania and the recipients themselves were in Romania. The mapping exercise did not include the programs of the European Investment Fund (EIF) because the relevant program information was not available. This is also due to the fact that some of the programs were managed by third parties, making it difficult to understand how much of the funding was dedicated towards which objectives and target beneficiaries. However, according to the EIF website, since 2008, the EIF has committed over €2 billion, composed of €1.8 billion in guarantees and funded instruments, €206 million in equity, and €123 million in microfinance and social entrepreneurship. The instruments of the EIF typically also target ecosystem enablers such as incubators and accelerators, which are usually not targeted by national public support programs.

with government agencies, identified 50 public programs supporting science, technology, and innovation (STI) and entrepreneurship during 2014–20. This section examines the overall portfolio of 50 programs, including their estimated budget allocations, objectives, types of intervention, and beneficiaries. The analysis also assesses the functionality and governance of selected Romanian STI support programs (the “functional analysis”).

**Thirteen of the 50 instruments, with a related total budget allocation of €949 million, have entrepreneurship as an explicit goal.** The remaining three-quarters of the policy mix relates primarily to innovation & competitiveness, R&D, or digitization. These areas, however, may be considered indirectly relevant to entrepreneurship or the development of the broader ecosystem.

**Romania can use internal learning to increase the effectiveness of its innovation policies.** Across 27 indicators spanning design, implementation, and governance, Romanian public entrepreneurship programs only consistently used best practice on two indicators—program origin and project closures. However, some programs scored higher than others on the same indicators, indicating opportunities for learning within Romania. Figure 0.12 shows the maximum and minimum scores for each indicator in addition to the average score for each indicator. The maximum scores are coded in green, the average scores are coded in yellow, and the minimum lower scores are coded in red. Some indicators have relatively high scores in at least one instrument, even when the average is quite low. This indicates that instruments that are not currently using best practices can learn from those that are.

**FIGURE 0.12** Functional Analysis Results—Scores by Category across the Set



Source: World Bank Group.

**There are several indicators that seem to need systematic improvement.** These indicators are design indicators associated with the use of logic models, inputs and activities of the instrument rather than supported projects, and the matter of setting instrument objectives and definition of specific outcomes and impacts. There is also an implementation indicator in this group, namely, the budget, that seems also to be a systemic issue.

**Program design was the weakest of the three key areas of the assessment framework.** Among the design categories, the use of logic models, accounting for inputs and activities, and the proper identification and measurement of outcomes were particularly lacking.

**In contrast, the program origins and closures were one of the highest-scoring features of the analysis.** This is explained by the fact that many of the examined entrepreneurship programs were partly funded by the European Commission, whose operating programs are highly formalized, requiring documentation and good rationales for inclusion of programs in their funding schemes. This avoids pitfalls related to arbitrary reasoning, imitation, or undue influence in the creation of new programs. However, it is possible that this formalized origin also affected deeper consideration of some other design features: more than once, interviewees commented that a program had been designed in a certain way because of the expectations of the co-funder (the European Commission), rather than because it was the most effective or efficient way to deliver the desired change.

**The analysis found that program implementation and governance scored slightly better than design, although there was scope for major improvement in most categories.** Among the implementation categories, the areas of greatest concern are (1) application and selection processes, (2) management structures, (3) budgets, (4) the incentives associated with staff performance, and (5) evaluation mechanisms.

**The analysis found relatively good internal and external coordination mechanisms (coordination with programs within the agency and with other agencies).** This is partly because programs within the European Commission's "priority axes" have some coordination mechanisms built in. However, in some cases those mechanisms could be utilized further to provide more strategic perspectives on the related programs.

**The analysis also found that Romania lacks a central institution to oversee the implementation of public instruments for entrepreneurship.** Many instruments were structured in a way that involved both a managing authority (MA) and an intermediary body (IB) working in coordination. Additionally, disbursements for these programs, as measured by absorption rates, are weak, indicating lack of suitable institutional capacity. Data from October 2020 indicates that the absorption rate was only 34.7 percent for programs administered by the Human Capital Program (*Programul Operațional Capital Uman*, POCU), 31.8 percent for the Regional Operational Programme (*Programul Operațional Regional*, POR), and as low as 26.5 percent for the Competitiveness Operational Programme (*Programul Operațional Competitivitate*, POC).

**The mapping also identified a total of 33 enablers supporting entrepreneurship.** Twenty-seven of them participated in the World Bank Entrepreneurship Ecosystem Enablers survey, which is used as the main reference for this analysis.<sup>5</sup> The services offered by these enablers are meant to complement those offered by public programs. However, given the diversity of the programs offered—in terms of their scope, objectives, geographical coverage, and types of beneficiaries—the enablers and the services they provide overlap with public programs or each other, resulting in coordination challenges.

**The most typical ecosystem enablers in the sample are private for-profit community builders or event organizers.** The most common functions of enablers were as community builders or event organizers (14 organizations), investors or financial institutions (7 organizations), and accelerators (5). Most were private for-profit (20 organizations) and nongovernmental organization non-profit (10 organizations). The Romanian state role (public-private partnerships) was very limited. International organizations were not identified.

**The top three services provided by ecosystem enablers were strengthening and building collaboration networks, management and business training, and access to finance.** The availability of assistance with building

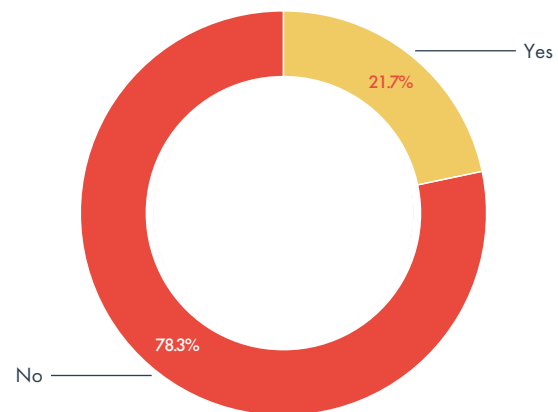
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5. Appendix B provides more details about the methodology used to implement the survey.

and strengthening collaboration networks underscores the importance of network density within the startup ecosystems and reflects comments reported in primary research interviews about the need for better ecosystem-wide connections. The next most frequent core service was management and business training; this category may also include mentoring support, which is a common feature of many accelerators. However, if one considers both core and complementary offers, then market access was delivered more frequently. Access to finance was the third most common core service. About 19 enablers provided services related to strengthening and building collaboration networks, 14 enablers provided managerial and business training for new entrepreneurs starting a new business (for example, change of mindset), and 12 provided finance. This is consistent with the fact that the function of most of the organizations in the sample is holding events to build communities, followed by investing and accelerating new ventures. As complementary services, they provide business training for existing firms, support to comply with current regulations and, to a lesser extent, support for technology adoption. Most do not provide financial support (19 enablers), and equity finance and grants play a small role. Most enablers did not expect beneficiaries to pay for the non-financial services that they provide.

**Most ecosystem enablers reported following key performance indicators (KPIs) regularly, but only a few of them conduct rigorous impact evaluation to inform programming.** About a third (9) of the enablers supporting entrepreneurial activities performed quarterly performance reviews, 8 conducted annual reviews, and 7 conducted monthly reviews. The vast majority reviewed KPIs at a higher frequency. Firm scale-up and firm creation are the top KPIs, with well over half of enablers indicating one of these as their principal KPIs. Follow-up funding was another popular indicator, and some enablers used other indicators. However, only about 21.7 percent of enablers completed any kind of impact evaluation to evaluate their success (figure 0.13). Moreover, almost none shared their results publicly. Where evaluations had been undertaken—whether using control groups or not—the results were almost never made public. This lack of data transparency makes it difficult for entrepreneurs to decide between programs run by ecosystem enablers and evaluate their costs (even if only in terms of opportunity cost rather than financial cost). A lack of data also hinders third-party evaluation of the ecosystem enablers and makes it difficult for funders and policymakers to determine their effectiveness.

**FIGURE 0.13** Impact Evaluations Conducted by Ecosystem Enablers



Source: World Bank Group

## OVERVIEW OF CHAPTER 4. POLICY RECOMMENDATIONS

### KEY QUESTIONS

Chapter 4 provides policy recommendations informed by the results of the analytical work presented in this report and consultations with key actors of the entrepreneurship ecosystems in Romania. In brief, more funding needs to be allocated to improve quality and scale-up of firms, as well as promote networking and deepening linkages with successful founders, including diaspora entrepreneurs. The chapter provides evidence-driven and stakeholder-driven policy recommendations aligned with the pillars of the ecosystem. It also compares our policy recommendations with the Top 12 policy interventions proposed by the Romanian ecosystem.

An overview of each policy recommendation is provided in this report. Detailed policy recommendations including timeframe, implementation bodies, notional costing, and KPIs can be found in a separate document, *Scaling Entrepreneurship in Romania: A Policymaker's Toolkit*.

This chapter aims to address the following questions:

- Is this mix of public programs and ecosystem enablers conducive to supporting quality entrepreneurship?
- What are the main gaps in support for the Romanian entrepreneurship ecosystem identified through the diagnostic report?
- What are the prioritized policy recommendations to support entrepreneurship based on the key findings of this report and ecosystem stakeholders?

**The essential recommendations have to do with better targeting the policy mix and improving the functionality of public programs supporting entrepreneurship.** Romania could improve entrepreneurship quality by rebalancing its policy mix to target high-potential startups with ambitions of scaling up. For the rebalancing to be effective, Romania would, in conjunction, need to improve the functioning of public entrepreneurship support programs, which can be facilitated by building capacity among implementing agencies.

**These policy recommendations and prioritization were derived from two mutually reinforcing activities: the diagnostic of Romanian's entrepreneurship ecosystem and strategy working group sessions with key actors of the Romanian entrepreneurship ecosystem.** This diagnostic surfaced 11 evidence-based policy recommendations, and the Romanian ecosystem identified their "Top 12" interventions. Our analysis and the bottom-up strategy development process identified a number of similar policies, programs, and institutions. There are two main differences. First, based on an analysis of public instruments supporting STI and entrepreneurship, the evidence-based analysis identified an urgent need to recalibrate the policy mix and improve its functionality. Second, the Romanian ecosystem identified a need to appoint Chief Technology Officers (CTOs) in government. Although we concur with this recommendation, the authorities need to prioritize other critical interventions.

**The overall objectives of the policy recommendations are to refocus attention on starting and scaling high-quality firms and improve the governance and functionality of existing instruments.** The recommendations are categorized as policies, programs, or institutions. Policies refer to legislative or regulatory reforms to create an enabling environment for high-growth entrepreneurship to take root and thrive. Programs refer to programs that target entrepreneurs, firms, and other ecosystem actors. Institutions refer to governance and entities essential for the entrepreneurship agenda. The 11 policy recommendations are as follows:



## Policies

1. Recalibrate the policy mix for starting and scaling high quality innovative firms by (a) Improving the functionality of instruments, and (b) Implementing a comprehensive package of reforms tailored to high quality innovative firms (i.e., the National Startup Ecosystem Strategy).
2. Reform regulations to strengthen entrepreneurship and investments refers to initiatives that ease starting and exiting a business; incentivizes appropriate sources of financing into startups; promotes public procurement; and addresses IP protections.
3. Implement Startup Visas refers to immigration incentives to attract skilled talent and investors.

## Programs

4. Strengthen ecosystem enablers refers to a pilot program to build capacity and deepen networks and linkages of Romanian ecosystem actors.
5. Create a Startup Fund refers to establishing a fund that directly invests into riskier stage firms.
6. Build and promote a network of Romanian founders and diaspora refers to leveraging exposure and expertise of successful founders and diaspora to advise on critical issues such as market access and resources.
7. Scale-up through exports refers to initiatives to help Romanian startups access international markets.

## Institutions





















8. Establish a One-Stop Agency or “Ecosystem Hub” refers to the formation of a centralized institution to implement programs and policies identified under the National Startup Ecosystem Strategy and the Startup Fund.

## Policies, Programs, and Institutions

9. Improve entrepreneurship education and strengthen the role of universities in the ecosystem refers to human capital related measures to improve the quality of Romanian startups.
10. Incentivize innovation to foster knowledge spillovers into the private sector refers to ensuring startups and firms can benefit from R&D infrastructure.
11. Promote the Digital Economy identifies three subcomponents for consideration by Romanian policymakers. They are (i) promoting e-commerce platforms; (ii) increasing digital skills; and (iii) improving managerial capabilities to enable technology adoption.

**These recommendations are also prioritized in several ways.** (See table 0.2.) “Quick wins” are actions that are visible, have immediate benefit, and can be delivered quickly. “Mission critical” refers to activities that (i) are extremely time sensitive because the government is currently designing the new programming period, which provides an opportunity to embed data-driven and specific, measurable, attainable, relevant, and time-bound (SMART) policy recommendations; or (ii) lay the groundwork for future recommendations. If these recommendations are not immediately prioritized, Romanian authorities risk missing its economic objectives. “Flagship” refers to critical activities that should be undertaken to further development of Romania’s emerging entrepreneurship ecosystem. “Foundational long-term” refers to critical activities that require a longer time horizon to come to fruition because there are other “foundational” elements that need to be sequenced and prioritized first.

**TABLE O.2** Prioritization of Policy Recommendations

Policy Recommendations	Prioritization	Time Sensitive	Quick Win
Recalibrate the policy mix for starting and scaling high quality innovative firms by (a) Improving the functionality of instruments, and (b) Implementing a comprehensive package of reforms tailored to high quality innovative firms	 Mission critical	 Yes	 Yes
Reform regulations to strengthen entrepreneurship & investments	 Mission critical	 Yes	 Yes
Establish a one-stop agency “Ecosystem Hub”	 Mission critical	 Yes	 Yes
Strengthen ecosystem enablers	 Flagship	 Yes	
Create a startup fund	 Flagship		
Improve Entrepreneurship Education and strengthen the role of Universities in the ecosystem	 Flagship	 Yes	
Implement Startup Visa Program	 Flagship	 Yes	 Yes
Build and promote a network of Romanian founders and diaspora	 Flagship		
Scale-up through exports	 Flagship		
Incentivize innovation to foster knowledge spillovers into the private sector	 Foundational longterm	 Yes	
Promote the digital economy	 Foundational longterm	 Yes	

Source: World Bank Group

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CHAPTER 1

# ENTREPRENEURSHIP ECOSYSTEM IN ROMANIA: A CROSS-COUNTRY ANALYSIS

## KEY QUESTIONS

Chapter 1 examines the context of entrepreneurship in Romania through a cross-country comparison, following a conceptual framework that covers key outputs and structural pillars of the ecosystem. These pillars are the supply factors, the demand factors, and the barriers to the flow of resources that are critical for generating more and better firms. The analysis exploits both firm-level data and cross-country indicators.

This chapter aims to address the following questions through a cross-country comparison:

- How are entrepreneurship outputs performing in Romania, both in terms of quantity (number of new firms entering) and quality (number of firms scaling up and innovating)?
- What are the conditions of the entrepreneurship supply factors in Romania (that is, the infrastructure, human capital, and knowledge available for entrepreneurs)?
- What are the conditions of the entrepreneurship demand factors in Romania (that is, access to markets, capabilities of existent firms, and entrepreneurs entering the market)?
- What are the key barriers in Romania to allocation of resources towards higher quality entrepreneurship, with respect to access to finance, the regulatory environment, and culture?

## 1.1 CONCEPTUAL FRAMEWORK

**An entrepreneurship ecosystem is the sum of complementary factors within a geographic area (e.g., city or country) that are needed for an entrepreneur starting a business able to scale up and innovate.** Strong entrepreneurship ecosystems rest on three pillars (figure 1.1). That is, they require a sufficient supply of resources (physical, human, and knowledge capital), a suitable set of demand factors (access to markets, firm capabilities, and entrepreneurial characteristics), and an efficient set of allocation factors (access to finance, regulations, and social capital) that facilitate the optimal accumulation of resources to the most productive firms. In a functional ecosystem, three outcomes are likely to occur: One, more new firms will enter the market. Two, existing firms will grow. And three, innovation will accelerate. When these three things happen, it is likely that productivity and job growth will also accelerate. These increases in productivity and job growth are the ultimate desirable outcomes of entrepreneurship.

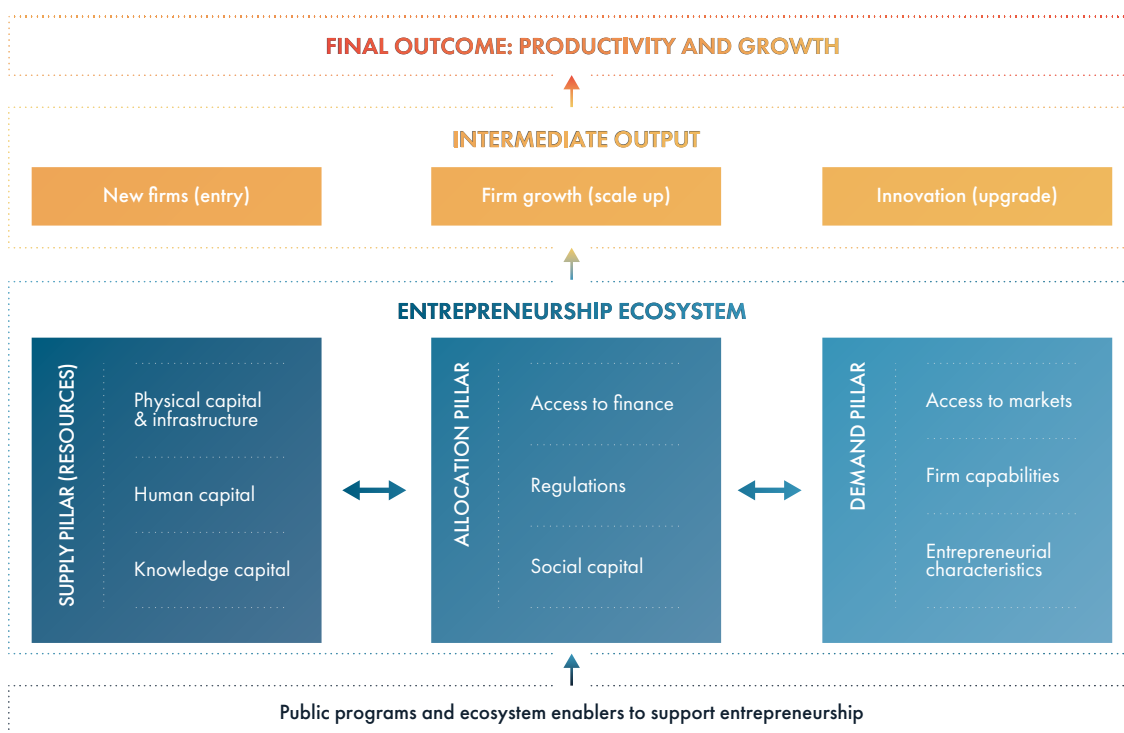
**This chapter follows the conceptual framework depicted in figure 1.1 to analyze the entrepreneurship ecosystem in Romania at the country level.** It does so by comparing Romania with peer countries with respect to entrepreneurship performance (entry, scale up, and innovation) and the entrepreneurship ecosystem pillars. This analysis is complemented in chapter 2 with a deep dive into the subnational entrepreneurial landscape with focus on technology startups.

**Policy makers can influence the entrepreneurship ecosystem to maximize economic growth, and subsequent high-quality job creation, by addressing market failures.** The combination of supply, demand, and allocative factors within a healthy ecosystem results in the creation of high-paying jobs, increased exports, innovation, and productivity growth. Under this conceptual framework, entrepreneurship outputs are assessed in terms of firm dynamics—entry, growth (scaling up) and innovation (upgrading). Longer-term entrepreneurship outcomes are measured in terms of productivity and jobs, and potentially in terms of revenues, exports, and economic growth. Market failures may arise in any of the factors of the entrepreneurship ecosystem: the supply, demand, or allocation pillars.<sup>6</sup> Governments can influence an ecosystem directly through policy instruments and regulations or

6. Some of these failures can be government failures or inefficiencies created by interventions of the government itself (for example, distortive regulations).

indirectly through ecosystem enablers that support entrepreneurship, which can affect any of those pillars (bottom of figure 1.1 in navy). The assessment of the public programs and the non-government intermediary organizations supporting entrepreneurs is presented in chapter 3, followed by policy recommendations in chapter 4.

**FIGURE 1.1** Entrepreneurship Ecosystem: Conceptual Framework



Source World Bank 2022.

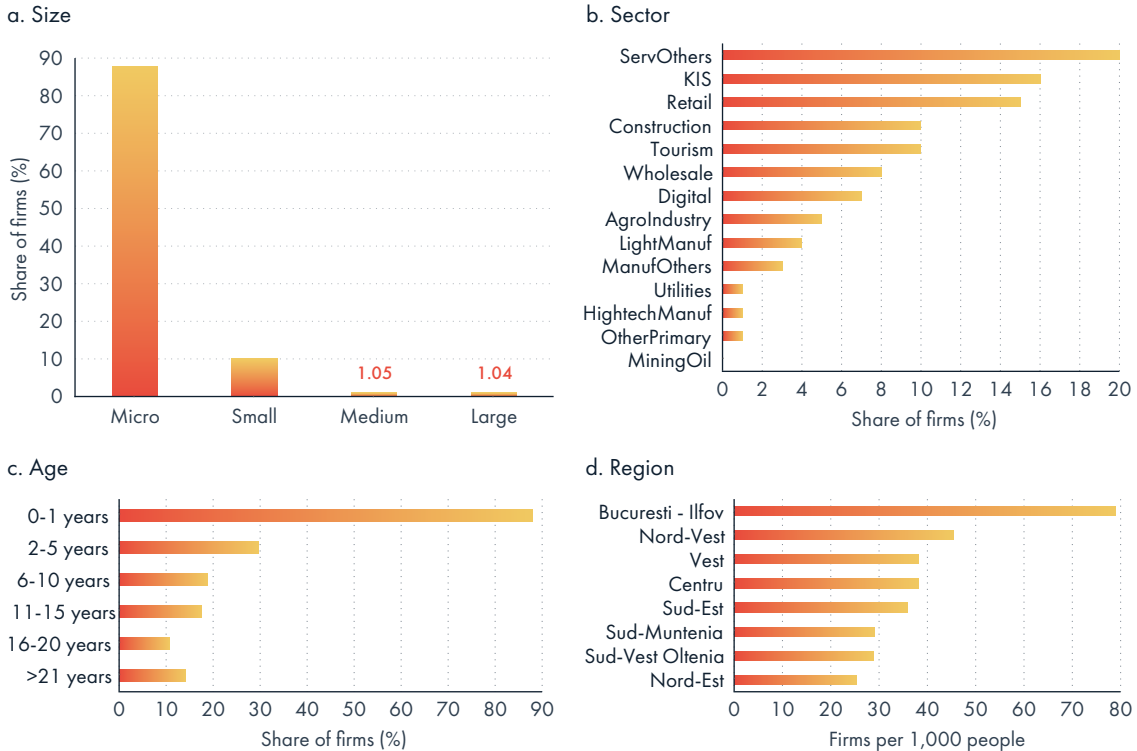
## 1.2 THE UNIVERSE OF FIRMS IN ROMANIA

**The population of formal businesses in Romania consists mostly of MSMEs in the services sector.** The latest business registry data, which only covers formal MSMEs, suggests that the country had 428,585 formal businesses in 2019. Among formal firms, micro businesses (0–9 employees) account for the largest share, at 88 percent (figure 1.2, panel a). Among micro firms, around 15 percent is self-employment. Yet, large firms play a significant role in the labor market, accounting for 34 percent total employment.<sup>7</sup> Most firms in Romania are in the services sector, with significant participation in knowledge-intensive services. These are followed by firms in the retail, construction, tourism, and wholesale sectors (figure 1.2, panel b). Modern economic activities, such as digital businesses and high-tech manufacturing have smaller shares, in line with what is observed in other economies.

**A large share of firms is young and concentrated around the Bucharest-Ilfov region.** Almost 40 percent of registered firms in Romania are less than 6 years of age (figure 1.2, panel c). The region of Bucharest-Ilfov hosts the most formal firms (24 percent), followed by North-West and Centre. The Bucharest-Ilfov and North-West regions not only have the largest concentration in absolute number of firms but also have the largest density of firms in per capita terms (figure 1.2, panel d), suggesting that the two regions lead the number of entrepreneurial activities even when controlling for population size across regions. These regional differences are investigated further in chapter 3, which identifies the potential of the local ecosystems based on characteristics of firms' agglomeration.

7. European Commission 2019 Romania SBA Fact Sheet

**FIGURE 1.2** Distribution of Romanian Firms by Size, Sector, Age, and Region (2019)



Source: Business Registry.

Note: Micro: 0–9 employees; Small: 10–49 employees; Medium: 50–149 employees; Large: 150+ employees. KIS = knowledge-intensive services.

## 1.3 ENTREPRENEURSHIP PERFORMANCE IN ROMANIA

This section assesses entrepreneurship performance in Romania along three key dimensions: (i) entry and exit, (ii) scale-up, and (iii) technological upgrade and innovation. Peer countries for comparison were selected through two steps. First, we conducted a cluster analysis using the Organization for Economic Cooperation and Development’s (OECD’s) Structural and Demographic Business Statistics.<sup>8</sup> This model identified countries from the Central and Eastern European region, the Baltics, Scandinavia, Western Europe, Southern Europe, the Middle East, and Latin America. Following presentation of the cluster analysis and proposed list of comparator countries, the North-East Regional Development Agency suggested additional peer and aspirational benchmark countries. As a result of these exercises, we benchmark entrepreneurship performance in Romania using cross-country comparison indicators from Bulgaria, Croatia, the Czech Republic, Estonia, Finland, Hungary, the Netherlands, Poland, Portugal, and Slovakia.

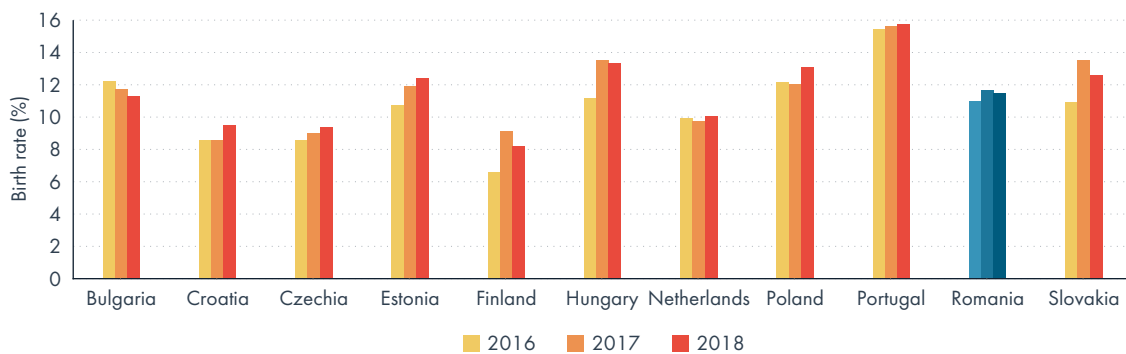
### 1.3.1 ENTRY AND EXIT

The birth rate of enterprises in Romania is around 11 percent, which is the average among national peers. Since 2015, the number of firms has increased significantly. Micro firms, in particular, experienced a 120 percent growth from 2011 to 2019. From 2011 to 2015, 21,695 new companies were registered in Romania. From 2015 to 2019,

8. This database was selected because it includes indicators on the total number of active enterprises and enterprise birth and death rates in 40 countries. Peer and aspiration countries were selected based on gross domestic product (GDP) per capita and other relevant variables, including labor force participation rate, labor force with advanced education, compound annual growth rate, and new business entry rate.

this number jumped to 86,309 new businesses. Figure 1.3 compares the birth rate of enterprises, defined as the share of new enterprises with respect to the total population of firms, across countries. For the selected counterpart countries, the proportion of newly created businesses as a share of active firms has averaged around 11.5 percent. In Romania, the same indicator was around 11 and 12 percent between 2016 and 2018. Enterprise birth rates are higher in Estonia (12.4 percent), Portugal (15.7 percent), Hungary (13.3 percent), and Slovakia (12.6 percent).

**FIGURE 1.3** Birth Rate of Enterprises by Year

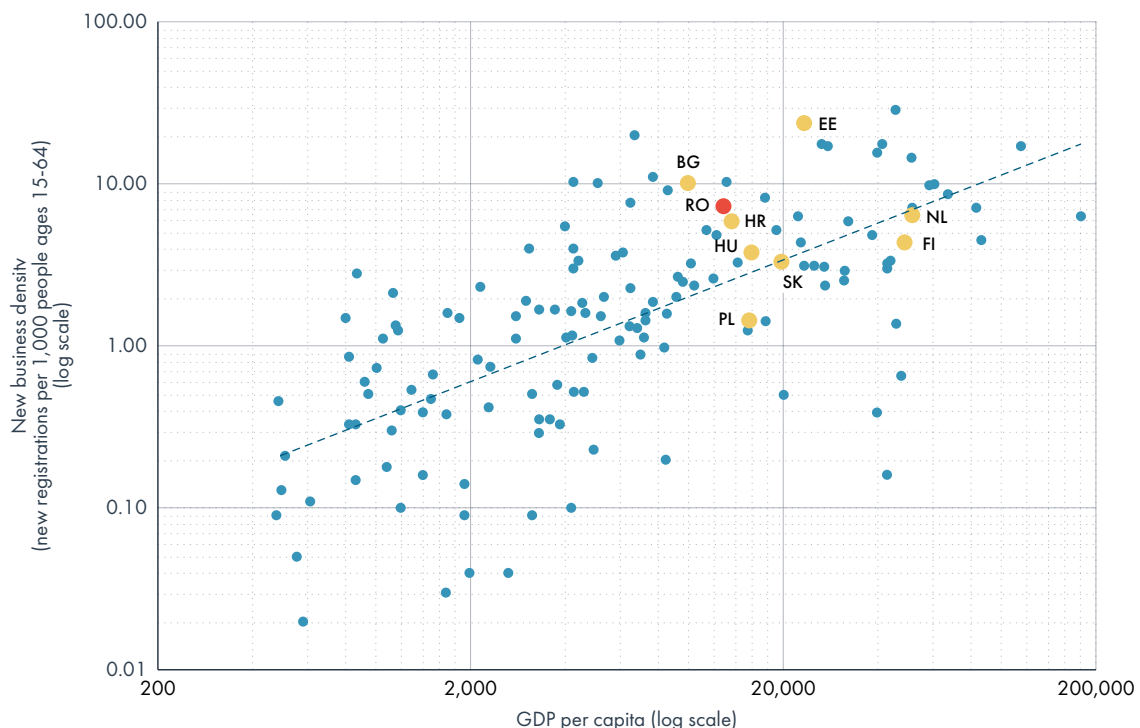


Source: Eurostat 2020.

Note: Birth rate is the number of enterprise births in the reference period (t) divided by the number of enterprises active in t, expressed as a percentage.

**New business density in Romania is high compared to peers with similar per capita income.** New business density refers to the number of new registered firms normalized by the working age population. New business density in Romania (6.5) is higher than would be predicted based on the cross-country relationship based on the latest information available across countries and controlling for per capita income (figure 1.4).

**FIGURE 1.4** Business Creation Normalized by Working Age Population with Respect to Per Capita Income

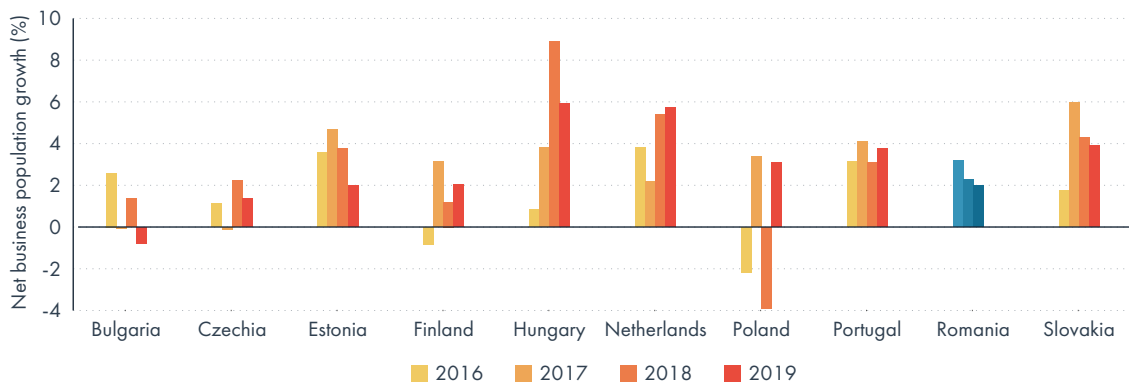


Source: World Bank Group Entrepreneurship Survey and World Development Indicators.

Note: BG = Bulgaria; EE = Estonia; FI = Finland; GDP = gross domestic product; HR = Croatia; HU = Hungary; NL = the Netherlands; PL = Poland; RO = Romania; SK = Slovakia. Year: 2019

**Net business population growth, which takes into consideration entry and exit rates, decreased between 2016 and 2019.** Net business population growth captures the change in national business counts and sheds light on the overall degree of geographical dispersion in business activity between countries. Comparator countries with the highest net business creation rates over this period are Hungary (8.9 percent) and the Netherlands (5.7 percent), as compared to Romania (3.2 percent) where there is a downward trend (figure 1.5). Yet, overall performance in terms of average net growth in Romania is close to the average observed across peers over the 2016–19 period.

**FIGURE 1.5** Net Business Population Growth by Year

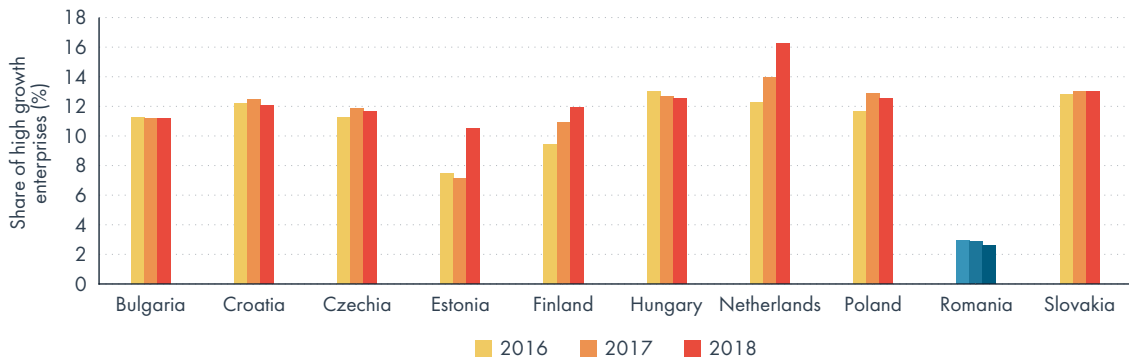


Source: Eurostat 2020.

### 1.3.2 SCALE UP

**Although Romania has a relatively high entry rate, its firms are less likely to achieve high growth.** Romania's business population has increased—growing by 10 percent between 2014 and 2018. However, the share of high-growth firms<sup>9</sup> in Romania has been stable, hovering around 3 percent between 2016 and 2018 (figure 1.6). Moreover, the share of high-growth firms in Romania is well below that in peer countries, which averages 11.4 percent. Only a small number of high-growth firms are hiring many employees (Flachenecker et al. 2020). The share of high-growth firms in the manufacturing sector is particularly small compared to that in other countries. This trend is also observed among young firms. Romania also has few young high-growth firms (5 years or younger).

**FIGURE 1.6** High-Growth Firms by Year



Source: Eurostat 2020.

Note: Based on the OECD-Eurostat definition of high-growth firms.

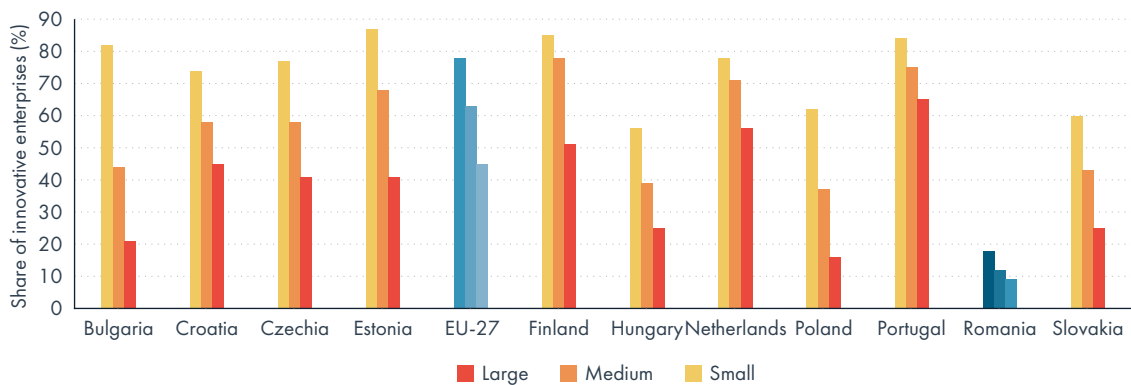
9. Using the OECD-Eurostat definition of high-growth firms as “[a]ll enterprises with average annualized growth greater than 20 percent per annum, over a three-year period, and with ten or more employees at the beginning of the observation period” where growth can be measured in number of employees or in turnover (OECD-Eurostat 2007; OECD 2010).



### 1.3.3 INNOVATION

**Romanian firms are also less likely to innovate than the EU average.** Around 10 percent of Romanian firms report that they innovated—introduced a new or significantly improved process or service in the previous twelve months—while the EU average is 60 percent (Eurostat 2018). Like those in other countries, small firms in Romania are less likely to innovate than large firms. In Romania, large firms are twice as innovative as smaller firms, but across the EU the difference is only 30 percent (figure 1.7).

**FIGURE 1.7** Innovative Enterprises by Size

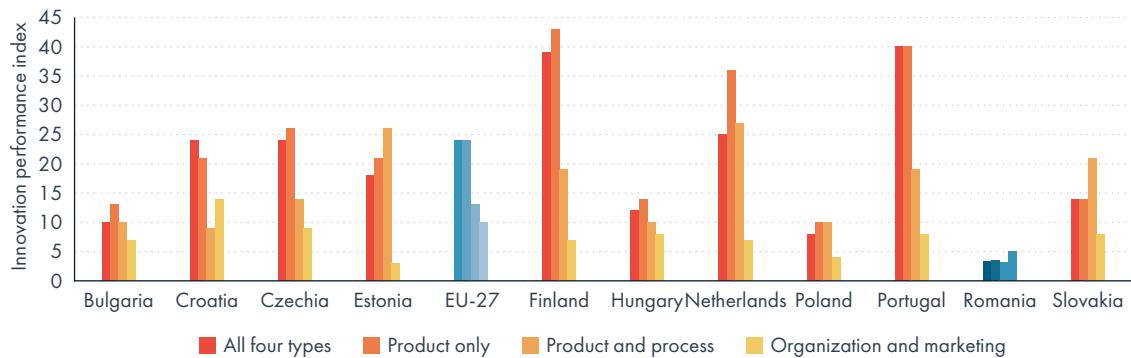


Source: Eurostat 2018.

Note: An enterprise is considered innovative if, during the reference period, it successfully introduced a product or process innovation, had ongoing innovation activities, abandoned innovation activities, completed but had not yet introduced an innovation, or was engaged in in-house R&D or R&D contracted out. EU-27 = the 27 European Union member states excluding the United Kingdom. R&D = research and development.

**Few Romanian firms introduce new products.** Romanian firms lag their international peers in all types of innovation (figure 1.8). The gap is especially large for innovation of new products—24 percent of firms in the EU report introducing new products, compared to only 4 percent of firms in Romania. In contrast to what is observed at the EU level, however, female entrepreneurs in Romania are more likely than male entrepreneurs to offer new products and services (24.9 percent vs. 22.3 percent). Romania’s low performance on innovation is also reflected in other metrics. The European Innovation Scoreboard highlights the low performance of Romania with respect to the EU regarding non-research and development (non-R&D) innovation expenditures, business process innovation, and employment in innovative enterprises.<sup>10</sup>

**FIGURE 1.8** Innovation Performance by Type of Innovation



Source: Eurostat 2018.

Note: Innovation refers to the implementation of a new or significantly improved product (good or service), process, marketing method, or organizational method in business practices, workplace organization, or external relations. EU-27 = the 27 European Union member states excluding the United Kingdom.

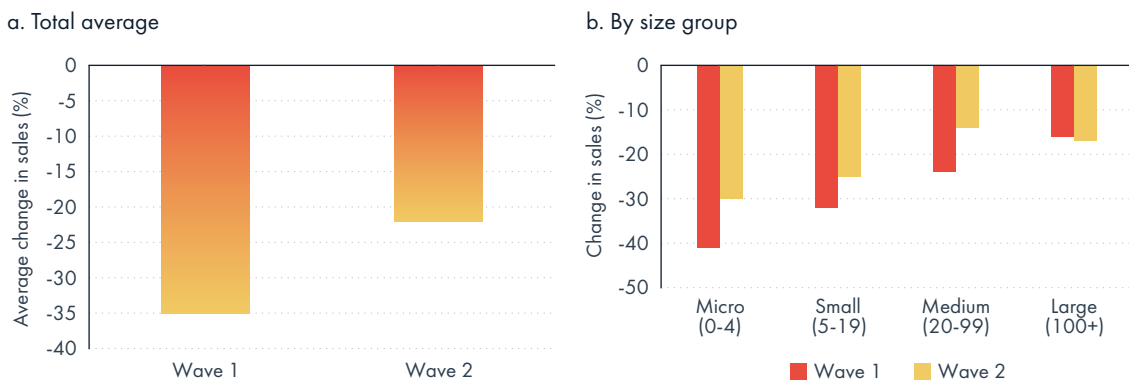
10. EIS-RIS 2021 (European and Regional Innovation Scoreboards 2021) <https://ec.europa.eu/research-and-innovation/en/statistics/performance-indicators/european-innovation-scoreboard/eis>

### 1.3.4 THE IMPACT OF COVID-19 ON ROMANIAN FIRMS

**The challenges for scaling up and innovating might be exacerbated by the COVID-19 shock.** Overall, the analysis on entrepreneurship performance suggests a dynamic process of new firms entering the market in Romania (quantity), but a significant gap regarding quality, described by the low share of firms reaching high-growth status and innovating. Evidence across countries suggests that this gap between quantity and quality of firms may be exacerbated in the context of COVID-19, as the number of new registered firms has been increasing, along with poor performance of existing businesses. Yet, the increasing adoption of digital technologies across businesses of diverse size, sector, and region, may also provide an opportunity for innovation and technology upgrade.

**Romanian firms have been affected significantly by COVID-19, and the effects of the crisis are heterogenous across firms.** During the COVID-19 pandemic, the World Bank launched a Business Pulse Survey to assess how Romanian firms have been impacted by COVID-19 and the impact of public sector support measures to mitigate business losses. Firms experienced a significant negative shock, with sales dropping by more than a third (relative to 2019) in the first wave, during the initial phases of the lockdown and COVID-19 crisis between May and July 2020. Sales dropped 22 percent during the second wave, between September and October 2020 (figure 1.9, panel a). However, not all firms experienced the same negative shock. Small and micro firms were disproportionately affected (figure 1.9, panel b). The negative shock was also persistent. Firms that experienced a negative shock in the first wave also experienced a negative shock in the second wave, a few months later.

**FIGURE 1.9** Change in Sales During COVID-19 Wave 1 and Wave 2 Relative to 2019



Source: World Bank Group, COVID-19 Business Pulse Surveys.

Note: Wave 1 covers the period May–July 2020. Wave 2 covers the period September–October 2020. Estimates based on regressions controlling by size, sector, and region.

**During the pandemic, firms significantly increased the adoption and use of digital technologies.** Although the pandemic is characterized by recurring waves of COVID-19 outbreaks, and cash-strapped Romanian firms anticipate ongoing cash flow challenges, digital adoption is a clear silver lining (figure 1.10). An estimated 91 percent of firms use digital technology, of which 22 percent started using technology and 34 percent increased the use during the first COVID-19 wave in the country. Adoption of digital technology could lead to significant productivity gains if it “sticks” and is complemented by organizational changes.

**A higher intensity in the use of digital technologies could contribute to a faster recovery and the development of an ecosystem for SMEs and startups to innovate.** It could induce productivity gains and reduce the persistent productivity gap previously found between European and United States firms. However, digital technologies are complex and heterogeneous and can affect the opportunities of growth and convergence across different

**FIGURE 1.10** Fraction of Businesses Starting or Increasing Use of Digital Technology during the First COVID-19 Wave



Source: World Bank Group, COVID-19 Business Pulse Surveys.

Note: Wave 1 covers the period May–July 2020. Wave 2 covers the period September–October 2020.

firms and local economic contexts unevenly. For digitalization to spur a productivity-driven recovery, it must concentrate on business functions with the highest potential to spur upgrade and firm growth (Cirera et al. 2020). In Romania, firm digitalization is concentrated in business functions such as marketing, sales, and business administration, but it is important to facilitate the extension of these gains towards technologies applied to production as well.

**Access to public support related to the pandemic is tapering off and still very unequally distributed.** Most firms did not receive any support. Although smaller firms were more affected by the crisis in terms of their drop in sales, they were less likely to access public support. The program that appears to have reached the largest number of firms is wage subsidies, but only 15 percent of firms said they had received this type of support by wave 2. There are significant opportunities to improve access to public support because the two main reasons preventing firms from receiving it are lack of awareness and cumbersome (and costly) application procedures.

## 1.4 ENTREPRENEURSHIP PILLARS IN ROMANIA

**This section assesses the factors that characterize the entrepreneurship ecosystem pillars.** As introduced in the conceptual framework, this report takes an ecosystem perspective, viewing entrepreneurship as an activity that arises from a set of complementary factors, such as knowledge and resources, available through institutions and individuals within a region. As illustrated in figure 1.1 above, this ecosystem perspective is based on three pillars comprising supply factors, demand factors, and barriers to the accumulation and allocation of resources.

### 1.4.1 SUPPLY FACTORS

**Entrepreneurs and firms need physical capital and infrastructure, human capital, and knowledge as inputs for producing goods and providing services.** The availability of these factors in the ecosystem plays a key role for entrepreneurs when deciding whether to start a new business, expand, or innovate. Firstly, physical infrastructure is the backbone of the economy. Lately, increasing attention has been given to the importance of ICT infrastructure because evidence suggests that it may have an important effect on growth and the diffusion of new technologies (Toader et al. 2018). Thus, this section pays particular attention to this topic. It complements the analysis by assessing some indicators on the availability of human capital, with an emphasis on science, technology, engineering, and mathematics (STEM) and digital skills, as well as the availability of R&D and business knowledge present in institutions and through collaboration between research organizations and the private sector.

