


**International Journal of Innovative Technologies in Economy**

e-ISSN: 2414-1305

**Operating Publisher**
**SciFormat Publishing Inc.**
ISNI: 0000 0005 1449 8214

2734 17 Avenue SW,
Calgary, Alberta, T3E0A7,
Canada
+15878858911
editorial-office@sciformat.ca

| | |
|---|---|
| **ARTICLE TITLE** | WHICH COUNTRIES COULD BECOME EASTERN EUROPE'S "SILICON VALLEY"? A COMPARATIVE STUDY OF INNOVATION ECOSYSTEMS IN POLAND, ESTONIA, CZECHIA, AND ROMANIA |
| **DOI** | https://doi.org/10.31435/ijite.4(56).2026.5984 |
| **RECEIVED** | 28 July 2026 |
| **ACCEPTED** | 30 September 2026 |
| **PUBLISHED** | 14 October 2026 |
| **LICENSE** | The article is licensed under a **Creative Commons Attribution 4.0 International License.** |

© The author(s) 2026.
This article is published as open access under the Creative Commons Attribution 4.0 International License (CC BY 4.0), allowing the author to retain copyright. The CC BY 4.0 License permits the content to be copied, adapted, displayed, distributed, republished, or reused for any purpose, including adaptation and commercial use, as long as proper attribution is provided.

# WHICH COUNTRIES COULD BECOME EASTERN EUROPE'S "SILICON VALLEY"? A COMPARATIVE STUDY OF INNOVATION ECOSYSTEMS IN POLAND, ESTONIA, CZECHIA, AND ROMANIA

***Ramil Baylarov*** *(Corresponding Author, Email: ramil.baylarov.edu@outlook.com)*
*PhD Candidate in Economics and Business Sciences, Universidad Rey Juan Carlos (URJC), Madrid, Spain*
*ORCID ID: 0000-0001-9086-7393*

**ABSTRACT**

This study examines the potential for the emergence of a Silicon Valley-style innovation ecosystem in Central and Eastern Europe through a comparative analysis of Poland, Estonia, Czechia, and Romania. Rather than relying on a single indicator or attempting to establish a definitive national ranking, the study adopts a multidimensional perspective that considers institutional quality, research and development capacity, human capital, higher education, tax competitiveness, foreign investment, and geographical and economic conditions. The research employs a theoretical and comparative design based on a review of relevant academic literature and secondary information from international and institutional sources. The comparison highlights distinct development profiles among the selected countries: Estonia demonstrates strengths in institutional quality and innovation performance, Czechia has a strong research and development base, and Poland benefits from its market size and strategic economic position. Romania provides an additional perspective on the opportunities and constraints facing innovation development in the region. The study argues that a Silicon Valley-style ecosystem cannot be explained by any single policy or economic indicator. Instead, its development depends on the interaction of institutions, knowledge creation, skilled human capital, entrepreneurial activity, investment conditions, and the commercialisation of innovation. The findings should be interpreted as a qualitative comparative assessment rather than a causal or exhaustive ranking of national innovation systems.

**KEYWORDS**

Innovation Ecosystems, Central and Eastern Europe, Poland, Estonia, Czechia, Romania, Human Capital, Research and Development

**CITATION**

Baylarov, R. (2026). Which countries could become Eastern Europe's "Silicon Valley"? A comparative study of innovation ecosystems in Poland, Estonia, Czechia, and Romania. *International Journal of Innovative Technologies in Economy*, 4(56). https://doi.org/10.31435/ijite.4(56).2026.5984

**COPYRIGHT**

**© The author(s) 2026.** This article is published as open access under the **Creative Commons Attribution 4.0 International License (CC BY 4.0)**, allowing the author to retain copyright. The CC BY 4.0 License permits the content to be copied, adapted, displayed, distributed, republished, or reused for any purpose, including adaptation and commercial use, as long as proper attribution is provided.

## 1. Introduction

The emergence of successful innovation ecosystems has become a prominent theme in debates on technological competitiveness, regional development, and economic transformation. Silicon Valley is widely regarded as a leading example of how entrepreneurship, research institutions, skilled labour, investment, and knowledge-sharing networks can interact to foster technological innovation. However, its experience should not be viewed as a model that can be replicated simply by adopting a particular tax policy or increasing research expenditure. Rather, its development reflects the interplay of institutional, economic, social, and historical factors.

Central and Eastern Europe offers a valuable setting in which to examine how innovation ecosystems evolve under different national conditions. Since the transition away from centrally planned economies, countries in the region have undergone substantial changes in their institutional frameworks, industrial structures, integration into the international economy, and research capacities. Although they share certain historical characteristics, their innovation trajectories and economic structures differ considerably. These

differences make comparative analysis useful for identifying the conditions that may foster the emergence of more competitive, technology-oriented economies.

This study examines Poland, Estonia, Czechia, and Romania, four countries that differ in