#### Physical Capital and Infrastructure

**Over the last decade, Romania has been proactively investing in its digital infrastructure, but ICT usage by households and firms still lags EU peers.** Figure 1.11 shows that about 81 percent of firms in Romania have fixed broadband connections as compared to 92 percent of firms in EU. The gap between Romanian and EU access to fixed broadband connections is also observed with respect to households, which may play an important role as workers and consumer markets. Worryingly, almost 20 percent of Romanians have never used the Internet, and less than a third only have basic digital skills, with a notable divide between rural and urban users. Although ICT usage remains relatively low, the COVID-19 pandemic expanded the use and adoption of digital technologies.

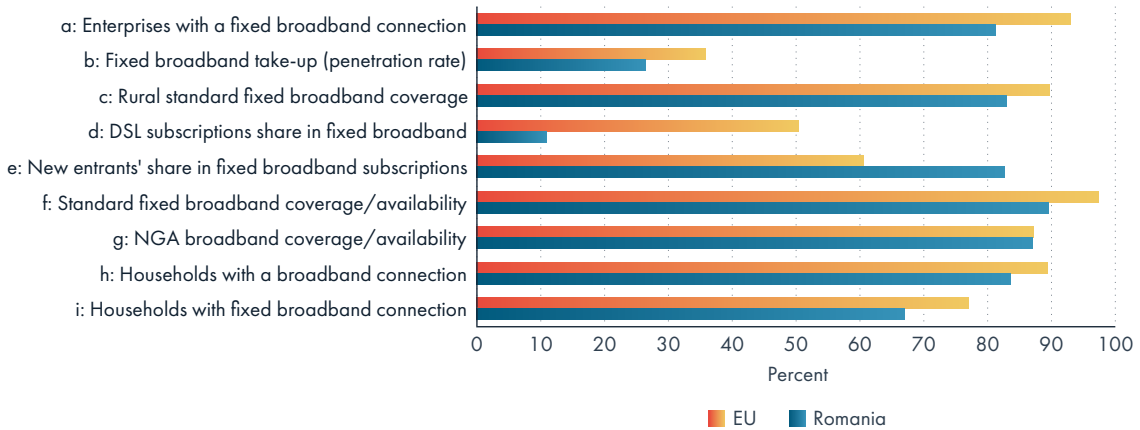
**Physical infrastructure is also relevant, especially with the observed increase in e-commerce, because it enables supply and delivery of goods across regions.**<sup>11</sup> Romania's main cities and commuting zones are relatively sparsely distributed compared with much of the rest of the EU (European Commission 2016<sup>12</sup>). Where cities are far from each other, transport infrastructure can compensate for distance. However, indicators such as the

11. Additional details are described in the Access to Markets section.

12. European Commission (2016). The state of European cities 2016: cities leading the way to a better future. <https://unhabitat.org/sites/default/files/download-manager-files/The%20State%20of%20European%20Cities%202016%20eBook%20HIGH.pdf>

efficiency of train services (from the World Economic Forum *Global Competitiveness Index 2019*<sup>13</sup>) demonstrate that Romania lags the EU average, ranking 24 of 26 countries. As a result, Romanian innovators and entrepreneurs face higher barriers—including to supplying and distributing goods across the country and physically meeting other members of the ecosystem (such as cofounders and VCs)—than those in other EU countries.

**FIGURE 1.11** ICT Connectivity of Romania and EU Member States



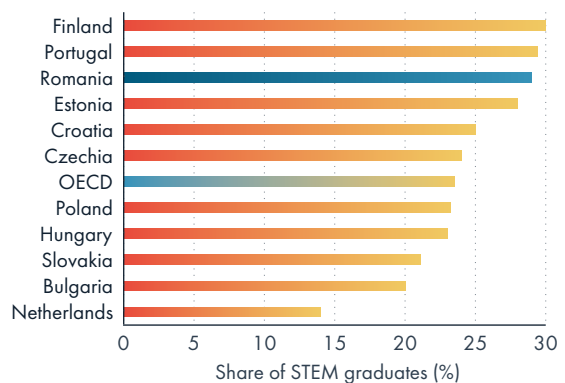
Source: European Commission Digital Agenda Scoreboard Key Indicators 2020. [https://digital-agenda-data.eu/datasets/digital\\_agenda\\_scoreboard\\_key\\_indicators](https://digital-agenda-data.eu/datasets/digital_agenda_scoreboard_key_indicators)  
 Note: a. in percent of enterprises, b. in subscriptions per 100 people, c. in percent of households, d. in percent of fixed broadband subscriptions, e. in percent of fixed broadband subscriptions, f. in percent of households, g. in percent of households, h. in percent of households, and i. in percent of households. DSL = digital subscriber line; NGA = next generation access.

## Human Capital

**A high share of Romanian graduates focuses on STEM as compared to peers.** Almost a third of graduates go into science and engineering disciplines, which is a strength for the country, as shown in figure 1.12.<sup>14</sup> Three times more men (30 percent) as compared to women (9 percent) work in STEM occupations. However, this gender gap is smaller in Romania than in most other EU Member States. Moreover, Romania shines with a high share of ICT specialists who are female (23 percent) compared to the significantly lower EU average (17 percent) (European Commission 2020b). The high proportion of graduates in science and engineering provides Romania with opportunities to develop and support R&D-intensive entrepreneurship activities that leverage high-skilled workers.

**However, high shares of STEM graduates do not translate into a high share of R&D personnel in businesses, and many employers see the low-quality skills developed by the graduates to be a challenge.** Although STEM training may be necessary for producing R&D personnel, data suggest that it is insufficient. The country has around four R&D personnel per thousand employees, the lowest value of the comparator group (that have

**FIGURE 1.12** Share of Graduates in Science, Technology, Engineering, and Mathematics



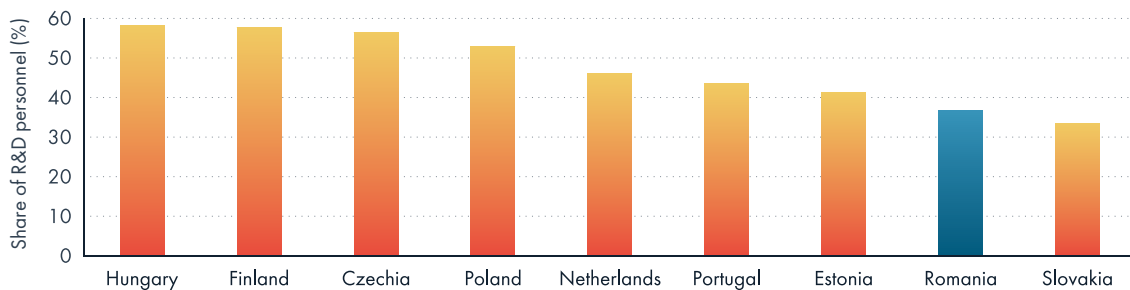
Source: UNESCO 2019.  
 Note: Share of all tertiary-level graduates. OECD = Organisation for Economic Co-operation and Development. Year: 2020. STEM = science, technology, engineering, and mathematics

13. Rating based on a survey by the World Economic Forum evaluating frequency, punctuality, speed and price of train / seaport / air transport services / quality of roads (respectively), using a scale from 1 (extremely inefficient, among the worst in the world) to 7 (extremely efficient, among the best in the world). EU value is calculated as a simple average.

14. UNESCO Institute for Statistics (2019) (indicator is categorized in the database under “education” and “other policy relevant indicators”)

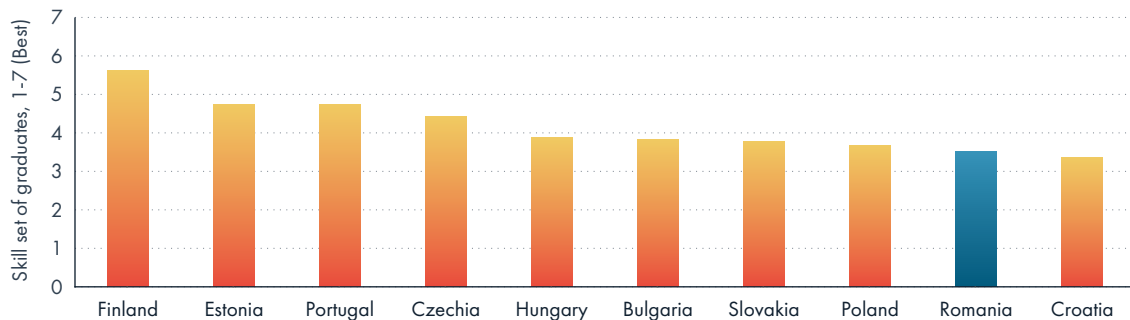
data available)—Finland has the highest number with 19 (OECD 2021b). Moreover, the share of R&D personnel in businesses is similarly low with only 36 percent of all R&D personnel working in businesses (figure 1.13). Relatedly, industry perceptions of the graduates' quality of skills needed by businesses rank below the European average. According to the World Economic Forum Global Competitiveness Index (2019).<sup>15</sup> Romania scores 3.5 (scores range from 1 [not at all] to 7 [to a great extent]), whereas the European average is over 4.2, indicating a gap in needed skills including areas of entrepreneurship (figure 1.14). One potential explanation for the gap may be “brain drain” (Gavriloaia 2020). According to Eurostat,<sup>16</sup> in 2017, a significantly larger share of Romanians with a doctorate, masters, or college degree were living in a state different than the one in which they were born, compared to 2008. The differences amount to 144 percent between 2017 and 2008. The regional inequality and significant concentration of activities in the capital city indicate the potential challenge facing several subnational ecosystems.

**FIGURE 1.13** Total Business Enterprise R&D Personnel as a Percentage of the National Total



Source: OECD, Main Science and Technology Indicators database 2021. R&D = research and development.

**FIGURE 1.14** Skill Set of Graduates



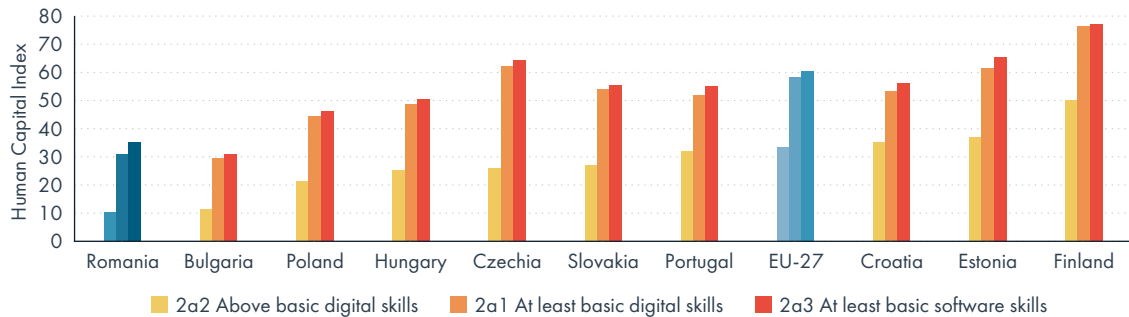
Source: World Economic Forum Global Competitiveness Index 2019

Note: average score of the two following questions: (1) “In your country, to what extent do graduating students from secondary education possess the skills needed by businesses?” and (2) “In your country, to what extent do graduating students from university possess the skills needed by businesses?” In each case, the answer ranges from 1 (not at all) to 7 (to a great extent).

**Moreover, there is significant room for improving basic digital skills among workers in Romania.** Digital skills are key for innovative firms and startups, but they are also important for driving demand and consumption of digital products and services. Figure 1.15 shows that less than one-third of people aged 16–74 have at least basic digital skills (58 percent in the EU as a whole), and only 10 percent have above basic digital skills (against the EU average of 33 percent).

15. The indicator uses the average score of the two following questions: (1) “In your country, to what extent do graduating students from secondary education possess the skills needed by businesses?” and (2) “In your country, to what extent do graduating students from university possess the skills needed by businesses?” In each case, the answer ranges from 1 (not at all) to 7 (to a great extent). Available at [https://todata360.worldbank.org/indicators/hc01f6c6e?country=ROU&indicator=41397&countries=BGR,POL,SVK,HUN,CZE,HRV,EST,PRT,FIN&viz=line\\_chart&years=2017,2019](https://todata360.worldbank.org/indicators/hc01f6c6e?country=ROU&indicator=41397&countries=BGR,POL,SVK,HUN,CZE,HRV,EST,PRT,FIN&viz=line_chart&years=2017,2019)

16. Eurostat (2019), Report on migration and the migrant population (retrieved from [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Migration\\_and\\_migrant\\_population\\_statistics/](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Migration_and_migrant_population_statistics/)).

**FIGURE 1.15** Level of Digital Skills and ICT Specialists

Source: European Commission Digital Economy and Society Index 2020. <https://digital-agenda-data.eu/datasets/desi/indicators>

Note: This is a composite index that summarizes relevant indicators on Europe's digital performance. Digital Economy and Society Index Human Capital Digital Skills refer to people with "basic," "above basic," or "at least basic" skills in four dimensions: information, communication, problem solving, and software for content creation (as measured by the number of activities carried out during the previous three months). It also accounts for employment of ICT specialists, female ICT specialists, and people with a degree in ICT. Year: 2020. EU-27 = the 27 European Union member states excluding the United Kingdom; ICT = information and communications technology.

**There are also opportunities to address Romania's human capital challenges via systematic diaspora engagement.** Box 1.1 below contains additional insights on Romanian diaspora, also referred to as Romanian emigrants.

### BOX 1.1 Leveraging the Romanian Diaspora

According to the OECD study, "Talent Abroad: A Review of Romanian Emigrants," Romania has the fifth largest diaspora in the world and is growing. According to available published estimates, more than 97 percent of Romanian emigrants worldwide live in OECD countries, fewer than 70,000 Romanian emigrants live in non-OECD countries, and about two-thirds of this group resides in non-OECD countries of the EU.

In 2015/16, around 3.6 million people born in Romania were living in OECD countries, of which 54 percent were women. Additionally, 90 percent of Romanian émigrés in OECD countries live in Europe, primarily Italy, which has one third of this population (over 1 million). This is followed by Germany (680,000) and Spain (573,000). Most of the other emigrants lived in the United Kingdom, the United States, Hungary, France, or Canada.

**Migration for employment is dominant motive.**

- Emigration intentions are particularly high among young people, nearly half of 15–24-year-old say they intend to immigrate likely related to poor job prospects for young people, especially those with high education.
- Of those that have already immigrated, almost two-thirds of Romanian diaspora in Europe said that they emigrated for employment reasons. Though only one in seven declared having a job offer prior to departure. The second most important motive was family, accounting for 31 percent across the EU.

**Close to a fourth of Romanian emigrants in OECD countries are highly educated** though distribution of educational attainment among Romanian emigrants varies across countries of residence. Romanian emigrant women now have a higher level of education than men but differences in the distribution of education levels by gender vary by destination country, this is particularly striking in the United Kingdom and France.

**Romanian emigrants have relatively high unemployment level but those who are highly educated do better.** Romanian emigrants mostly work in low-skilled occupations and sectors, especially in South European countries. For those that

do work in highly skilled jobs, almost half of tertiary educated Romanian emigrants in OECD countries are overqualified. Almost nine out of ten Romanian emigrants self-perceive that their full potential not exploited in the host country, and that they have the skills to cope with more demanding duties than those required to perform their current jobs.

**Poor reintegration of some return migrants into the labor market hinders diaspora contributions to Romania's economic development.** Highly educated return migrants have relatively poor reintegration outcomes, possibly due to lack of a reliable network to help them find a job or loss of country-specific knowledge from being abroad. Many low-educated return migrants turn to self-employment while the highly educated are often overqualified (44 percent compared to 19 percent for non-migrants).

**Implications for Romania's existing diaspora policy:**

- There is a need to better understand the dynamics of Romanian migration within the EU, especially in the context of free mobility within the EU. Mobility patterns have become more complex and diverse and there is a need to better distinguish between temporary and permanent migration. This requires longer tracking of individuals across countries.
- Improve the proper use of skills possessed by Romanian emigrants to mitigate high level of overqualification and better increase their contributions to Romania's economy. This has implications for remittances as well as skills transfer.
- Help return migrants find or create better opportunities in Romania, either by improving skills matching with needs of Romanian firms or by better supporting them to become entrepreneurs, especially high-growth firms.
- Fostering stronger ties with children of Romanian emigrants born in OECD countries so that they can contribute to their country of residence and to Romania to maintain the possibility of living in Romania.
- Fostering stronger ties to existing diaspora networks, such as the scientific diaspora network (<https://ad-ast-ra.ro/>) and high-growth entrepreneurs.

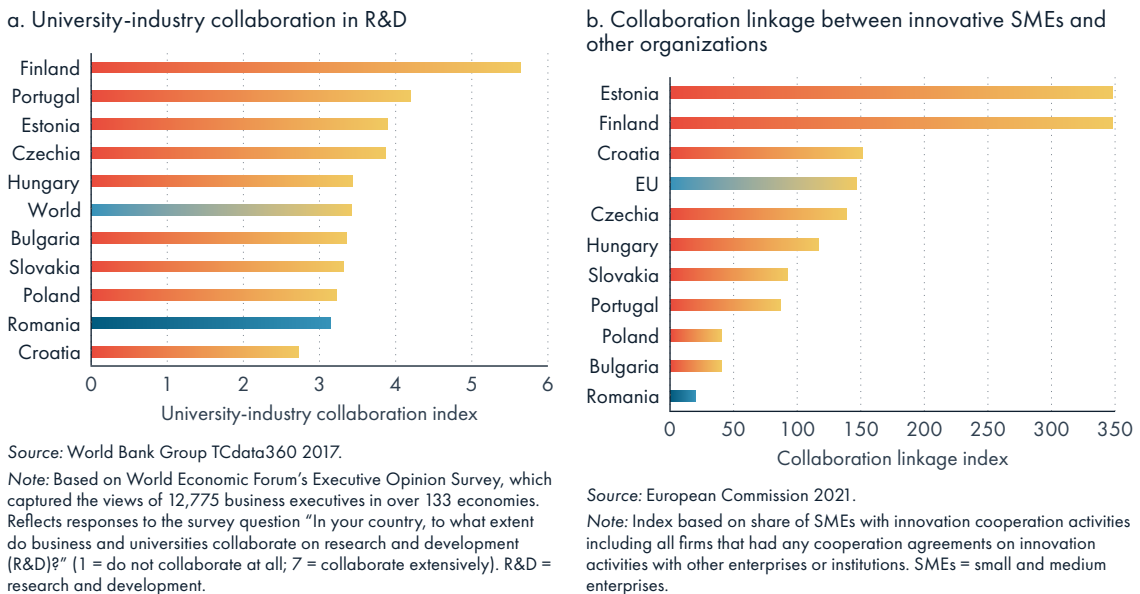
## Knowledge Capital

**Public support for knowledge transfer is limited.** Large public investments in R&D infrastructure and university research are not translating into private sector innovation, and the limited capacity of subnational technology transfer offices (TTOs) is a weakness in the institutional framework for commercialization. The lack of strong mechanisms to build and transfer knowledge to businesses translates into low production of IP.

**Despite large investments in R&D infrastructure projects, public sector investments are not translating into private sector innovation.** A high share of public R&D expenditures has been directed into a few flagship projects. For example, with the European Commission, Romania co-invested around €320 million (equivalent of 30 percent of the gross domestic R&D expenditure in 2019) into the Magurele Science Park, the largest research, innovation, and development project in the country (Banila 2019). Although the park is important basic research infrastructure, few incentives were built-in to ensure spillovers in the form of private-public collaboration. Despite large investments in public R&D infrastructure projects, firms are not utilizing it for their growth, and knowledge spillover is limited.

**Public sector investments in university research are also not translating into private sector innovation.** Various sources of information aiming to measure university-industry collaboration and collaboration between innovative SMEs and other organizations (for example, European Commission 2021) suggest that Romania lags its counterparts (figure 1.16). This indicates that public sector investments are not translating into private sector *outputs* as further highlighted by a low share of patents (see next paragraphs). Such linkages matter not only for ensuring the translation of research and new ideas into real-world innovations but also for ensuring the relevance of university teaching and research. Historically, Romanian universities have not developed strong linkages with the business sector. Knowledge exchange activities are now legally enabled as part of a higher education institution’s mission, but Romanian companies may not be proactively establishing linkages with universities given low levels of R&D and limited technological specialization and knowledge intensity.

**FIGURE 1.16** Collaboration in R&D and Business Innovation



**The limited capacity of subnational TTOs is a weakness in the institutional framework for commercialization.** A functional review of the Romanian R&D system (World Bank 2011) described the technology transfer infrastructure as a weak link in the sector, which could explain why few firms are innovating with other firms. The network of institutions specialized in technology transfer and innovation (ReNITT) consisted of 39 accredited technology transfer centers, technology info centers, and technology and business incubators in 2011. However, anecdotal evidence from the North-East and North-West regions (for example, Alexandru Ioan Cuza University, Gheorghe Asachi Technical University, University of Medicine and Pharmacy Cluj-Napoca, and Babeş-Bolyai University) shows that most TTOs are

very small, employing one or two people. Moreover, most TTOs are embedded within universities and are mainly transactional and used for patent applications. TTOs are more effective if they act as innovation brokers between ecosystem players, taking a more proactive, strategic role in encouraging spinoffs and facilitating cross-organizational innovation.

**The lack of strong mechanisms to build and transfer knowledge to businesses translates into low production of IP.** Romania has around 20 patent applications per billion regional gross domestic product (GDP) in purchasing power standards (PPS), but its peers Poland, Croatia, and Bulgaria have each over 30 patent applications per billion GDP, and innovation leaders such as Israel have over 140 patent applications per billion GDP (European Commission 2020a). In Romania, patents are usually applied for and granted as part of research activities, merely to satisfy funding instrument requirements, and mostly without a clear commercialization strategy. Limited resources and lack of a strategic approach also mean that most patent applications are national rather than EU or international, which has implications for the quality of those patents.

## 1.4.2 DEMAND FACTORS

**Demand plays a crucial role in a healthy ecosystem.** Expanding markets for new and incumbent enterprises and having firms and entrepreneurs with capabilities to convert innovative ideas into businesses are crucial. Even if the supply pillar provides resources (in the form of physical, human, and knowledge capital) and the allocation pillar enables the allocation of such resources towards productive firms (through access to finance, appropriate regulations, and social capital), the ecosystem must have access to markets, skilled entrepreneurs, and capable firms to demand and use these resources in production and service provision.

### Access to Markets

**Romania is a mid-size market, with an estimated population of 20 million consumers.** Even when the capabilities of existing firms are limited, expanding access to markets (customers) can help businesses scale production and increase product quality.<sup>17</sup> Romania successfully diversified its export basket toward medium-technology products, although this transformation slowed after the 2007–08 global recession. Over the last two decades, Romania switched from labor-intensive low-technology sectors (such as garments, footwear, and metals) to more advanced sectors (like automotive, machinery, and electronic equipment) (World Bank 2018). Since 2008, export growth has increasingly been driven by existing products and markets and relied more on the intensive margin (that is, exports of the same products to the same markets). In the preceding decade, the extensive margin (that is, exports of new products or to new markets) accounted for almost half of export growth.

**Inefficiencies in Romania's public procurement system severely limit domestic market access for SMEs.** The EU's Romania Country Report 2018 (European Commission 2018) highlights inefficiencies in Romania's public procurement and concludes that "the irreversibility of the public procurement reform and further monitoring in the context of the EU Semester process remains essential." The inefficiency is reflected in the EU Single Market Scoreboard,<sup>18</sup> on which Romania scores unsatisfactorily on 9 out of 12 indicators, including SME contractors and SME bids.<sup>19</sup> According to the most recent data available (2019), SMEs bid on 35 percent of public procurement contracts but are awarded only 5 percent of them. This indicates that there are barriers preventing smaller firms from participating in public procurement procedures.

**As for access to external markets, Romania has a low share of exporters compared to peers and low import content of exports.** Only 17 percent of Romanian firms export more than 1 percent of their sales abroad (figure 1.17,

17. Atkin, Khandelwal, and Osman (2017) show through a randomized controlled trial that facilitating access to markets can also lead to productivity gains.

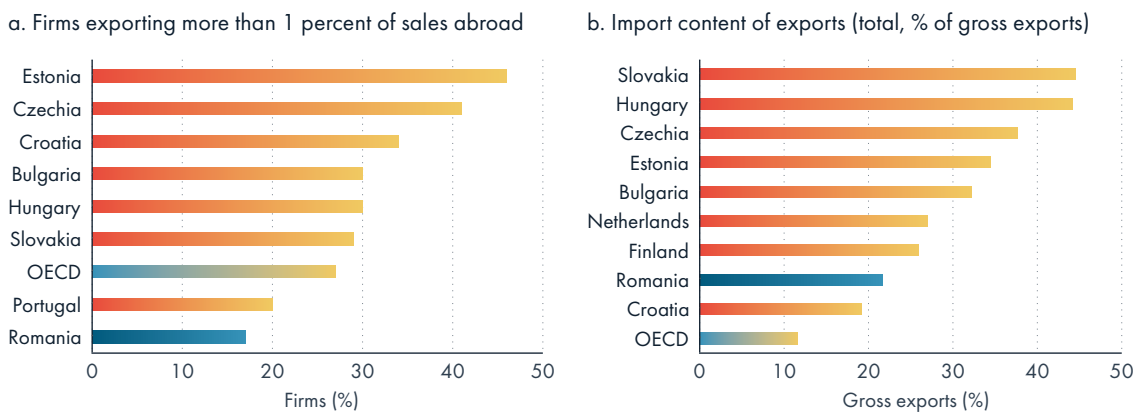
18. [https://single-market-scoreboard.ec.europa.eu/policy\\_areas/public-procurement\\_en](https://single-market-scoreboard.ec.europa.eu/policy_areas/public-procurement_en)

19. The unsatisfactory indicators are (1) single bidder; (2) no calls for bids; (3) cooperative procurement; (4) award criteria; (5) SME contractors; (6) SME bids; (7) missing calls for bids; (8) missing seller registration numbers; and (9) missing buyer registration numbers. The three most important indicators—single bidder, no calls for bids, and publication rate—are linked with competition, transparency, and market access, the core principles of good public procurement.



panel a). Exports in three of the main high-technology products exported by Romania (medicinal and pharma, electrical machinery and appliances, and scientific instruments) recorded low quality increases (3.6 percent, 1.9 percent and 1 percent respectively) between 1996 and 2010 that fell short of the quality increases in the automotive sector (8.8 percent) and were more in line with the quality performance of declining sectors like clothing and footwear. Romanian exporters tend to specialize in assembly, low-value-added, and downstream labor-intensive segments of global value chains. High-technology exports exhibit the lowest survival probabilities in Romania, with less than 10 percent of export relationships surviving more than 5 years. Moreover,<sup>20</sup> the import content of exports is relatively low compared to country peers (figure 1.17, panel b), which suggests that facilitating access to imports should be a relevant component when designing and implementing policies aimed at supporting firms with high-growth potential.<sup>21</sup> Together, figure 1.17 panels a and b reveal that Romania's share of exports and imports is low compared to peer countries.

**FIGURE 1.17** Share of Firms Exporting and Importing



Source: OECD 2020. Firms exporting more than 1 percent of sales abroad (indicator).

Note: The figure shows the percentage of firms that are exporting more than 1 percent of their sales abroad. OECD = Organisation for Economic Co-operation and Development

Source: OECD 2021a.

Note: The figure shows the percentage of gross exports that are imported inputs. OECD = Organisation for Economic Co-operation and Development

## Use of e-Commerce and Digital Platforms

**Analysis for the World Bank flagship *Europe 4.0: Addressing the Digital Dilemma* indicates that Romania can reap benefits from continuing to adopt new transactional technologies.** Transactional technologies, such as digital commerce platforms and blockchain, better match supply and demand to facilitate market transactions by lowering information asymmetries. They thereby hold the promise to both promote market inclusion of small and young firms and foster the convergence of Romanian catching-up regions. Higher use of online sales is associated with smaller productivity gaps between large and small firms in sectors using online sales intensively.

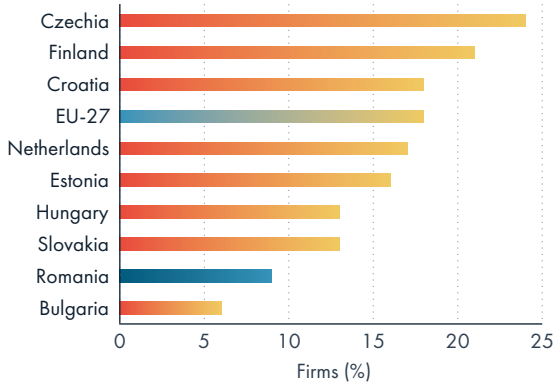
**Use of e-commerce remains low in Romania.** Prior to COVID-19, fewer than 10 percent of firms in Romania had conducted sales on an e-commerce platform (figure 1.18). Moreover, between 2014 and 2018, Romania experienced a five percent decline in the share of firms using business-to-consumer (B2C) websites or apps to sell online (Hallward-Driemeier et al. 2020). Internet purchases by individuals in Romania are also low—9 percent of Romanians have made a purchase online, slightly lower than the EU average of 11 percent (figure 1.19). These two figures are complementary because sales on e-commerce platforms (supply) are a function of Internet purchases by individuals (demand). EU membership alone has not enabled countries such as Romania to significantly scale up their use of digital technologies.<sup>22</sup>

20. The import content of exports is the share of imported inputs in the overall exports of a country and reflects the extent to which a country is a user of foreign inputs (OECD 2021a).

21. Cruz, Baghdadi, and Arouri (2021) show that an increase in import barriers led by changes in non-tariff measures reduces the likelihood of achieving high-growth status through import channels.

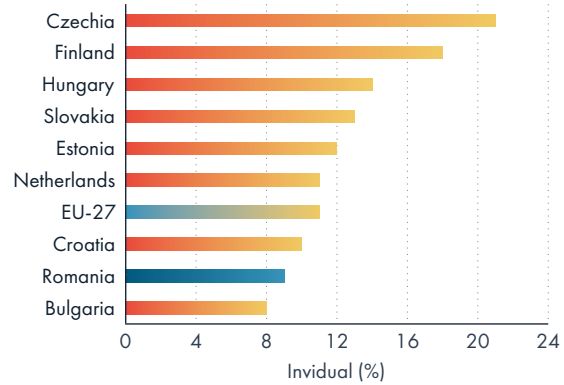
22. Based on Eurostat and OECD data.

**FIGURE 1.18 Firms Selling on e-Commerce Platforms**



Source: Eurostat.  
 Note: EU-27 = the 27 European Union member states excluding the United Kingdom.

**FIGURE 1.19 Individuals Making Internet Purchases**



Source: Eurostat.  
 Note: EU-27 = the 27 European Union member states excluding the United Kingdom.

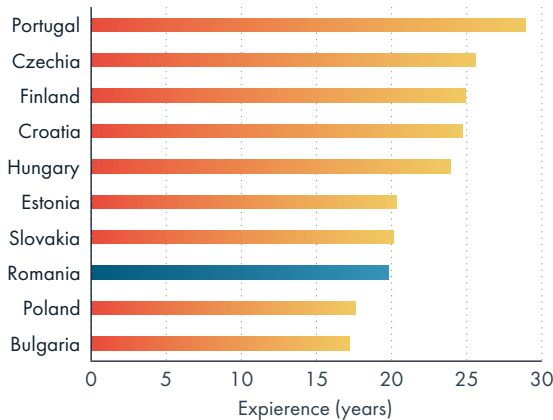
**Uptake of e-commerce platforms has accelerated during the COVID-19 pandemic.** Romania saw the share of firms selling online rise to 19 percent in 2020 from 9 percent in 2018. However, there remains vast unrealized potential: less than 20 percent of firms received even 1 percent of their revenue via online sales.

### Firm Capabilities

**Although top managers have good work experience, Romanian firms provide little employee training.** Better firm capabilities mean a greater capacity for new and existing firms to adopt new technologies and recognize opportunities and risk. Top managers in Romania have an average of 19.8 years of experience working in the firm’s sector, comparable with the EU average of 20.6 years (figure 1.20, panel a). However, only 20.5 percent of Romanian firms offer formal training to their employees, whereas the EU average is 34.7 percent (figure 1.20, panel b). This not only hinders the collective efforts to be innovative but also lowers the technological absorption capacity of the organization.

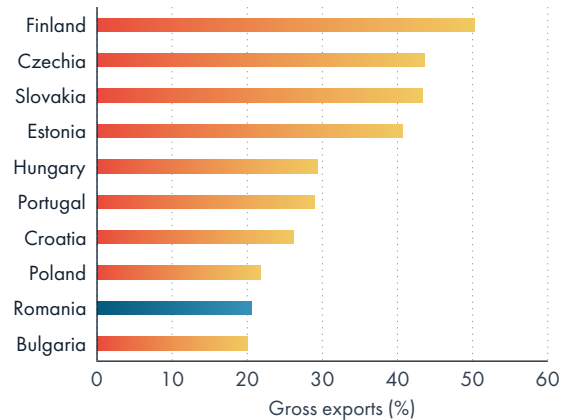
**FIGURE 1.20 Management Practices of Firms**

a. Experience of top manager in similar sector



Source: World Bank Group Entrepreneurship Survey 2019.  
 Note: Indicator based on a survey with business owners and top managers in 814 Romanian firms: “How many years of experience working in this sector does the Top Manager have?”

b. Firms offering formal training



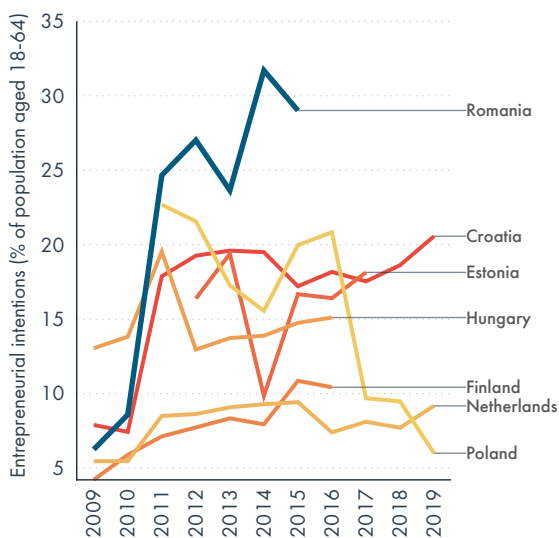
Source: World Bank Group Entrepreneurship Survey 2019.  
 Note: Indicator based on a survey with business owners and top managers in 814 Romanian firms: “Over the fiscal year, did this establishment have formal training programs for its permanent, full-time employees?”

## Entrepreneurial Characteristics

**Self-reported intentions to start a business in Romania are high, but many of these businesses are driven by necessity rather than by the pursuit of opportunities.** The entrepreneurial intentions of Romanians aged 18–64 years old are higher than in comparator countries. In 2015, for example, 29 percent of 18–64-year-olds in Romania were “latent entrepreneurs” and stated intent to start a business within three years (figure 1.21, panel a). However, many of these businesses are not driven by opportunities. Rather, “necessity entrepreneurship” is the dominant type of entrepreneurship in Romania (figure 1.21, panel b). Although Romania’s self-employment rate of 16.4 percent in 2017 is above the EU average of 13.7 percent (OECD 2017), many of these businesses are considered necessity-driven enterprises because they were created due to limited opportunities in the labor market. Three in ten businesses were created because the entrepreneurs did not have any other opportunities in the labor market. The share of entrepreneurs pushed by necessity was higher than the EU average in all observed demographic groups.

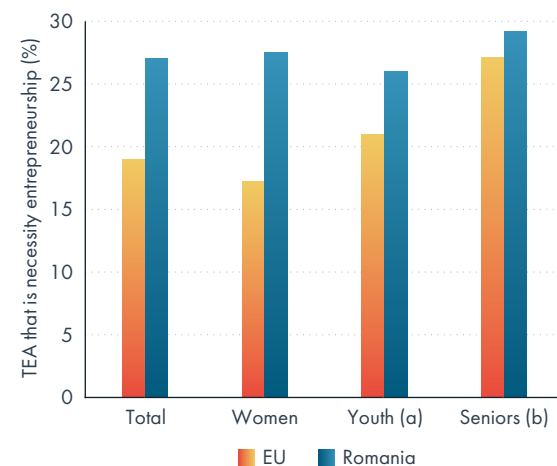
**FIGURE 1.21** Entrepreneurial Intentions and Entrepreneurship by Necessity

a. Entrepreneurial intentions  
(% of 18–64 population, 2009–19)



Source: Global Economic Monitor.

b. Proportion of TEA that is necessity entrepreneurship,  
2015–19



Source: Global Economic Monitor.

Note: TEA = total entrepreneurial activity.

a) Youth are defined as those 18–30 years old.

b) Seniors are defined as those 50–64 years old.

### 1.4.3 BARRIERS TO ALLOCATION AND ACCUMULATION OF RESOURCES

**Entrepreneurs with good business ideas and opportunities need access to finance, adequate regulations, and a favorable environment to acquire resources and succeed.** Firm growth is often constrained by the availability of funding, typically preventing new ventures from investing in innovative projects. This interferes with firms’ ability to improve productivity, finance their growth, and meet working capital requirements and market demand. Entrepreneurs also benefit from an efficient business environment with clear rules, reducing unnecessary bureaucratic steps, and a culture that stimulates appetite for risk, builds social capital, and promotes trust.

#### Access to Finance

**SMEs and startups typically require different sources of financing.** Most SMEs can obtain loans from commercial banks. However, 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. Moreover, the assets of innovative young firms often consist of intangibles such as patents, user-networks and branding,

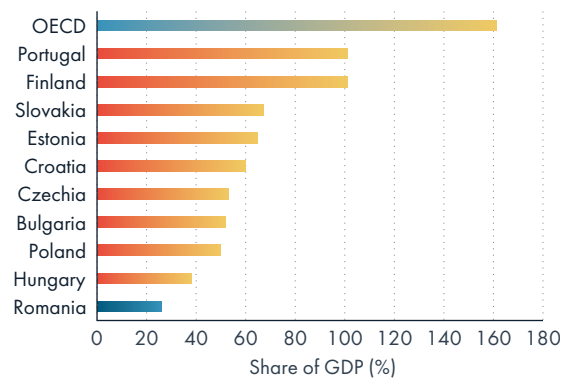
which are much harder to value and borrow against than tangible assets such as machinery. Hence, startups typically self-finance (including borrowing from friends and family), seek grant funding, or raise investments from accelerators, angel investors, and venture capital (VC) funds. Several financial institutions (including banks, VCs, angels, crowdfunding) provide access to financial capital in Romania. At the end of 2019, the Romanian banking sector included 34 credit institutions. However, it lacks geographical diversity and, more importantly, access for all stages of a company's growth.

## SME Finance

**The share of domestic credit to the private sector in Romania is low.** Within Europe, the share of domestic credit to the private sector (as a share of GDP) is the highest in Portugal, Finland, Estonia, and Slovakia, but Romania and Hungary are catching up (figure 1.22). The prevalence of bank loans in Romania is lower than the EU average (this funding is accessed by 39 percent of SMEs in Romania, compared to 49 percent for the EU-28<sup>23</sup> average). The private lending interest rate is highest in Croatia and Romania and lowest in the Netherlands and Hungary. Romania's interest rate is almost twice as high as the OECD average, but evidence indicates that access to debt financing is more important than the rate itself. Romanian firms with strong balance sheets report no real problems in accessing funding, but newer firms struggle to obtain credit.

**Pan-European financing instruments are available to Romanian SMEs.** The European Investment Bank (EIB) has provided €2.1 billion of financing to financial intermediaries so they can provide loans to small businesses in Romania in amounts as small as €25,000 (European Investment Bank 2018). The European Investment Fund (EIF) has also committed €1 billion to SMEs; to date, over 18,000 SMEs have received financing via the EIF (European Investment Bank 2018).

**FIGURE 1.22** Access to Finance through Domestic Credit: Domestic Credit to the Private Sector as a Percentage Share of GDP



Source: World Bank Group 2020. <https://data.worldbank.org/indicator/FS.AST.PRVT.GD.ZS?locations=RO-OE>

Note: GDP = gross domestic product.

## Startup Finance

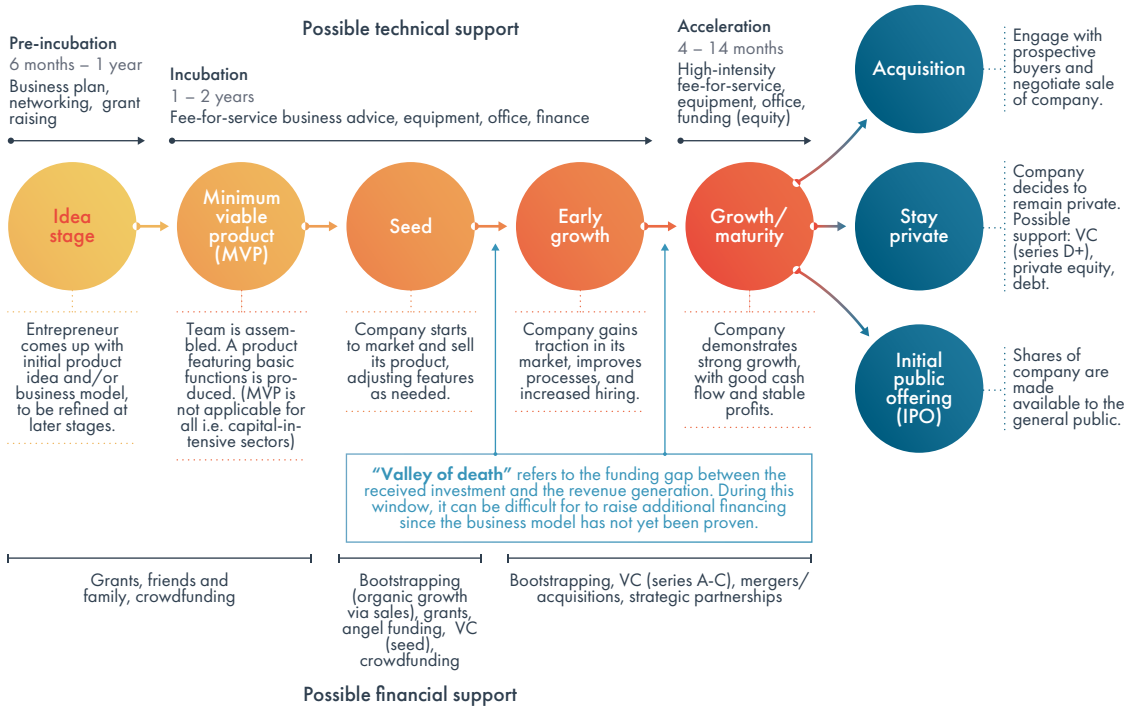
**Sources of startup financing range depending on the firm lifecycle.** During the ideation stage, firms typically self-finance, receive grants, or leverage crowdfunding platforms. During the seed stage, firms start to expand sources of financing to include angel investments. In some instances, organic growth via sales help keep companies afloat. During the growth stages, typically associated with larger investment rounds, startups seek investment from VC funds. It can take years for technology-intensive startups to start generating profits, and many are susceptible to the “valley of death.”<sup>24</sup> See figure 1.23 for additional details.

**Funding for early-stage pipeline-building—smaller firms and nascent startups—remains limited.** Romanian public sector financing mechanisms are not tailored for small firms and startups because they tend to favor post-revenue firms, which may have the effect of supporting incumbents over new entrants. Moreover, equity and debt financing for research and development remain below the EU average (European Commission 2017). This is in line with the findings discussed in the Knowledge Capital section. However, smaller average deal sizes contribute to low levels of equity financing in Romania.

23. EU-28 refers to all the member states of the European Union from the accession of Croatia in 2013 to the withdrawal of the United Kingdom in 2020.

24. The “valley of death” refers to a period from inception to product market fit during which a startup has to rely largely on money from investment to survive. During this period, startups have begun operations but have not yet generated revenue. Startups can be susceptible to valley of death at multiple stages of their lifecycle. See figure 1.23.

**FIGURE 1.23** Startup Life Cycle & Sources of Financing



Source: World Bank Group.  
 Note: VC = venture capital.

**Due to the high-risk profile of nascent startups, the public sector may play a catalytic role.** During the ideation and incubation stages, also referred to as pre-seed financing, startups typically self-finance or receive grant funding. According to the European Commission’s review of public funds for entrepreneurship, existing startup instruments are mainly small scale, below €50,000 (European Commission 2017). See chapter 2 for additional analysis from the World Bank’s review of public expenditures for entrepreneurship. Based on available data regarding pre-seed and seed rounds, it is estimated that earlier stage startups face a financing gap between €50,000 and €200,000.

**Romania has 14 active networks for business angels, totaling more than 250 investors, which could be important financing and mentorship resources for startups.** In addition to acceleration programs, angel networks represent important sources of funding for seed stage firms. Although the other angel investment<sup>25</sup> communities remain informal, Romania’s first business angel association was formalized and joined the European Business Angels Network (EBAN). According to 2021 data tracked by Cluj-based incubator, Activize, 54 startups received a total of €18 million from angel investments and equity crowdfunding campaigns.

**Romanian VC investment as a share of GDP and VC deals are also lower than the EU average.** Within Europe, VC investments as a share of GDP are the highest in Finland and Estonia but the lowest in Romania and Bulgaria (figure 1.24). Although the compound annual growth rate of total VC investments in Romania is in line with the EU average, Romania’s growth would need to be considerably above the EU average in order to reach a similar level of total VC investments. According to PitchBook (2020), VC deals in Europe totaled €10.6 billion in third quarter (Q3) 2020. That is one of the strongest quarters on record, bringing year-to-date funding to €29.5 billion (in 2019, a total of €37.2 billion was raised). There is, however, a large gap between first-time rounds and follow-on rounds of funding. In the first 9 months of 2020, 93.4 percent of all VC funding in Europe went to follow-on rounds. The

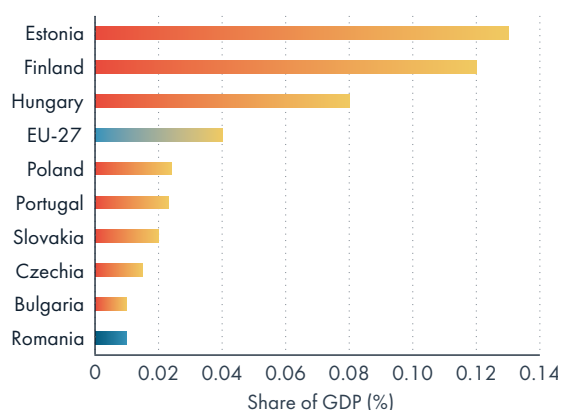
25. Angel investing, which is the practice of private individuals investing personal capital into private companies, is typically associated with startup and early-stage firms with high-risk profiles. Angel investors are particularly valuable in supporting young firms because they are often committed to providing non-capital support such as mentoring, guidance on developing business strategies, industry or commercial connections, and follow-on funding.

median deal size is \$1.2 million for angel/seed, \$2.7 million for early-stage VC, and \$5.9 million for later-stage VC investments in Europe. In Romania, the average funding in 2020, at €552,000 per round, is similar to the previous year (2019), in a context of increased numbers of seed rounds. (Without the UiPath transaction, the average funding per round would be €552,000.)<sup>26</sup>

**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 (Florida 2016) tracked VC investment and startup activity across cities in the United States and found that VC investment are extremely concentrated in specific regions; other regions show very little investment activity.<sup>27</sup>

**Despite robust crowdfunding, angel investing, and VC investment activity, Romania's innovation finance remains limited with VC activity amounting to 0.001 percent of GDP, which is well below the EU average of 0.27 percent (World Bank 2018).** In addition, crowdfunding platforms have been playing a useful role in funding Romanian startups.<sup>28</sup> In 2020, the equity crowdfunding platform, SeedBlink considerably contributed to the ecosystem by facilitating 48 crowdfunding campaigns with a total value of over €23 million, more than half of which came from equity crowdfunding investors.<sup>29</sup> Table 1.1 below summarizes the type of investments into Romanian startups and firms, compared to peer countries, from 2019 to 2020.

**FIGURE 1.24** Access to Finance through Venture Capital: Total VC as a Percentage Share of GDP



Source: OECD Stat Venture Capital Investments 2019. [https://stats.oecd.org/Index.aspx?DataSetCode=VC\\_INVEST](https://stats.oecd.org/Index.aspx?DataSetCode=VC_INVEST)

Note: EU-27 = the 27 European Union member states excluding the United Kingdom; GDP = gross domestic product; VC = venture capital.

**TABLE 1.1** Type of Investments by Country (Central and Eastern Europe, in € Thousands)

Stage	Romania	Hungary	Czechia	Bulgaria	Poland	Slovakia	Croatia	Estonia
Seed	1,629	50,243	792	3,470	16,670	5,570	1,090	4,567
Startup	7,590	49,880	9,015	3,125	45,091	13,645	3,750	7,933
Later stage venture	883	25,410	4,400	970	50,157	1,700	850	9,575
Growth	60,876	40,883	25,000	1,699	123,850	1,500	117,379	85,933
Rescue/turnaround	0	7,314	0	0	0	0	0	0
Replacement capital	2,000	0	0	0	0	0	0	0
Buyout	0	52,553	240,653	0	195,171	0	23,051	240,121
<b>Total</b>	<b>72,977</b>	<b>226,283</b>	<b>279,860</b>	<b>9,264</b>	<b>430,939</b>	<b>22,415</b>	<b>146,210</b>	<b>348,128</b>

Source: Invest Europe's 2020 Central & Eastern Europe Private Equity Statistics: Statistics on Fundraising, Investments, and Divestments June 2021. <https://www.investeurope.eu/media/3983/invest-europe-cee-activity-report-2020.pdf>

Note: Poland was the leading destination with a quarter of the region's total investment value and home to almost a fifth of the companies receiving funding. By investment value, it was followed by Estonia with 21 percent of the Central and Eastern Europe total, the Czech Republic (17 percent), Hungary (14 percent) and Croatia (9 percent). These five countries comprised 86 percent of the total Central and Eastern Europe investment by value in 2020 and 73 percent by number of companies. Driven by VC investments, Hungary saw 236 companies receiving private equity investment in 2020, the largest number of deals recorded and 42 percent of the Central and Eastern Europe total. VC = venture capital.

26. Ernst & Young: Romanian Tech Startups Ecosystem December 2020 [https://www.ey.com/en\\_ro/strategy-transactions/2020-romanian-start-up-ecosystem-funding-round-count-went-up-27](https://www.ey.com/en_ro/strategy-transactions/2020-romanian-start-up-ecosystem-funding-round-count-went-up-27)

27. The United States' most powerful and fastest-growing companies are clustered in hubs like Silicon Valley, New York City, Boston, and Seattle, and VC shares a similar concentration.

28. Crowdfunding—the practice of raising funds from multiple individuals via the web—first emerged in an organized form in the low-investment environment of 2008 and has quickly grown into a multi-billion-dollar industry that channels funds into hundreds of thousands of ventures globally. Hollywood has also used crowdfunding to finance movie projects.

29. Dealroom (2020), Crunchbase (2020), Ernst & Young (2020), investment data tracked by Activize during 2020 and 2021.

According to 2021 startup investment data tracked and analyzed by Activize:<sup>30</sup>

- 18 Romanian startups received €2.05 million in pre-seed financing (average of less than €200k/deal),
- €17.4 million raised in 42 seed rounds (ranging from €200k to €1 million per round), and
- €29.5 million raised in 15 growth rounds (over €1 million per round).

## Regulation

**Romania's 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. EU accession led to substantial *de jure* reforms, which were often subsequently reversed or weakly implemented (World Bank 2018). The restrictiveness of Romania's regulatory environment is driven by state control and additional barriers to entrepreneurship. Pro-competition regulation can help boost income per capita by increasing investment and employment, and it can also stimulate firms to become more innovative and efficient. According to the product market regulation (PMR) indicators,<sup>31</sup> Romanian markets are more restrictive than those of newer EU member countries.

**Romania's regulatory framework makes it difficult to start businesses.** Barriers to entrepreneurship include an inefficient license and permits system and administrative burdens on startups (World Bank 2018). Some regulations prevent entrepreneurs from structuring their firms in the most appropriate way (for example, preventing startups from compensating or rewarding staff with stock options, which is difficult under current legislation).

**Investing in Romanian startups is also difficult due to regulatory uncertainties.** Fundraising can also be particularly onerous: many entrepreneurs report that fundraising can become a full-time activity, diverting precious attention away from building their business. Regulations that stimulate investments into startups are also critical because these types of firms typically do not qualify for debt financing from commercial banks. Romania has regulations that target 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). At present, angel investment and crowdfunding platforms have an unclear status within the Romanian regulatory environment. The legal uncertainties may dissuade investors, especially those based overseas, from making the sorts of investments that could turn ordinary tech startups into high-potential startups, which often receive equity financing<sup>32</sup> from angel investors, VC funds, or crowdfunding platforms. The Romanian entrepreneurship ecosystems have raised this issue explicitly.<sup>33</sup>

**Moreover, Romania's insolvency framework makes it difficult for firms to "fail fast."** An insolvency framework is critical for building a conducive environment for startups 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 cost of bankruptcy are sub-optimal. It merits additional attention because firm closure is a natural and expected way in which resources are reallocated in a healthy entrepreneurship ecosystem.

**Romania lacks a single policymaking authority responsible for startups, including tech startups and high-potential startups.** Existing institutions, including the Romanian Executive Agency for Funding Higher Education, Research, Development and Innovation (UEFISCDI), originated from education and research and, thus, academic focus is part of their culture. UEFISCDI is also needed to transform the R&D environment because Romania performs poorly on

30. These calculations exclude UiPath's Series F financing round and FintechOS's Series B financing round.

31. Pro-competition regulation in the markets for goods and services can help boost living standards, can raise output per capita by increasing investment and employment, and can encourage firms to be more innovative and efficient, thereby lifting productivity. To measure countries' regulatory stance and to track reform progress over time, since 1998 the OECD has been producing a set of indicators of product market regulation (PMR). This set includes an economy-wide indicator and a group of indicators that measures regulation in various sectors. The information used to construct the PMR Indicators is collected through a PMR questionnaire. The questionnaire includes over 1,000 questions on economy-wide or industry-specific regulatory provisions. The information collected through the questionnaire is scored and aggregated into the PMR indicators.

32. As discussed above, in the early days of team or company formation, startups typically self-finance or receive grants. Firms typically source equity financing from seed stage onwards.

33. The Romanian ecosystem raised issues surrounding ease of starting a business and regulatory incentives to crowd-in private sector investment activity.

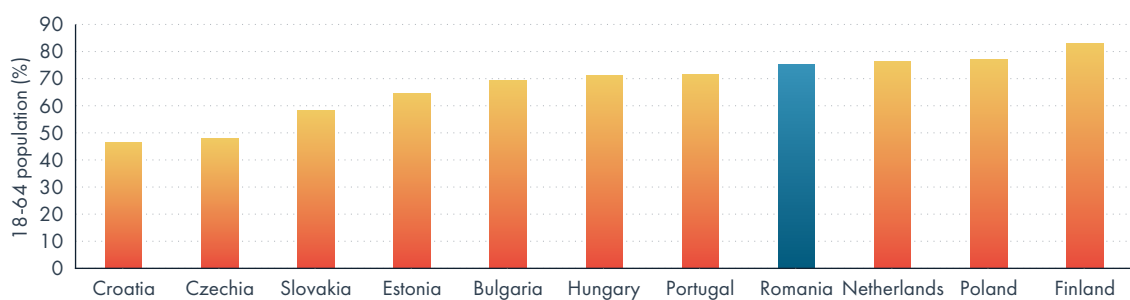
the European Innovation Scoreboard (European Commission 2021) and focusing on startups would distract from its core mission. Moreover, policies fostering the entrepreneurship ecosystem are quite specific due to the nature of high-potential startups and require specialized expertise. Therefore, an institution targeting startups and scale-ups needs to be very different from other agencies in terms of governance, capabilities, and overall agility to work hand-in-hand with ecosystem players, investors, and policy circles. This was further validated by the functional review of public support programs for entrepreneurship, showing that programs are generally risk averse and are typically directed towards ‘safer,’ more established and already profitable firms (see section 2.1 Public Programs). Therefore, a dedicated institution needs an appropriate understanding of the nature of startups—including tech startups and high-potential startups—and new technologies to manage risk instead of seeking to minimize it.

**The need for Romania to have a central policymaking authority for startups is widely recognized.** In fact, it has already been recognized by the Romanian ecosystem itself<sup>34</sup> and by the EU in a report on startups in Romania (European Commission 2017). In addition, several European and international peer and aspirational ecosystems have established entrepreneurship agencies that implement programs targeting startups and high-tech firms. These countries include Chile (Chile’s Economic Development Corporation [CORFO] and the Startup Chile acceleration program), France (La Mission French Tech), Poland (Startup Poland), Portugal (Startup Portugal), Serbia (Digital Serbia Initiative and Innovation Fund), Luxembourg (House of Entrepreneurship), among many others.

## Culture and Social Capital

**In Romania, entrepreneurship is accorded reasonably high social status, increasingly considered a desirable career choice, and widely promoted by the media.** Seventy-five percent of 18–64-year-olds in Romania believe that successful entrepreneurs have high status, much higher than in Croatia (47 percent) and close to the share in the Netherlands (76 percent) (figure 1.25). Entrepreneurship is also often promoted as a potential career pathway in the media, including through many European Social Fund programs.

**FIGURE 1.25** Perception that Successful Entrepreneurs Have High Status



Source: World Bank Group TCdata 360 based on Global Entrepreneurship Monitor: High Status Successful Entrepreneurship 2019. <https://tcdata360.worldbank.org/indicators/aps.entrp.high>

Note: The figure shows the percentage of the 18–64 population who agree with the statement that, in their country, successful entrepreneurs have high status. This indicator is based on the Global Entrepreneurship Monitor’s Adult Population Survey, which tracks the entrepreneurial attitudes, activity, and aspirations of individuals. It is administered to a minimum of 2,000 adults in each country.

**Romania ranks low on indicators of social capital, performing weakest on institutional trust and civic and social participation.** This low social capital, which has been observed by the EU (European Commission 2017) is also evident in the ecosystem where stakeholders reported siloed networks and limited collaboration and connectedness between stakeholders, reinforcing the perception of ecosystem fragmentation. There also appears to be a limited “give back” mentality in Romania. During the early stages of company establishment, startups rely on critical business advisory support mechanisms including business coaching, technical guidance, and mentorship. Romania’s limited “give back” culture could be constraining the growth of startups that rely on mentorship from seasoned business experts.

34. See Chapter 4 for full list of Top 12 Interventions proposed by the Romanian ecosystem.



## 1.5 STRENGTHS AND CHALLENGES FOR ENTREPRENEURSHIP IN ROMANIA

**Romania's entrepreneurship performance is characterized by high entry rates and low levels of scaling up and innovation compared to regional and global peers.** Although firm entry seems stable and relatively high for Romania's per capita income level, the share of high-growth firms and firms promoting innovation are significantly smaller than in peer countries. Thus, the main challenge faced by the national entrepreneurship ecosystem in Romania is mostly related to the intensive margin (scaling up and innovating), which captures challenges associated with the quality of entrepreneurship. Table 1.2 summarizes some of the key strengths and challenges associated with entrepreneurship performance and the pillars of the ecosystem at the national level, as described within this chapter.

**TABLE 1.2** Summary of Key Challenges and Strengths of Entrepreneurship in Romania

Outcome/Pillars	Strengths	Challenges
<b>Entrepreneurship Outcomes</b>		
Entry (new firms)	New firm creation – consistent across age groups and gender	Necessity entrepreneurship is dominant due to lack of economic opportunities
Scaling up	-	Limited number of high-growth firms
Innovation	-	Low levels of business innovation
<b>Entrepreneurship Pillars</b>		
<b>Supply</b>		
Physical capital and infrastructure	Improvements in physical and digital infrastructure in the last decades	Low usage of digital technologies Sparsely distributed commuting zones
Human capital	Large share of science and engineering graduates. Higher participation of female in STEM, compared to EU.	Small number of R&D personnel Low digital skills and brain drain
Knowledge capital	Investments in flagship R&D infrastructures	Limited collaboration within and between private-public sector, including academia
<b>Demand</b>		
Access to markets	Access to EU markets Public Procurement reforms	Low exports and low content of imports Limited use of e-commerce
Firm capabilities	Sectoral experience of top managers	Limited formal training for employees
Entrepreneurial characteristics	High positive perception of entrepreneurship	Necessity (vs. opportunity/growth) entrepreneurship is dominant
<b>Barriers</b>		
Access to finance	Availability of VC financing for later stage startups and firms	Limited financial instruments Small credit market
Regulations	Regulatory reforms driven by EU ascension	High-level of state control barriers
Social capital and culture	Entrepreneurship has a reasonably high social status and is increasingly considered a desirable career choice	Limited generalized interpersonal trust Lack of a giveback culture

Note: EU = European Union; R&D = research and development; STEM = science, technology, engineering, and mathematics; VC = venture capital.

**This summary provides a broad perspective on a complex system.** Many of the key factors necessary to strengthen Romania's entrepreneurship ecosystem are structural and require investment, resources, and time to mature. Moreover, there are unknowns in terms of effectiveness of policy interventions in this area. The high-level assessment described in this chapter is intended to help with the identification of key priority areas for which further experiments, a more detailed diagnostic, and more precise interventions are needed.

**To propose more specific interventions, more information is needed about available resources, the potential of local entrepreneurship ecosystems, and the challenges they face.** It is key to understand the resources available to support entrepreneurship activity, both from the public sector and from ecosystem enablers. It is also important to identify the potential of local entrepreneurship ecosystems—based on specific sector-regions in Romania—and understand these challenges across them. There is also significant variation regarding strengths and challenges of local ecosystems, taking into consideration their sectoral and regional characteristics. Thus, identifying the potential of local entrepreneurship ecosystems and their specific challenges would allow for more customized and effective interventions. The next chapters aim to address these issues.

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CHAPTER 2

# STARTUPS AND LOCAL ENTREPRENEURSHIP ECOSYSTEMS



## KEY QUESTIONS

Chapter 2 analyzes the subnational landscape of businesses and assess the potential of Romania's local entrepreneurship ecosystems with a focus on tech startups. First, it provides an overall perspective on the distribution of firms and entrepreneurship performance at the subnational level. Second, the chapter identifies the potential of local entrepreneurship ecosystems through agglomerations of firms in technology-intensive sectors in terms of the quality of the firms and the diversity of their economic activities. Third, it analyzes the results of the World Bank Group Romania Startup Survey—a new nationally representative dataset collected for this report. Finally, the chapter uses network analysis to identify the connectedness of key actors of the entrepreneurship ecosystem in Romania.

This chapter aims to address the following questions:

- How is economic activity distributed regionally within Romania?
- Where are the more technology-intensive regional ecosystems in Romania?
- What are the key characteristics of tech startups in Romania?
- What are the key obstacles reported by tech startups in Romania?
- How does connectedness play out among Romania's ecosystems?

**A national perspective on the outcomes and pillars of entrepreneurship ecosystems is critical, but entrepreneurship and startup growth are localized phenomena.** The aggregate analysis of entrepreneurship and the startup ecosystem in the previous chapter helps identify critical barriers and provides the “big picture,” but a country could have numerous local ecosystems of varied depth and sectoral focus. The enterprises in these ecosystems might also vary in sophistication, from subsistence micro-businesses, through tech startups, to spinoffs from large companies. As such, these local ecosystems could have different potential for growth and may require different policy interventions. Therefore, targeting interventions to local environments and specific sectors may be necessary.

**Local entrepreneurship ecosystems are inextricably linked with their immediate surrounding environment and sector-specific needs.** As Audretsch et al. (2012) put it, the “fortunes of regions and entrepreneurs are intertwined.” The environment plays an important role in shaping the critical factors that enable entrepreneurs to enhance productivity and competitiveness. As described in the conceptual framework at the beginning of this report, starting a business, ensuring it survives and eventually expands, and contributing to overall economic development depend on the quality of nine factors over three pillars combined with effective policy instruments and ecosystem enablers. Most of these factors are local and are difficult to move across sectors and regions. Resources (physical, human, and knowledge capital) face mobility costs both geographically and across sectors. Factors that facilitate access to them (such as regulations and access to finance) can vary significantly across sectors and regions. Similarly, factors that influence demand (for example, access to markets) are also sector- and region-specific.

**Identifying potential entrepreneurship ecosystems and assessing their pillars are important prerequisites for designing well-targeted effective policies and interventions.** This chapter begins by describing some key differences between the regions in Romania. Then, it identifies potential subnational ecosystems. It applies a new methodology for identifying and assessing local entrepreneurship ecosystems that combines data on density, diversity, and quality of firms (Cruz, Torres, and Trang, 2021). As a final step, the chapter presents a connectedness analysis, which helps us understand the relationships between entities in the ecosystem and the regional interdependencies. The results of this section are key to target interventions at a regional level based on inferences from local sectoral ecosystems.

**This chapter examines and spotlights the potential of local entrepreneurship ecosystems with particular focus on tech startups.** A key message from Chapter 1 is that, despite a relatively high entry rate of new firms, Romania's entrepreneurship performance is challenged by low levels of innovation and scale up. But innovation and scaling

up are strongly associated with firms that succeed in digital and high-tech sectors, which we examine further in this chapter. The analysis relies on firm-level data from four sources (box 2.1): the Romania Business Registry, private data sources on startups (CB Insights and PitchBook), and new evidence from the World Bank's Romania Startup Survey, which collected two samples for this report, one on tech startups, and one on high-potential Startups.

### BOX 2.1 Firm-Level Data Used in the Analysis

The analysis in this chapter relies on a rich firm-level dataset combining four sources:

**Romania's Business Registry** is an established census covering all formally registered and active businesses in Romania. It provides comprehensive indicators for all firms in Romania, including MSMEs. The indicators cover firms' characteristics, operations, and dynamics such as revenue, employment, and sector. MSME operations in Romania cut across almost all economic sectors and data are presented at 4-digit International Standards of Industrial Classification (ISIC). The sample consists of more than 6 million observations from 2011 to 2019, representing a population of nearly 1.2 million establishments. Around 87 percent of enterprises in the sample are micro firms (1–9 employees), 10.79 percent are small firms (10–49 employees), and 1.18 percent are medium firms (50–99 employees). Large firms with more than 100 employees represent only 1.14 percent of firms in the sample. Bucharest has the highest concentration of firms (19.6 percent), followed by Cluj (6.09 percent) and Timis (4.37 percent). Ialomita, Caras-Severin, Borosani, Covasna, Mehedinti have the lowest concentration of firms. Each accounts for less than 0.8 percent of firms in the country.

**PitchBook and CB Insights databases.** These proprietary datasets from PitchBook and CB Insights rely on techniques varying from web scraping to gathering firm information from entrepreneurship networks and VC and other investment deals. The data search focuses on collecting information

on tech startups or digitalized firms that would be attractive for VC or private equity investors due to certain innovative elements in their business models or core product offerings. These data sources have been widely used to understand the dynamics of tech startup firms and are part of the World Bank's forthcoming Global Digital Businesses database. The data are particularly rich in information about tech startups that have successfully managed to scale up through VC, private equity, and mergers and acquisitions.

The **World Bank Group Romania Startup Survey (Tech Startup Sample)** is a nationally representative survey, implemented by the World Bank Group in 2021, focusing on tech startups. The startup population was defined as young firms (with 5 or less years of age) in digital business solutions or high-tech manufacturing sectors. The tech startup definition was based on the revision of several *Startup Laws* that limit the age of potential beneficiaries towards young firms and was informed by the ISIC sectors of firms that are part of the *PitchBook and CB Insights Startup* data, when merged with the Romania's Business Registry, which was used as a sampling frame for the survey.<sup>a</sup> The survey is stratified by sector (core digital businesses, other digital, and high-tech manufacturing) and by region (Bucharest metropolitan area, Cluj, Brasov, and other regions).

The **World Bank Group Romania Startup Survey (High-Potential Startup Sample)** is an administration of the World Bank Group Romania Startup Survey to a sample of firms from the PitchBook and CB Insights databases.

a. The full list of 4-digit ISIC sectors covered in digital business solutions and high-tech manufacturing is available in Appendix A.

## 2.1 THE REGIONAL LANDSCAPE OF MSMES AND ENTREPRENEURSHIP IN ROMANIA

**There is high economic, entrepreneurial, and technological disparity between Romania's regions.** The geographic distribution of firms in Romania reflects significant regional disparity.<sup>35</sup> There is a large concentration of firms in the Bucharest-Ilfov region (figure 2.1, panel a), which is also the richest in terms of GDP per capita (160 PPS in percent of the EU-27 average in 2019).<sup>36</sup> Although the highest concentration of economic and entrepreneurial activity is in Bucharest-Ilfov, Mehedinti and Covasna have the lowest concentration of such activity.

**Entrepreneurship dynamics (the entry and exit of firms) also varies across regions.** The Bucharest-Ilfov region has the highest rate of firm creation, while Harghita has the lowest (figure 2.1, panel b). Hunedoara, Mehedinti and Caras-Severin have the highest rate of firm exit (figure 2.1, panel c). In addition, the number of high growth

35. Romania is divided in four macroregions, eight regions (North-West, Centre, North-East, South-East, South-Muntenia, Bucharest-Ilfov, South-West Oltenia and West), and 42 counties.

36. The volume index of GDP per capita in purchasing power standards (PPS) is expressed in relation to the European Union average set to equal 100. If the index of a country is higher than 100, this country's level of GDP per head is higher than the EU average and vice versa. Eurostat. <https://ec.europa.eu/info/departments/eurostat-european-statistics> "EU-27" refers to the 27 European Union member states excluding the United Kingdom.

firms<sup>37</sup> increased in the Bucharest-Ilfov region. In other regions within Romania, the number of high-growth firms remained constant, with a small decline in the North-West and West regions.

**FIGURE 2.1** Entrepreneurship Dynamics at the Subnational Level

a. Concentration of firms by region

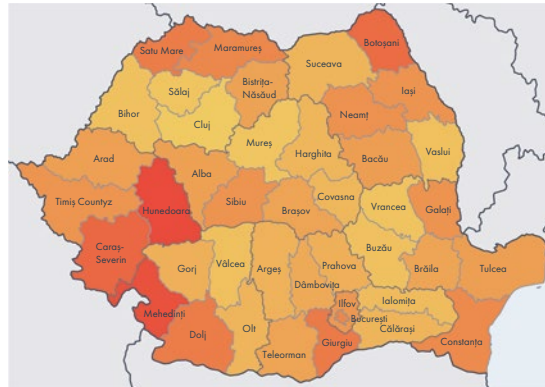
b. Firm entry rate



Low High

Low High

c. Firm exit rate



Low High

Source: Romanian Business Registry 2019

**Having a high entry rate of new firms is a signal of potential dynamism in the ecosystem, but it is not in itself a sufficient condition for a dynamic ecosystem.** An important question associated with the entry rate is the quality of the entrepreneurs and firms that are starting businesses. High exit rates may reflect lack of opportunities for expanding and surviving, although exit rates can also increase if less efficient firms are leaving the market, and this space is being occupied by more productive firms.

**Bucharest-Ilfov also has the highest share of young and high-growth firms, again suggesting that it is the most advanced local entrepreneurship ecosystem.** Evidence from the United States and other advanced economies suggests that young high-growth firms are responsible for a significant chunk of the new jobs created in an economy over time (Haltiwanger et al. 2013, 2017). South-West Oltenia and West have the lowest concentration of young and high-growth firms (table 2.1), while North-East and Bucharest-Ilfov have the highest employment rate in the country (72 percent) and Centre and West have the lowest rate (60.3 percent). Ten percent of the total

37. Using the OECD-Eurostat definition of high-growth firms as “[a]ll enterprises with average annualized growth greater than 20 percent per annum, over a three-year period, and with ten or more employees at the beginning of the observation period” where growth can be measured in number of employees or in turnover (OECD-Eurostat 2007; OECD 2010).

employment in Bucharest-Ilfov is in the high-tech sector, followed by West with 5.3 percent. The South-East region has the smallest share at 0.9 percent.

**TABLE 2.1** MSME Characteristics across Economic Regions

Regions	Concentration of Firms (%)			
	Firms	Young Firms	High-Growth Firms	5+ employees
Bucharest-Ilfov	23.95	24.60	25.86	22.13
Centre	11.59	11.09	12.13	12.68
North-East	10.60	10.56	11.56	11.56
North-West	15.20	14.99	14.39	15.05
South-East	11.26	10.91	10.69	11.06
South-Muntenia	11.19	11.38	11.29	11.64
South-West Oltenia	7.28	7.43	5.87	6.80
West	8.89	9.01	8.19	9.04
<b>Total Romania</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Business Registry 2019.

Note: Young firms are defined as those less than 5 years of age. MSME = micro, small, or medium enterprise.

**Human capital is a key comparative advantage in Bucharest-Ilfov.** According to Eurostat (2020), the population in Bucharest-Ilfov has the most education (40.5 percent have completed tertiary education), followed by the North-West (20.1 percent) and Centre (17.1 percent) (figure 2.2). Similarly, the Bucharest-Ilfov region has the highest concentration of human capital working on science and technology, and the highest number of R&D personnel and researchers in comparison to the rest of the country. Bucharest-Ilfov also has the highest R&D expenditure in the country (1.1 percent of its GDP); the second highest expenditure is in the West region (0.4 percent of its GDP). This concentration of human capital in Bucharest-Ilfov is a key factor for the development of knowledge-intensive activities in this region, which is also associated with the availability of a more complex knowledge system supporting firms. Appendix D compiles information on other pillars by region.

**FIGURE 2.2** Human Capital (Regional Pillar)

Region	Population by educational attainment level (tertiary education) (2020) (% of total population)	Human resources in science and technology (2020) (% of active population)	Employment in high technology sector (2020) (% of total employment)	Expenditure on R&D (2019) (% of GDP)	R&D personnel and researchers (2019) (individuals)
Bucharest-Ilfov	40.5	53.2	10.0	1.1	16,826
Centre	17.1	27.4	2.4	0.3	3,947
North-East	11.8	15.6	1.5	0.3	2,729
North-West	20.1	28.0	2.9	0.2	2,010
South-East	13.1	22.3	0.9	0.1	1,127
South-Muntenia	13.1	20.5	1.4	0.3	1,975
SouthWest Oltenia	16.7	23.9		0.1	678
West	17.0	24.5	5.0	0.4	2,373

Source: Eurostat 2020.

Note: Human resources in research and technology refers to the share of active population in the age group 15–74 that is classified as human resources in science and technology (HRST), that is, having successfully completed an education at the third level or being employed in science and technology. GDP = gross domestic product; R&D = research and development.

**The distribution of human capital and knowledge, along with other resources, across local ecosystems is also reflected in the sectoral specialization across regions.** Every region has its own productive strengths and knowledge specializations. The disparity between the regional distribution of firms in the country can also be observed through the concentration of human capital by sector in each region (figure 2.3). Most digital, knowledge-intensive and wholesale enterprises, in services, as well as most high-tech manufacturing enterprises, in industry, are concentrated in Bucharest-Ifov. However, mining and oil firms are mostly concentrated in the North-West region, while other primary industries are concentrated in the Centre region. Most agro-industrial and light manufacturing firms are more spread throughout the country, with the highest concentration in the South-East and South-Muntenia regions, and in the North-West and Centre regions respectively. This distribution of economic activities is common across the world: complex economic activities (such as ICT and biotechnology) tend to concentrate in a few urban areas, while less complex economic sectors tend to be widely dispersed (Balland et al. 2020).

**FIGURE 2.3** Share of Firms by Region and Sector (Human Capital/Regional Pillar)

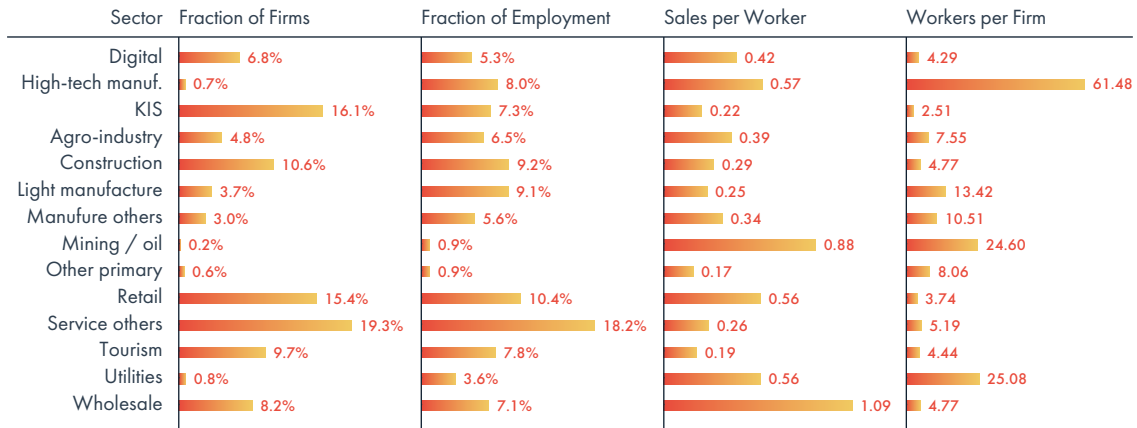
Region	Digital	KIS	High Tech Manuf.	Light Manuf.	Agro-industry	Construction	Manuf. Others	Mining / oil	Other Primary	Retail	Serv. Others	Tourism	Utilities	Wholesale
Bucharest-Ifov	41	35	22	12	9	23	17	13	2	16	24	19	22	32
Centre	9	11	13	16	11	12	14	14	21	10	12	14	11	11
North-East	8	9	9	14	11	11	11	8	18	13	10	10	7	9
North-West	14	14	15	18	15	18	18	23	18	13	16	16	14	14
South-East	7	9	13	10	17	10	11	9	10	15	10	14	13	10
South-Muntenia	8	9	12	13	16	11	11	14	11	15	12	10	15	10
South-West Oltenia	5	6	6	7	9	6	8	8	9	11	7	8	8	6
West	7	9	9	9	11	9	9	12	11	8	10	9	10	8

Source: Business Registry 2019. KIS = knowledge-intensive services.

**Three technology-intensive sectors stand out as relevant for the entrepreneurship ecosystem in Bucharest-Ifov, a region that plays a key role in entrepreneurship performance in Romania.** Digital services, knowledge-intensive services, and high-tech manufacturing are disproportionately concentrated in the Bucharest-Ifov ecosystem. These sectors have in common the fact that they are knowledge-intensive, but high-tech manufacturing is distinctly different from digital services and knowledge-intensive services—there are many fewer high-tech manufacturing firms, but they tend to employ many more people than digital services or knowledge-intensive services firms (figure 2.4). Combined, digital services, knowledge-intensive services, and high-tech manufacturing account for about 24 percent of formal firms in Romania and 20 percent of jobs. An important characteristic of these sectors is that they tend to be composed of firms that are relatively more productive and provide better jobs than firms in other sectors.



**FIGURE 2.4** Descriptive Statistics



Source: Business Registry 2019.

Note: KIS = knowledge-intensive services.

## 2.2 IDENTIFYING LOCAL TECHNOLOGY-INTENSIVE ENTREPRENEURSHIP ECOSYSTEMS

**An important step for the design of policies to support entrepreneurship is to identify geographic locations with high potential.** The identification of local entrepreneurship ecosystems is key for three reasons. First, it identifies regions that have similar potential for specific entrepreneurial activities. This means that specific policies could be applied for an ecosystem that comprises several cities or counties. Second, it identifies the ecosystems' maturity, which signals the level of interventions required to develop them. For instance, an incipient ecosystem would require different and more numerous measures in comparison with a maturing ecosystem. Finally, it identifies the specific indicators that the ecosystem is lacking.

**The existence and potential of local ecosystems can be captured by the sectoral diversity and quality of firms in a given location.** Sectoral diversity is a key component for entrepreneurship and innovation. Diversity tells us how varied the productive knowledge base in a region is and is strongly associated with increased output, productivity, and growth (Karlsson, Rickardsson, and Wincent 2019). Firm quality provides indications of business dynamism and the potential for additional growth.<sup>38</sup>

**Entrepreneurship ecosystems are characterized by the connectedness of actors through the share of ideas and knowledge and common interest for business transactions.** Focusing on broad sectors helps capture the fact that entrepreneurship ecosystems share similar features in terms of market resources (for example, workers' skills and knowledge capital), demand factors (access to market, quality of entrepreneurs), and barriers to allocation (such as regulation and access to finance). Because an ecosystem is characterized, in part, by the connections that lead to the transfer of resources and knowledge between relevant actors, it is important to delimit a broad sector of activities that captures common supply and demand factors, as well as barriers to allocation and accumulation of resources across firms.

**Therefore, to identify local entrepreneurship ecosystems, this section evaluates the diversity and quality of geographical agglomerations of firms within a broad sector.** It identifies and analyzes the potential of local entrepreneurship ecosystems associated with four relevant sectors in Romania—digital services, knowledge-intensive services, high-tech manufacturing, and light-manufacturing—using data from the Romanian Business Registry. Digital services, knowledge-intensive services, and high-tech manufacturing were selected for their strategic potential as

38. For more details on the importance of quality of entrepreneurship in identifying the potential of an entrepreneurship ecosystem, see Guzman and Stern (2020).

being more technology-intensive activities. Light manufacturing provides a good comparison as a more traditional activity that is still relevant for Romania. The methodology identifies agglomerations of firms across diverse subsectors using a variety of quality indicators that are correlated across counties. Box 2.2 describes the algorithm used to identify high potential ecosystems.

**BOX 2.2 Identifying Entrepreneurship Ecosystems**

The algorithm to identify entrepreneurship ecosystems for a value chain evaluates the diversity and the quality of geographical agglomerations of firms within the value chain. Agglomerations are identified based on a measure of spatial correlation, Moran's  $I$ , measuring the extent to which a county is, on average, similar to the surrounding counties with respect to a certain characteristic.

To measure diversity, the algorithm first looks for statistically significant agglomerations of counties with a high density of establishments within each 4-digit subsector in the value chain. It then counts the number of subsectors for which a county is part of an agglomeration. (Appendix A lists the subsectors.) The count is then categorized into three broader measures of diversity: no sector agglomerations, agglomerations in one subsector, and agglomerations in more than one subsector.

To measure quality, the algorithm first looks for statistically significant agglomerations of counties with indications of business dynamism and the potential for additional growth. It then counts the number of quality indicators for which a county is part of an agglomeration. There are nine quality indicators: young firms, large firms (by number of workers), large firms (by turnover), number of high-growth firms, share of high-growth firms, highly productive firms, new firms, entry rate, and survival rate. In this assessment, four quality indicators were used: The young firms' indicator is the share of all firms in the ecosystem that are less than 5 years old. The large firms (by number of workers) indicator is the share of all firms in the ecosystem that are in the top

5 percent of the distribution of firms by number of employees. The share of high-growth firms' indicator is the share of high-growth firms in the ecosystem.<sup>a</sup> The highly productive firms indicator is the share of all firms in the ecosystem that are in the top 5 percent of the distribution of firms by sales per worker. The other five quality indicators were used for validation purposes only. As with diversity, the count of quality indicators is categorized into three broader measures of quality: no quality agglomerations, agglomerations in one quality indicator, and agglomerations in more than one quality indicator.

The potential for each ecosystem is then defined by the combination of both diversity and quality. The broad diversity and quality indicators are combined into a typology to identify regions in Romania with agglomerations of high-quality firms in diverse industries within a value chain (table B2.2.1). *Diverse high-potential* ecosystems exhibit agglomerations in more than one quality component and agglomerations in more than one subsector within the value chain. *Narrow high-potential* ecosystems exhibit agglomerations in more than one quality component and agglomerations in only one subsector within the value chain. *Diverse emerging* ecosystems exhibit agglomerations in one quality indicator and more than one subsector. *Narrow emerging* ecosystems exhibit agglomerations in one quality indicator and one subsector. *Diverse incipient* ecosystems exhibit agglomerations in more than one subsector but no quality agglomerations. *Narrow incipient* ecosystems exhibit agglomerations in a single subsector but no quality agglomerations.

**TABLE B2.2.1 Local Entrepreneurship Ecosystem Typology**

	Quality (indicators)		
	Multiple = High-potential	One = Emerging	None = Incipient
Diversity (subsectors) Multiple = Diverse	Diverse high-potential ecosystems	Diverse emerging ecosystems	Diverse incipient ecosystems
One = Narrow	Narrow high-potential ecosystems	Narrow emerging ecosystems	Narrow incipient ecosystems
None			

a. Using the OECD-Eurostat definition of high-growth firms as "[a]ll enterprises with average annualized growth greater than 20 percent per annum, over a three-year period, and with ten or more employees at the beginning of the observation period" where growth can be measured in number of employees or in turnover (OECD-Eurostat 2007; OECD 2010).

The results show that digital services and knowledge-intensive services ecosystems are agglomerated around a few large metropolitan areas (See figure 2.5.) Digital services firms are defined as those providing mostly digital content.<sup>39</sup> Examples of digital services are transactional technologies that facilitate market transactions by

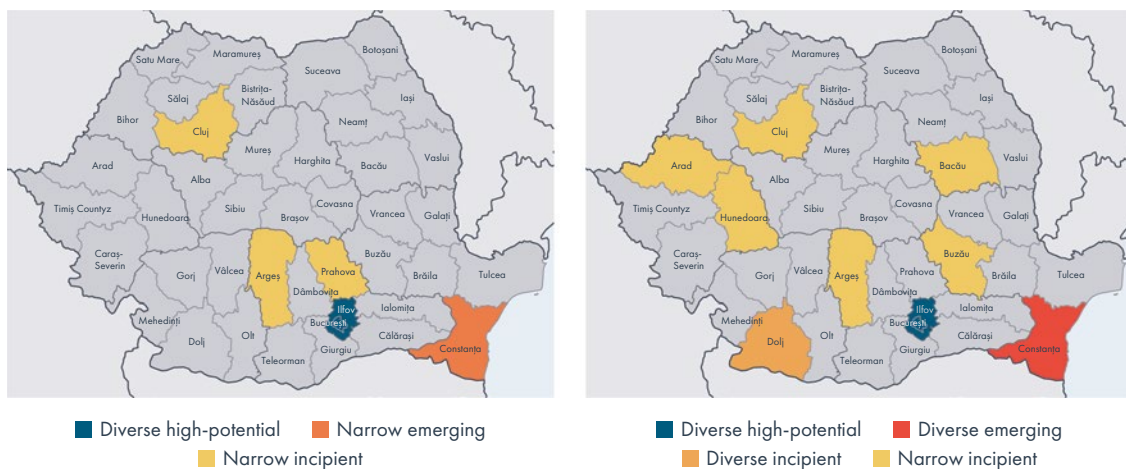
39. The definition for digital businesses used in this work is adapted from the United States Bureau of Economic Analysis on measuring the digital economy (Barefoot et al. 2018).

lowering information asymmetries (such as e-commerce platforms or blockchain), informational technologies that exploit the exponential growth of data and or reduce the cost of computing (such as cloud computing, big data analytics, or machine learning), and operational technologies that combine data with physical automation (such as smart robots, 3D printing, or the Internet of Things) (Hallward-Driemeier et al. 2020). Knowledge-intensive services enterprises (Miles et al. 1995) are those whose employment structures are heavily weighted towards professional and technical expertise. Examples of these firms are engineering services, research and experimental development, and specialized health services.

**FIGURE 2.5** Digital and Knowledge-Intensive Services

a. Digital business solutions

b. Knowledge-intensive services



Source: World Bank Group using data from the Romanian Business Registry 2019.

**Bucharest, in particular, stands out as a high-potential local ecosystem—both for digital business and for knowledge-intensive services—characterized by relevant agglomeration in terms of the diversity and quality of firms.** High-potential ecosystems in terms of diversity and quality in digital services and knowledge-intensive services are disproportionately concentrated around Bucharest-Ifov (figure 2.5). The counties of Constanta and Craiova have relevant emerging ecosystems in terms of diversity of firms. Other counties, including Cluj and Arges (for both digital businesses and knowledge-intensive services), Prahova (for digital); and Arad, Hunedoara, Bacau, and Buzau also demonstrate initial conditions of incipient ecosystems (for at least one activity within digital business and knowledge-intensive services).

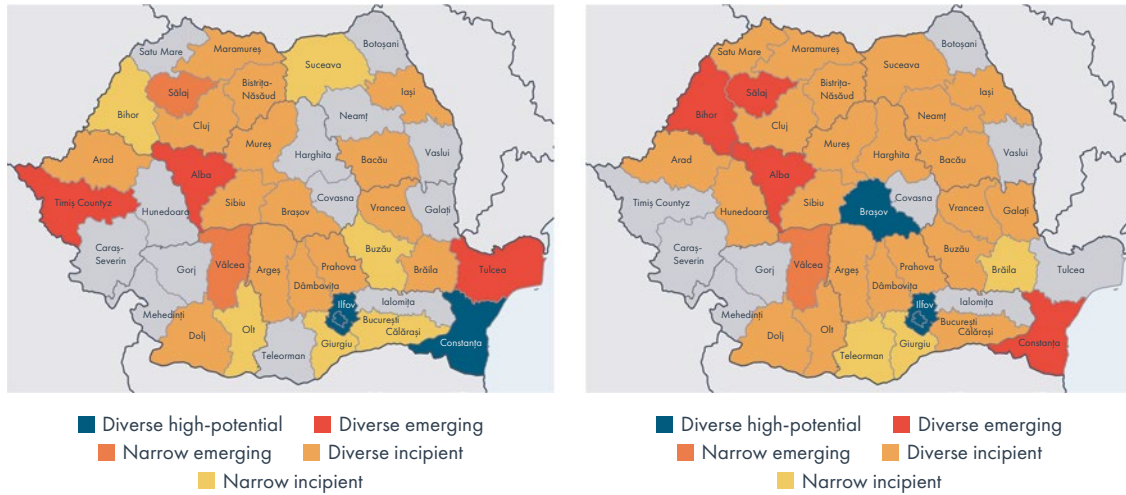
**Potential high-tech manufacturing ecosystems tend to be more dispersed geographically, but there are also few firms in those ecosystems.** High-tech manufacturing in general refers to industries associated with the intensive use of advanced technologies. These industries are associated with the manufacturing of pharmaceutical products and pharmaceutical preparations; computer, electronic, and optical products; aircraft, spacecraft, and related machinery; and advanced chemical products (Eurostat 2018). Figure 2.6 (panel a) shows the distribution of ecosystem types based on the relative concentration of firms in high-tech manufacturing in terms of sector diversity and quality. For comparison, figure 2.6 (panel b) shows the distribution of light manufacturing ecosystems. In general, high-tech manufacturing requires more specialized knowledge (and know-how) than light manufacturing and has the potential to produce more sophisticated knowledge spillovers, which are required to foster innovation in Romania.

**Romania has examples of most types of local ecosystems.** As the previous figures show, Romania has numerous ecosystems in both light manufacturing and high-tech manufacturing, as well as a number of ecosystems in digital business services and knowledge-intensive services. The ecosystems across these sectors nearly cover the gamut of types of local ecosystems, with the exception that no narrow high-potential ecosystems were observed (table 2.2).

**FIGURE 2.6** High-Tech and Light Manufacturing

a. High-tech manufacturing

b. Light manufacturing



Source: World Bank Group using data from the Romanian Business Registry 2019.

**TABLE 2.2** Types of Local Ecosystems

Diversity	Quality	Counties	Sector	Characteristics
Diverse	High-potential	Bucharest-Ilfov	Digital, knowledge-intensive services, high-tech manufacturing, light manufacturing	Many significant agglomerations across sectors; knowledge-intensive activities
Narrow	High-potential	—	—	Multiple quality agglomerations in a single sector
Diverse	Emerging	Tulcea	High-tech manufacturing	Some relevant agglomerations in strategic sectors; some coverage of entrepreneurship enablers
Narrow	Emerging	Constanța	Digital business solutions	Relevant agglomerations in a single sector; some coverage of entrepreneurship enablers
Diverse	Incipient	Dolj	Knowledge-intensive services	No significant agglomerations in strategic sectors; low coverage of entrepreneurship enablers
Narrow	Incipient	Teleorman	Light manufacturing	No significant agglomerations in strategic sectors; low coverage of entrepreneurship enablers

Note: — = not observed.

**The disproportionate concentration of digital business and knowledge-intensive services firms around large metropolitan areas highlights the importance of human and knowledge capital, as well as the local market, as key factors for potential ecosystems.** Understanding these factors is important to define policy strategies, given that not all regions will be able to provide the conditions to improve the attraction of high-quality startups. At the same time, there might be gains from enhancing the capacity to provide and transfer knowledge to areas that have emerging or incipient ecosystems, as well as taking on board the challenges and limitations of regions that do not provide these conditions. These findings do not necessarily mean that counties in which relevant ecosystems were not identified do not have potential associated with the respective sectors. Rather, it means that businesses in these ecosystems will likely face additional challenges. Therefore, any policy strategies related to these counties should aim to connect with and benefit from knowledge in counties with high-potential ecosystems.

## 2.3 THE CHARACTERISTICS OF DIGITAL AND TECH STARTUPS IN ROMANIA

**To understand the landscape and the challenges of digital and high-tech ecosystems in Romania, the World Bank conducted a nationally representative Tech Startup Survey between 2020 and 2021.** The survey had six sections: (i) basic characteristics of the firm; (ii) founder and management characteristics; (iii) development stage and funding; (iv) access to knowledge and network; (v) obstacles to entrepreneurship; and (vi) performance and prospects.

**The World Bank Group Startup Survey used two samples—a tech startup sample and a high-potential sample.** The tech startup sample focuses on a population of young firms (up to 5 years of age) classified as digital solutions businesses or high-tech manufacturing firms that are part of the Romanian Business Registry, which captures all formally registered active establishments in Romania. The high-potential sample was drawn from two proprietary databases of notable Romanian startups. This population is a selected group of Romanian startups that receives international funding and is captured through web-scraping techniques developed by PitchBook and CB Insights. The two firms specialize in identifying businesses that have scaled up using financial instruments that are usually associated with high-growth patterns (for example, VC).<sup>40</sup> This population of high-potential startups is considered an aspirational benchmark in this analysis.

**Triangulating the data from these two populations of firms provides a new perspective on the landscape for startups in Romania.** The selection of these populations had three main goals. The first was to get the most comprehensive sample of Romanian tech startups to improve the understanding of the entrepreneurial environment and identify the specific characteristics and needs of Romanian tech startups focused on the domestic market, not all of which have aspirations to growth. The second was to find a group of high-potential startups from Romania that have attracted international focus and potentially funding for growth. The third goal was to find the similarities and differences between the tech startups and the high-potential startups. Because many questions refer to the characteristics of the founders and challenges faced by firms at early stages (for example, where the ideas and initial financing came from), the comparison can provide interesting insights into differences in the observable characteristics of entrepreneurs in tech startups and high-potential startups. A closer look at these startups and their comparison will better inform public policy to foster the entrepreneurship ecosystem in the country. (See box 2.3 for more detail on the samples and the rationale for them. Full details on both datasets and the procedures used to implement the survey are available in Appendix A.)

### BOX 2.3 Defining and Measuring Tech Startups in Romania

**The definition of startups is controversial and often not rigorous.** In many circles, including among economists, *startups* are defined just as new firms. This definition captures a widely accepted dimension of startups—they are new or young firms—and facilitates the availability of comparable data across countries and regions. However, it does not convey a qualitative component that is usually present in the policy discussions regarding *innovative, technology-based, digital, high-growth, or high-potential* startups. The challenges to incorporating this qualitative component in any empirical work or even regulatory norms (such as startup laws) begin with defining these terms and observing in them in the data.

**This report takes a new approach to understanding startups in Romania.** It uses two samples, one to capture a representative sample of tech firms meeting the standard

definition of startups by age and another to capture high-potential startup firms with the qualitative characteristics that are often of interest to policy makers.

**To capture startup firms with qualitative features of interest, the World Bank Group Startup Survey “high-potential” sample focuses on the population of firms in the PitchBook and CB Insights dataset.** The total universe of firms in this dataset is 448. Due to the small population of firms, a random sample of 200 firms was selected, and 105 responses were obtained. These firms are not categorized by region and are mostly classified in the dataset under “digital business solutions.” However, by merging the data from PitchBook and CB Insights with the Romanian Business Registry, we were able to identify the standard economic sectors (ISIC) of these high-potential startups. We observe that these

40. PitchBook is an independent research firm dedicated to providing premium data, research and technology covering private capital markets, including VC, private equity and M&A transactions. It covers more than 3 million companies globally, 1.5 million deals, 363,000+ investors, and 66,000+ funds. CB Insights is a tech market intelligence platform that analyzes millions of data points on VC, startups, patents, partnerships and news.

firms are predominantly in digital businesses (for example, computer programming and information services). Some, albeit fewer, are in retail and wholesale (for example, e-commerce), knowledge-intensive services (for example, marketing), and manufacturing.

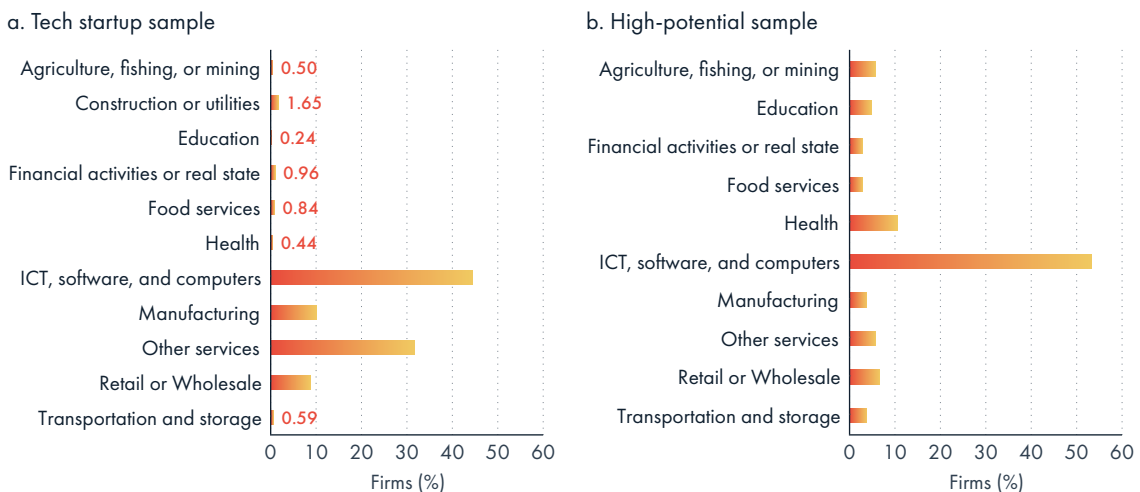
However, the PitchBook and CB Insights dataset is not representative. Although proprietary data such as PitchBook and CB Insights have been widely used to analyze the dynamics of startups with qualities of interest to policy makers, they tend not to be representative of firms in a country based on simple observable characteristics such as sector and age. These platforms identify high-quality, usually successful, businesses by web-scraping their transactions using keywords such as *private equity*, *VC*, *investment banking*, *angel investing*, and *consulting*.

Therefore, to capture a representative sample of tech startups by age, region, and sector, the World Bank Group Startup Survey “tech startup” Sample focuses on young digital and high-tech manufacturing businesses. This subset comprises all firms in Romania that are under five years old and are classified as digital (computer programming and software development, and other digital) and high technology manufacturing. This dataset has a total of 24,502 firms, and a representative sample of 542 firms was used in this survey. The sample was stratified by region (Bucharest metropolitan area, Cluj, Brasov, and other regions) and by sector (core digital, other digital, and high-tech manufacturing). The sector definition was informed by observing the predominance of similar activities in the PitchBook/CB Insights data. The sampling frame was based on *Lista Firme*, which has the contact information for all active firms in the Romanian Business Registry.

### 2.3.1 FIRM CHARACTERISTICS

**Digital (ICT, software, and computer) firms dominate both samples.** Most startups in the tech startup sample were micro businesses with one or zero employees. A slight majority had no employees, which means that there is an important share of self-employment. Most started operation with only zero to one employee. Less than 30 percent of the firms grew in terms of employment since their establishment. Most startups in the high-potential sample are young, digital micro businesses with three or more employees. This contrasts with the tech startup sample, in which firms typically had even fewer employees and a high percentage of self-employment. Most startups in the high-potential sample began their operations with only one to three employees. As intended, firms in both samples are mainly in the digital sector (ICT, software, and computers) (figure 2.7).

**FIGURE 2.7** Businesses by Main Economic Activity



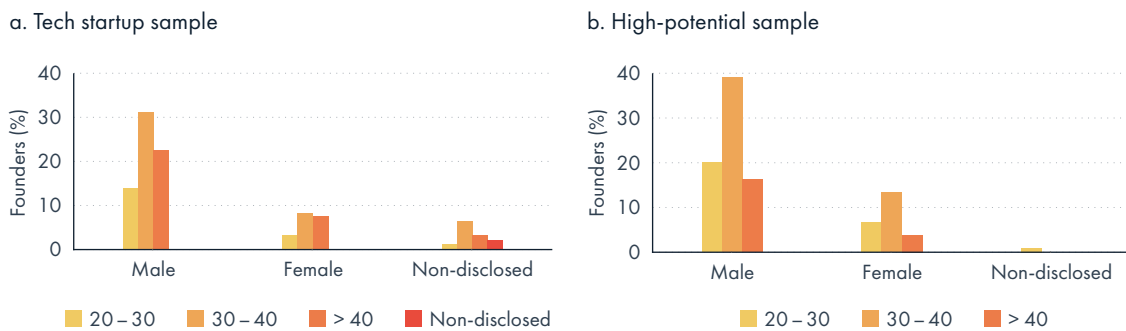
Source: World Bank Group Romanian Startup Survey 2020.

Note: Sector refers to the information reported by the firm during the interview. ICT = information and communications technology.

### 2.3.2 FOUNDER AND MANAGEMENT CHARACTERISTICS

**Most startup founders are males under the age of 45.** In the tech startup sample, most of the founders' ages are between 28 and 45 years old, with a small high concentration between 35 to 40. In the high-potential sample, most founders' ages are between 25 and 45 years old. In the tech startup sample, around 77 percent of firms have one founder, 16 percent of firms have two founders, and less than 7 percent have more than 3 founders. Firms in the high-potential sample tended to have more founders: around 80 percent of firms had two or three founders. In both samples, there is a large gender gap in founders. In the tech startup sample, 68 percent of firms reported that their founders were male, 19 percent reported they were female, and 11 percent did not disclose this information (figure 2.8, panel a). Similarly, in the high-potential sample, 75 percent of firms reported that their founders were male, 24 percent reported they were female, and 6 percent did not disclose this information (figure 2.8, panel b).

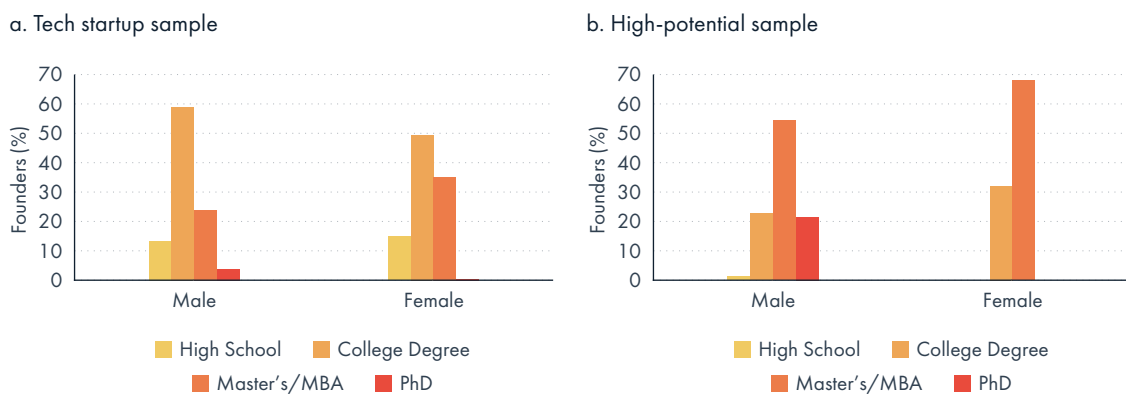
**FIGURE 2.8** Founder's Age and Gender



Source: World Bank Group Romanian Startup Survey 2020.

**Founders in the high-potential sample are usually better educated than those in the tech startup sample.** Most founders in the tech startup sample have college and master's degrees, 12.7 percent of them do not have a college degree, and 2.8 percent have a PhD (figure 2.9, panel a). Most founders of firms in the high-potential sample have college and master's degrees, 16 percent have a PhD and 1 percent do not have a college degree. Women founders in the high-potential sample usually have higher education than their male counterparts (figure 2.9, panel b).

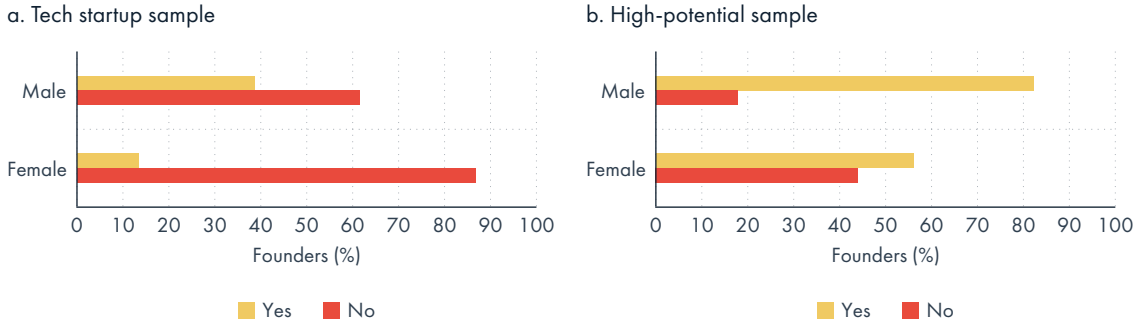
**FIGURE 2.9** Founders' Highest Degree/Level of Education



Source: World Bank Group Romanian Startup Survey 2020.

**Founders in the high-potential sample also usually have more experience abroad than those in the tech startup sample.** Thirty-four percent of the managers of firms in the tech startup sample have either worked or studied abroad, mostly in other European countries (figure 2.10, panel a). By comparison, 76 percent of founders in the high-potential sample have either worked or studied abroad, mostly in the United States (68.8 percent) or in European countries (26.2 percent) (figure 2.10, panel b).

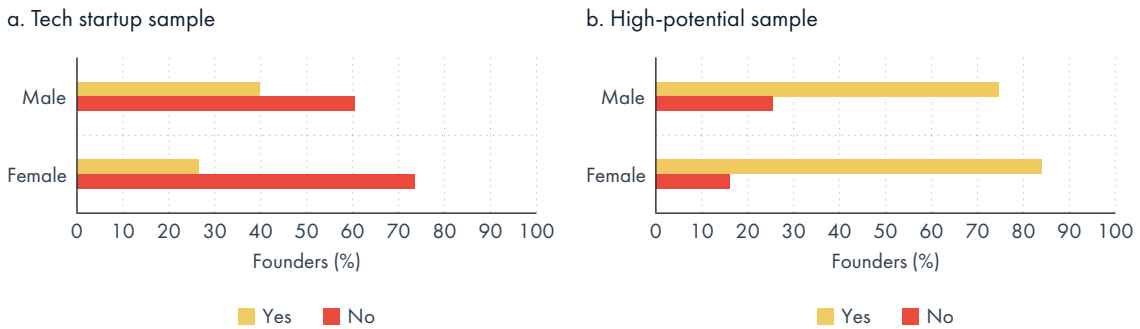
**FIGURE 2.10** Founders' Experience Abroad



Source: World Bank Group Romanian Startup Survey 2020

**Founders of high-potential startups had more experience in the same sector.** That is, firms in the high-potential sample were more likely to have both founders with previous experience in the same sector and founders with previous experience starting a business. Few of the founders of firms in the tech startup sample had previous experience in the same sector of activity of their firms, and most of them (67 percent) had not helped start or started another business before they started their current business (figure 2.11, panel a). In contrast, most of the founders in the high-potential sample had previous experience in the same sector of activity of their startup, and most of them (76 percent) had helped start or started another business before they started their new business (figure 2.11, panel b). Finally, top managers tend to be founders: in both samples, 93–95 percent of the firms report that one of the founders is the top manager of the company.

**FIGURE 2.11** Previous Experience Starting or Owning a Business



Source: World Bank Group Romanian Startup Survey 2020

## 2.4 ENTREPRENEURSHIP OUTPUT: DIGITAL AND HIGH-TECH STARTUPS

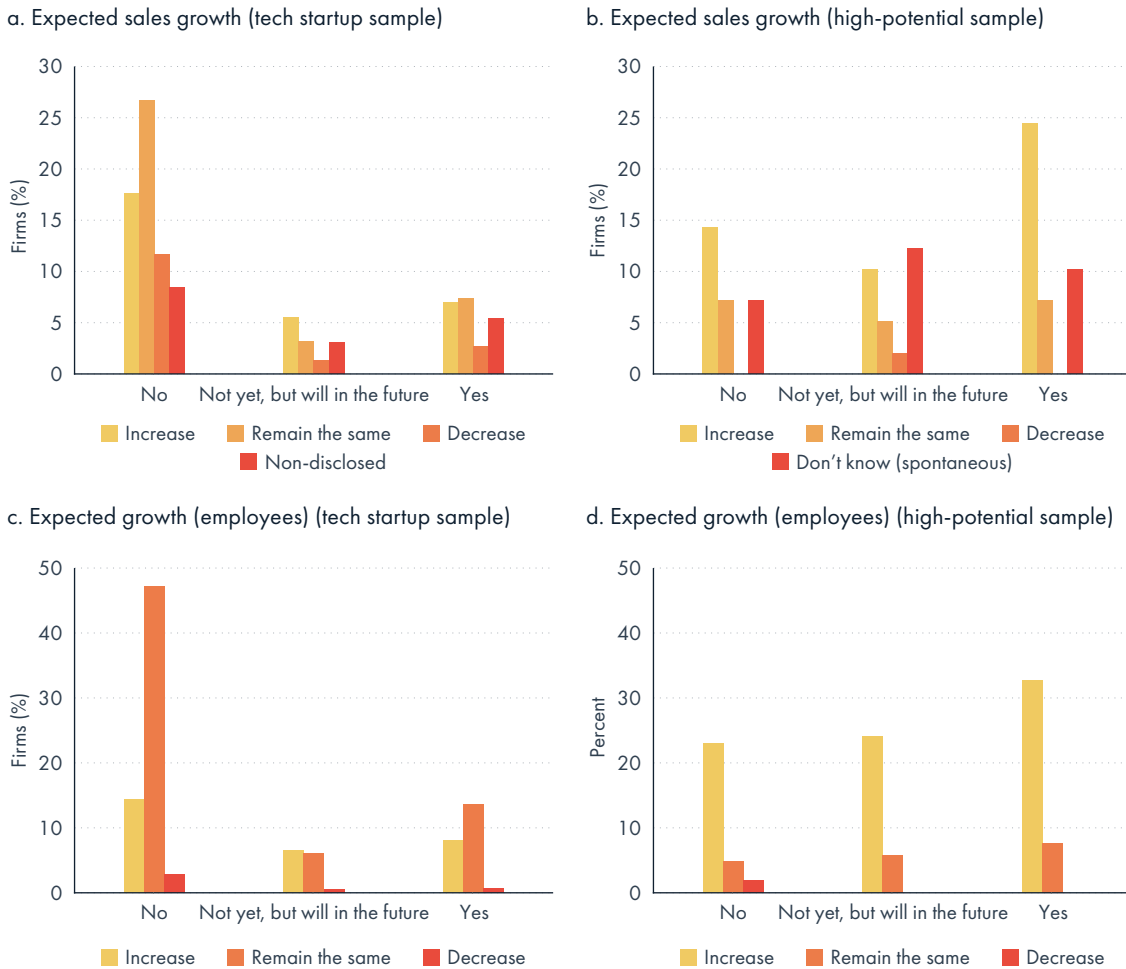
### 2.4.1 SCALING UP

**In contrast to startups in the tech startup sample, those in the high-potential sample are banking on proprietary technology, processes, or procedures to drive short-term growth.** Among startups in the high-potential sample, the largest fraction (nearly a quarter) have proprietary technology, processes, or procedures *and* expect to grow sales in comparison to 2019 (figure 2.12, panel a). By contrast, more than a quarter of firms in the tech startup sample have no proprietary technology *and* expect that their 2020 sales will remain the same as those in 2019 (figure 2.12, panel b). A similar pattern can be observed in terms of employment growth for the next 12



months. Most of the startups in the tech startup sample have no proprietary assets and expect little employment growth in the next year (figure 2.12, panel c). By contrast, most of the startups in the high-potential sample anticipate growing their headcount in the next year (figure 2.12, panel d).

**FIGURE 2.12 Startup Growth (Next 12 Months) (Conditional on Having Proprietary Technology, Processes, or Procedures)**

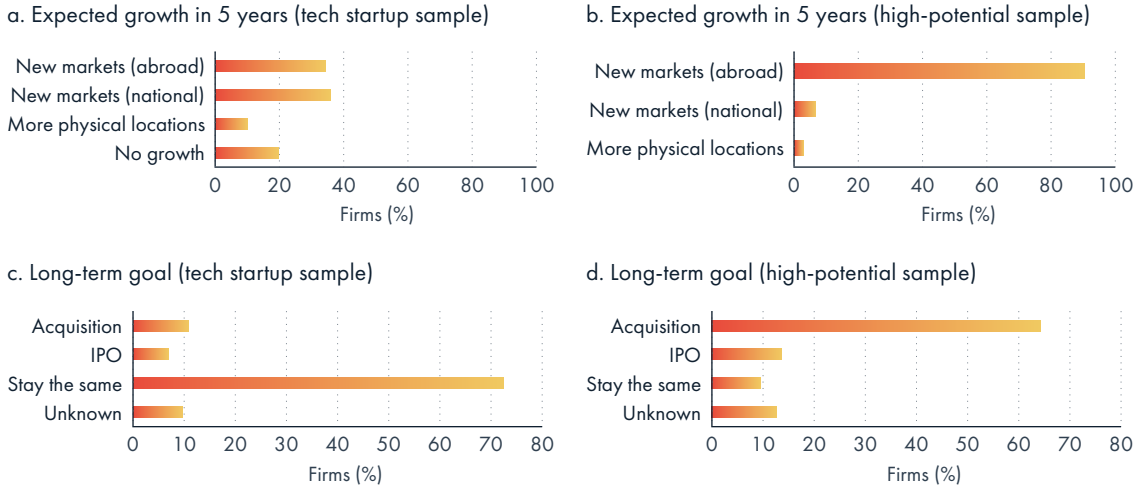


Source: World Bank Group Romanian Startup Survey 2020.  
 Note: Comparison based on startups that have proprietary technology, processes, or procedures.

**Firms in both samples expected to grow in the mid-to long-term, but those in the high-potential sample anticipate being acquired.** Most firms in the tech startup sample expected that their business would expand in the next five years, with growth in new markets, at a national level, and abroad (figure 2.13, panel a). Most firms in the high-potential sample also expected that their business would grow in the next five years, but primarily by expanding into new markets abroad (figure 2.13, panel b). Interestingly, most of the companies in the tech startup sample expected to stay the same (figure 2.13, panel c), whereas most of those in the high-potential sample expected to be acquired (figure 2.13, panel d).

**Firms in the high-potential sample were more profitable than those in the tech startup sample.** In the high-potential sample, 38 percent of firms were already profitable compared to 22 percent of firms in the tech startup firm sample. Most (63 percent) of the tech startups were unprofitable compared to the high-potential startups sample (34 percent). Among the companies in both samples that were not yet profitable, most expected to be revenue positive in the next 1 to 2 years.

**FIGURE 2.13** Startups’ Mid- Long-Term Growth

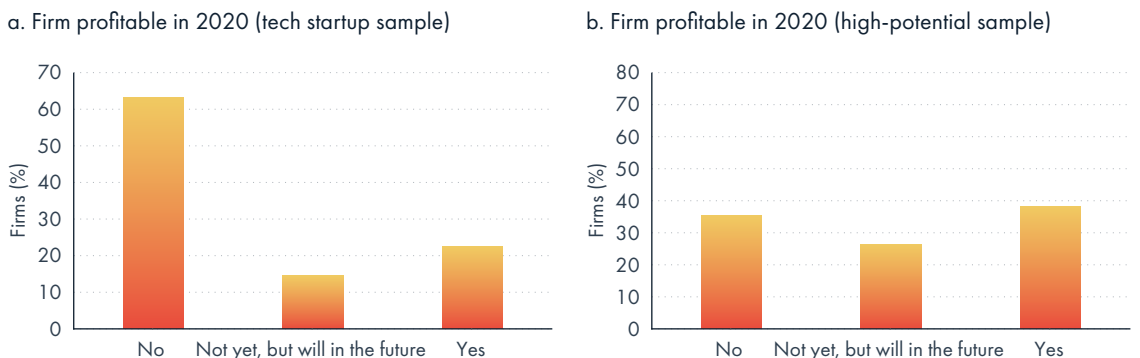


Source: World Bank Group Romanian Startup Survey 2020.  
 Note: IPO = initial public offering.

**Startups in the high-potential sample reported more growth than those in the tech startup sample.** According to respondents in the tech startup sample, 35.5 percent of firms experienced flat sales growth in 2020, in comparison to the same period in 2019; while 28.8 percent saw an increase, and 14.9 percent a decrease. For those reporting growth, the typical increase was between 30 percent to 50 percent. Most growth was in digital and health-related business, as well as retail and wholesale. By contrast, most respondents in the high-potential sample reported that their sales increased during 2020, in comparison to the same period in 2019. The growth followed a similar pattern as for firms in the tech startup sample, concentrating mostly on digital business, health services and retail/wholesale. The typical increase was between 50 and 100 percent.

**High-potential startups with proprietary technology tend to have better-educated founders and are more likely to be profitable.** Most of the founders of profitable tech startups have college degrees, whereas most of the founders of profitable high-potential startups have MBAs or other master’s degrees. Another crucial difference is that high-potential startups with propriety technology are more likely to be profitable—among high-potential startups with propriety technology, 38.2 percent were profitable, whereas only 22.4 percent of tech startups with propriety technology were profitable (figure 2.14). Having propriety technology therefore seems to play a more important role in the profitability of high-potential startups than it does in the profitability of tech startups.

**FIGURE 2.14** Startups’ Profitability (Conditional on Having Proprietary Technology, Processes, or Procedures)

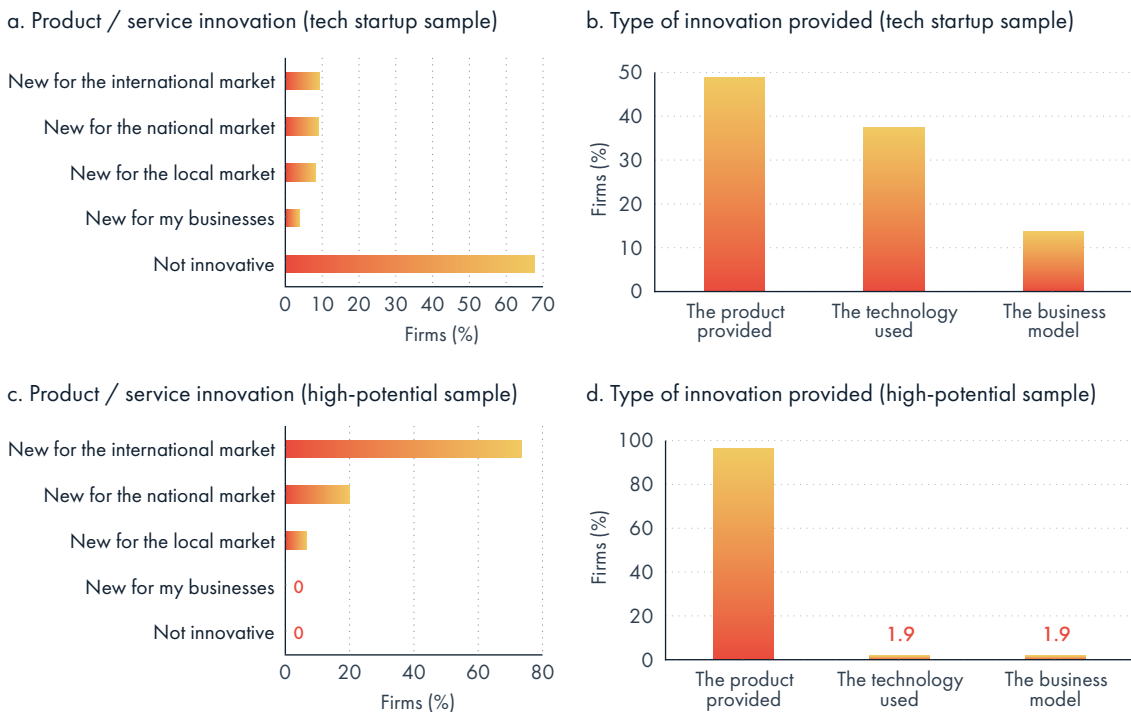


Source: World Bank Group Romanian Startup Survey 2020.

### 2.4.2 INNOVATION

**Most tech startups do not consider themselves innovative.** Among the firms in the tech startup sample, 67.5 percent did not consider themselves innovative. Some 21.4 percent reported developing an innovation ever, and 12.5 percent expected to do it in the future. Less than 20 percent were developing a new-to-market technology or processes in national or international markets. (figure 2.15, panel a). Most of the firms that are innovating are providing innovative products or technology; some are also innovating business models (figure 2.15, panel b). Twenty-six percent of these firms had applied for a patent, copyright or trademark, and 39 percent of firms are planning to do so. This could potentially be an indicator of limited knowledge creation and innovation, or limited awareness of the IP systems.

**FIGURE 2.15 Startup Innovation**



Source: World Bank Group Romanian Startup Survey 2020.

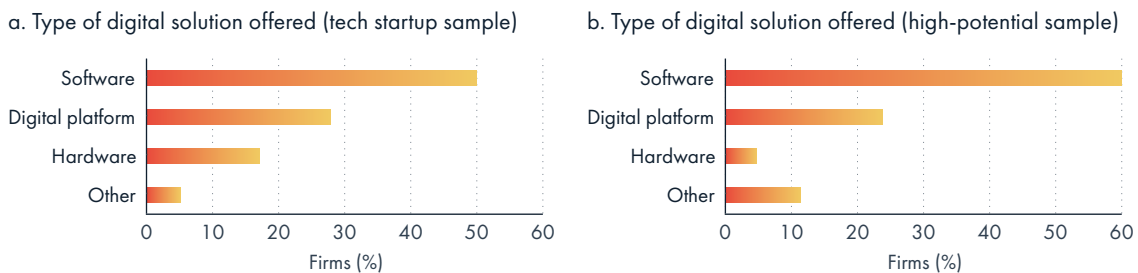
**By contrast, all high-potential startups considered themselves innovative.** All the high-potential startups considered themselves innovative. Seventy-three percent reported new-to-market technology in international markets, and 20 percent in national markets. (figure 2.15, panel c). Most of these firms are providing mainly innovative products rather than technologies or business models (figure 2.15, panel d). Moreover, around 40 percent of startups in the high-potential sample reported that they had developed proprietary technology, processes, or procedures that no other company can use, and 30 percent are planning to do so. Also, 27 percent of them reported that they had applied for a patent, copyright, or trademark, and 50 percent of them are planning to do so. Thus, startups in the high-potential sample are more inclined to generate new products or processes, and they could be relatively more aware about IP systems.

**Nevertheless, most of the startups in the tech startup and high-potential samples identified themselves as technology firms.** Seventy percent of the firms in the tech startup sample use or provide services associated with the use of new digital technologies, and the remaining 30 percent are more traditional companies that do not consider technology to be a core component of their businesses and do not embrace digital transformation.<sup>41</sup>

41. It is important to recall that the sample of startups surveyed focuses on digital and knowledge-intensive industries.

One-half of the tech startups provided customers with digital solutions, such as software development (50 percent), digital platforms (27.9 percent), or hardware development (17.0 percent) (figure 2.16, panel a). In contrast, 93 percent of firms in the high-potential sample use or provide services associated with the use of new digital technologies. Also, 94 percent of these firms provided digital solutions to customers. Like the tech startups, the high-potential startups mainly provide software solutions (60 percent), digital platforms (23.8 percent), and other services (11.4 percent) (figure 2.16, panel b).

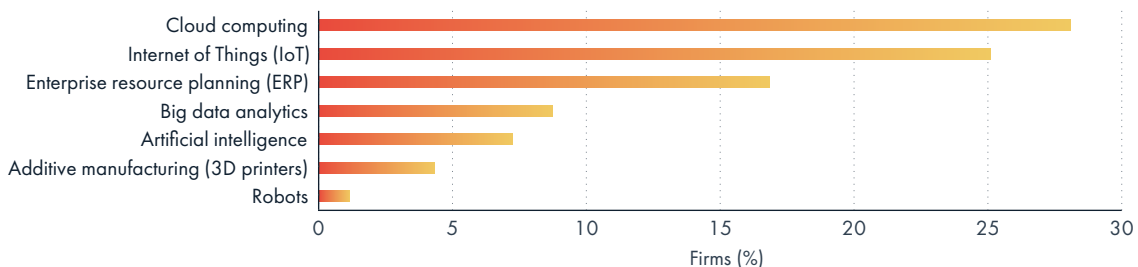
**FIGURE 2.16** Technologies Provided and Used by Startups



Source: World Bank Group Romanian Startup Survey 2020.

**In terms of technology use (that is, input-based rather than output-based technology), the majority of technology use is related to business administration, marketing and sales.** Among firms in the tech startup sample, 28.1 percent use cloud computing for business purposes, 25.1 percent use the Internet of Things, and 16.9 percent use enterprise resource planning (figure 2.17). Big data analytics and artificial intelligence were not widely used.

**FIGURE 2.17** Main Technologies Used in Tech Startups



Source: World Bank Group Romanian Startup Survey 2020.

Note: 3D = three-dimensional.

## 2.5 DIGITAL AND HIGH-TECH ECOSYSTEM PILLARS

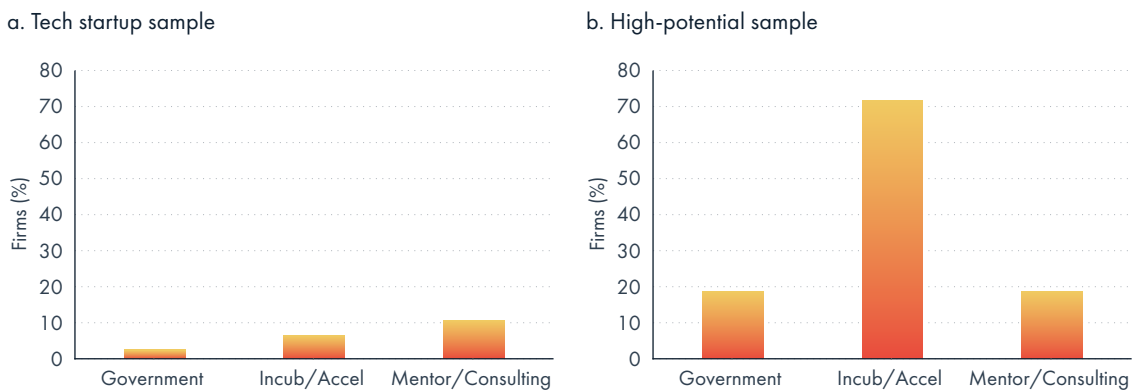
**The digital and high-tech ecosystem is the entrepreneurship ecosystem focused on the digital and high-tech sectors.** In other words, it is the entrepreneurship ecosystem in which tech startups and high-potential startups operate. To support tech startups and high-tech startups, therefore, it is necessary to understand the characteristics of the digital and high-tech ecosystem in Romania and, in particular, how well it supplies the factors that form the three pillars of an entrepreneurship ecosystem: supply, demand, and allocation. This can be accomplished using data from the World Bank Romania Startup Survey that we have been discussing.

### 2.5.1 ACCESS TO KNOWLEDGE, INFORMATION, AND IDEAS

**Startups in the high-potential sample receive more formal support from incubators or accelerators (and thus, more mentorship) than startups in the tech startup sample do.** Most respondents in the tech startup sample reported that they did not receive the support of an incubator or accelerator training program, nor that of a

government program (figure 2.18, panel a). In the high-potential sample, 72 percent of startups did receive support from an incubator or accelerator training program, which typically included dedicated mentorship programs for entrepreneurs, although fewer received support from government programs (figure 2.18, panel b). It is not possible to determine whether the other 28 percent did not get support from incubators or accelerators due to a lack of demand or a lack of supply. However, given the gaps identified in section 1.4, it must be suspected that a lack of supply of “supporting” infrastructure is the bigger issue.

**FIGURE 2.18** Formal Support to Startups

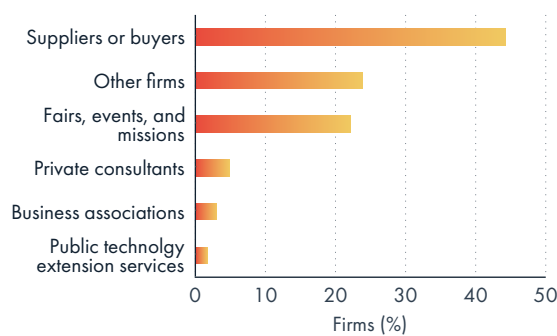


Source: World Bank Group Romanian Startup Survey 2020

**Tech startups seek informal advice.** The existence of demand for business support is further evidenced by the fact that firms report seeking information about investment decisions, such as the acquisition of new machines, equipment, or software. However, the primary sources of such advice for firms in the tech startup sample are not institutionalized and are usually spontaneous: this includes suppliers and buyers, as well as trade fairs, events, and other firms (figure 2.19). Firms in the tech startup sample use business associations, incubators, accelerators, public agencies, or universities comparatively infrequently to share their experiences. This further suggests that there is a gap on the ‘supply side’ for business advice, and that strengthening support programs, including public programs and ecosystem enablers, may benefit the Romanian ecosystem.

**In contrast, startups in the high-potential sample were much more likely to refer to business associations for advice.** Like startups in the tech startup sample, they also referred to suppliers or buyers for information to make decisions about the acquisition of new machines, equipment, or software. Other firms, private consultants and fairs/events were also used.

**FIGURE 2.19** Source of Information for Managerial Decision Making (Tech Startup Sample)

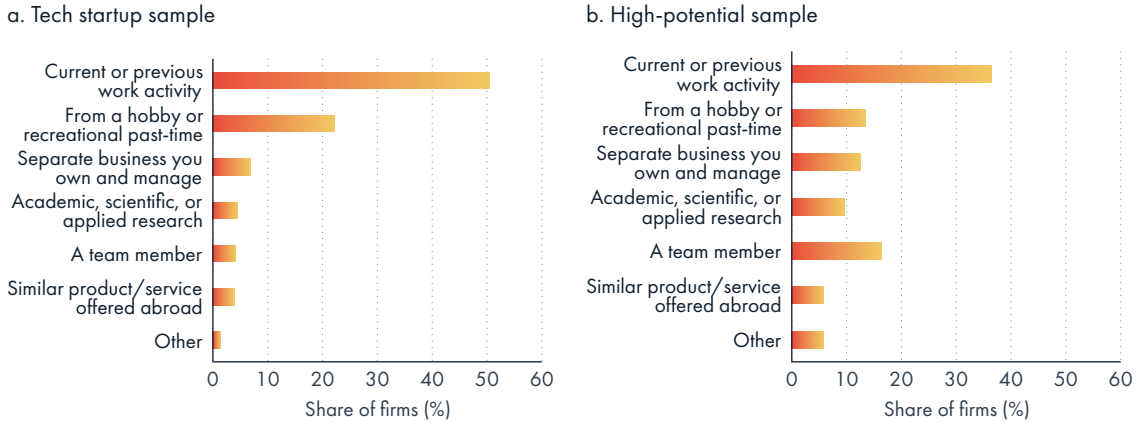


Source: World Bank Group Romanian Startup Survey 2020.

**Relatively few startups in the tech startup sample are engaged in the commercialization of academic research.** Most founders of firms in the tech startup sample report that the inspiration for starting a new business came from previous work activity, and significant number report that it was related to a hobby or a recreational past time (figure 2.20, panel a).

**In contrast, the high-potential startups were about twice as likely to originate from academic research.** Startup founders in the high-potential sample also often gained their inspiration from their previous work activity. Compared with the tech startups, they were less likely to report gaining their inspiration from a hobby and more likely to report gaining inspiration from a team member (figure 2.20, panel b).

**FIGURE 2.20** Startups Inspiration (Source of a New Business Idea)



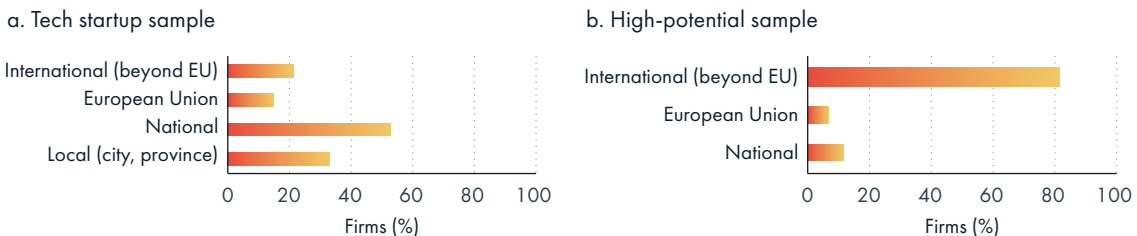
Source: World Bank Group Romanian Startup Survey 2020.

**The average time that it took a business to move from an idea to an initial design or prototype was between 1 and 12 months, regardless of whether the business was a tech startup or a high-potential startup.** From initial design or prototype to a complete design or prototype took from 1 to 6 months according to firms in both samples. Similarly, the respondents in both samples estimated that to move from the product/service being completed to being ready to sell took around 1–6 months. The respondents in both samples indicated that it took approximately 5–6 months to have stable revenue (from the first time they had revenue), and in a few cases it could take more than 12 months.

### 2.5.2 ACCESS TO MARKETS

**Most firms in the tech startup sample think of the Romanian national market first.** The bulk of firms in the tech startup sample (51.3 percent) focus on the national market, followed by local markets (32.1 percent), while the rest focus on international markets, with a preference to do business beyond the EU (20.8 percent). By contrast, most firms in the high-potential sample think of the international markets (defined as beyond the EU) first (81.7 percent), followed by national markets (11.5 percent), and the EU (6.7 percent). It is important to recall that these categories are not exclusive: firms do focus on national and international markets at the same time (figure 2.21).

**FIGURE 2.21** Target Market Scope

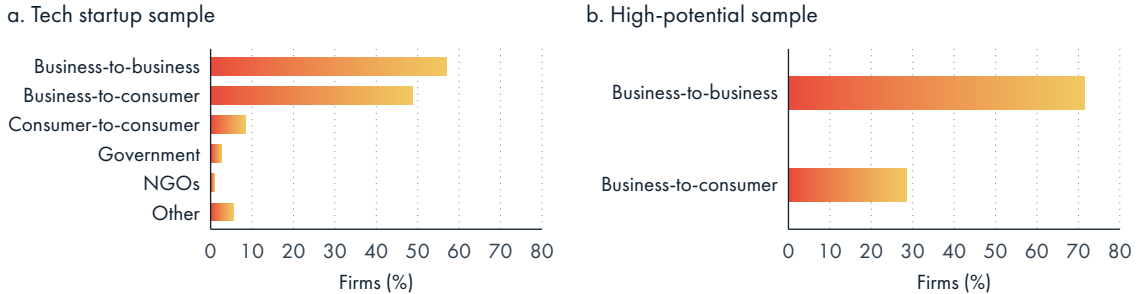


Source: World Bank Group Romanian Startup Survey 2020

Note: A firm can target more than one market.

**Few firms in the tech startup sample target the business-to-government (B2G) market.** Most tech startups focused on the business-to-business (B2B) (57 percent) and B2C (49 percent) markets (figure 2.22, panel a). A small share of firms (2 percent) target the B2G market, which indicates untapped potential, including for public procurement. By contrast, most firms in the high-potential sample (figure 2.22, panel b) are focused on the B2B (71 percent) or B2C (29 percent) markets, and none target the B2G market. Like the previous case, these categories are not exclusive. Startups that focused on B2B solutions could focus on B2C solutions too.

**FIGURE 2.22 Target Buyer**

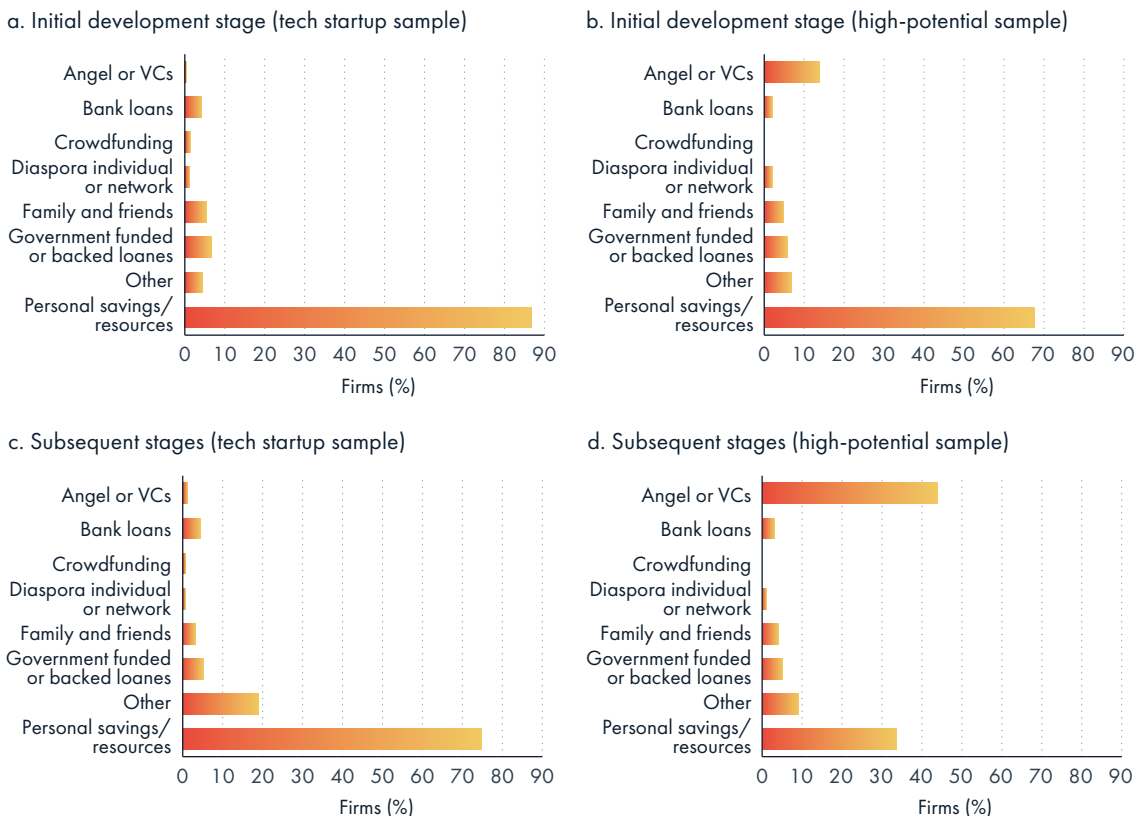


Source: World Bank Group Romanian Startup Survey 2020.  
 Note: A firm can target more than one market. NGOs = nongovernmental organizations.

### 2.5.3 ACCESS TO FINANCE: DEVELOPMENT STAGE AND FUNDING

**Personal savings or resources are the main source of funding for the initial development stages of startups in both samples, although some startups in the high-potential sample have angel investment or VC.** (See figure 2.23, panels a & b). Angel investment and VC are funding sources for startups in the high-potential sample only. This dependence on personal resources underscores what was noted in chapter 1 regarding the lack of access to finance: it is likely to be a significant impediment to the development of the ecosystem because, if personal savings are seen as a requirement, entrepreneurial activity will be restricted to individuals with sufficient personal resources.

**FIGURE 2.23 Funding by Stage**



Source: World Bank Group Romanian Startup Survey 2020. VCs = venture capitalists.

**Startups in the high-potential sample typically expected to use VC for subsequent growth.** In the tech startup sample, most of the funding after the initial stage was expected to continue to come from personal resources. In contrast, in the high-potential sample, most of the funding after the initial stage was expected to come from angel investors and VCs and, to a smaller degree, from personal resources (figure 2.23, panels c & d).

**Accessing loans is a problem for startups in both samples.** A vast majority of firms said that over the last three years they have not received a loan for purchasing machines or equipment or licensing software. Half of the firms said that they had attempted to borrow money to expand production at least 9 times over the last three years but could not get a loan. However, the other half did not ask to borrow money to expand production.

### 2.5.4 NETWORK AND CULTURE

**Entrepreneurs' social networks are important.** Respondents from both samples reported that personal and family ties were very important for accessing support (tech startup sample: 61.6 percent; high-potential sample: 44.8 percent). They also reported that local business links (tech startup sample: 41.6 percent; high-potential sample: 46.67 percent) were important. This underscores the commentary made in section 1.4 regarding the importance of social capital.

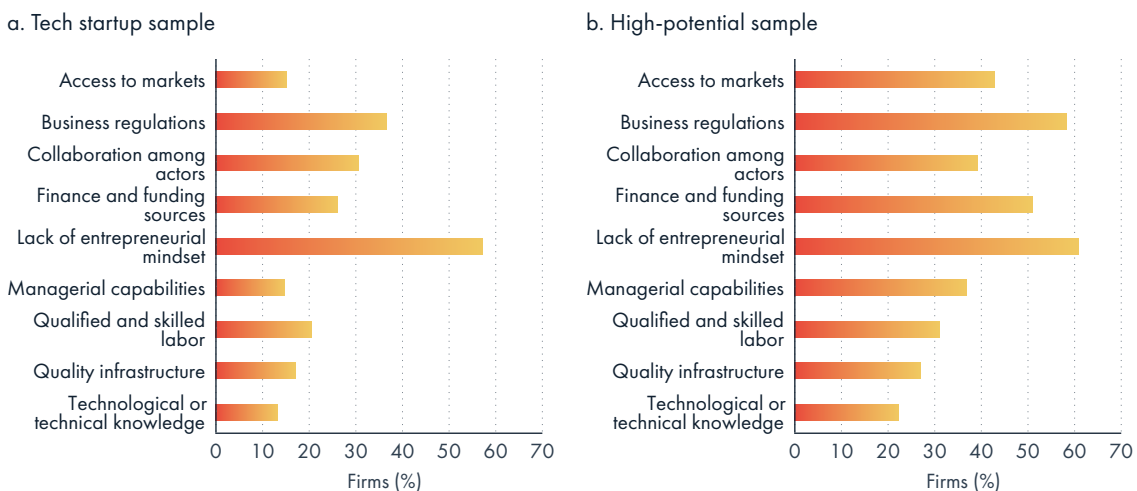
**Startups in the high-potential sample also indicated that transnational and regional networks are very important for them.** Forty percent of the firms have business (as a supplier or as buyer) with a multinational firm. Also, they pointed out that founder's alumni networks are moderately relevant for them, although they are less important if the alumni network is abroad, which contrasts with the previous responses.

**By contrast, startups in the tech startup sample see some networks as offering little value at present.** Respondents reported that links to public officials are not relevant, and that college alumni networks did not add value, especially if the alumni network was abroad. Diaspora networks, other transnational networks, and regional networks were typically seen as unimportant or adding little value. This may be because most of these startups think of the Romanian national market first.

### 2.5.5 PERCEIVED OBSTACLES FOR STARTUPS

**The two biggest obstacles for entrepreneurship reported by startups in both samples were business regulations and the lack of an entrepreneurial mindset.** (See figure 2.24.) Regulations, which were identified as an issue in every Romanian region, included labor regulations and administrative issues such as permits and taxes.

**FIGURE 2.24** Obstacles to Entrepreneurship



Source: World Bank Group Romanian Startup Survey 2020.



In addition, respondents identified that the lack of collaboration among actors could also be an obstacle, which means that entrepreneurship ecosystems have poor internal connections. Respondents reported existing technological or technical knowledge—as well as infrastructure quality and managerial capabilities—as generally favorable.

**The survey data relates to qualitative perceptions and should be interpreted cautiously.** Although it may be helpful in determining relative priorities for entrepreneurs, it should not be interpreted as suggesting that the other factors do not need to be improved, especially because it is unclear whether respondents calibrated their expectations with regards to Romania or with regards to other ecosystems. For example, it is surprising that the participants in the *tech startup* sample identified that access to finance is favorable, especially since the same respondents also reported that they typically relied on their own funding to start a business.

## 2.6 THE CONNECTEDNESS OF DIGITAL AND HIGH-TECH STARTUP ECOSYSTEMS

**Human networks (community) are a critical element of entrepreneurship ecosystems.** They support the identification of entrepreneurial opportunities, access to finance, access to information, the creation of resources and spillovers, strategic alliances, and status signaling. The social networks of an entrepreneurship ecosystem connect all other elements so entrepreneurs can access the resources needed to create startups.

**The connectedness of an ecosystem refers to the interdependencies and interactions among its constituting actors (founders, universities, accelerators, and others).** These interactions are key to explain why one ecosystem outperforms another because when highly connected entrepreneurial actors can access or transmit ideas and other forms of knowledge within networks of relationships, spillovers can occur. Also, highly connected entities enhance innovation and learning, and facilitate entrepreneurship (Scott, Hughes, and Ribeiro-Sioriano 2021).

**The connectedness of ecosystems plays a key role in determining their strength.** The conceptual importance of connectedness in ecosystems is supported by significant prior research and theoretical models. Previous works on using network measures for social capital in entrepreneurship ecosystem assessments include the Startup Genome “Global Startup Ecosystem Report 2018” (Startup Ecosystem 2018), the Endeavor Insights 2014 report on “The Power of Entrepreneur Networks” (Endeavor Insights 2014), and the 2018 World Bank Group–Global Entrepreneurship Research Network (GERN) Ecosystem Connections Mapping.<sup>42</sup>

**The connectedness analysis has three goals.** The first is to identify key players in the ecosystem, that is, those that can have the most influence if targeted by interventions. The second is to identify clusters<sup>43</sup> in the ecosystem and their structure, coverage, and trends, such as investments, knowledge sharing, and so on. The third is to identify the interdependencies between apparently isolated local ecosystems.

**Understanding and measuring connectedness among actors in the ecosystem can improve policy making.** The conceptual framework described at the beginning of this report allows us to link social capital and connectedness measures to policies and institutions through the implicit interactions between the policy layer and the ecosystem pillars. Understanding the locations and structure of ecosystem connections and clusters allows policymakers to better structure their programs. In particular, information about connectedness makes it possible to set policy targets based on clusters with high-potential ecosystems rather than traditional geographical jurisdictions, which may be a more efficient way of targeting funds.

**The high-potential sample of the World Bank Group Romanian Startup Survey included several questions to identify the relations between the entities that are part of the Romanian entrepreneurship ecosystem and their respective locations.** The startups were asked where their founders had studied, who were their investors or who had offered them financial support, which accelerators or incubators had supported them, who were the

42. <https://www.genglobal.org/research/ecosystem-connections-mapping>

43. Dense network of companies and institutions in a certain geographic sphere.

founders' mentors, and so on. Using the answers, a network of relations was built, and a network analysis was performed. (See box 2.4.)

**The network analysis shows that three universities are the top players in Romania's entrepreneurship ecosystems.** Politechnica University of Bucharest, the University of Bucharest, and Babes-Bolyai University are the most connected entities (and with most important connections) within the ecosystem, as well as the key providers of human capital (figure 2.25). Universities are usually among the top players in entrepreneurship ecosystems (compare Mulas and Gastelu-Iturri 2016; Mulas et al. 2021). However, this does not necessarily mean that these universities are actively promoting entrepreneurship. Rather, due to their size and importance, they are important producers of human and social capital.

**BOX 2.4 Network Measures**

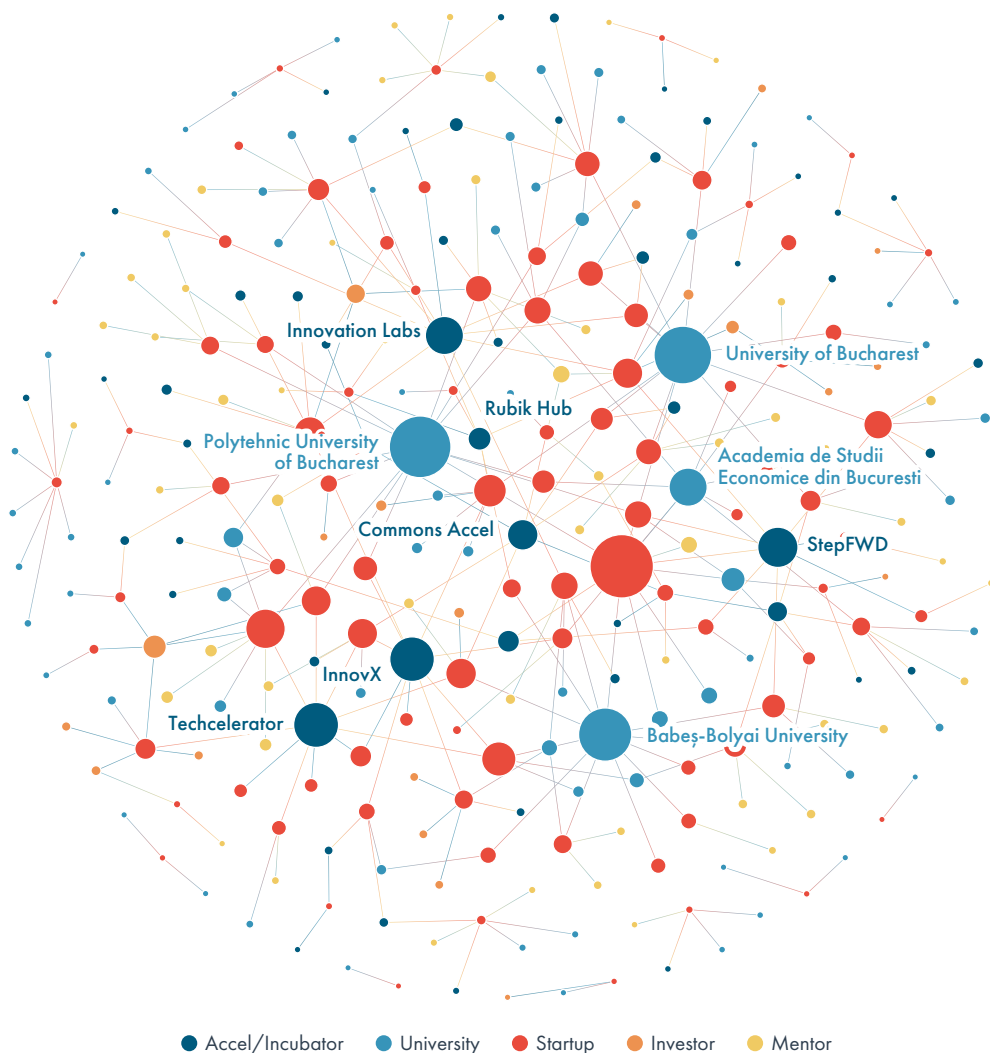
In a network analysis, the nodes of the network represent the individual entities (startups, investors, accelerators/incubators, mentors) and the edges (links) represent the relationships that exist between them. Calculating the centralities of the nodes allow us to identify the most important players in the ecosystem. In this analysis, three measures are calculated:

**Degree centrality:** measures the number of other nodes within the ecosystem to which each node is directly connected.

**Eigenvector centrality:** measures the importance of a given node based on the importance of the other nodes that are associated with it.

**Modularity:** measures the strength of the connections between the nodes and detects the communities (groups, clusters) that exist in the network.

**FIGURE 2.25** Romanian Entrepreneurial Network



Source: World Bank Group Romanian Startup Survey 2020.

Note: Figure shows the connectivity of the complete ecosystem. The circles' size is the centrality (how connected) each entity is.

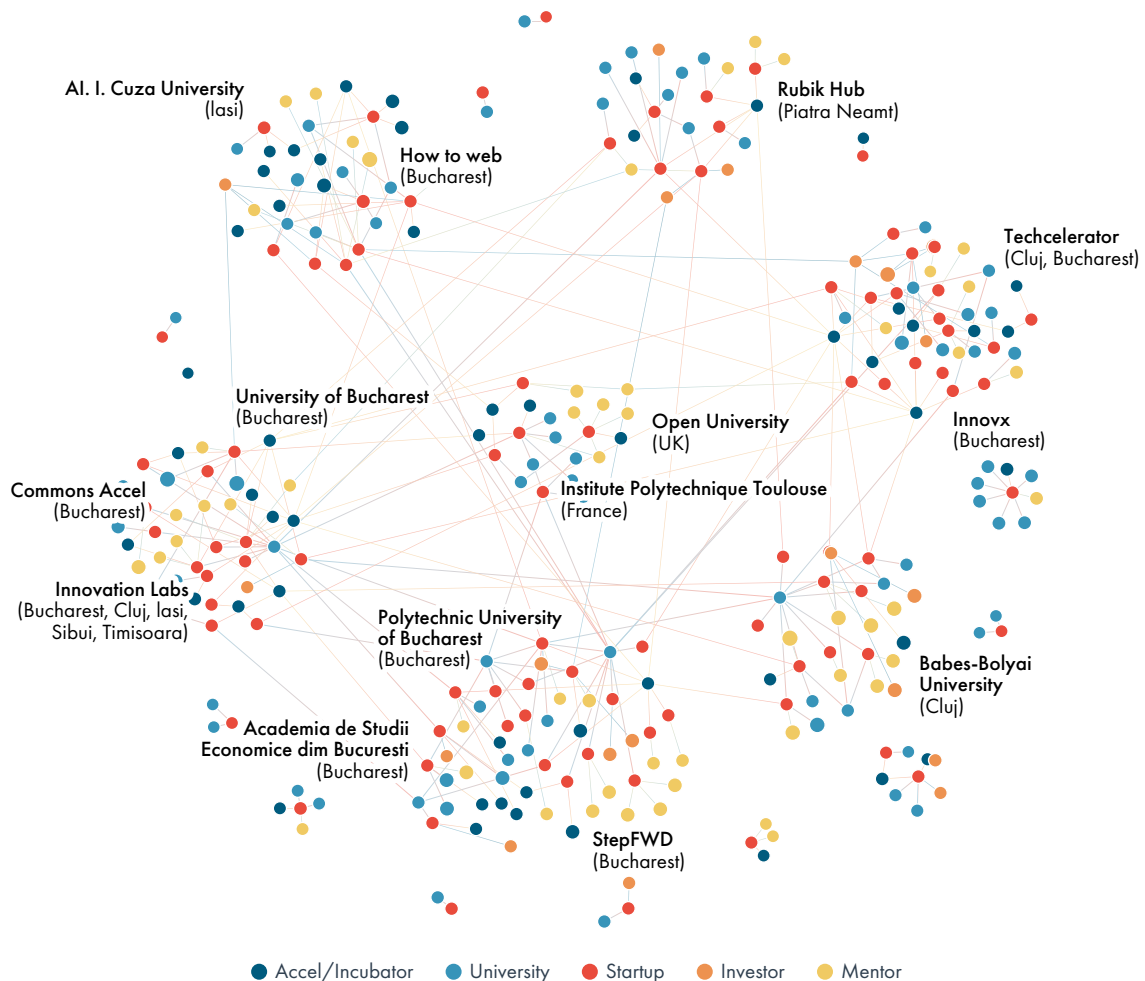
**After universities, accelerators and incubators are the second most important group of players in the ecosystem.** The most relevant accelerators and incubators in the ecosystem are InnovX (an EU accelerator), TechAccelerator (an international accelerator) and StepFWD (a pre-accelerator program). It is important to recall that these findings are not comprehensive, because they are based on the answers given by the surveyed startups.

**Universities, accelerators, and incubators are key because of their positions in the network.** These entities are key to facilitating the connections and exchanges of knowledge and know-how in Romania. They usually hold more information and can instantly connect and spread information with the wider network. Interventions in central entities could generate positive externalities for the whole national ecosystem. (Appendix E has a list that identifies each entity.)

**The analysis showed that only one central entity provides funding.** GapMinder VC was the only key player in the ecosystem that provides funding. This is unusual, although it perhaps reflects the relatively undeveloped state of VC in Romania, as well as the fact that, as reported in earlier chapters, most entrepreneurs tend to use personal savings rather than debt or equity.

**The cluster analysis shows that there are seven distinctive clusters in the Romanian startup ecosystem and fourteen isolated entities.** (See figure 2.26) Most of the main clusters are linked to specific universities or accelerators, which is expected (figure 2.27). Universities and accelerators are key providers of social capital, and previous studies (Mulas and Gastelu-Iturri 2016; Mulas et al. 2021) have shown that most successful startups are usually associated (through their

**FIGURE 2.26** Romanian Clusters

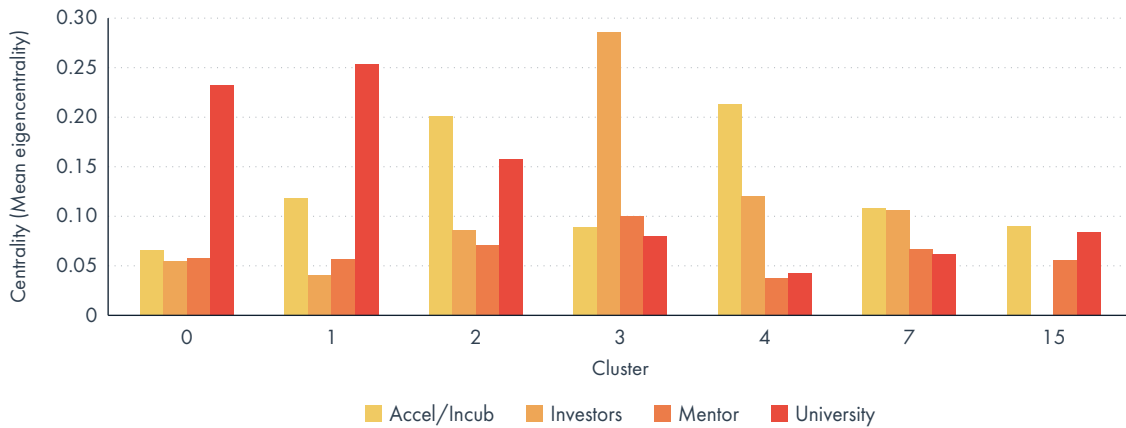


Source: World Bank Group Romanian Startup Survey 2020

Note: Figure shows the clusters (communities) that form the Romanian startup ecosystem.

alumni networks) with the country’s main generators of human capital (universities). Also, successful startups are commonly associated with international (and experienced) accelerators. Although this study does not use specific metrics for startup ‘success,’ the most important clusters are associated with entities that follow previously explained patterns.

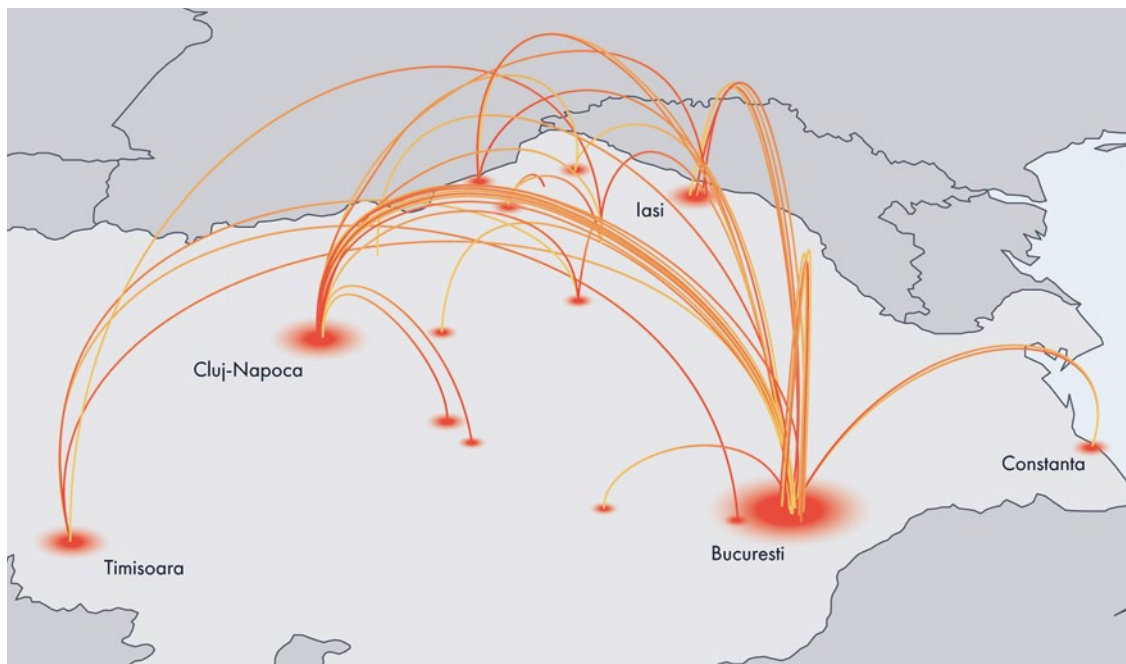
**FIGURE 2.27** Cluster Composition



Source: World Bank Group Romanian Startup Survey 2020.  
 Note: Clusters 5–7 and 8–14 are not included due to their small size.

**The data reinforces the importance of the Bucharest-Ifov ecosystem for Romania, with few entrepreneurship support structures outside of the main hubs.** Including a geographic dimension in the network (by geo-localizing all the entities) shows that the most predominant connections are between Bucharest, Cluj, Iasi, Timisoara, and Constanta (figure 2.28). These local ecosystems rely on each other, mostly in terms of human and social capital

**FIGURE 2.28** Local Ecosystems Connectedness



Source: World Bank Group Romanian Startup Survey 2020.  
 Note: The links represent the connections between the entities in the Romanian startup ecosystem. The weight of the lines represents the importance of these links (the number of connections between the cities). See <https://romania.data593.com/romania> for a high-resolution scalable version of this map.

and finance. However, most of the local startups relate to Bucharest's universities, accelerators, and funders. The data also show that firms rely little on their local ecosystems, with the exceptions of Bucharest and Cluj-Napoca. Therefore, improving the Bucharest ecosystem could generate important externalities to other local ecosystems in the country, regardless of their economic activity. Additionally, more attention to all other regions is needed to strengthen ecosystem support structures across Romania.

**Most of the international connections of Romanian startups are linked to the United States and the United Kingdom.** Usually, these connections are with foreign universities or investors. However, this connectedness is minimal in comparison to the domestic connections. (Less than 10 percent of total connections are international.) These international connections are key for the success of startups, mainly because this kind of connectedness is relevant for improving human and social capital, as well as a achieving a better understanding of larger markets and building trust with international actors.

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CHAPTER 3

# SUPPORTING ENTREPRENEURSHIP SYSTEMS

## KEY QUESTIONS

Chapter 3 assesses the support for entrepreneurship and innovation in Romania. The first part of the chapter focuses on public programs supporting entrepreneurship and innovation. It examines the offer of 50 public programs, the resources allocated to them, and the consistency of this policy mix with policy priorities. The functional analysis assesses how well these public programs are managed across 27 dimensions associated with best practices in design, implementation, and governance. The second part of the chapter focuses on mapping and describing the services and resources provided by ecosystem enablers, that is, non-government institutions supporting entrepreneurship and startups in Romania.

This chapter aims to address the following questions:

- What is the current policy mix of public programs for entrepreneurship and innovation?
- Are the public programs targeting innovative and high-growth entrepreneurship in Romania?
- Are the public programs following best practices in design, implementation, and governance?
- Who oversees public programs for entrepreneurship and innovation?
- What are the characteristics of entrepreneurship ecosystem enablers in Romania, and how are they allocating resources to support entrepreneurship?

**Programs, policies, and institutions that provide support for entrepreneurship and MSMEs can play a crucial role in enhancing an entrepreneurship ecosystem.** A key component of an entrepreneurship ecosystem is the interaction between entrepreneurs, firms, and support programs run by governments and ecosystem enablers. These programs vary in nature and may target different factors of an ecosystem, ranging from infrastructure through financing and regulations to human capital. Additionally, institutions often have different objectives and may compete for resources and beneficiaries. Poorly designed public programs can displace or inhibit private initiative and innovation. Thus, it is important to understand both the public programs and those of the ecosystem enablers that are operating in an ecosystem.

## 3.1 PUBLIC PROGRAMS

**The mapping exercise, which was conducted in collaboration with government agencies, identified 50 public programs supporting science, technology, and innovation (STI) and entrepreneurship during 2014–20.** The initial stage of the review was to compile a list of relevant programs involving public resources; this list explicitly included subnational (regional), national, and supra-national (European Commission) programs,<sup>44</sup> provided that the program was at least partially administered within Romania and the recipients themselves were in Romania. This section examines the overall portfolio of 50 programs, including their estimated budget allocations, objectives, types of intervention, beneficiaries and so on. The analysis also assesses the functionality and governance of selected Romanian STI support programs (the “functional analysis”).

**The total budget allocation for these programs was over €3.6 billion.** The total budget allocation came mostly from the European Structural and Investment Funds (ESIF) and national funds. Many of these programs span multiple years; if one normalizes these by year, then the estimated budget allocation for all 50 programs is around

44. The mapping exercise did not include the programs of the EIF because the relevant program information was not available. This is also due to the fact that some of the programs were managed by third parties, making it difficult to understand how much of the funding was dedicated towards which objectives and target beneficiaries. However, according to the EIF website, since 2008, the EIF has committed over €2 billion, composed of €1.8 billion in guarantees and funded instruments, €206 million in equity, and €123 million in microfinance and social entrepreneurship. The instruments of the EIF typically also target ecosystem enablers such as incubators and accelerators, which are usually not targeted by national public support programs.

€577 million per annum. This figure assumes that all programs are operating simultaneously, which reasonably reflects the period of 2019-2020, and have budgets spread evenly across time.

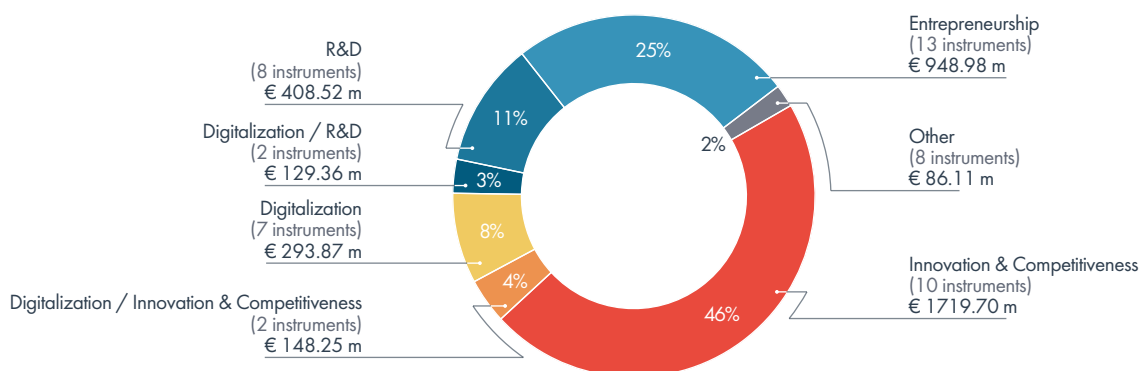
**However, absorption of funds is low.** For several reasons, including a lack of suitable institutional capacity at various levels, Romania usually spends only a portion of the allocated funds. Using data from October 2020, this absorption was only 34.7% for programs administered by the Human Capital Program (*Programul Operațional Capital Uman*, POCU), 31.8 percent for the Regional Operational Programme (*Programul Operațional Regional*, POR) and as low as 26.5 percent for the Competitiveness Operational Programme (*Programul Operațional Competitivitate*, POC). In what follows, we have typically referred to allocated budget as the best indication of public priorities. However, it should be borne in mind that the *actual* expenditure on innovation and entrepreneurship will be much lower because of the low absorption rate.

**Romania lacks a centralized institution to oversee and disburse funding for public instruments.** Public programs are often implemented by two institutions which contributes to coordination challenges and other administrative burdens. It also results in low disbursements of funds, as measured by absorption rates discussed above.

### 3.1.1 ENTREPRENEURSHIP AS A PRIMARY OBJECTIVE

**About one-quarter of the STI programs had a primary focus on entrepreneurship.** The programs identified by this research were grouped into four broad categories based on the stated ultimate objective of the program: (1) entrepreneurship, (2) innovation and competitiveness, (3) digitalization, and (4) research and development (R&D).<sup>45</sup> Of the 50 programs, 13 primarily targeted entrepreneurship, 11 primarily targeted digitalization, 12 primarily targeted innovation and competitiveness, and 10 primarily targeted R&D (figure 3.1). There was some overlap among the programs: of the 11 programs targeting digitalization, two also targeted R&D, and two also targeted innovation and competitiveness. In addition, eight programs did not fall into any of the four categories. Although only a minority of these programs were specifically focused on entrepreneurship, the remainder addressed areas that were potentially of indirect relevance to entrepreneurship—such as supporting the broader ecosystem—or were otherwise relevant to startups as well as established firms, and so are included here as part of the broader “policy mix.”

**FIGURE 3.1** Distribution of Estimated STI Public Budget Allocation in Romania by Top-level Objective, 2014–20, in € Million and %



Note: Policy mapping of 50 instruments (2014–20), of which 11 were affiliated with digitalization, 13 with entrepreneurship, 12 with innovation and competitiveness, and 10 with R&D. Mostly from European Structural and Investment Funds (ESIF) and national funds. R&D = research and development; STI = science, technology, and innovation.

45. Classifying the programs into the four categories allows differentiating them in terms of target beneficiaries and type of support provided. Although all four categories are directly or indirectly relevant for startups and scaleups, the rationale was to better understand the main objectives of the programs, which clarify the mechanisms (that is, type of support) by which startups and scaleup might have been supported. Programs categorized in (1) entrepreneurship typically target new or younger firms, whereas programs in (2) innovation and competitiveness are typically more inclusive of all firm sizes and provide support more on the product innovation side. Programs under (3) digitalization typically provide support for the acquisition of digital equipment and focus more on the process innovation side. Programs under (4) R&D typically focus on earlier stages of research, development, and innovation. That is, while the innovation and competitiveness category focuses on later stages of (product) innovation, the R&D category focuses on the earlier stages of innovation. However, there is a degree of overlap between the categories, and some programs have multiple objectives that fit in more than one of these categories.



**A little over one-quarter of the total STI budget allocation (€949 million total over the period) was allocated to entrepreneurship-related programs.** Annual budget allocation can thus be estimated at €144 million, that is, around one quarter of the estimated annual budget allocation for all 50 programs (€577 million).

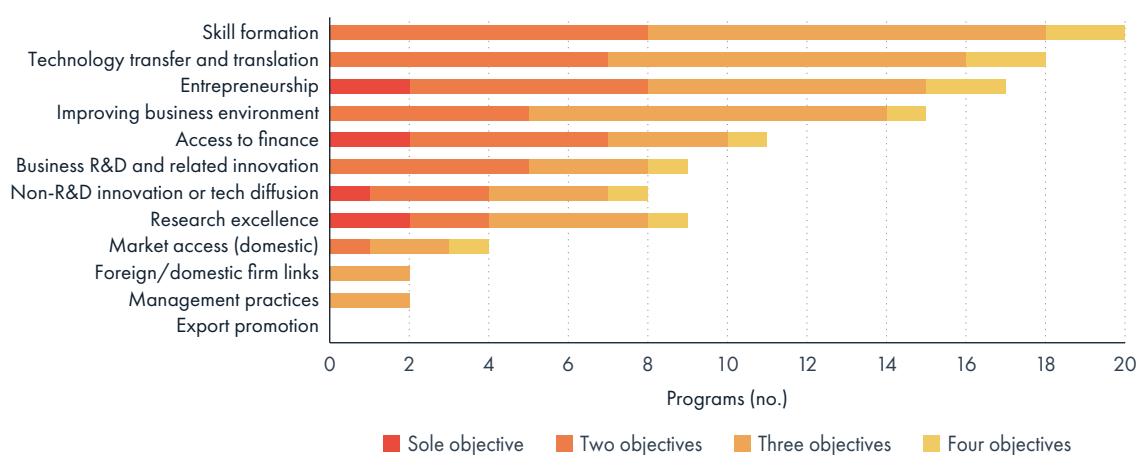
**Most of the budget is concentrated in a few large programs.** The three largest programs—one under the State Aid Program for Financing Investment Projects (*Programul Ajutoare de Stat Pentru Finanțarea Proiectelor Pentru Investiții*) and two under the Regional Operational Program (*Programul Operațional Regional*)—account for half of this annualized budget, and roughly a quarter of the programs receive three-quarters of the total estimated budget allocation. The remaining 75 percent of the programs share one quarter of the budget between them, and more than half the programs in the set involved less than €5 million average estimated allocation. This raises the question whether they have the scale necessary to achieve impact (even if they are well designed and implemented), or whether the administrative effort for such programs is disproportionately burdensome.

### 3.1.2 ENTREPRENEURSHIP AS A SPECIFIC OBJECTIVE

**If one reclassifies programs according to more specific objectives—that is to say, detailed activities that are incentivized or supported—a slightly different picture emerges.** The policy mix in the previous section is based on the stated ultimate objectives of the programs. However, some of the “entrepreneurship-related” activities are broad and include such things as improving access to finance or promoting technology diffusion. Moreover, some non-entrepreneurship instruments may benefit entrepreneurs. As an example, a “digitalization” program might be suitable for start-ups developing new digital technologies. In some cases, detailed activities can be considered intermediary routes by which a general objective is to be achieved. For example, a program might have as its goal improving competitiveness and approach it via improving management practices.

**Many of the “entrepreneurship” programs within the policy mix are dedicated to improving the supporting conditions or ecosystem.** Figure 3.2 shows the policy mix of 50 programs reclassified by specific objectives. Under this reclassification, only interventions that support individual entrepreneurs, rather than the ecosystem or other adjacent activities, are considered “entrepreneurship” instruments. Using this stricter definition, 17 programs of the set of 50 are directly targeted at entrepreneurship.

**FIGURE 3.2** Number of Public Programs by Specific Objective



Source: World Bank Group.

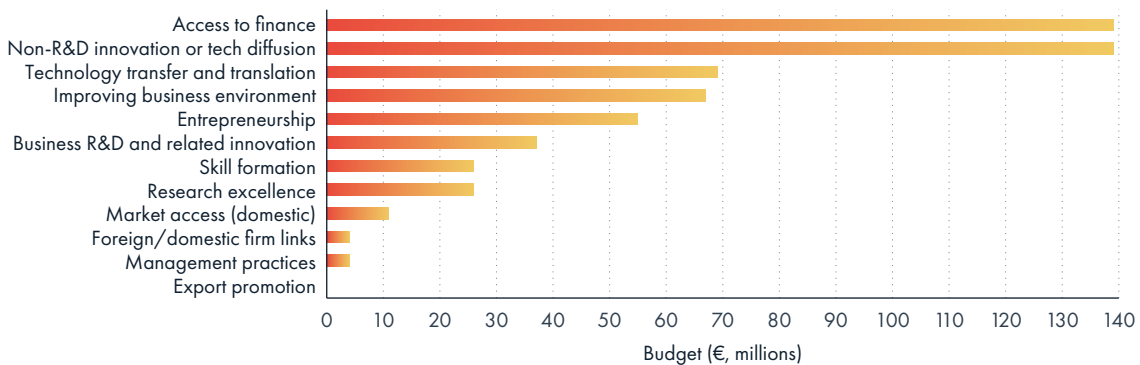
Note: R&D = research and development.

**However, most of the entrepreneurship-related programs include several specific objectives.** Only two of these programs were focused solely on entrepreneurship (with an associated budget of €7.5 million); the remaining 15 were targeted at entrepreneurship together with one or more other target areas (with the budget for dual objective instruments totaling €8.5 million; triple-objective instruments €35 million and those with four or more objectives

totaling €3.5 million).<sup>46</sup> This is a feature of the policy mix as a whole and suggests that there may be lack of clarity in the design of some programs, leading to a lack of focus. In turn, this raises questions about the potential effectiveness of the policy mix, and whether there may be opportunities to improve effectiveness through more specific, dedicated programs.

**The proportion of annual budget allocation on STI programs that is focused on direct support for entrepreneurship is closer to 10 percent.** The annual budget allocation on specific, entrepreneurship-focused programs is €55 million (figure 3.3), which is about 9.5 percent of the €577 million per estimated annual budget allocation for all 50 programs. Very few programs—with little associated budget—address management practices, linkages with foreign firms, market access, or export promotion. These are potential gaps that may inhibit the technology adoption and scaling of Romanian MSMEs, especially given the weaknesses identified in chapter 1. Within the access to finance category, there is a preference for more established firms: the total budget of instruments available to mature firms to support access to finance is approximately 40 percent greater than those available for firms at seed stage.

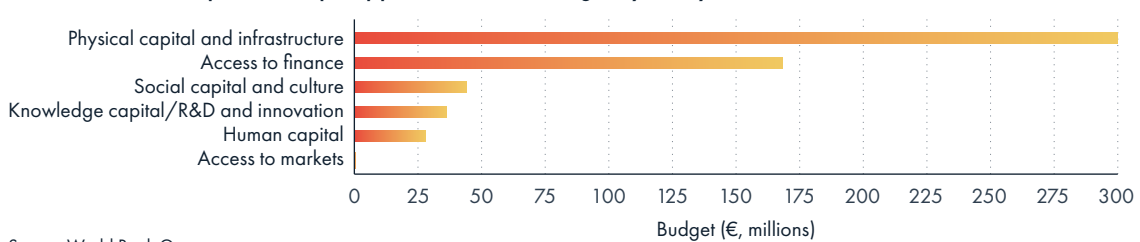
**FIGURE 3.3** Public Program Estimated Budgets by Specific Objective



Source: World Bank Group.  
 Note: R&D = research and development.

**Most funding goes to the infrastructure and access to finance factors of the entrepreneurship ecosystem.** Figure 3.4 groups the estimated budget allocation by the ecosystem factors described in the conceptual framework of this report. Not all factors receive the same support. There is significant funding devoted to physical capital and infrastructure, and several programs with moderate funding are devoted to access to finance. However, few programs and relatively little funding are devoted to efforts to improve human capital<sup>47</sup> or market access.<sup>48</sup> Although the regulatory environment is one of the ecosystem factors, it is not reflected in figure 3.4 because regulatory improvements would not typically take the form of such instruments. Within the access to finance category, there is a preference for more established firms: the total budget of the access to finance instruments available to mature firms is around 40 percent greater than the total budget of instruments that are available to firms at the seed stage.

**FIGURE 3.4** Entrepreneurship Support Estimated Budget by Ecosystem Factor



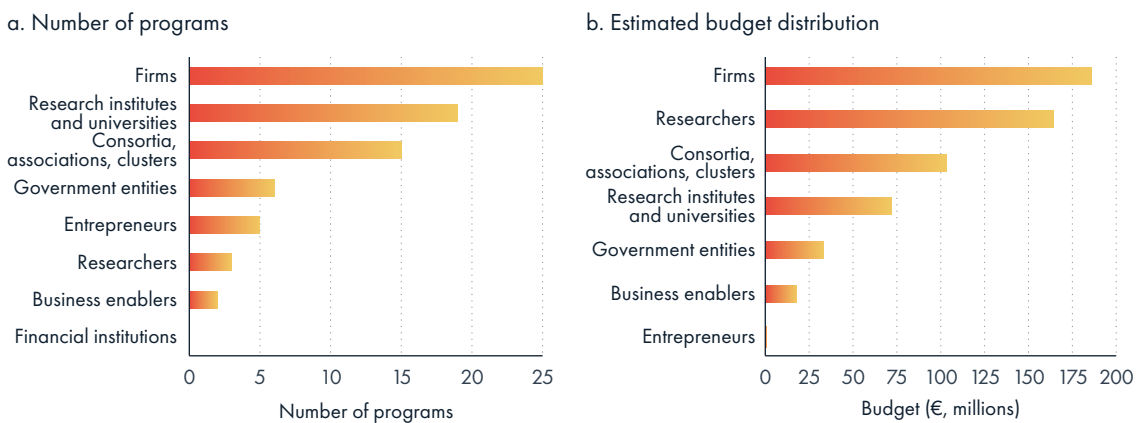
Source: World Bank Group.  
 Note: R&D = research and development.

46. Note: where an instrument specified multiple objectives, it was assumed that the budget was split equally across these objectives.  
 47. Because the public support programs typically do not treat the ecosystem factors “firm capabilities” and “entrepreneurial characteristics” separately, one can assume that the objectives related to these factors are grouped under human capital.  
 48. The categorization by specific objective allowed for instruments to target multiple objectives, with the budget of the instrument being spread accordingly. The categorization by ecosystem factor allocated each instrument to a single pillar.

### 3.1.3 SUPPORT BY BENEFICIARY TYPE

**Direct support to entrepreneurs and enabling organizations is limited.** The direct beneficiaries of the set of 50 STI programs are the types of organizations or individuals who were eligible to receive support. Direct support for entrepreneurs or prospective entrepreneurs (as opposed to young firms) is very limited in both number and budget (figure 3.5); this illustrates a lack of ‘pre-startup’ support. Support for ecosystem enablers such as accelerators, incubators, and business associations are also relatively limited, with both a relatively low number of programs and a relatively small overall budget directed towards them.

**FIGURE 3.5** STI Programs and Estimated Budgets by Type of Direct Beneficiary



Source: World Bank Group.

Note: STI = science, technology, and innovation.

**Programs were poorly targeted at startups, in terms of catering to their size, profitability, technology readiness levels, and so on.** For example, among the programs that focused on the private sector, many simultaneously targeted several firm sizes and life cycles, with little specialization (figure 3.6, panels a & b). Experience indicates that each of these business activity segments requires special skills to serve them; even firms at different startup phases have different needs (Marcon and Ribeiro 2021). Thus, the policies needed to support high-potential startups (such as small startups 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 startups and other firms, including other SMEs. As described in the introduction, startups may be considered a special subset of SMEs. Among other differences, their capacity building and financing needs differ from those of established SMEs. Tech startups and high-potential startups, in turn, are special subsets of startups, and also require specialized attention.

**Several entrepreneurship programs are available only to firms that are already profitable.** The private equity and VC industries exist largely because some high-potential startups that are ultimately very profitable undergo considerable pre-revenue periods during which they are focused on growth and user adoption. Excluding these high-potential startups from eligibility is therefore likely to forego some of the benefits of having successful high-potential startups in an ecosystem.

**Programs are generally risk averse.** In addition to a focus on profitable firms, many programs specifically target mature firms (figure 3.6, panels c & d) and market-ready technologies. This indicates a general risk-aversion, with instruments directed towards ‘safer’ options. Although public bodies must be cautious with public funds, it should be understood that a supportive innovation ecosystem needs to assist technology development across the spectrum of technology readiness, from the laboratory to the market, and that innovation and entrepreneurship always entail risks. Therefore, the portfolio of support instruments should not seek to *minimize* risk, but rather should aim to *manage* it, with an appropriate understanding of the nature of start-ups and new technology.

**FIGURE 3.6** STI Program and Allocated Budget Distribution by Target Firm Characteristics



Source: World Bank Group.

Note: Programs can address multiple segments. STI = science, technology, and innovation. R&D = research and development; S&T = science and technology.

a. Micro: 0–9 employees; small: 10–49 employees; medium: 50–249 employees; large: 250 or more employees.

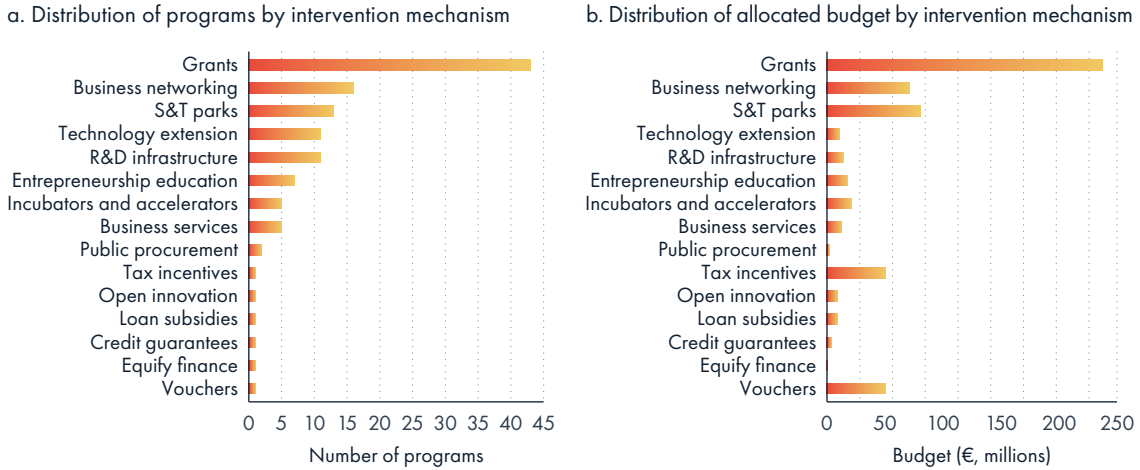
b. Firm stages were defined as follows: “Seed” refers to an innovation or business venture in its initial stage, not yet registered officially as a business; “Startup” refers to enterprises typically under 5 years old where an idea already has gone through prototyping or is in the pre-commercial/commercial stages; “Scale-up” refers to the stage where an idea is already commercialized and is being scaled up for growth and expansion, often requiring financing by debt or equity; “Mature” refers to firms that have reached post-expansion/post-growth stages and are in their consolidation phase.

### 3.1.4 INTERVENTION MECHANISMS

**In the STI policy mix as a whole—not just the subset of entrepreneurship-related programs—grants are the dominant intervention mechanism, both by number and by value.** In fact, nearly all programs examined by this exercise (43 of 50) used grants or matching grants as the preferred mechanism of intervention (figure 3.7, panel a). Grants received nearly three times as much budget as any other intervention mechanism (figure 3.7, panel b).

**Grants are comparatively straightforward to administer but are not sufficient in themselves.** Some factors affecting entrepreneurial activity—such as mindset, culture, or regulatory burden—may not be easily changed or resolved by the addition of public funds, so grant-making should not be considered a substitute for wider reform. In addition, public funding can sometimes have a distortionary effect on private markets. However, given the overall stage of development of the entrepreneurship ecosystem in Romania, any distortionary effect of the current grants is likely to be minimal. Further, there are sound economic reasons why it may be appropriate to use grants to incentivize activities that have positive externalities (such as R&D). This section should not therefore be interpreted as suggesting that current grant funding is sufficient.

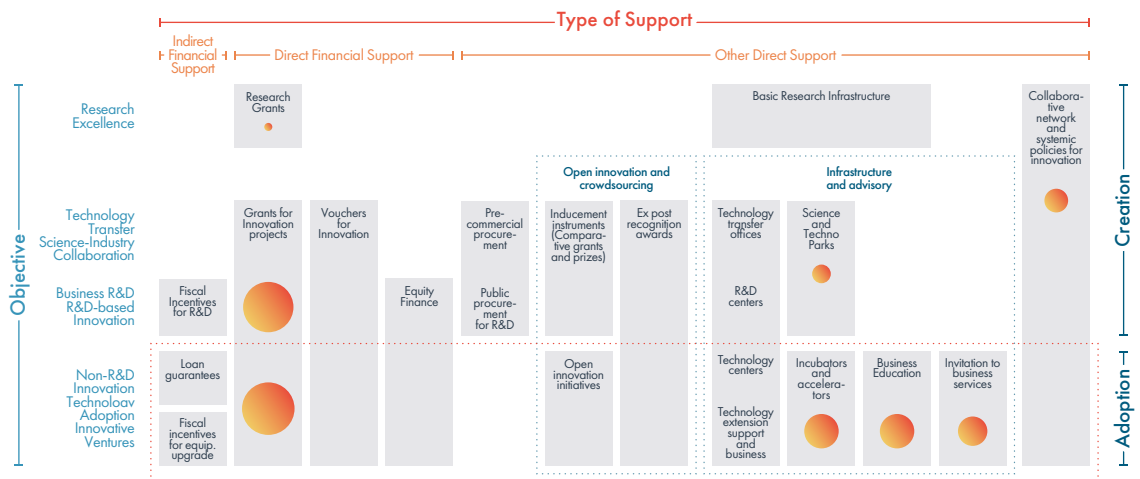
**FIGURE 3.7** Programs by Type



Source: World Bank Group.  
 Note: Total does not sum to 50 because some programs use multiple intervention mechanisms.

**A significant share of resources is being applied towards technology adoption.** Figure 3.8 maps the publicly funded entrepreneurial support landscape by distributing the resources allocated across two dimensions: (1) the type of support (indirect financial support, direct financial support, and direct non-financial support) and (2) the objective (innovation versus technology adoption). As can be seen from the chart, there are slightly greater resources devoted to instruments which support technology adoption than creation. Moreover, echoing the image above, the chart below also shows that the bulk of resources are provided in the form of direct financial support.

**FIGURE 3.8** Programs by Broad Type and Objective



Source: World Bank Group.  
 Note: The size of each bubble is proportionate to total funding. R&D = research and development.

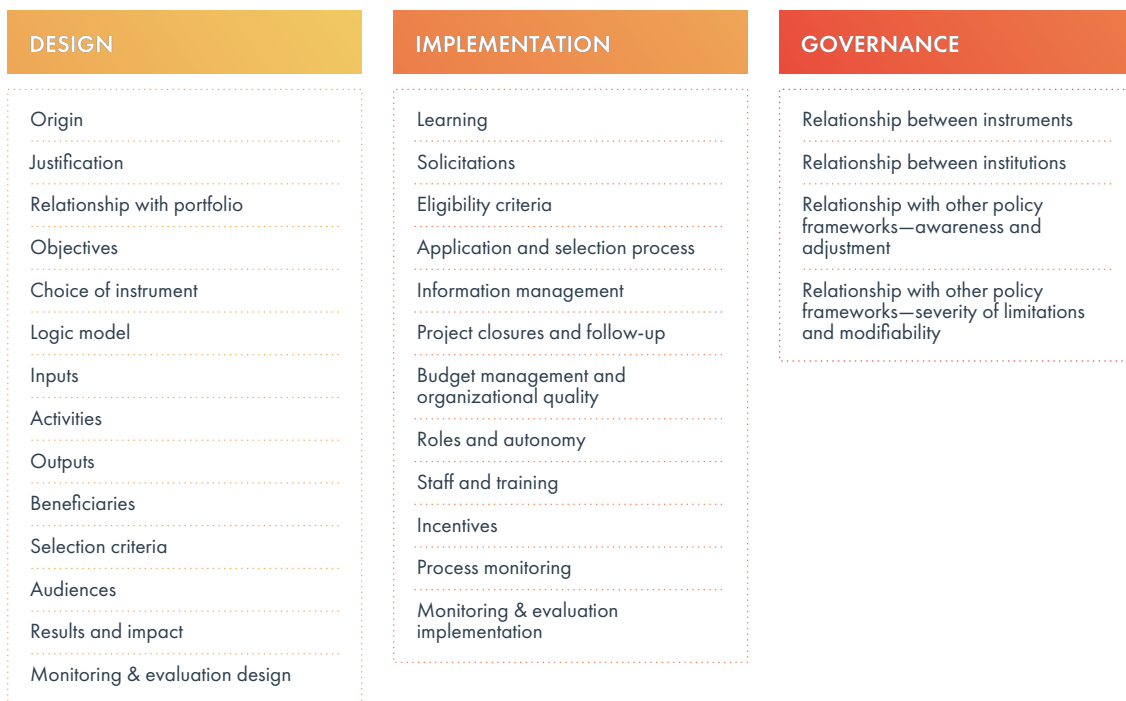
### 3.1.5 FUNCTIONAL ANALYSIS

**This section examines the functionality of public programs—the quality of the processes involved in creating and implementing each program.** Aspects of functionality include design, implementation, monitoring and evaluation systems, human resources, and governance (the program’s integration and interactions with other programs, institutions, and regulations). This functional analysis complements the analysis of the policy mix discussed

in the sections above and enables providing evidence-based recommendations for improving the design, implementation, and governance of programs. It is explicitly *not* an impact evaluation, nor a performance evaluation of the program managers' competences.

**The functional analysis was undertaken by means of structured interviews using an assessment framework benchmarked to international best practices.** The analysis aims to reveal whether key elements of effective innovation policies are in place in three key areas: design, implementation, and governance. The assessment framework, developed by the World Bank, scored support programs on a total of 31 variables (14 related to program design, 12 related to implementation, and 4 related to program governance) as shown in figure 3.9. Multiple reviewers were used to reduce bias. This research component did not cover the entire set of 50 STI programs but a smaller subset of 9 programs that were more closely focused on entrepreneurship.

**FIGURE 3.9** Functional Analysis Assessment Framework



Source: World Bank Group.

**Program design refers to the rationale for and design of each program, including such aspects as its contribution to higher-level objectives, its justification, the logic behind it, and its suitability for monitoring and evaluation.** Public interventions must be designed through a process covered by the rule of law and consistent with general national or regional goals for research and innovation. They must be properly justified and address real problems, avoiding the trap of addressing false failures. This justification can also help avoid capture of public resources by certain vested beneficiaries. Once a system failure is identified, policy makers should consider the full range of alternative intervention designs rather than simply copying existing programs. By design, interventions should follow a logic model with a clear, well-articulated theory of change, which helps depict the shared relationships and causal linkages between program inputs, activities, outputs, and outcomes and logically connects them to higher-level strategic objectives. Logic models should define indicators for inputs, activities, outputs, and outcomes that allow for monitoring and evaluation of program performance.

**Program implementation refers to the processes for administering a program, including the application, selection, and reporting processes.** These should be clear and transparent, and knowledge management systems should be in place to allow for systematic learning and improvement of the program during implementation. Implementing agencies must have adequate workforce and organizational structures to administer the program,

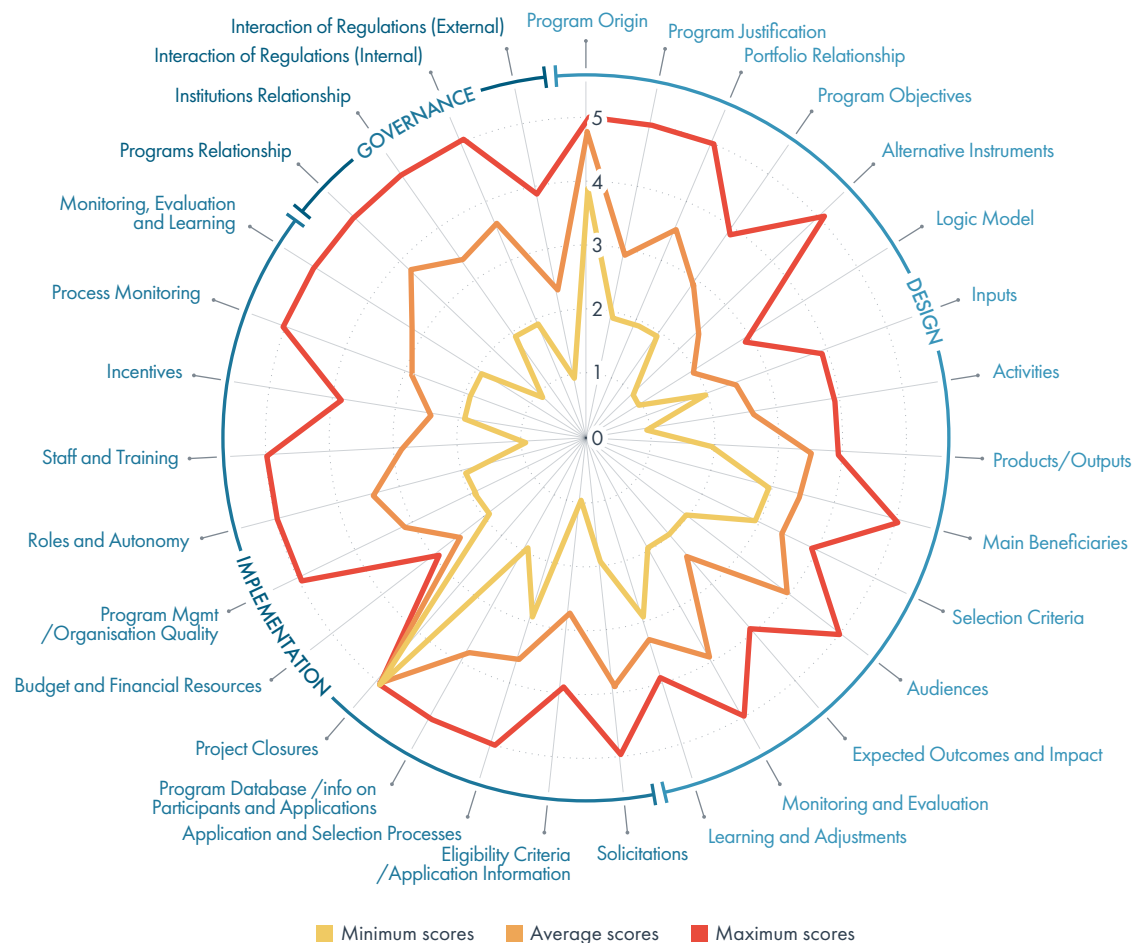
and staff should have training opportunities and incentives that are relevant to program performance (rather than generic to public administration staff). Internal and external monitoring and evaluation of the program should take place, and, critically, evaluation results should be used to improve and adapt the program.

**Program governance refers to the interacting effects of programs, institutions, and jurisdictions on the ability of a program to deliver on its goals.** Good practice is for coordination mechanisms to minimize overlap and enhance complementarities between the program and other programs and agencies. Implementing staff should also be aware of external laws and regulations that can inhibit the implementation of the program and should be proactive in taking steps to adapt for optimal operation of the program.

### Results of the Functional Analysis

The results of the functional analysis suggest a large variation across dimensions practices associated with design, implementation, and governance (inter-institutional integration) of the programs. Figure 3.10 shows the scores across the set of 9 programs, with average scores shown in yellow, and the minimum and maximum scores for each variable within the set shown in orange and green respectively. A mid-range score of 3 should not necessarily be interpreted as ‘average’ globally but rather as a functional aspect that is satisfactory but has room for improvement. The following subsections analyze the results in the three key areas of the assessment framework: program design, implementation, and governance.

**FIGURE 3.10** Functional Analysis Results—Scores by Category across the Set



Source: World Bank Group.

## Program Design

**Program design was the weakest of the three key areas of the assessment framework.** Among the design categories, the use of logic models, accounting for inputs and activities, and the proper identification and measurement of outcomes were particularly lacking.

**The analysis found consistent weaknesses in the logic model of entrepreneurship programs, as well as the models' inputs and the programs' budgets, objectives, outcomes and incentives.** A well-defined logic model helps define indicators that allow for monitoring and evaluation of program performance, as well as assisting better targeting of programs, and potentially also the choice of intervention mechanisms (as mentioned in the section above). The absence of logical framework leads to a lack of connection between outputs and outcomes.

**Relatedly, several entrepreneurship programs lacked measurable objectives at the system level.** Many programs specified objectives in terms of project or beneficiary achievements rather than the overall effects of the program on the innovation system or economy such as jobs, productivity or economic growth. In addition, several programs had seemingly been designed without considering alternative models of intervention for the stated objectives, which would in part explain the dominant

**In contrast, the program origins were one of the highest-scoring features of the analysis.** This is explained by the fact that many of the examined entrepreneurship programs were partly funded by the European Commission, whose operating programs are highly formalized, requiring documentation and good rationales for inclusion of programs in their funding schemes. This avoids pitfalls related to arbitrary reasoning, imitation, or undue influence in the creation of new programs. However, it is possible that this formalized origin also affected deeper consideration of some other design features: more than once, interviewees commented that a program had been designed in a certain way because of the expectations of the co-funder (the European Commission), rather than because it was the most effective or efficient way to deliver the desired change.

## Program Implementation

**The analysis found that program implementation and governance was, overall, slightly better than design, although there was scope for major improvement in most categories.** Among the implementation categories, the areas of greatest concern are (1) application and selection processes, (2) management structures, (3) budgets, (4) the incentives associated with staff performance, and (5) evaluation mechanisms.

**Application and selection processes are suboptimal.** Many programs had a division of labor in processing applications, with different roles given to different entities. Different groups might be responsible for financial and technical assessments, for example. In addition, there was some repetition in verification processes. These features are likely to limit timely responses. Furthermore, the analysis also suggested that administrative burdens for many beneficiaries are high. There has been a significant effort by managing bodies to simplify the application processes for support schemes and reduce the bureaucracy for applicants. However, there were still indications that these processes remain overly complex for applicants and could be further simplified. For example, it was reported that startups and MSMEs often needed to hire consultants and advisors to apply for government support schemes; this is an indicator that the application processes are overly complex. This likely deters entrepreneurs and shifts support away from the most resource-scarce firms with high potential. We emphasize that, for most start-ups, every activity has a substantial opportunity cost, and hence the ease of application and timeliness of decisions are essential to building trust in the public support system.

**The management structure of programs imposes a burden.** Many entrepreneurship programs were structured in a way that involved both a managing authority (MA) and an intermediary body (IB) working in co-ordination. This co-ordination was well-practiced, with the division of responsibilities being generally well-defined. However, interviews revealed some tensions between these bodies, and, from a management theory perspective, unless carefully managed, it is highly likely that this structure introduces additional friction and costs.



**Some budgets were mis-sized.** There were several examples of entrepreneurship support schemes that were substantially oversubscribed, suggesting that there may not have been a good understanding of the potential demand in the design of the solicitations.

**The performance assessments of staff—and hence their incentives—were not related to the content of the programs.** This practice follows, as in other areas, the processes established for public service. Public management processes were not monitored for continuous improvement, which is also reflected in its lower average score. In addition, some process monitoring scores were low not because of an absence of monitoring, but because of the administrative burden that existing monitoring and reporting imposed on staff. It was clear from interviews that this constituted a heavy burden in many cases, with perceived duplication of reporting processes in some instances.

**The analysis found significant variation in the evaluation mechanisms.** Evaluation mechanisms were relatively strong at the ‘priority axis’ level (that is, in terms of having mechanisms to track and monitor the top-level outcomes of the wider portfolio of STI programs as a whole). Evaluation mechanisms were also relatively strong at the level of individual projects (for example, tracking the outputs of grants to specific start-ups). However, they were relatively weaker at the program level (that is, the level needed to determine whether a specific program is effectively achieving its goal). Improved evaluation at the program level would also support rationalization of the portfolio by providing information about which programs are more effective and potentially should be scaled-up and which need to be modified or even abandoned. This may relate to the lack of measurable objectives at the system level mentioned above. Again, understanding which programs are effective would also benefit from (and support the development of) a deeper theory of change, which would in turn support the development of more effective programming in the future.

## Program Governance

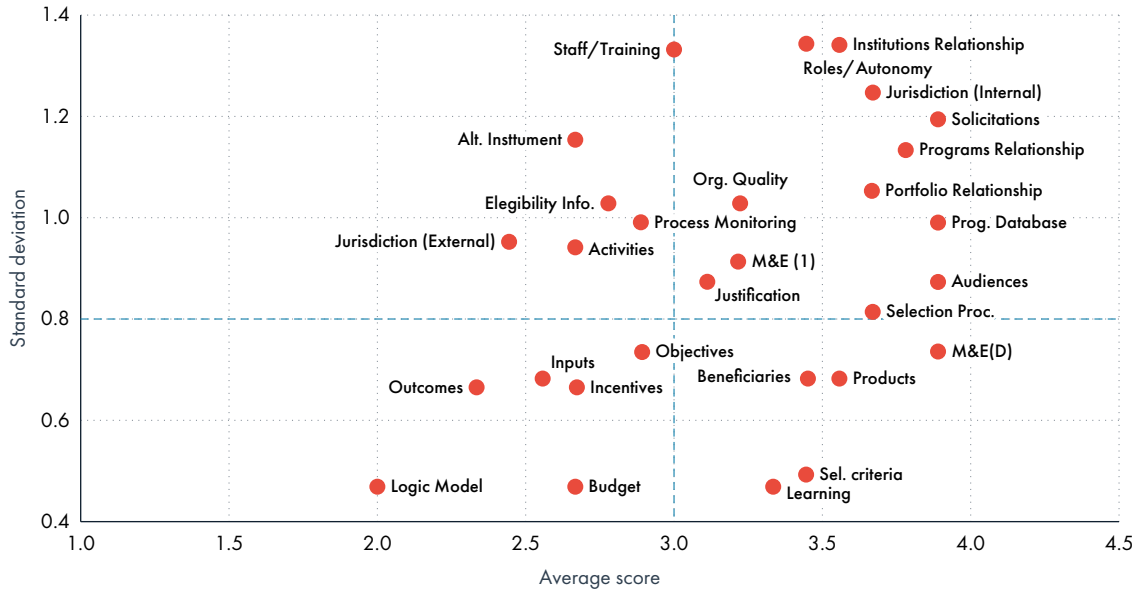
**The analysis found relatively good internal and external coordination mechanisms (coordination with programs within the agency and with other agencies).** This is partly because programs within the European Commission’s ‘priority axes’ have some coordination mechanisms built in. However, in some cases those mechanisms could be utilized further to provide more strategic perspectives on the related programs.

**The functional analysis also found several instances of entrepreneurship programs being constrained by European State Aid rules.** This was primarily due to the State Aid rules not being well-adjusted to the innovation support by government interventions. However, these rules are not easy to change, and managers were typically aware of these rules and their constraints.

### 3.1.6 SUMMARY

**Overall, Romania has a good base of public programs to build upon in many categories but needs to improve the consistency of strong system-wide practices.** Examining the variance of scores can reveal categories that are consistently strong or weak, as opposed to categories where there are some isolated examples of good practice or uneven implementation. The bottom-left quadrant of figure 3.11 illustrates categories that are *consistently weak*. The top left quadrant shows categories with *variable weakness*; these are categories where there are learning opportunities for many programs and some pockets of good practice upon which to build. The top right quadrant illustrates *variably strong* categories; here, good practice is not uniformly established, but there is a good base upon which to build. There are learning opportunities for selected programs. Finally, the bottom right quadrant shows categories which were *consistently strong*; these are areas where there are already good system-wide practices in place, providing learning opportunities for other programs.

**FIGURE 3.11** Program Category Scores versus Variance



Source: World Bank Group.

## 3.2 ECOSYSTEM ENABLERS

**This section focuses on ecosystem enablers, defined as nongovernmental organizations supporting entrepreneurship.** In most ecosystems, enablers—including but not limited to community builders, event organizers, incubators, accelerators, mentors, business angels, and seed and VCs—play a significant role, especially to support startups. These programs vary in nature and may support different elements of an entrepreneurship ecosystem, ranging from infrastructure through financing and regulations to human capital, to broader ‘ecosystem coordination.’ There is evidence, for example, that accelerators have positive spillover effects on the wider business ecosystem, as well as direct impact on the accelerated startups (Bone et al. 2019). In addition, these programs are usually carried out by wide-ranging institutions that often have different governance models and objectives and frequently compete for resources and beneficiaries.

**The analysis is based on a preliminary mapping and survey of entrepreneurship ecosystem enablers in Romania led by the World Bank.** The analysis provides a broad overview of the number and type of enablers in Romania.<sup>49</sup> However, because many of the enablers were of fundamentally distinct types, it was only possible to gain a coarse-grained view of them using a single survey instrument. Further research is therefore warranted.

### 3.2.1 MAPPING OF ENABLERS IN ROMANIA

**This section examines the characteristics of ecosystem enablers supporting entrepreneurship in Romania.** The mapping identified a total of 33 enablers supporting entrepreneurship, 27 of which participated in the World Bank Entrepreneurship Ecosystem Enablers survey, which is used as the main reference for this analysis.<sup>50</sup> The services offered by these enablers are meant to complement those offered by public programs. However, given the diversity of the programs offered—in terms of their scope, objectives, geographical coverage, and types of

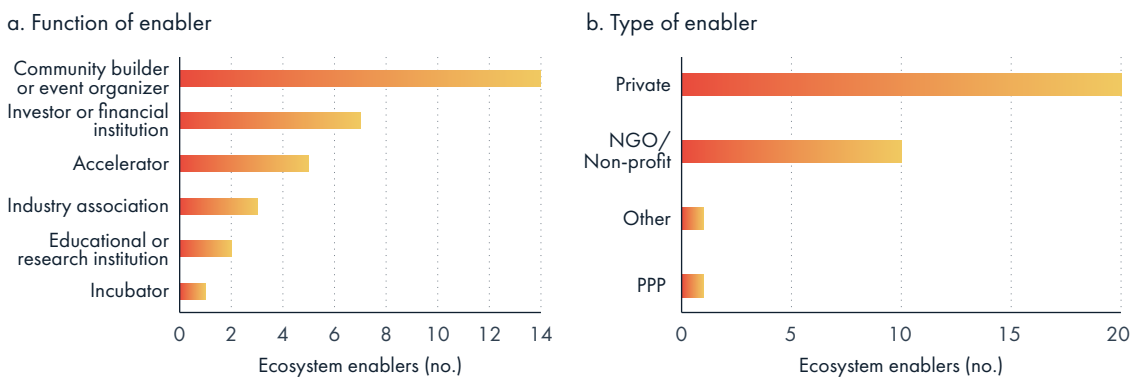
49. The ecosystem enablers that responded to the survey are among the most actively involved with startup events, conferences and hackathons and are managing programs or competitions for startups. They are constantly present at ecosystem events. Many offers additional support by partnering with other organizations.

50. Appendix B provides more details about the methodology used to implement the survey.

beneficiaries—the enablers and the services they provide overlap with public programs or each other, resulting in coordination challenges.

**The most typical ecosystem enablers in the sample are private for-profit community builders or event organizers.** The most common functions of enablers were as community builders or event organizers (14 organizations), investors or financial institutions (7 organizations), and accelerators (5) (figure 3.12, panel a). Most were private for-profit (20 organizations) and nongovernmental organization non-profit (10 organizations). The Romanian state role (public-private partnerships) was very limited (figure 3.12, panel b). International organizations were not identified.

**FIGURE 3.12** General Characteristics of Ecosystem Enablers



Source: World Bank Entrepreneurship Ecosystem Enablers Survey 2021.

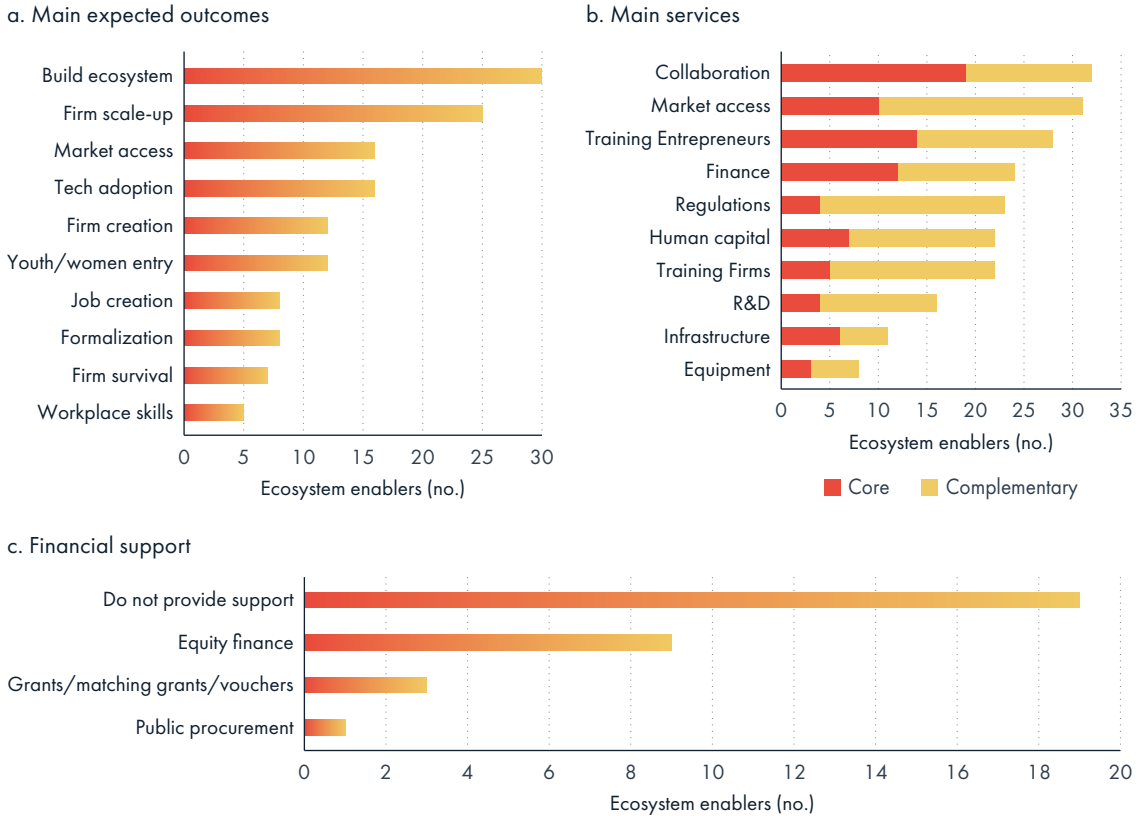
Note: Total does not sum to 32 because some enablers have multiple functions. NGO = nongovernmental organization; PPP = public-private partnership.

### 3.2.2 SERVICES AND FINANCIAL INSTRUMENTS PROVIDED BY ECOSYSTEM ENABLERS

**The main objectives reported by these organizations are building the ecosystem and firm scale up, followed by helping firms access markets and adopt technology.** Supporting formalization, survival, and development of workplace skills are among the least reported objectives (figure 3.13, panel a). Interestingly, job creation was not widely seen as an expected outcome by many enablers, nor was firm survival. This suggests that, for many ecosystem enablers, job creation is an outcome that follows firm scaling rather than being the end-goal of the enablers. Moreover, in high-tech sectors, it is possible for some startups to create significant value without increasing their staff headcount.

**The top three services provided by ecosystem enablers included strengthening and building collaboration networks, management and business training, and access to finance.** This underscores the importance of network density within the startup ecosystems, and reflects comments reported in primary research interviews about the need for better ecosystem-wide connections. The next most frequent core service was management and business training; this category may also include mentoring support, which is a common feature of many accelerators. However, if one considers both core and complementary offers, then market access was delivered more frequently. Access to finance was the third most common core service. About 19 enablers provided services related to strengthening and building collaboration networks, 14 enablers provided managerial and business training for new entrepreneurs starting a new business (for example, change of mindset), and 12 provided finance (figure 3.13, panel b). This is consistent with the fact that the function of most of the organizations in the sample is holding events to build communities, followed by investing and accelerating new ventures. As complementary services, they provide business training for existing firms, support to comply with current regulations and, to a lesser extent, support for technology adoption. Most do not provide financial support (19 enablers), and equity finance and grants play a small role (figure 3.13, panel c). Most enablers did not expect beneficiaries to pay for the non-financial services that they provide.

**FIGURE 3.13** Main Expected Outcomes, Services, and Types of Support



Source: World Bank Entrepreneurship Ecosystem Enablers Survey 2021.  
 Note: Total does not sum to 32 because some enablers have multiple outcomes and services. R&D = research and development.

**Services demonstrate a partially complementary fit with public programs.** Access to finance is a common feature of both public programs and ecosystem enablers, underscoring the importance of finance to young startups. However, there are some areas where the services provided are noticeably different. For example, if one examines ‘non-core’ services as well as core services, assistance with market access and managerial expertise was commonly provided by the ecosystem enablers in the survey; however, these objectives received very limited attention from the public programs examined in section 2.1 above.

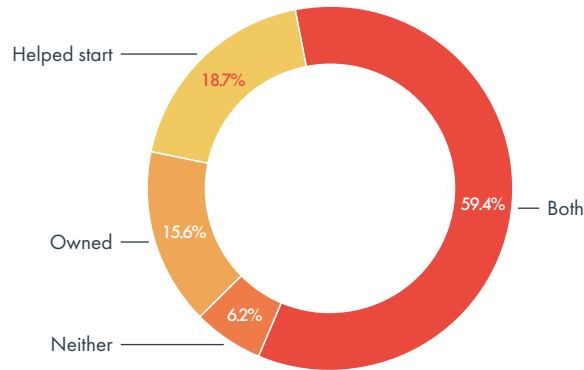
### 3.2.3 MANAGEMENT CHARACTERISTICS OF ECOSYSTEM ENABLERS

**Management characteristics of ecosystem enablers matter because of the critical role they play in entrepreneurship support to innovative firms and startups.** High-level assessments on the quality of entrepreneurship programming (including staff capabilities) are included in identifying strengths and weaknesses in entrepreneurship ecosystems. Influence of ecosystem enablers can also extend beyond just unlocking networks and access to finance for young firms. Enablers can also influence program outreach, particularly to women entrepreneurs and other underserved segments. Similar to understanding individual entrepreneurial characteristics, see Chapter 3, this analysis also looks at characteristics of enablers because of their fundamental role for guiding young firms and seeks to understand trends that can translate into tangible considerations for policymakers.

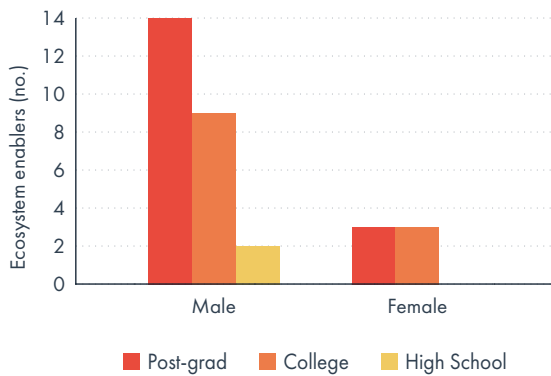
**Most of the top managers of ecosystem enablers are the founders, and they have helped to start or owned other businesses, with few exceptions.** (See figure 3.14, panel a.) These managers tend to have a college education or higher level of education, 14 of them holding a postgraduate degree (figure 3.14, panel b). About a third of top managers have spent at least a month abroad pursuing academic objectives (figure 3.14, panel c).

**FIGURE 3.14** Management Characteristics of Ecosystem Enablers

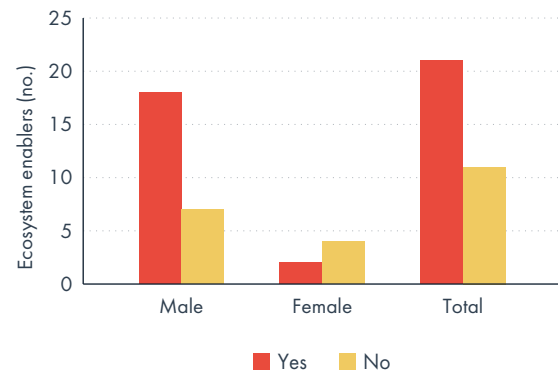
a. Has the top management helped to start or owned other businesses?



b. Highest level of education of the top manager



c. Did the top manager study abroad for more than a month?

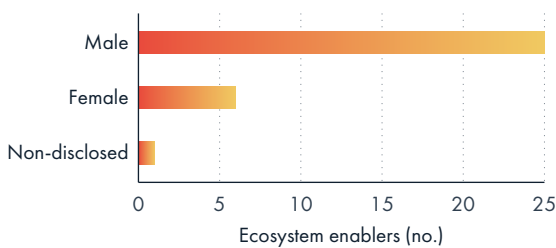


Source: World Bank Entrepreneurship Ecosystem Enablers Survey 2021.  
 Note: Total does not necessarily sum to 32 because some enablers have multiple managers.

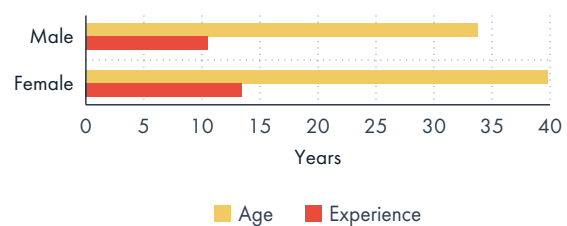
**Few top managers of ecosystem enablers are women, but they tend to have more experience, be more highly educated, and be more likely to have studied abroad.** Only six of the top managers in enablers are women (figure 3.15, panel a). They tend to be older than male managers (39.9 versus 33.8 years old on average) and have more years of experience working in the sector than men (figure 3.15, panel b). Female managers also tend to be more likely to have studied abroad (figure 3.15, panel c). The disproportionate distribution across gender in managerial positions in ecosystem enablers may also reflect potential barriers associated with female entrepreneurs.

**FIGURE 3.15** Management Characteristics by Gender

a. Top managers' gender



b. Average years of working experience and age of top managers

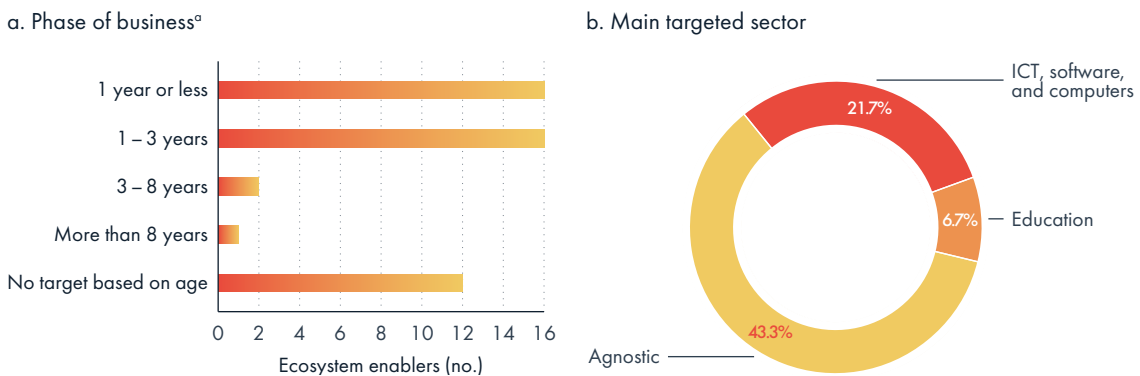


Source: World Bank Entrepreneurship Ecosystem Enablers Survey 2021.

### 3.2.4 BENEFICIARIES OF ECOSYSTEM ENABLERS

**Ecosystem enablers in Romania target mostly young businesses and tend to either focus on ICT or be sector agnostic.** About 16 enablers serve businesses between 0 to 3 years of age. About 12 have no target based on age, and a minority serve companies 3 years of age or older (figure 3.16, panel a). Half of the enablers focus mainly on the digital sector (ICT, software, and computers), 6.7 percent focus on beneficiaries in the education sector, and the rest are sector agnostic (figure 3.16, panel b).

**FIGURE 3.16 Target Beneficiaries by Business Age and Sector**



Source: World Bank Entrepreneurship Ecosystem Enablers Survey 2021.

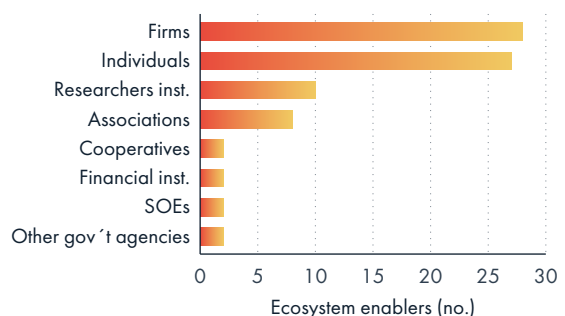
Note: a. 12 programs support firms of all ages; 8 programs support firms up to 3 years; 16 programs support firms between 1 and 3 years of age; 16 programs support firms less than 1 year old; and 1 program supports firms more than 8 years old. Total does not sum to 32 because some enablers have multiple target beneficiaries. ICT = information and communications technology.

**Most ecosystem enablers target firms and individuals as beneficiaries.** Twenty-eight enablers provide their services to firms (startups), and 27 provide their services to individuals (entrepreneurs and potential entrepreneurs) (figure 3.17). Fewer enablers support research institutions or associations, and very few support cooperatives, financial institutions, SOEs, or other government agencies. Female beneficiaries accounted for between 20 and 50 percent of direct individual beneficiaries depending on the enabler. However, the percentage of female applicants to the enablers' programs is not known. Ecosystem enablers' focus on individuals is in notable contrast to the mix of public programs, which, as discussed in section 3.1.3 above, included very few instruments that were open to individuals. This suggests that there is potentially unmet demand for support to ideation phase entrepreneurs.

**Ecosystem enablers rely on network events and advertising for recruiting beneficiaries.**

The enablers reported that the most common approach for recruiting beneficiaries to their programs were through network events and online advertising, followed by offline advertising. Word of mouth is the least popular method of reaching out to potential beneficiaries.

**FIGURE 3.17 Target Beneficiaries by Type**



Source: World Bank Entrepreneurship Ecosystem Enablers Survey 2021.

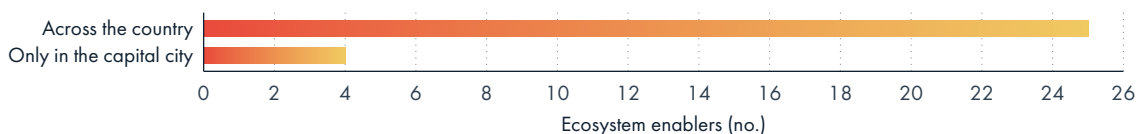
Note: Total does not sum to 32 because some enablers have multiple target beneficiaries. SOEs = state-owned enterprises.

**The enabler survey revealed that accelerator programs are more selective.** This is in line with global trends because accelerators target "scale up" stage firms and rapidly match them with capital and advisory in order to help firms further scale. In contrast, incubators typically support more nascent firms over a longer time horizon. In Romania, accelerators admitted around 30 percent of applicants, whereas incubators admitted 85 percent of applicants. Other enablers, such as investors and financial institutions, reported supporting around of 25 percent of applicants.

### 3.2.5 GEOGRAPHICAL COVERAGE OF ECOSYSTEM ENABLERS

**Most ecosystem enablers cover both Bucharest and other regions.** 25 enablers target Bucharest and other regions, while 4 target Bucharest exclusively (figure 3.18). Bucharest-Ilfov and North-West have the largest share of target beneficiaries. However, Bucharest has the fewest enablers per enterprise. This means that the number of enablers in the city does not correspond to the concentration of businesses in it.

**FIGURE 3.18** Regional Distribution (Program Coverage)



Source: World Bank Entrepreneurship Ecosystem Enablers Survey 2021.

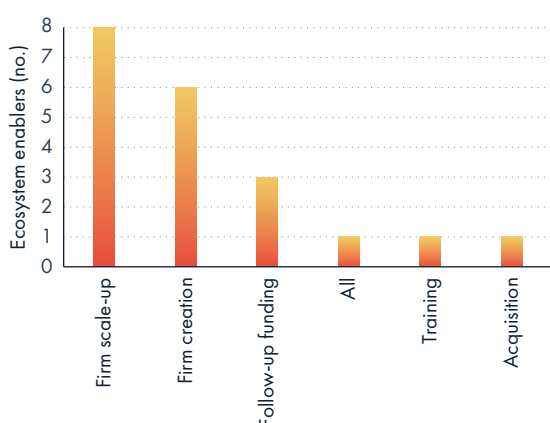
Note: Total does not sum to 32 because some enablers did not answer the question.

### 3.2.6 MONITORING AND EVALUATION PROCESSES

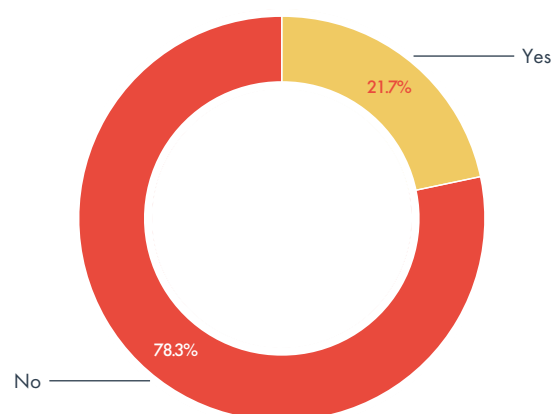
**Almost all ecosystem enablers reported following KPIs regularly.** About a third (9) of the enablers supporting entrepreneurial activities performed quarterly performance reviews, 8 conducted annual reviews, and 7 conducted monthly reviews. The vast majority reviewed KPIs at a higher frequency. Firm scale-up and firm creation are the top KPIs, with well over half of enablers indicating one of these as their principal KPIs. Follow-up funding was another popular indicator, and some enablers used other indicators (figure 3.19, panel a). Nearly all ecosystem enablers (25 out of 27) collect feedback on a regular basis, and enablers use this feedback to adapt their performance as well.

**FIGURE 3.19** M&E Systems Used by Ecosystem Enablers

a. Main KPIs



b. Impact evaluation conducted



Source: World Bank Entrepreneurship Ecosystem Enablers Survey 2021.

Note: Total does not sum to 32 because some enablers did not answer the question.

**However, very few ecosystem enablers perform rigorous impact evaluations.** Only about 21.7 percent of enablers completed any kind of impact evaluation to evaluate their success (figure 3.19, panel b). In particular, impact evaluation using a control group was rare. The use of a control group to compare with the treatment group is considered good practice in generating a higher standard of evidence. Such evaluation is more common within public-sector bodies or not-for-profit organizations (which need to demonstrate their impact to taxpayers or donors). However, it can also be valuable to private-sector organizations. For one thing, it helps identify which services may

be more impactful than others, enabling the organization to adapt to stay as relevant and useful as possible. It can also help make a case for sponsorship or attracting high-quality startups

**Moreover, almost none shared their results publicly.** Where evaluations had been undertaken—whether using control groups or not—the results were almost never made public. This lack of data transparency makes it difficult for entrepreneurs to decide between programs run by ecosystem enablers and evaluate their costs (even if only in terms of opportunity cost rather than financial cost). A lack of data also hinders third-party evaluation of the ecosystem enablers and makes it difficult for funders and policymakers to determine their effectiveness.

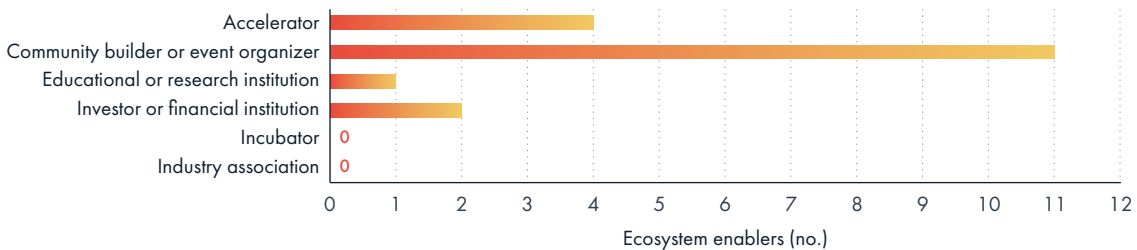
**Many ecosystem enablers need to modernize their processes.** Many enablers reported using tools for tracking KPIs such as standardized software and digital apps. However, many others reported that they still relied on hand-written processes. This suggests a need for modernization.

### 3.2.7 IMPACT OF COVID-19

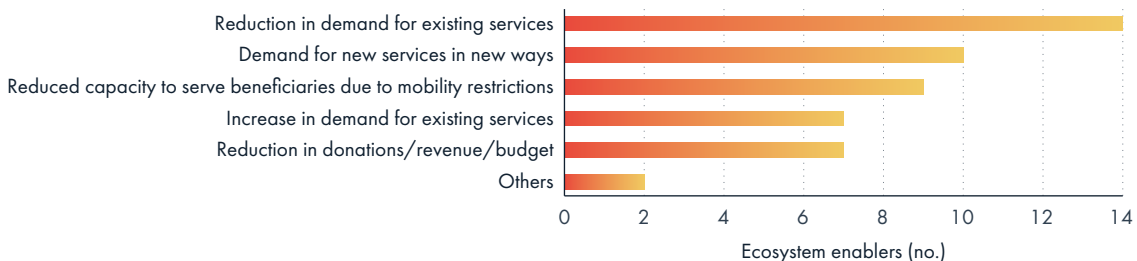
**Around 60 percent of the enablers reported being significantly impacted by the COVID-19 outbreak due to the reduced demand for existing and new services.** Accelerators, community builders, and event organizers were most impacted, followed by educational and research institutions and investors or financial institutions (figure 3.20, panel a). The main impact was a reduction in demand for services, both existing and new (figure 3.20, panel b). Many ecosystem enablers reported that mobility restrictions also reduced their ability to serve beneficiaries.

**FIGURE 3.20** Effect of COVID-19 on Ecosystem Enablers

a. COVID-19 outbreak significantly impacted this enabler



b. Channels that best describe the impact of COVID-19 on the enabler



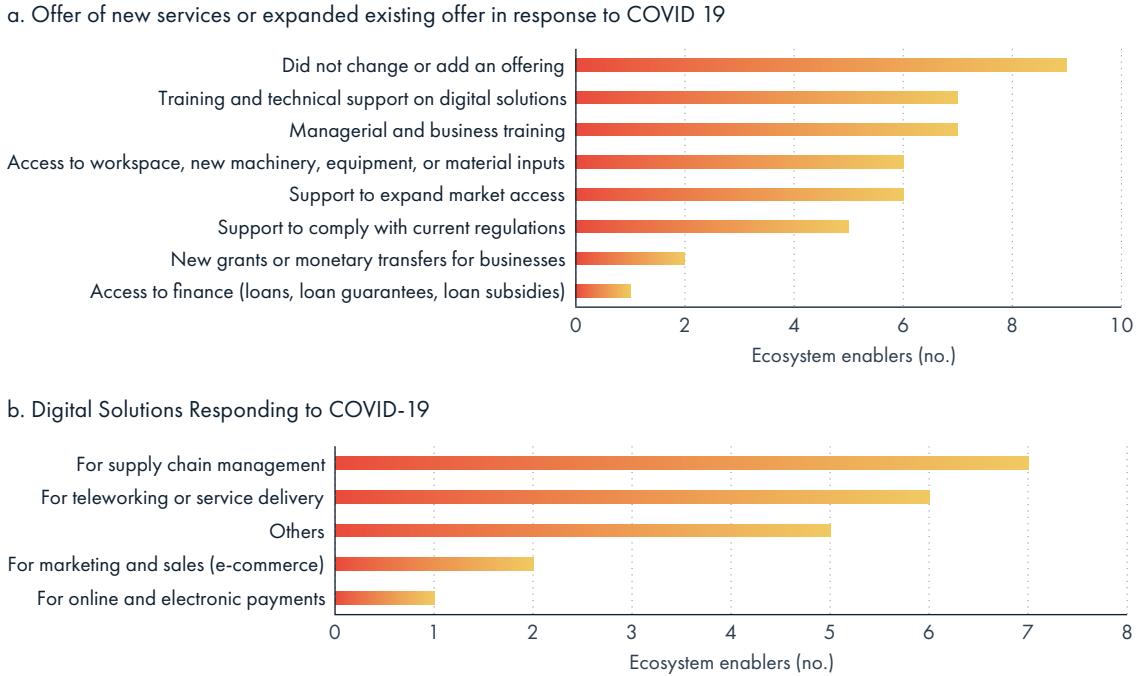
Source: World Bank Entrepreneurship Ecosystem Enablers Survey 2021.

Note: a) Total does not sum to 32 because some enablers did not answer the question. b) Total does not sum to 32 because some enablers experience multiple impacts.

**Despite COVID-19, many ecosystem enablers started or expanded their training and technical support offering for digital solutions and managerial and business training.** (See figure 3.21, panel a.) Similarly, they kept offering access to workspaces, new machinery, and equipment; as well as their support for expanding market access. Furthermore, most of the training and technical support provided by Intermediary Organizations (IOs) was associated with digital solutions focused mostly on supply chain management, service delivery, marketing and sales (e-commerce), and online and electronic payments (figure 3.21, panel b).



**FIGURE 3.21 Services Needed to Support Businesses Responding to COVID-19**

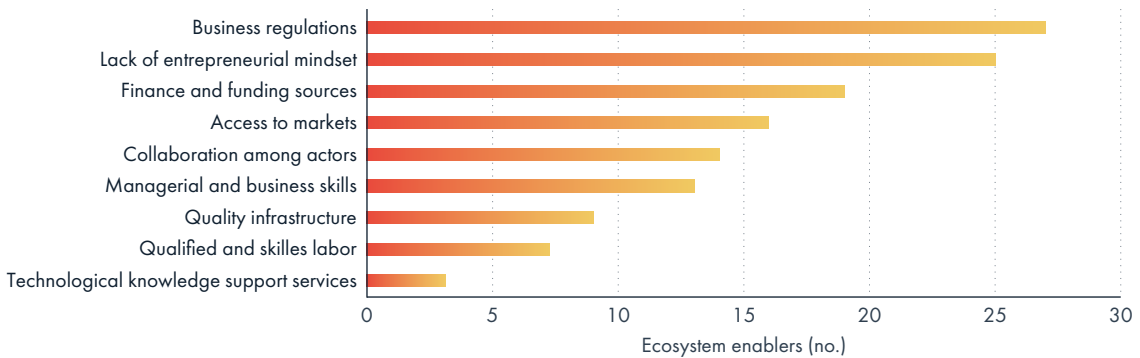


Source: World Bank Entrepreneurship Ecosystem Enablers Survey 2021.  
 Note: Total does not sum to 32 because some enablers did not provide digital solutions.

### 3.2.8 PERCEIVED BARRIERS TO ENTREPRENEURSHIP

**Like entrepreneurs, ecosystem enablers reported that regulations and a lack of entrepreneurial mindset were the major barriers to entrepreneurship** (See figure 3.22.) Finance and funding opportunities were also seen as poor. Enablers also agreed with entrepreneurs and startups that there were generally favorable conditions related to quality of infrastructure, qualified and skilled labor, and technical knowledge support services in the country. Opinions were mixed as to whether Romania has a favorable environment in terms of collaboration between actors, market access, and managerial or business skills.

**FIGURE 3.22 Barriers to Entrepreneurship as Perceived by Ecosystem Enablers**



Source: World Bank Entrepreneurship Ecosystem Enablers Survey 2021.  
 Note: Total does not sum to 32 because enablers face multiple barriers.

### 3.3 SUMMARY

**Based on these assessments of public programs and ecosystem enablers, it can be concluded that there is significant room for improvement when it comes to the capacity of existing institutions responsible for entrepreneurship programming.** Consistent with analysis discussed in Chapter 1, the creation of a centralized agency whose core mission is to further entrepreneurship through targeted interventions will be critical to furthering Romania's entrepreneurial aspirations, including providing direct and indirect support to ecosystem enablers. Startups, although regarded as MSMEs statistically speaking, have completely different aspirations for leveraging digital technologies to scale their business models and achieve growth. These require targeted policies, distinct programs and financing instruments as compared to those for traditional SMEs. Hence, the organizations that manage these programs also need to be very different in terms of their governance, staff capabilities, and overall agility to work hand-in-hand with ecosystem players, investors, and policy circles. Some characteristics of well-functioning entrepreneurship agencies include a clear mission, vision, and values; focused communications campaign and clear branding; good governance structure; capable staff (ideally recruited from private sector); and a robust M&E system. Romania is possibly the only EU member state that does not have a properly functioning innovation or entrepreneurship agency. It loses out in terms of knowledge sharing on innovation/entrepreneurship policy making and programming by not being a member of the European Network of Innovation Agencies (TAFTIE), which in turn impacts beneficiaries of Romania's entrepreneurial programs.

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CHAPTER 4

# POLICY RECOMMENDATIONS



## KEY QUESTIONS

**Chapter 4 provides policy recommendations informed by the results of the analytical work presented in this report and consultations with key actors of the entrepreneurship ecosystems in Romania.** In brief, more funding needs to be allocated to improve quality and scale-up of firms, as well as promote networking and deepening linkages with successful founders, including diaspora entrepreneurs. The chapter provides evidence-driven and stakeholder-driven policy recommendations aligned with the pillars of the ecosystem. It also compares our policy recommendations with the Top 12 policy interventions proposed by the Romanian ecosystem.

An overview of each policy recommendation is provided in this report. Detailed policy recommendations including timeframe, implementation bodies, notional costing, and KPIs can be found in a separate document, *Scaling Entrepreneurship in Romania: A Policymaker’s Toolkit*.

This chapter aims to address the following questions:

- Is this mix of public programs and ecosystem enablers conducive to supporting quality entrepreneurship?
- What are the main gaps in support for the Romanian entrepreneurship ecosystem identified through the diagnostic report?
- What are the prioritized policy recommendations to support entrepreneurship based on the key findings of this report and ecosystem stakeholders?

**This report presents a comprehensive diagnostic of entrepreneurship performance and pillars of the entrepreneurship ecosystem in Romania.** The following sections provide (i) evidence-based policy recommendations based on the report’s findings and analysis and (ii) a comparison of the evidence-based policy recommendations with the “Top 12” interventions proposed by the Romanian entrepreneurship ecosystem through the Strategic Working Groups, organized as part of the European Commission-funded “Romania’s Startup Ecosystem Strategy” initiative.

**The policy recommendations and prioritization were derived from two mutually reinforcing activities: analysis presented in earlier chapters of this report and from strategy working group sessions with key actors of the Romanian entrepreneurship ecosystem.** They also draw upon the World Bank’s *A Practitioner’s Guide to Innovation Policy* (Cirera et al. 2020), a wider review of the literature on the impact of programs to support entrepreneurship, and an extensive consultation with key actors of entrepreneurship ecosystems in Romania and abroad. This diagnostic surfaced 11 evidence-based policy recommendations while the Romanian ecosystem identified its “Top 12” interventions. The proposed interventions are prioritized by urgency, resource, and cost considerations. The description of the policy interventions includes a short summary of the “main problem”, based on key findings of the diagnostic. Second, an intervention is proposed, followed by a brief description of the instruments. The policy recommendations are categorized by:

- Policies – refer to legislative/regulatory reforms to create an enabling environment for high growth entrepreneurship to take root and thrive;
- Programs – refer to programs that target entrepreneurs, firms, and other ecosystem actors; and
- Institutions – refer to governance and entities essential for the entrepreneurship agenda.

The table below illustrates the categorization. It is possible for policy recommendations to span two or three categories, as indicated by table 4.1 below.

**TABLE 4.1** Categorization of Policy Recommendations
















Refocus attention on starting and scaling high-quality innovative firms Improve governance & functionality of existing instruments		
Policies	Programs	Institutions
<ul style="list-style-type: none"> <li>Recalibrate the policy mix for starting and scaling high quality innovative firms and improve the functionality of instruments</li> <li>Reform Regulations to Strengthen Entrepreneurship &amp; Investments</li> </ul>	<ul style="list-style-type: none"> <li>Strengthen Ecosystem Enablers</li> <li>Create a Startup Fund</li> <li>Build and Promote a Network of Romanian Founders &amp; Diaspora</li> <li>Implement Startup Visa Program</li> <li>Scale-Up through Exports</li> </ul>	<ul style="list-style-type: none"> <li>Establish a One-Stop Agency "Ecosystem Hub"</li> </ul>
<ul style="list-style-type: none"> <li>Improve Entrepreneurship Education</li> <li>Incentivize innovation to foster knowledge spillovers into the private sector</li> <li>Promote the Digital Economy</li> </ul>		

Source: World Bank Group.

**The recommendations are also prioritized in several ways.** These recommendations also identify prioritization (or sequencing), time sensitivity, and "quick wins"<sup>51</sup> (table 4.2). Priorities are coded as follows:

- *Mission critical* refers to activities that are (i) extremely time sensitive since the government is currently designing the new programming period which provides an opportunity to embed data-driven and "SMART" policy recommendations based; and/or (ii) lay the groundwork for future recommendations. If these recommendations are not immediately prioritized, Romanian authorities risk missing its economic objectives.
- *Flagship* refers to critical activities that should be undertaken to further development of Romania's emerging entrepreneurship ecosystem.
- *Foundational long-term* refers to critical activities that require a longer time horizon to come to fruition since there are other "foundational" elements that need to be sequenced and prioritized first.

**TABLE 4.2** Prioritization of policy Recommendations

Policy Recommendations	Prioritization	Time Sensitive	Quick Win
Recalibrate the policy mix for starting and scaling high quality innovative firms by (a) Improving the functionality of instruments, and (b) Implementing a comprehensive package of reforms tailored to high quality innovative firms	 Mission critical	 Yes	 Yes
Reform regulations to strengthen entrepreneurship & investments	 Mission critical	 Yes	 Yes
Establish a one-stop agency "Ecosystem Hub"	 Mission critical	 Yes	 Yes
Strengthen ecosystem enablers	 Flagship	 Yes	
Create a startup fund	 Flagship		
Improve Entrepreneurship Education and strengthen the role of Universities in the ecosystem	 Flagship	 Yes	
Implement Startup Visa Program	 Flagship	 Yes	 Yes

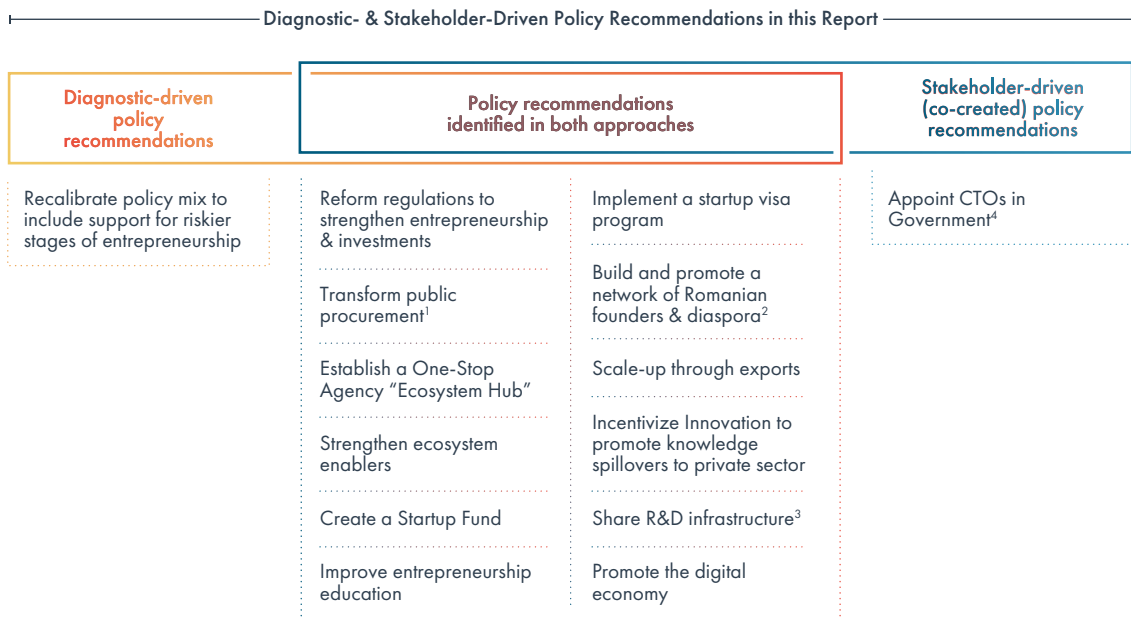
51. This refers to whether it is visible, has immediate benefit, and can be delivered quickly.

Policy Recommendations	Prioritization	Time Sensitive	Quick Win
Build and promote a network of Romanian founders and diaspora	 Flagship		
Scale-up through exports	 Flagship		
Incentivize innovation to foster knowledge spillovers into the private sector	 Foundational longterm	 Yes	
Promote the digital economy	 Foundational longterm	 Yes	

Source: World Bank Group.

**Our analysis and interventions identified from the bottom-up strategy development process identified a number of similar policies, programs, and institutions.** The figure below illustrates the overlap between evidence- and stakeholder-driven policy recommendations. There are two main differences. First, based on an analysis of public instruments supporting STI and entrepreneurship, our analysis identified an urgent need to recalibrate the policy mix and improve its functionality. Second, the Romanian ecosystem identified a need to appoint Chief Technology Officers (CTOs) in government. Although we concur with this recommendation, the authorities need to prioritize other critical interventions.

**FIGURE 4.1** Overlap between Evidence- & Stakeholder-Driven Policy Recommendations in This Report



Note: CTOs = chief technology officers; R&D = research and development.

1. This recommendation is incorporated into the “Reform regulations to strengthen entrepreneurship & investments” intervention

2. This recommendation overlaps with an activity identified under the “Scale-Up through Exports” stakeholder-driven intervention

3. This recommendation is incorporated into the “Incentivize Innovation to promote knowledge spillovers to private sector” intervention

4. We concur that this is a critical recommendation but there are many other foundational aspects that need to be prioritized given the foundational nature of this activity

**BOX 4.1 Top 12 Interventions Identified by the Strategy Working Groups****Intervention 1: Reform Startup and Investment Related Regulations**

Specifically:

- a. Stock options
- b. Digitization of company formation
- c. VC regulations
- d. Crowdfunding
- e. Angel investment
- f. Corporate VC

**Intervention 2: Establish a One-Stop Agency for Startup Ecosystem**

Its role could include:

- a. Advocacy
- b. Think and Do Tank
- c. Connector
- d. Capacity-builder
- e. Funder
- f. Data-gatherer

**Intervention 3: Improve Entrepreneurship Education**

Specifically:

- a. Entrepreneurship education
- b. Infuse academia with entrepreneurs
- c. Expose lecturers to entrepreneurship

**Intervention 4: Strengthen Ecosystem Enablers**

Proposed activities:

- a. Capacity-building for enablers
- b. University collaboration with European Digital Innovation Hubs (eDIHs) / chambers of commerce / business associations
- c. Organization of a Romania Ecosystem Summit

**Intervention 5: Create a Startup Fund**

This entails:

- a. Establishing the fund
- b. Co-creating the investment thesis
- c. Monitoring fund targets

**Intervention 6: Incentivize Innovation**

Including:

- a. Enterprise sector collaboration
- b. Tech transfer capability fund
- c. Clarification of unclear tech transfer legislation
- d. Promoting in-house research & development (R&D) activities in firms

**Intervention 7: Implement Startup Visas**

Introducing:

- a. Startup visas
- b. Incentives for digital nomads

**Intervention 8: Share R&D Infrastructure**

Including:

- a. Developing an open access policy
- b. Mapping and dissemination
- c. Pilot program for accessibility

**Intervention 9: Startup to Scaleup through Exports**

To improve access to markets, activities include:

- a. Establishing an overseas 'Landing Pads'
- b. Showcasing Romanian startups
- c. Creating a diaspora entrepreneurs' network

**Intervention 10: Transform Public Procurement**

Reforms to perceived barriers to public procurement opportunities include:

- a. Training for public sector officials
- b. Targeting SMEs / startups
- c. Challenge prizes

**Intervention 11: Appoint Chief Technology Officers (CTOs) in Government**

Proposed activities to help the public sector play a critical role in this agenda:

- a. Funding CTO roles at city-, regional-, national-levels
- b. Building political legitimacy on all levels
- c. Introducing sandboxes and testbeds to promote experimentation and innovation

**Intervention 12: Build Confidence in Digital**

Promote Internet use and market access through:

- a. E-commerce education
- b. "Trust in E-commerce" body
- c. Clarifying ministerial responsibilities

## POLICY RECOMMENDATION 1

## RECALIBRATE THE POLICY MIX FOR STARTING AND SCALING HIGH QUALITY INNOVATIVE FIRMS BY (A) IMPROVING THE FUNCTIONALITY OF INSTRUMENTS, AND (B) IMPLEMENTING A COMPREHENSIVE PACKAGE OF REFORMS TAILORED TO HIGH QUALITY INNOVATIVE FIRMS

MISSION  
CRITICALTIME  
SENSITIVEQUICK  
WINGOVERNMENT SUPPORT  
NEEDED

### RATIONALE

As discussed in Chapter 3 of this Report, Romania's current policy mix for STI and entrepreneurship is not optimized for firms at the earliest stages and entrepreneurs, nor does it address the quality of firms at entry and the limited number of high-growth firms in the ecosystem. Romania hovers at round 3 percent of high-growth firms compared to 11.4 percent in peer countries. This reflects policymakers' limited understanding of how startups differ from SMEs because many instruments target post-revenue firms.

Our functional analysis of existing support programs reveals that:

- Many instruments are under-disbursing, suggesting misalignment between the instrument's objectives and target beneficiaries.
- Several instruments are targeted at mature firms (regardless of their size) rather than for firms in the very early stages of development.
  - Additionally, several instruments are available only to firms that are already profitable. This likely excludes high-growth startups since they typically undergo a considerable pre-revenue period, during which they are focused on growth and user-adoption. During this stage, high-growth startups typically rely on grants or financing from accelerators, angel investors, or VCs.
  - Relatedly, many instruments specifically target established technologies at high technology readiness levels (TRLs, that is, mature, market-ready technologies); however, a supportive innovation ecosystem needs to provide support for technologies across the spectrum of technology-readiness.
- Individual entrepreneurs (as opposed to firms) have little direct funding.
- Very few policy instruments benefit ecosystem enablers, such as incubators, accelerators, and other critical actors. Efforts to recalibrate the policy mix must also include improving attention to national and localized entrepreneurship ecosystems. As discussed in a forthcoming recommendation, Romania's subnational entrepreneurial ecosystems vary in quality of support, which in turn, translates to limited support to startups and innovative firms.
- Some instruments existed because of the direction of the European Commission, rather than having been identified as a particular systemic failure.
- Administrative costs for program management are high because it requires coordination between a Managing Authority and an Intermediary Body.
- Monitoring and evaluation capabilities of program staff are weak, limiting opportunities to understand the impact of existing instruments and scaling up of programs that are meeting and/or exceeding program objectives. This indicates a need to improve capabilities of program implementors for design, implementation, and governance, with a special focus on M&E.





## APPROACH

This recommendation is divided into three specific sub-categories:

- (1A) Rebalancing the policy mix,
- (1B) Improving functionality of the policy mix; and
- (2) Passing and implementing a comprehensive package of reforms, i.e., the National Startup Ecosystem Strategy.

## POLICY RECOMMENDATION 2

# REFORM REGULATIONS TO STRENGTHEN ENTREPRENEURSHIP & INVESTMENTS



MISSION  
CRITICAL



TIME  
SENSITIVE



QUICK  
WIN



## RATIONALE

As discussed in chapters 1 and 2, the current business environment is preventing firms from growing, scaling, and investments to occur:

- Although Romania performs well on entry of new firms, it does not have a high share of tech startups and especially high-potential startups. Much entrepreneurship in Romania is driven by necessity, rather than opportunity, with many firms lacking the ambition to innovate or other characteristics to become high growth firms.
- Additionally, Romania does not have a culture that destigmatizes “rapid business failure” and promotes serial entrepreneurship.
- Romanian startups rely on self-financing and are unable to scale effectively. Startups, on average, do not access traditional capital markets for scaling up. Instead, they rely on angel investors, VCs (including corporate VC), or crowdfunding platforms.
- Regulations surrounding the ownership and commercialization of IP, especially that derived from universities and publicly-funded research, are widely seen as confused, conflicting and vaguely worded, requiring expert legal advice to interpret, and leaving much uncertainty concerning liabilities (which may include criminal offences for errors).<sup>52</sup>
- Public procurement is an important market for many startups and SMEs. Although recent reforms have improved awareness, the current public procurement processes and platforms are still perceived as difficult to access for startups and other small firms. Streamlining public procurement, with particular attention to the needs of innovative startups, can expand the domestic market for startups while simultaneously helping bring beneficial innovations into the public sector.

52. See “Supporting Innovation in Catching-up Regions in Romania: Intellectual Property Landscape Analysis Report” Internal report by European Commission, ADR Nord-Vest, ADR Nord-Est & World Bank Group (May 2021).



## APPROACH

This recommendation is divided into four reform areas.

- Digitizing company formation,<sup>53</sup> supporting distressed firms, and improving the ease of exiting a business;
- Investing in startups;
- Clarifying IP rights; and
- Improving access to public procurement opportunities.

### POLICY RECOMMENDATION 3

## ESTABLISH A ONE-STOP AGENCY ("ECOSYSTEM HUB")



MISSION  
CRITICAL



TIME  
SENSITIVE



QUICK  
WIN



GOVERNMENT SUPPORT  
NEEDED



## RATIONALE

The Romanian Startup ecosystem faces several challenges, including a lack of understanding of startups and how they differ from other SMEs, and reliable data about the ecosystem as a whole. SME legislation and the policy mix do not take into account the needs of young, growth-oriented firms with novel technology or new business models. There is also poor coordination between policymakers and startup ecosystem stakeholders. Despite promising regional clusters, Romanian startups have no coherent national voice to champion their needs.

In post-transition economies, very often the innovation or startup programming and agencies are established under the auspices of a ministry in charge of research, innovation, science, and technological development (Poland, Croatia, Serbia, Bulgaria, Kazakhstan) given that these ministries tend to have a stronger understanding of the nature of technology driven startups and the need to support R&D and innovation intensive companies in collaboration with the research sector. They also see it as a critical opportunity to prevent brain drain of young researchers or even promote brain gain from the among diaspora or international technical and research talent. Most importantly, however, is the importance of having a ministry with ownership and willingness to champion this cross-cutting agenda of innovation and entrepreneurship. And alliances with ministries in charge of industry and economy are not only natural but also highly desirable in the long term as these tend to very often be involved in critical business environment regulations (starting/closing a business, bankruptcy, investors regulations, R&D tax credits, etc.) that are necessary for the formation and growth of a healthy innovation and entrepreneurship/startup ecosystem, including the startups/scaleups, investors, and enabler organizations.

This would assist in clarifying the policy distinction between startups and SMEs, help negate issues of policy capture by incumbents (by providing a different cabinet-level champion), assist in promoting technology transfer and science-driven spinouts, and ensure that the agency remains focused on.

53. When it comes to ease of starting a business, Romania has met objectives established by the European Commission's Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW), "Start-up Procedures." It takes 1-3 days to register a business and costs €26 (target is €100 or less). This is currently a paper-based procedure.



### APPROACH

We recommend that the first step should be to draft a ‘blueprint’ of the new agency, taking into consideration the different roles that it might play. The overall objective of establishing an Ecosystem Hub is to create an institutional framework and implementation capacity to address structural challenges for startups, scale-ups, and facilitators of the innovation and entrepreneurship support. However, there are many different models of innovation agency or startup agency, and we recommend that the structure of this organization be determined after the strategy has been developed.

## POLICY RECOMMENDATION 4

# STRENGTHEN ECOSYSTEM ENABLERS



FLAGSHIP



NOT TIME SENSITIVE



### RATIONALE

In most ecosystems, ecosystem enablers (or “startup support organizations”) play an important role. There is evidence, for example, that accelerators can not only improve various success measures for startups that receive their services but may also play a wider ecosystem coordinating function.<sup>54</sup> However, at present there are relatively few such enablers in Romania, and those which exist are of limited capacity and variable quality. Most lack a rigorous monitoring and evaluation framework, which limits opportunities for learning and suggests the need for sharing good practices more widely. As indicated by the policy mix analysis above, there are relatively few instruments which are devoted to supporting ecosystem enablers, meaning that many ecosystem enablers are under-resourced and rely on financing and support from donors.

In addition, existing ecosystem enablers are concentrated primarily in the Bucharest-Ilfov region, with few entrepreneurship support structures outside of the main hubs. Enabler organizations located beyond the main hubs tend to have weaker access to networks, including financial capital and capacity building. Given that the Bucharest-Ilfov region has the highest rate of new firm creation and highest share of young and high-growth firms, it is understandable that private-sector enablers would choose to locate themselves here, where demand is greatest. However, this concentration risks exacerbating regional economic disparities.

Data suggests that the major ecosystems outside the Bucharest-Ilfov region are around Cluj-Napoca, Iasi, Timisoara and Constanta. However, the data also suggests that startups in these other ecosystems remain highly dependent upon the Bucharest ecosystem for university talent and facilities, accelerators, and funders.

54. See, for example, Bone et al. (2019).



### APPROACH

We suggest the need for a program to strengthen ecosystem enablers across Romania. The aim of such program would be to build overall capacity (especially outside the Bucharest-Ilfov region), to improve quality and performance measurement, and to increase the connections between enablers (in order to encourage sharing of good practice, as well as their access to resources).

The program should also include capacity-development grants for ecosystem enablers (potentially requiring matched funding from other sources such as local authorities, VCs, or corporates). Such grants could be spent in various ways, including such activities as subsidized makerspaces, rapid-prototyping facilities and the provision of stipends from accelerators to entrepreneurs in order to allow founders to concentrate on startup-building activities (as is common in many other accelerator programs).

## POLICY RECOMMENDATION 5

### CREATE A STARTUP FUND



FLAGSHIP



NOT TIME SENSITIVE



GOVERNMENT SUPPORT NEEDED



### RATIONALE

Risk finance is a critical requirement for starting and scaling new firms. However, the Romanian VC sector is under-developed, meaning that VC remains difficult to access. Numbers of VC deals, and total value invested, are low in comparison with other European countries – although numbers of deals and transaction value increased quite rapidly between 2019 and 2021. As discussed in the policy mix analysis above, available public instruments prioritize post-revenue firms and do not provide financial support for firms at the earliest and riskiest stages.



### APPROACH

This recommendation proposes establishing a new public fund to increase amount of direct capital into startups and riskier stage firms.<sup>55</sup> The design of the Startup Fund and its instruments should be informed by an in-depth study of the existing entrepreneurial finance landscape, including the existing supply of corporate VC and investment from overseas VC firms, as well as estimates of likely demand from Romanian startups and specific financing gaps.<sup>56</sup> However, we suggest that careful consideration be given to its establishment as a co-investment fund, in order to encourage the development of private sector VCs, rather than displace this activity.

The fund could be Government owned, although it is strongly recommended that it involves private-sector partners and expertise, including a performance-driven process for investment selection and due consideration of the need to develop a pipeline of sufficient deal-flow to sustain the development of

55. In recognition of the public sector's role in supporting startups, many countries are launching specific finance instruments. This list includes France, Serbia, Chile, and many others.

56. Though the EIF recently conducted an landscape analysis to inform a Fund of Funds intervention within the National Resilience and Recovery Plan, riskier stage firms, including startups, still appear to be un/underserved by this proposed instrument.

private sector investors. There may be opportunities to leverage the diaspora network (see recommendation below) to identify co-investors.

In terms of fund size and stage, there is a particular need for pre-seed- and seed-stage funding in Romania, so we suggest that a sizeable portion of the fund should be dedicated to these stages. The exact size of the fund should be determined following the proposed study.

## POLICY RECOMMENDATION 6

# IMPROVE ENTREPRENEURSHIP EDUCATION AND STRENGTHEN THE ROLE OF UNIVERSITIES IN THE ECOSYSTEM



FLAGSHIP



TIME SENSITIVE



GOVERNMENT SUPPORT NEEDED



### RATIONALE

Universities can play many important roles in stimulating entrepreneurship – such as inspiring students and cultivating an entrepreneurial mindset, providing entrepreneurial skills, directly assisting the formation of spinouts, and transferring technologies to existing young firms to enable them to become more innovative. However, most of these functions are weaker in Romania than in other European countries. Although Romania has a high share of STEM graduates, this has not translated into high numbers of innovative startups.

Of particular concern is the quality of entrepreneurship education: whilst there have been numerous programs to improve entrepreneurial training, many entrepreneurs still complain that their university education did not provide them with appropriate knowledge or skills, with academic teaching of entrepreneurship being perceived as low quality, outdated, and disconnected from real-world experience. This is exacerbated by the fact that many teachers and lecturing staff have limited exposure to the private sector. Entrepreneurial skills also pose considerable challenges to university management, including staff responsible for overall planning and budgeting and academic development.



### APPROACH

Several previous projects funded by the European Commission have tried to improve entrepreneurial skills training and ‘third mission’ activities within Romanian universities. In addition, a number of highly relevant pilot programs were implemented in the World Bank project “Supporting Innovation in Romanian Catching-up Regions”. We therefore recommend that a review of these projects is undertaken before new initiatives are launched or these programs are scaled.

In addition, we suggest that this section should be read with reference to the others; specifically, there may be opportunities to combine entrepreneurial skills training with digital skills training (as discussed under ‘Promote the Digital Economy’), and a need to co-ordinate the supply-side interventions discussed in this section with the demand-side interventions of the following section (‘Incentivize innovation to foster knowledge spillovers into the private sector’).

With that said, we recommend that several actions would improve entrepreneurship education for students, for career counselors and university lecturers, as well as building wider entrepreneurial capabilities within these institutions, and engagement with the wider ecosystem:

- Removing regulatory hurdles for Entrepreneurship Education;
- Infusing Academia with Entrepreneurs and Industry Experts to facilitate knowledge transfer;
- Educator Training & Study Visits;
- Incentives & Metrics for Entrepreneurship & Entrepreneurial Education;
- Establish an advisory council for educational reforms;
- Expansion of Research Valorization fund<sup>57</sup>;
- Expansion of Technology transfer capability building program<sup>58</sup>; and
- Enabler better use of R&D infrastructure.

## POLICY RECOMMENDATION 7

# IMPLEMENT A STARTUP VISA PROGRAM



FLAGSHIP



TIME SENSITIVE



QUICK WIN



GOVERNMENT SUPPORT NEEDED



### RATIONALE

As discussed in Chapter 1, Romania suffers a “brain drain” of talent. As well as making better use of the emigrant diaspora, we suggest this drain should be countered through pro-active ‘brain gain’ measures, aimed at attracting talent and other resources into Romania. Specifically, we recommend a Startup Visa scheme to provide a simple fast-track for immigrant entrepreneurs or investors wishing to relocate to Romania.

In addition, we recommend an expansion of the existing “digital nomad” scheme, since there are likely to be spillover benefits for startups arising from an increased concentration of high-quality digitally experienced talent, even if such individuals are not entrepreneurs themselves. Various studies have shown that promoting such mobility stimulates an exchange of ideas which foster and encourage economic growth.<sup>59</sup> Other possible spillover effects include increased usage of online platforms, which can help push adoption within Romania.



### APPROACH

Startup Visas (also referred to as ‘Entrepreneurs Visas’ or ‘Innovators Visa’) are used by over 30 countries across the world to attract immigrant entrepreneurs who are deemed likely to contribute to the local economy. Typically, such visas enable residency for a period, subject to certain conditions – which may include an assessment of the feasibility of the applicant’s business idea and its potential scalability, sponsorship by an ecosystem enabler in the host country, proof of sufficient capital or other

57. Leveraging best practices from the World Bank’s pilot project on “Supporting Innovation in Romanian Catching-up Regions”

58. Leveraging best practices from the World Bank’s pilot project on “Supporting Innovation in Romanian Catching-up Regions”

59. One such study found that scientific migration stimulates the quality of research and the biggest gainers from migration could be the labs that attract people from different backgrounds and disciplines to create a dynamic team. For more information, see: Hunter, Philip. “Brain drain, brain gain or brain sharing? New studies of the migration routes of scientists show that international mobility benefits all parties including countries that are net exporters of researchers.”

means to support themselves and any dependents, and foreign language skills. Some schemes also apply criteria relating to the startup's age, investment, or turnover; a few schemes, such as Lithuania's Startup Visa, also limit startups to specific technology sectors. In some cases, a Startup Visa converts to a permanent residency visa if certain conditions are met.

Some Startup Visa schemes extend to investors, too. For example, Portugal's Startup Visa offers a fast track to foreign investors (and their dependents) from non-EU countries to obtain a Residence Permit in Portugal. To be eligible, investors must invest €175,000 into a business incubator including €25,000 of capitalization into the venture. Investors are also required to work with a business incubator for three years.<sup>60</sup>

## POLICY RECOMMENDATION 8

# BUILD AND PROMOTE A NETWORK OF ROMANIAN FOUNDERS AND DIASPORA



FLAGSHIP



NOT TIME SENSITIVE



### RATIONALE

Human capital is vital for the development of startups. However, it is well-known that Romania has for several years suffered from a “brain drain”, with much top talent leaving the country. In addition, the pandemic has dramatically accelerated remote working across the globe, giving rise to new risks of a “virtual brain drain”, whereby talent is (remotely) poached by overseas firms and is thus unavailable to local startups. However, the presence of a large Romanian diaspora (the fifth largest diaspora group in the world) also creates a significant opportunity: a network which can support Romanian entrepreneurs in expanding overseas, as well as potentially acting as investors and advisors. Moreover, the globalization of talent also creates opportunities to gather ideas, insights, and best practices from across the globe which can be applied to support the starting and scaling of firms in Romania. Successful Romanian startups and Romanian diaspora have greater expertise, exposure, and networks than the general population of Romanian tech startups.<sup>61</sup>

In addition, there are opportunities to improve the visibility of Romanian startups and technology in other countries. Doing so will help raise the profile of the ecosystem among potential customers, investors, and other ecosystem participants, improving both market access and foreign investment into Romanian startups. (See also the recommendations below concerning ‘Scale-up through exports’; these recommendations should be coordinated.)

60. Source: <https://harveylawcorporation.com/portugal-visa-startup-program/>

61. This refers to a representative sample of tech startups by age, region, and sector that focuses on young digital and high-tech manufacturing businesses. This subset comprises all firms in Romania that are under five years old and are classified as digital (computer programming and software development, and other digital) and high technology manufacturing. This dataset has a total of 24,502 firms, and a representative sample of 542 firms was used in this survey. The sample was stratified by region (Bucharest metropolitan area, Cluj, Brasov, and other regions) and by sector (core digital, other digital, and high-tech manufacturing). The sector definition was informed by observing the predominance of similar activities in the PitchBook/CB Insights data. The sampling frame was based on Lista Firme, which has the contact information for all active firms in the Romanian Business Registry.



### APPROACH

We recommend the creation and curation of a new network of Romanian founders and diaspora, which connects with Romanian ecosystem enablers. The initial core of this network may be identified using existing databases of high growth startups, including diaspora entrepreneurs and female entrepreneurs. It may potentially also include prominent business leaders, researchers, investors and so on. The launch of this network should be supported by a wide-reaching marketing and communications campaign, leveraging use of tech blogs, popular social media platforms, and other media.

This network will require a clear value proposition for members to join, as well as ongoing curation and regular “value-adding” events in order to ensure it remains sufficiently attractive for members to remain involved. We suggest that this may require testing or piloting in advance of the network’s creation, but it may include: networking events (potentially hosted by local embassies or consulates); opportunities to influence Romania’s ambitious national startup support strategy; media exposure and opportunities to showcase successful startups at leading industry events (e.g. Slush, VivaTech, the Consumer Electronic Show).

## POLICY RECOMMENDATION 9

# SCALE-UP THROUGH EXPORTS



FLAGSHIP



NOT TIME SENSITIVE



GOVERNMENT SUPPORT NEEDED



### RATIONALE

This recommendation focuses on improving access of Romanian startups to overseas markets through diplomatic missions and leveraging the Romanian founders and diaspora network (see recommendation above) in critical markets.

The domestic market for many digital startups is inhibited by low level of digital skills and limited use of e-commerce platforms among the general public. Unfortunately, export rates among Romanian firms are also very low in comparison with other countries. Many entrepreneurs report being dissuaded from exporting because they do not understand the conditions and culture in overseas markets, and do not know where to start. This is exacerbated by the under-development of overseas networks; by the lack of understanding of startups amongst trade attachés and related civil servants; and by a lack of appropriate skills and confidence amongst entrepreneurs. There is also a perceived lack of support from government and Romanian trade offices abroad for startups seeking to internationalize. Furthermore, many entrepreneurs report poor perceptions of Romanian startups abroad, which may present a further barrier to exporters.

In addition, there is a need for better strategic advice to startups, as there is a tendency for Romanian firms to target “aspirational” markets, such as Estonia, rather than basing their choice of markets on knowledge of existing trade links, diaspora connections, and so on.





## APPROACH

We propose a package of several measures:

- It is recommended that policymakers start with an analysis of barriers to export for Romanian digital startups and innovative firms. This should examine other startup internationalization programs to identify good practice, identify critical markets and a strategy for “soft landing pads”, and understand the presence of, and possible support from, Romanian diaspora (as per the recommendation above). Such a study will inform the following actions.
- Encouraging Economic Counsellors / Commercial Attachés within Romanian diplomatic missions (embassies and consulates) located in key markets to promote Romanian startups (e.g., specialized awareness-raising events involving high-quality Romanian entrepreneurs and key stakeholders from local startup ecosystems);
- Improving the reputation of Romanian startups through an annual showcase of leading firms and talent at global startup events;
- Domestic “export readiness” program for startups; and
- Piloting an international network of “landing pads”.

## POLICY RECOMMENDATION 10

# INCENTIVIZE INNOVATION TO FOSTER KNOWLEDGE SPILLOVERS INTO THE PRIVATE SECTOR



FOUNDATIONAL  
LONGTERM



TIME  
SENSITIVE



GOVERNMENT  
SUPPORT NEEDED



## RATIONALE

The recommendation, “Improve Entrepreneurship Education and strengthen the role of Universities in the ecosystem”, sought to stimulate the supply of innovation from public research. However, if this supply is not met with a corresponding demand from within the private sector, then it is unlikely to result in more innovations being brought to market. This recommendation therefore aims to encourage the demand side of innovation within the private sector, which is currently relatively weak in comparison with other European countries. This recommendation is not intended to address the wider gaps relating of technology adoption and non-R&D innovation which exist within Romania, which we recognize as important, but which are beyond the scope of this report.



## APPROACH

Various approaches to building linkages between research organizations and firms are being trialed in the World Bank’s “Supporting Innovation in Romanian Catching-up Regions” program, although most of the interventions piloted in that program are “supply-side” focused. We suggest that several activities can be taken now to stimulate the demand side of this technology transfer, including:

- Incentivizing R&D in early-stage firms;
- Encouraging Consortia for Collaborative Research;
- Establishing Knowledge Transfer Secondments; and
- Innovation Vouchers.

## POLICY RECOMMENDATION 11

## PROMOTE THE DIGITAL ECONOMY

FOUNDATIONAL  
LONGTERMTIME  
SENSITIVEGOVERNMENT  
SUPPORT NEEDED

## RATIONALE

Romania ranks 27th of 27 EU Member States in the 2021 edition of the Digital Economy and Society Index (DESI). While Romania ranks highly on connectivity (10th), it ranks lowly on most indicators measured by this index including:

- 25<sup>th</sup> on Integration of digital technology in businesses' activities which shows that 17 percent of SMEs sell online; and 33 percent of SMEs have at least a basic level of digital intensity; and
- 26<sup>th</sup> on human capital which shows that digital skills is low: 31 percent of individuals have basic digital skills (compared to EU average of 56 percent), 10 percent of individuals have above basic digital skills (compared to EU average of 31 percent); and 35 percent of individuals have at least basic software skills (compared to EU average of 58 percent); and 6 percent of firms offering ICT training.



## APPROACH

This recommendation is divided into three specific sub-categories.

- Category 1: Promoting e-commerce platforms
- Category 2: Increasing Digital Skills
- Category 3: Improving Managerial Skills<sup>62</sup>

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62. Recent studies (<https://voxeu.org/article/thriving-post-pandemic-economy>) highlight the importance of managerial practices for digitalization: firms that have better management practices are more prone to adopting digital technologies and do it faster.

## APPENDIX A

# SUBSECTOR LISTS

Appendix A provides the full list of 4-digit NACE<sup>63</sup> sectors used in the analysis of digital business, knowledge-intensive services, high-tech manufacturing, and light manufacturing in Chapter 2.

### A.1 DIGITAL BUSINESSES

NACE 4D	Description	NACE 4D	Description
4651	Wholesale of computers, computer peripheral equipment and software	5920	Sound recording and music publishing activities
4652	Wholesale of electronic and telecommunications equipment and parts	6110	Wired telecommunications activities
4741	Retail sale of computers, peripheral units and software in specialised stores	6120	Wireless telecommunications activities
4742	Retail sale of telecommunications equipment in specialised stores	6130	Satellite telecommunications activities
4743	Retail sale of audio and video equipment in specialised stores	6190	Other telecommunications activities
4763	Retail sale of music and video recordings in specialised stores	6201	Computer programming activities
4791	Retail sale via mail order houses or via Internet	6202	Computer consultancy activities
5821	Publishing of computer games	6203	Computer facilities management activities
5829	Other software publishing	6209	Other information technology and computer service activities
5911	Motion picture, video and television programme production activities	6311	Data processing, hosting and related activities
5912	Motion picture, video and television programme post-production activities	6312	Web portals
5913	Motion picture, video and television programme distribution activities	6391	News agency activities
		6399	Other information service activities n.e.c.
		9511	Repair of computers and peripheral equipment
		9512	Repair of communication equipment
		9521	Repair of consumer electronics

### A.2 KNOWLEDGE-INTENSIVE SERVICES

NACE 4D	Description	NACE 4D	Description
5811	Book publishing	7022	Business and other management consultancy activities
5812	Publishing of directories and mailing lists	7111	Architectural activities
5813	Publishing of newspapers	7112	Engineering activities and related technical consultancy
5814	Publishing of journals and periodicals	7120	Technical testing and analysis
5819	Other publishing activities	7211	Research and experimental development on biotechnology
6910	Legal activities	7219	Other research and experimental development on natural sciences and engineering
6920	Accounting, bookkeeping and auditing activities; tax consultancy	7220	Research and experimental development on social sciences and humanities
7010	Activities of head offices		
7021	Public relations and communication activities		

63. NACE stands for the Statistical Classification of Economic Activities in the European Community. The acronym comes from the French "nomenclature statistique des activités économiques dans la Communauté européenne."

NACE 4D	Description	NACE 4D	Description
7311	Advertising agencies	8559	Other education n.e.c.
7312	Media representation	8560	Educational support activities
7320	Market research and public opinion polling	8610	Hospital activities
7410	Specialised design activities	8621	General medical practice activities
7420	Photographic activities	8622	Specialist medical practice activities
7430	Translation and interpretation activities	8623	Dental practice activities
7490	Other professional, scientific and technical activities n.e.c.	8690	Other human health activities
7500	Veterinary activities	8710	Residential nursing care activities
8510	Pre-primary education	8720	Residential care activities for mental retardation, mental health and substance abuse
8520	Primary education	8730	Residential care activities for the elderly and disabled
8531	General secondary education	8790	Other residential care activities
8532	Technical and vocational secondary education	8810	Social work activities without accommodation for the elderly and disabled
8541	Post-secondary non-tertiary education	8891	Child day-care activities
8551	Sports and recreation education	8899	Other social work activities without accommodation n.e.c.
8552	Cultural education		
8553	Driving school activities		

### A.3 HIGH-TECHNOLOGY MANUFACTURING

NACE 4D	Description	NACE 4D	Description
1820	Reproduction of recorded media	2110	Manufacture of basic pharmaceutical products
1910	Manufacture of coke oven products	2120	Manufacture of pharmaceutical preparations
1920	Manufacture of refined petroleum products	2611	Manufacture of electronic components
2011	Manufacture of industrial gases	2612	Manufacture of loaded electronic boards
2012	Manufacture of dyes and pigments	2620	Manufacture of computers and peripheral equipment
2013	Manufacture of other inorganic basic chemicals	2630	Manufacture of communication equipment
2014	Manufacture of other organic basic chemicals	2640	Manufacture of consumer electronics
2015	Manufacture of fertilisers and nitrogen compounds	2651	Manufacture of instruments and appliances for measuring, testing and navigation
2016	Manufacture of plastics in primary forms	2652	Manufacture of watches and clocks
2017	Manufacture of synthetic rubber in primary forms	2660	Manufacture of irradiation, electromedical and electrotherapeutic equipment
2020	Manufacture of pesticides and other agrochemical products	2670	Manufacture of optical instruments and photographic equipment
2030	Manufacture of paints, varnishes and similar coatings, printing ink and mastics	2680	Manufacture of magnetic and optical media
2041	Manufacture of soap and detergents, cleaning and polishing preparations	2711	Manufacture of electric motors, generators and transformers
2042	Manufacture of perfumes and toilet preparations	2712	Manufacture of electricity distribution and control apparatus
2051	Manufacture of explosives	2720	Manufacture of batteries and accumulators
2052	Manufacture of glues	2731	Manufacture of fibre optic cables
2059	Manufacture of other chemical products n.e.c.	2732	Manufacture of other electronic and electric wires and cables
2060	Manufacture of man-made fibres		

NACE 4D	Description	NACE 4D	Description
2811	Manufacture of engines and turbines, except aircraft, vehicle and cycle engines	2893	Manufacture of machinery for food, beverage and tobacco processing
2812	Manufacture of fluid power equipment	2894	Manufacture of machinery for textile, apparel and leather production
2813	Manufacture of other pumps and compressors	2895	Manufacture of machinery for paper and paperboard production
2814	Manufacture of other taps and valves	2896	Manufacture of plastics and rubber machinery
2815	Manufacture of bearings, gears, gearing and driving elements	2899	Manufacture of other special-purpose machinery n.e.c.
2821	Manufacture of ovens, furnaces and furnace burners	2910	Manufacture of motor vehicles
2822	Manufacture of lifting and handling equipment	2931	Manufacture of electrical and electronic equipment for motor vehicles
2823	Manufacture of office machinery and equipment (except computers and peripheral equipment)	2932	Manufacture of other parts and accessories for motor vehicles
2824	Manufacture of power-driven hand tools	3011	Building of ships and floating structures
2825	Manufacture of non-domestic cooling and ventilation equipment	3012	Building of pleasure and sporting boats
2829	Manufacture of other general-purpose machinery n.e.c.	3020	Manufacture of railway locomotives and rolling stock
2830	Manufacture of agricultural and forestry machinery	3030	Manufacture of air and spacecraft and related machinery
2841	Manufacture of metal forming machinery	3040	Manufacture of military fighting vehicles
2849	Manufacture of other machine tools	3091	Manufacture of motorcycles
2891	Manufacture of machinery for metallurgy		
2892	Manufacture of machinery for mining, quarrying and construction		

#### A.4 LIGHT MANUFACTURING

NACE 4	Description	NACE 4	Description
1310	Preparation and spinning of textile fibres	1420	Manufacture of articles of fur
1320	Weaving of textiles	1431	Manufacture of knitted and crocheted hosiery
1330	Finishing of textiles	1439	Manufacture of other knitted and crocheted apparel
1391	Manufacture of knitted and crocheted fabrics	1511	Tanning and dressing of leather; dressing and dyeing of fur
1392	Manufacture of made-up textile articles, except apparel	1512	Manufacture of luggage, handbags and the like, saddlery and harness
1393	Manufacture of carpets and rugs	1520	Manufacture of footwear
1394	Manufacture of cordage, rope, twine and netting	1610	Sawmilling and planing of wood
1395	Manufacture of non-wovens and articles made from non-wovens, except apparel	1621	Manufacture of veneer sheets and wood-based panels
1396	Manufacture of other technical and industrial textiles	1623	Manufacture of other builders' carpentry and joinery
1399	Manufacture of other textiles n.e.c.	1624	Manufacture of wooden containers
1411	Manufacture of leather clothes	1629	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials
1412	Manufacture of workwear	1711	Manufacture of pulp
1413	Manufacture of other outerwear	1712	Manufacture of paper and paperboard
1414	Manufacture of underwear	1721	Manufacture of corrugated paper and paperboard and of containers of paper and paperboard
1419	Manufacture of other wearing apparel and accessories		

NACE 4	Description	NACE 4	Description
1722	Manufacture of household and sanitary goods and of toilet requisites	2443	Lead, zinc and tin production
1723	Manufacture of paper stationery	2444	Copper production
1724	Manufacture of wallpaper	2445	Other non-ferrous metal production
1729	Manufacture of other articles of paper and paperboard	2451	Casting of iron
2311	Manufacture of flat glass	2452	Casting of steel
2312	Shaping and processing of flat glass	2453	Casting of light metals
2313	Manufacture of hollow glass	2454	Casting of other non-ferrous metals
2314	Manufacture of glass fibres	2511	Manufacture of metal structures and parts of structures
2319	Manufacture and processing of other glass, including technical glassware	2512	Manufacture of doors and windows of metal
2320	Manufacture of refractory products	2521	Manufacture of central heating radiators and boilers
2331	Manufacture of ceramic tiles and flags	2529	Manufacture of other tanks, reservoirs and containers of metal
2332	Manufacture of bricks, tiles and construction products, in baked clay	2530	Manufacture of steam generators, except central heating hot water boilers
2341	Manufacture of ceramic household and ornamental articles	2540	Manufacture of weapons and ammunition
2342		2550	Forging, pressing, stamping and roll-forming of metal; powder metallurgy
2343	Manufacture of ceramic insulators and insulating fittings	2561	Treatment and coating of metals
2344		2562	Machining
2349		2571	Manufacture of cutlery
2410	Manufacture of basic iron and steel and of ferro-alloys	2572	Manufacture of locks and hinges
2420	Manufacture of tubes, pipes, hollow profiles and related fittings, of steel	2573	Manufacture of tools
2431	Cold drawing of bars	2591	Manufacture of steel drums and similar containers
2432	Cold rolling of narrow strip	2592	Manufacture of light metal packaging
2434	Cold drawing of wire	2593	Manufacture of wire products, chain and springs
2441	Precious metals production	2594	Manufacture of fasteners and screw machine products
2442	Aluminium production	2599	Manufacture of other fabricated metal products n.e.c.

## APPENDIX B

# METHODOLOGY OF THE ENTREPRENEURSHIP ENABLER SURVEY

**The entrepreneurship ecosystem mapping of enabler organizations was assessed through a survey.** The questionnaire targeted organizations that support entrepreneurship, beyond public agencies (although still including nongovernmental organizations which may have received public support). Such organizations—which include incubators, accelerators, and industry associations—are referred to as enablers or intermediary organizations. As a first step, a list of relevant Romanian enablers was identified. Several World Bank Group projects and initiatives were consulted to compile the list for the questionnaires, and feedback from local staff and consultants was also incorporated.

**Programs that clearly identify supporting entrepreneurship were included in the sample.** Overall, 488 enabler organizations supporting entrepreneurship were identified as the universe of interest for this analysis and the sample (53 organizations were contacted based on their relevance). The response rate for the survey was 60 percent (table B.1).

**Most of these intermediary organizations are relatively new.** Most of the intermediary organizations began supporting entrepreneurship in 2012 and 2013, with an increase of enablers during the last four years. About 96 percent of surveyed enablers started to function after 2010 (table B.2). Although these numbers do not imply causality, they are consistent with the possibility that a new regulatory environment post-2012 may have facilitated the expansion of the ecosystem supporting entrepreneurship and MSMEs (for example, institutions and programs providing financial services). Even if that was not the case, it is important to highlight that most of these institutions and programs were implemented in a relatively new regulatory environment.

**The survey was conducted online and by phone the first months of 2021.** A focal point in each organization was identified and was approached by project team members over the phone to introduce the survey. Following this, an official email containing a link to the survey was shared with the focal point. The respondents were given two weeks to complete the questionnaire, during which project team members also reached out to them by phone to ensure timely completion of the surveys. In situations where questionnaires were not completed sufficiently on the first attempt, an additional attempt was undertaken to gather information from an alternative respondent. The study methodology was adapted to the Romanian context. Implementation had to be compliant with COVID-19 government protocols, which led to the decision to use computer-assisted web interviewing (CAWI) and computer-assisted telephone interviewing (CATI) to replace face to face interviews, as initially planned by the team.

**TABLE B.1** Sample and Response Rates

Indicator	Intermediary Organizations (Q2)
Number of mapped IOs	488
Number of contacted IOs	53
Total responses	32
Response rate	60 percent

Source: World Bank Romania Entrepreneurship Ecosystem Mapping 2021.  
Note: IOs = intermediary organizations; Q2 = second quarter.

**TABLE B.2** Distribution of Enablers by Implementation Period

Program Implementation Period	IOs
Pre-2010	3.1%
2010–15	43.8%
2016–21	53.1%

Source: World Bank Romania Entrepreneurship Ecosystem Mapping 2021.  
Note: IOs = intermediary organizations.

## APPENDIX C

# THE WORLD BANK ROMANIA STARTUP SURVEY

### C.1 FIRST POPULATION: TECH STARTUP (DOMESTIC REGISTRY)

The first population used is called Tech Startup. This is a subset of companies that are part of the Romanian Business Registry. This subset comprises all the firm in Romania, which are under five years of existence and classified as digital (computer programming and software development, and other digital) and high technology manufacturing. Those firms are group geographically in the following regions: Bucharest, Cluj, Brasov and Others.

This dataset has a total number of 24,502 firms, from which a random sample of 500 firms was identified for applying the survey. This sampling was stratified by region and by sector. The adjusted population and full sample design can be found in table C.1 and table C.2.

**TABLE C.1** Adjusted Population

	Computer progr., IT, software	Other Digital	High-tech Manuf	Total
Bucharest	4,481	5,115	234	9,830
Cluj	1,333	645	82	2,060
Brasov	418	333	52	803
Others	5,545	5,382	882	11,809
<b>Total</b>	<b>11,777</b>	<b>11,475</b>	<b>1,250</b>	<b>24,502</b>
	48%	47%	5%	

Note: The total number of firms is: 24,502. IT = information technology; Manuf = manufacturing; progr. = programming.

**TABLE C.2** Full Sample Design

	Computer progr., IT, software	Other Digital	High-tech Manuf	Total
Bucharest	46	59	25	130
Cluj	46	33	41	120
Brasov	43	41	26	110
Others	58	54	28	140
<b>Total</b>	<b>193</b>	<b>187</b>	<b>120</b>	<b>500</b>

Note: IT = information technology; Manuf = manufacturing; progr. = programming.

To get a representative sample of these datasets, the firms were grouped by region (Bucharest, Cluj, Brasov and others) and by industry (computer programming, high-tech manufacturing and other digital). Within each group (cell) the order of firms was randomized and was extracted representative samples for every cell. The final list was split in different ordered batches. Each batch contained 500 firms and it was handed to Metro Media Transilvania (MMT)<sup>64</sup> to conduct the surveys in three months.

MMT used 6 batches of firms, there was a response rate close to 18 percent, and 542 responses were obtained. The sample obtained was verified and was in line with the sample design. All the results were weighted, and the findings are summarized in table C.3.

64. A Romanian company with more than 20 years of experience in conduction surveys, opinion pools or audience studies.



**TABLE C.3** Final Results Obtained

	Computer progr., IT, software	Other Digital	High-tech Manuf	Total
Bucharest	47	69	27	143
Cluj	68	41	14	123
Brasov	48	53	13	114
Others	55	57	50	162
Total	218	220	104	542

Note: IT = information technology; Manuf = manufacturing; progr. = programming.

## C.2 SECOND POPULATION: PITCHBOOK AND CB INSIGHTS (HIGH-POTENTIAL)

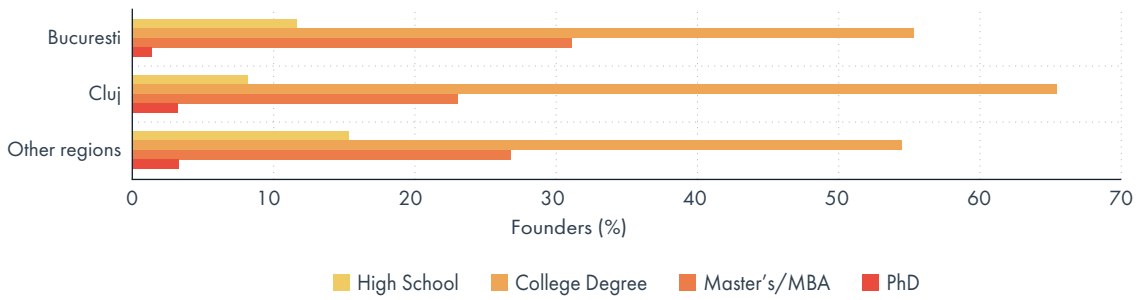
The *PitchBook/CB Insights* data contains all the firms that are registered in the PitchBook and CB Insights dataset and are labeled as Romanian. These firms are not classified by region and are not digital only. Also, these firms might be older than 5 years old. The total universe of firms in this dataset is 448 and using a matching algorithm, with human support, it was found that 130 firms match the Romanian Business Registry with a 100 percent of certainty and 26 firms matched with a certainty of 90 percent. Only 30 of all the matching firms are contained in the *Lista Firme* dataset. Due to the small population of firms, a sample of 200 firms randomized sample was selected. 105 responses were obtained. Table C.4 shows the composition of firms identified in the PitchBook and CB Insights lists.

**TABLE C.4** International List Composition

Sector	NACE 2	Total	Total Digital	Share DIGITAL
Computer programming, consultancy and related ...	62	49	49	100
Information service activities	63	19	19	100
Publishing activities	58	12	12	100
Retail trade, except of motor vehicles and mot...	47	6	3	50
Wholesale trade, except of motor vehicles and ...	46	5	1	20
Advertising and market research	73	5	0	0
Activities of head offices; management consult...	70	4	0	0
Office administrative, office support and othe...	82	3	0	0
Manufacture of food products	10	3	0	0
Human health activities	86	2	0	0
Land transport and transport via pipelines	49	2	0	0
Employment activities	78	2	0	0
Other professional, scientific and technical a...	74	2	0	0
Printing and reproduction of recorded media	18	2	0	0
Architectural and engineering activities; tech...	71	2	0	0
Scientific research and development	72	2	0	0
Telecommunications	61	2	2	100
Manufacture of computer, electronic and optica...	26	1	0	0
Food and beverage service activities	56	1	0	0
Manufacture of machinery and equipment n.e.c.	28	1	0	0

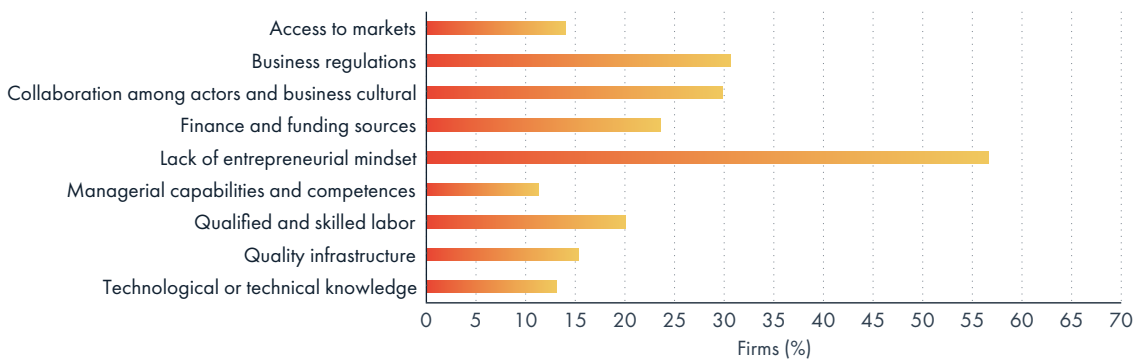
### C.3 ADDITIONAL FINDINGS

**FIGURE C.1** Founders' Highest Degree/Level of Education by County (Tech Startup Sample)

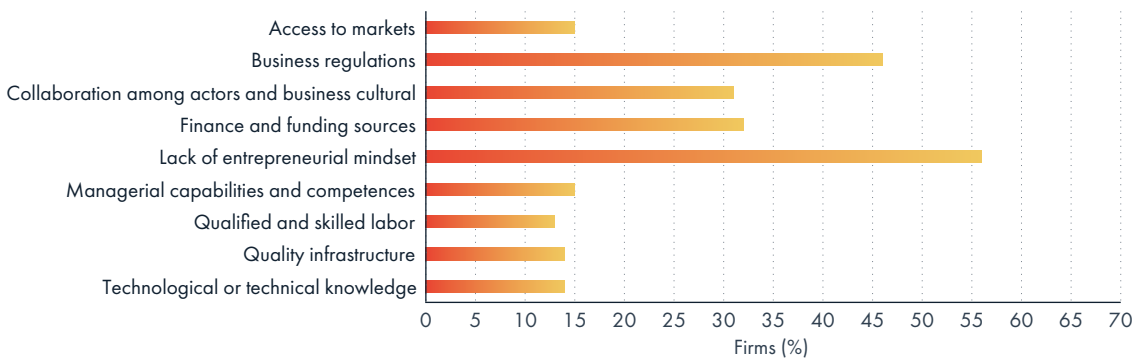


### C.4 OBSTACLES BY COUNTIES

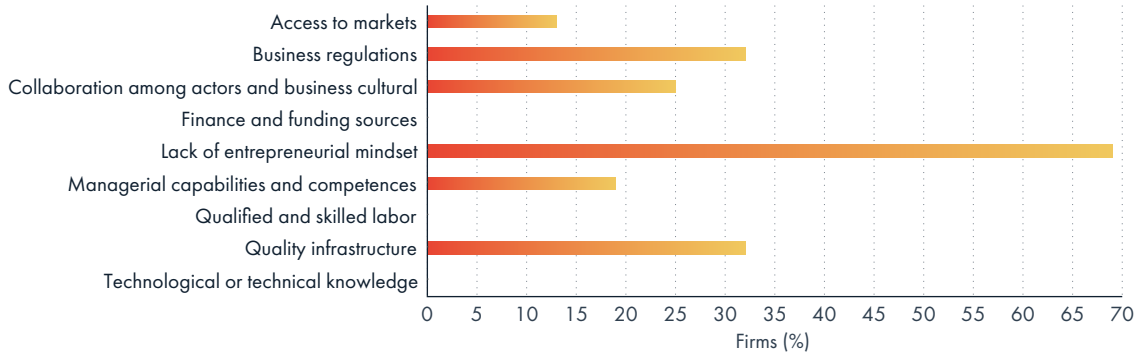
**FIGURE C.2** Bucharest



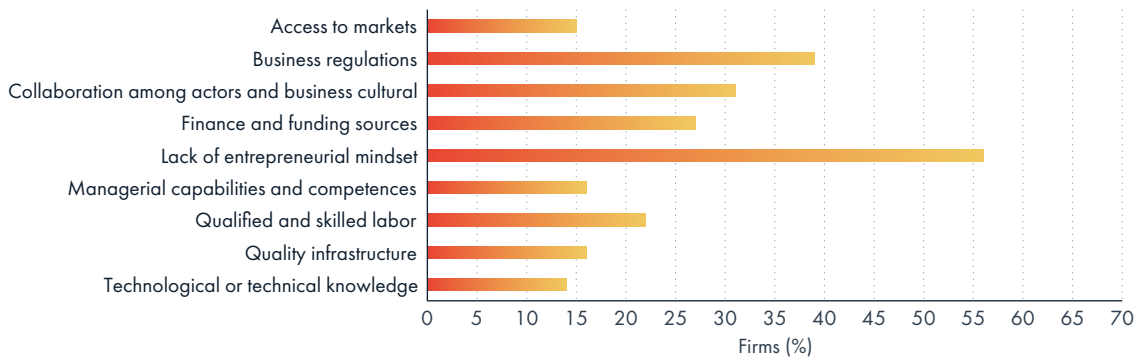
**FIGURE C.3** Cluj



**FIGURE C.4 Iasi**



**FIGURE C.5 Other Regions**



## APPENDIX D

# ENTREPRENEURSHIP PILLARS BY REGION

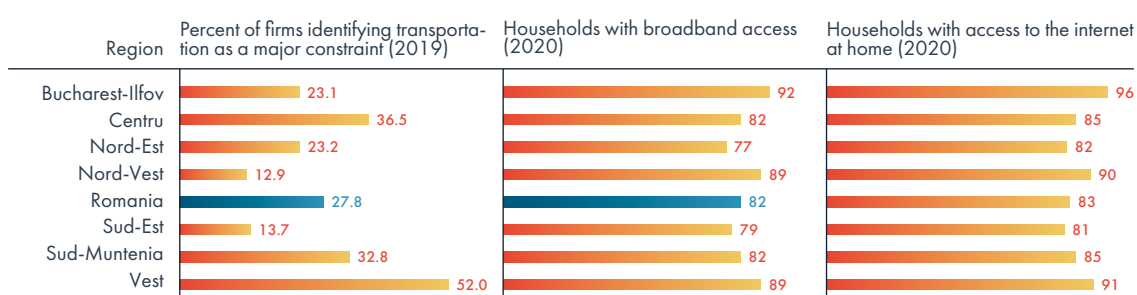
### D.1 SUPPLY FACTORS ACROSS REGIONS

#### Physical Capital and Infrastructure

**Information technology is a key factor for the development of entrepreneurship.** According to Eurostats 2020, Bucuresti/Ifov (96 percent), Nord-Vest (90 percent) and Vest (91 percent) have the highest population that have access to the Internet at home and broadband access. The rest of the regions access between 80 and 90 percent.

**Access to mobility is also a key characteristic of successful entrepreneurship ecosystems.** According to the World Bank Group Entrepreneurship Survey (2020), firms in the Nord-Vest (12.9 percent), Sud-Est (13.7 percent) and Bucharesti-Ifov (23.1 percent) regions considered that transportation is not a major constraint for their business (figure D.1). On the other hand, the Vest (52 percent) and Centru (36.5 percent) and Sud-Muntenia (32.8 percent) regions reported that transportation is one of their major constraints for businesses.

**FIGURE D.1** Physical Capital and Infrastructure by Region

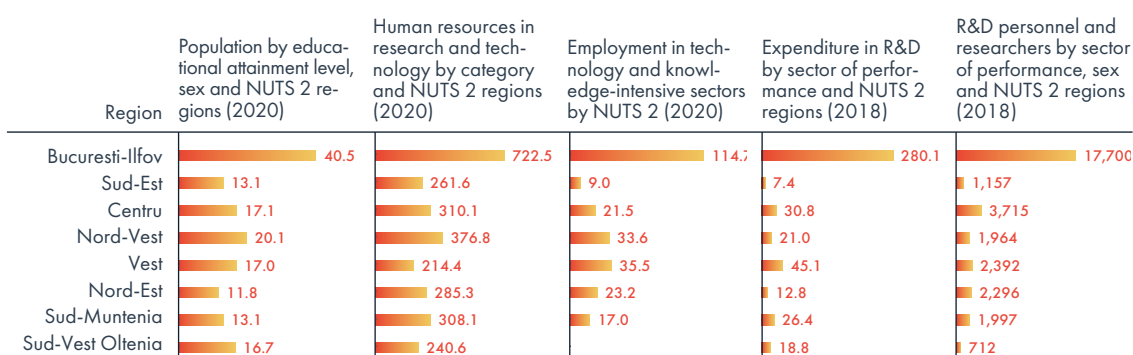


Source: Eurostats 2020; World Bank Enterprise Survey 2019.

#### Human and Knowledge Capital

**Human capital is mainly concentrated in Bucuresti-Ifov.** According to Eurostats 2020, the Bucuresti/Ifov region has the population with the highest level of education in the country (40.5 percent), followed by the Nord-Vest (20.1 percent) and Centru (17.1 percent) regions (figure D.2). Similarly, the Bucuresti/Ifov region has the highest concentration of human capital working on research and technology, and the highest number of R&D personnel

**FIGURE D.2** Human Capital by Region



Source: EUROSTATS 2020

Note: NUTS = Nomenclature of Territorial Units for Statistics (from the French "Nomenclature des unités territoriales statistiques").

and researchers in comparison to the rest of the country. Bucuresti-Ilfov also has the highest R&D expenditure in the country (€280.1 per inhabitant); the second highest expenditure is in the Vest region (€35.5 per inhabitant). This concentration of human capital in Bucuresti-Ilfov is a key factor for the development of knowledge-intensive activities in this region and explains why all the analyzed ecosystems clustered here.

**However, firms report that an inadequately educated workforce is a major constraint.** According to the World Bank Enterprise Survey (2020), firms in Bucuresti-Ilfov (63.2 percent), Centru (53.2 percent) and Vest (51.4 percent) identified an inadequately educated workforce as a major constraint on their businesses, followed by firms in Sud-Est (39.4 percent), Nord-Est (38.8 percent), Nord-Vest (29.6 percent) and Sud-Muntenia (24.6 percent). This means that, despite having a highly educated workforce in these regions, the educated workforce is still not sufficient for the growth of innovative firms.

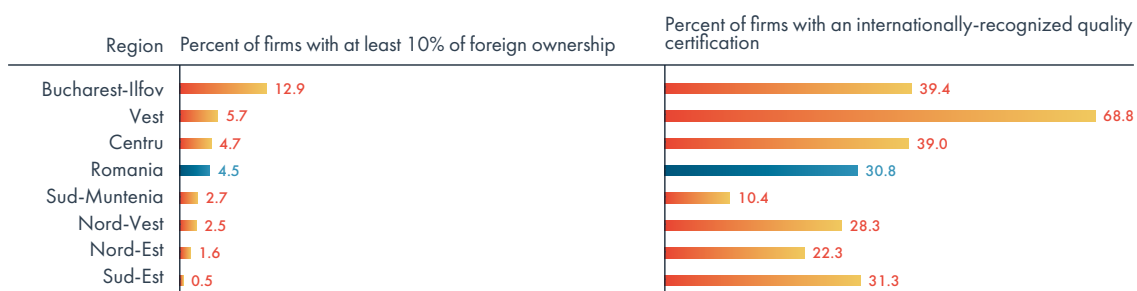
**Top management experience is also unevenly distributed.** The Sud-Est, Nord-Est and Centru regions reported that the top managers have the greatest number of years working in the firm's sector (22 years on average). Top managers in Sud-Muntenia, Vest, and Bucuresti-Ilfov have the fewest years in the sector (17 years on average).

## D.2 DEMAND FACTORS ACROSS REGIONS

### Firm Capabilities

**Foreign ownership signals the international focus of firms, and this is a source of non-endogamic knowledge.** Bucharest-Ilfov has the highest concentration of firms with at least 10 percent of foreign ownership (12.9 percent), followed by Vest (5.7 percent) and Centru (4.7) (figure D.3). The lowest share of companies with foreign ownership is in the Nord-Est and Sud-Est regions. Additionally, the Vest region has the highest percent of firms with an internationally recognized quality certification (68.8 percent), followed by the Bucuresti-Ilfov (39.4 percent) and Centru (39 percent) regions. Sud-Muntenia has the lowest percent of these kind of firms (10.4 percent). It is important to notice that the regions that have high-potential ecosystems are among the regions that have more international connections.

**FIGURE D.3** Firm Characteristics by Region



Source: World Bank Enterprise Survey 2019.

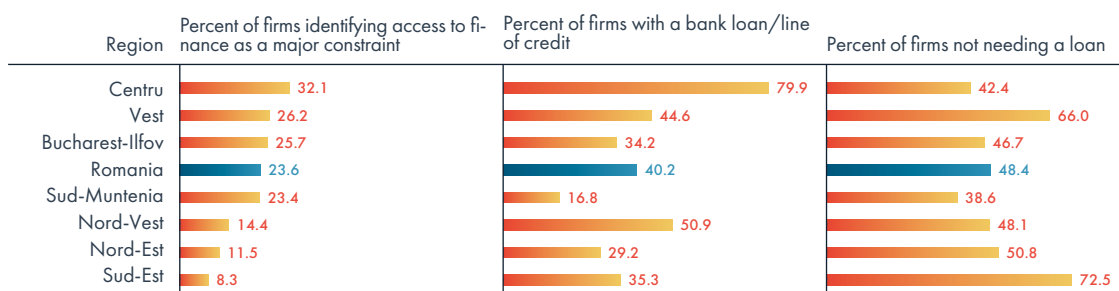
## D.3 BARRIERS TO ALLOCATION AND ACCUMULATION

### Access to Finance

**Regions with important ecosystems recognize that finance is a major constraint, and they need different sources of funding than the traditional ones in the country.** Firms in the Centru region identified that access to finance as a major constraint for the development of their businesses (32.1 percent), followed by Vest (26.2 percent) and Bucuresti-Ilfov region (25.7 percent) (figure D.4). On the other hand, Sud-Est and Nord-Est regional are the regions that expressed that finance is not a major constraint. Additionally, in the Sud-Est and Vest regions, a

high share of firms reported that they do not need a loan (72.5 percent and 66.0 percent, respectively). Fewer firms in Bucharest-Ilfov, Centru, and Sud-Muntenia reported needing loans (46.7 percent, 42.4 percent and 38.6 percent, respectively). Finally, in terms of access to finance, 79.9 percent of firms in Centru reported that they have a bank loan / line of credit, followed by Nord-Vest (50.9 percent), and Vest (44.6 percent). It is important to notice that most of startup funding comes from personal or family savings in Romania.

**FIGURE D.4** Access to Finance by Region



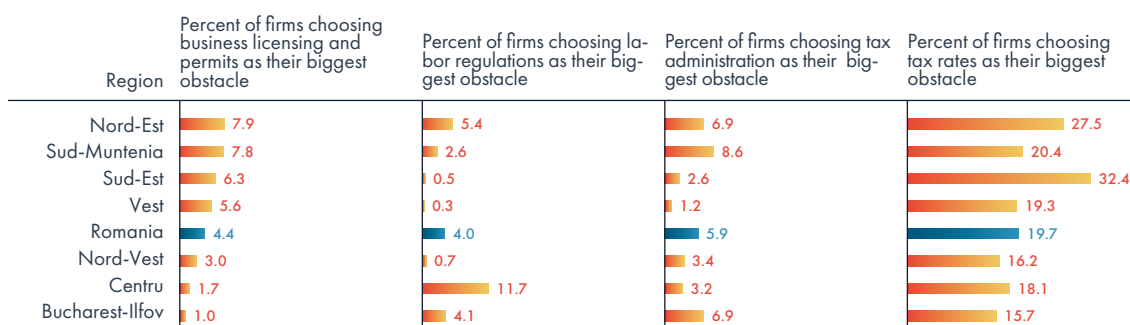
Source: World Bank Enterprise Survey 2019.

## Regulations

### Firms in different regions perceive licensing and permits, labor regulations, and tax rates to be obstacles.

Overall, few firms in Bucuresti-Ilfov (1 percent), Centru (1.7 percent) and Nord-Vest (3 percent) regions report that business licensing and permits are their biggest obstacle (figure D.5). On the contrary, forms in Nord-Est and Sud-Muntenia (7.9 percent) think that licensing and permits are obstacles for their businesses. Moreover, firms in the Centru region pointed out that labor regulation is one of their biggest obstacles (11.7 percent), followed by Nord-Est (5.4 percent) and Bucuresti-Ilfov (4.1 percent). On the contrary, firms in Nord-Vest, Sud-Est, and Vest do not consider labor regulation as a key constraint for their businesses. The Sud-Muntenia (8.6 percent), Nord-Est (6.9 percent) and Bucharest-Ilfov (6.9 percent) regions explained that tax administration is their biggest obstacle for entrepreneurship. Moreover, Sud-Est (32.4 percent), Nord-Est (27.5 percent), and Sud-Muntenia (20.4) reported tax rates as an obstacle for entrepreneurship. And to a lesser extent, Vest (19.3 percent), Centru (19.3 percent), Nord-Vest (16.2 percent), and Bucuresti-Ilfov (15.7 percent) think this is true.

**FIGURE D.5** Regulations and Taxes by Region



Source: World Bank Enterprise Survey 2019.

## APPENDIX E

# THE CONNECTEDNESS ANALYSIS

The nodes of the network represent the individual entities in the ecosystem (startups, investors, accelerators/incubators, mentors) and the edges (links) are the relationships that exists between them.

### E.1 NETWORK MEASURES

Calculating the centrality measures in this network builds understanding of which are the most important players in the ecosystem. In this analysis, three centrality measures were used:

*Degree centrality* measures the number of other nodes within the ecosystem to which each node is directly connected. It does not consider any second-order connections.

*Eigenvector centrality* measures the number of other nodes that are connected directly to the node but considers how well connected the other nodes are. In other words, the importance of a given node is based on the importance of the other nodes that are associated with it.

*Modularity* is a measure of the structure of the network. This uses an optimization method that measures the strength of the division of the network into modules (groups, clusters, or communities). Based on these strengths, it detects community structures.

### E.2 RAW RESULTS

**TABLE E.1** Raw Results

Entities	Type	Degree	Eigencentality
Acertivo	Startup	10	1.00
Politehnica University of Bucharest	University	13	0.96
University of Bucharest	University	12	0.89
Babeş-Bolyai University	University	12	0.82
InnovX	Accel/Incub	11	0.73
Techcelerator	Accel/Incub	10	0.68
StepFWD	Accel/Incub	8	0.59
AMSIMCEL SRL	Startup	9	0.58
Innovation Labs	Accel/Incub	9	0.57
Academia de Studii Economice din Bucuresti	University	9	0.56
Cyscale	Startup	5	0.50
Avoteca	Startup	7	0.47
Synovius	Startup	8	0.47
Commons Accel	Accel/Incub	7	0.43
Repsmate	Startup	6	0.43
Investory	Startup	5	0.43
Sitter.ro	Startup	7	0.42
formuladb	Startup	4	0.42

Entities	Type	Degree	Eigencentrality
Vestinda	Startup	7	0.39
Synaptiq	Startup	6	0.37
Weddplanner	Startup	3	0.37
Masterisk Ltd.	Startup	5	0.37
I'm Fine	Startup	7	0.37
ESX Intel World SRL	Startup	6	0.35
Exigo	Startup	3	0.34
HiringDNA	Startup	3	0.34
feexers	Startup	8	0.34
Allevo	Startup	2	0.34
Smart Rides	Startup	8	0.33
HowToWeb	Accel/Incub	4	0.32

### E.3 PLAYERS PER CLUSTER

**TABLE E.2** Cluster 0

Name	Type	Eigencentrality
Universitatea Tehnica Cluj-Napoca	University	0.163431
Universitatea Gh. Asachi Iasi	University	0.098808
Heidelberg University	University	0.077936
RubikEdu	Accelerator	0.077936
German Cancer Research Center	Mentor	0.077936
Ionut Patrahau	Mentor	0.064622
Oana Craioveanu	Mentor	0.064622
Seedblik	Mentor	0.064622
University of York	University	0.062739
Vlad Gliga	Mentor	0.062739
Ovidiu Ratiu	Investor	0.054467
Razvan Sima	Investor	0.054467
Voicu Oprean	Investor	0.054467
InnoEnergy	Accelerator	0.054467
Lucian Blaga	Mentor	0.048427

**TABLE E.3** Cluster 1

Name	Type	Eigencentrality
National School of Political and Administrative Studies	University	0.314432
Maastricht School of Management	University	0.192791
Quantic School of Business and Technology	University	0.192791
Radu Atanasiu	Mentor	0.192791
AgTech TM	Accelerator	0.098039
CMT Association NY	University	0.0804
Pilkington Ratiu Business School	University	0.0804
Vienna Business Summer School	Accelerator	0.0804



Name	Type	Eigencentrality
Elevator Lab	Accelerator	0.0804
Cristian Herghelegiu	Mentor	0.0804
University of California Berkeley	University	0.052044
Netopia	Investor	0.052044
YC Startup School	Accelerator	0.052044
Romanian Academy National Institute for Economic Research	University	0.052025
University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca	University	0.052025

**TABLE E.4** Cluster 2

Name	Type	Eigencentrality
Founder Institute	Accelerator	0.133079
Mihai Guran	Mentor	0.088591
Orange Fab	Accelerator	0.087859
Fortech	Investor	0.085812
Early Game Ventures	Mentor	0.085812
Cristian Onetiu	Mentor	0.072929
Marius Ghenea	Mentor	0.072929
Raju Sharma	Mentor	0.072929
Entrepreneurship Academy	University	0.072658
Ion Mincu University of Architecture and Urbanism	University	0.072658
University of St. Gallen	University	0.072658
Mihai Bonca	Mentor	0.072658
University of Nuertingen	University	0.055156
Irina Ianculescu	Mentor	0.055156
Techangels	Accelerator	0.049804

**TABLE E.5** Cluster 3

Name	Type	Eigencentrality
HowToWeb	Accelerator	0.31838
Future Makers	Investor	0.286402
University of Iasi	University	0.16302
École Supérieure d'Electricité	University	0.117127
Dan Adamescu	Mentor	0.117127
Gil Goldbaum	Mentor	0.117127
Jean Michel Akre	Mentor	0.117127
Idea jum	Accelerator	0.097497
Hackaton Innovation Labs	Accelerator	0.097497
Hackathon for health	Accelerator	0.097497
Bogdan Litescu	Mentor	0.097497
Social Impact Award	Accelerator	0.077142
HV Labs	Accelerator	0.077142
Ion Gheorghe Petrovai	Mentor	0.077142
Tony Kypreos	Mentor	0.077142

**TABLE E.6** Cluster 4

Name	Type	Eigencentrality
Romanian Academy	University	0.088298
Bucharest.ai	Accelerator	0.088298
GCG Consulting	Mentor	0.088298
Iuliu Hațieganu University of Medicine and Pharmacy	University	0.082514
EIT Health	Accelerator	0.068263
MVP Academy	Accelerator	0.067898
V7 Capital	Investor	0.067338
The Entrepreneurship Academy, Romania	University	0.057986
Ioana Marcu	Investor	0.057986
Tengo Office SRL	Investor	0.057986
Startarium	Accelerator	0.053714
Romanian Business Leaders	Mentor	0.045144
University of Liverpool	University	0.036484
University of Kent	University	0.036484
Technical Institute Cluj-Napoca	University	0.034142

**TABLE E.7** Cluster 7

Name	Type	Eigencentrality
Growceanu	Investor	0.134938
West University of Timisoara	University	0.105596
Universidade NOVA de Lisboa	University	0.096919
Université de technologie de Belfort Montbéliard	University	0.096919
University of Fribourg	University	0.096919
Diaspora Restart	investor	0.096919
Nicolaescu	Investor	0.08897
Marketing University	University	0.038787
Logic Industry	Mentor	0.021443
tbf.ro	Mentor	0.021443
Universitatea Maritimă din Constanța	University	0.021443
Razvan Ziemba	Mentor	0.021443
Ștefan cel Mare University of Suceava	University	0.018401
INSEAD	University	0.016626
Smart Ageing Prize	Accelerator	0.016626

**TABLE E.8** Cluster 15

Name	Type	Eigencentrality
Open University	University	0.14929
Google for Startups	Accelerator	0.14704
Malin Stefanescu	Mentor	0.118788
Andrei Pitiș	Mentor	0.100896

Name	Type	Eigencentrality
Institute National Polytechnique de Toulouse	University	0.074908
Romanian-American University	University	0.074908
Berlin School of Creative Leadership	University	0.074381
Technical University of Civil Engineering Bucharest	University	0.074381
University of Washington	University	0.074381
Newchip Accelerator	Accelerator	0.074381
Universitatea Politehnica Timisoara	University	0.063713
Paolo Ertreo	Mentor	0.036453
Climate KIC	Accelerator	0.026515
Bogdan Iordache	Mentor	0.026515
Dan Bugariu	Mentor	0.026515

## APPENDIX F

# GLOSSARY OF KEY CONCEPTS

**Access to Finance:** In the context of this white paper, access to finance refers to the availability and accessibility of appropriate funding mechanisms for entrepreneurs and firms. Types of financial instruments include loans from commercial banks, grants, financing from angel investors/networks, and private equity/VC funding. Access to finance is indicated by many sources as an important enabler of entrepreneurship, with firm growth often constrained by the availability of funding. Finance needs to be available throughout the country in sufficient quantities, in different forms, and with sufficient risk-appetite from the financier.

**Access to Markets:** Also referred to as “market access,” this refers to the ability of a company or country to sell goods and services within and across borders. Market access can be used to refer to domestic trade as well as international trade, although the latter is the most common context.

**Agglomeration economies:** This refers to the benefits that come when firms and people locate near one another together in cities and industrial clusters. It is mostly associated with transport cost savings, which facilitates the exchange of goods, services, and ideas. In this report, the term “agglomeration” is used to identify concentration of firms in a geographic location.

**Culture:** This refers to social norms, perceptions, and attitudes that influence an individual or society. Culture matters for entrepreneurship since evidence suggests that entrepreneurial attitudes are shaped by culture to some degree. Entrepreneurial activity at a country level is strongly correlated with positive perceptions of entrepreneurship and entrepreneurial opportunities. Moreover, there is evidence that exposure to innovation substantially increases the chances that children become inventors, and that the presence of visible role models of entrepreneurs may influence a person’s decision to becoming one, indicating that social factors matter.

**Digital Platforms:** This refers to an online channel that creates value through facilitating exchanges between two or more interdependent groups.

**E-Commerce:** This refers to the buying and selling of goods over the Internet. It can be a substitute for ‘brick and mortar’ stores, but some businesses maintain both.

**Entrepreneurship:** This refers to the activity of setting up a business or businesses. Specific to this white paper, we will focus on a subset of entrepreneurs starting growth-oriented innovative firms. High growth-firms aim to create large, vibrant businesses that grow rapidly, much beyond an individual’s subsistence needs, and intends to create significant income and jobs for others<sup>65</sup>. Throughout this paper, the terms “high growth firm” and “high growth entrepreneur” are used interchangeably.

**Entrepreneurship Ecosystem:** This refers to a system of interconnected and interdependent actors and resources that directly and indirectly support the creation and growth of new ventures. Ecosystems also refer to a physical environment whose development and growth are catalyzed by social and economic factors, for example, Silicon Valley, which is renowned for its startups that turn into international technology giants such as Apple, Google, PayPal, and much more.

**Human Capital:** This refers to the availability of skills necessary to support growth entrepreneurship. This includes, but is not limited to, managerial skills and technical skills (such as advanced digital skills). Skilled talent is a critical input for high growth firms. Skills shortages pose a great challenge to the innovative potential of the entrepreneurship ecosystem.

**Infrastructure:** This refers to the fundamental facilities and systems that facilitates connectivity; trade; the exchanges of goods, services, and ideas; and knowledge spillovers. By improving connectivity in physical realms

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65. Schoar, 2009.

(better roads, trains, general transport), we facilitate connectedness between stakeholders. By providing Internet access and ability to use it, we open new opportunities for entrepreneurs and future markets. By creating more enablers, such as providing more space for research and development (R&D) and entrepreneurs, we create a denser network and a more robust innovation ecosystem.

**Mature (SME/startup):** This refers to firms that have reached post-expansion/post-growth stages and are in their consolidation phase.

**Research & Development & Innovation:** This refers to the set of activities undertaken by corporations, governments, universities, or other actors to develop new products or services and improve existing ones. Innovation requires conscious effort to develop new ideas for products and processes.

**Regulatory Framework:** In the context of this report, “regulatory framework” refers to laws, regulations, policies, decrees, and executive orders developed and officially approved by the government to regulate the business environment, particularly related to startups. The regulatory environment can significantly help or hinder startups. Startups have numerous interactions with the state, from the initial process of company formation, to hiring or dismissing employees, obtaining permits, and resolving insolvency. Evidence suggests that the lighter the administrative burden of the processes, the more readily startups can form and scale.

**Scale-ups:** This refers to the stage where an idea is already commercialized and is being scaled up for growth and expansion, often requiring financing by debt or equity.

**SMEs:** This report adopts the European Commission definition,<sup>66</sup> which is based on two factors: (1) staff headcount and (2) either turnover or balance sheet totals.<sup>67</sup> It further qualifies the definition of SMEs based on age of firm. See Chapter 3 for additional details.

Company category	Staff headcount	Turnover	-OR-	Balance sheet total
Medium-sized	< 250	≤ €50M		≤ €43M
Small	< 50	≤ €10M		≤ €10M
Micro	< 10	≤ €2M		≤ €2M

**Startups:** This refers to enterprises typically under 5 years old where an idea already has gone through prototyping or is in the pre-commercial/commercial stages.

**Support Programs:** This refers to programs or instruments, implemented by public or private sector actors, that stimulate and/or support innovation and entrepreneurship. Support programs may take many different forms, including provision of financial, infrastructure or technical support, such as advice and mentorship. Other programs (such as accelerators or “startup hubs”) may be specifically intended to signpost or coordinate multiple activities or provide multiple services.

66. For additional information, visit: [https://ec.europa.eu/growth/smes/sme-definition\\_en](https://ec.europa.eu/growth/smes/sme-definition_en)

67. These ceilings apply to the figures for individual firms only. A firm that is part of a larger group may need to include staff headcount/turnover/balance sheet data from that group too.

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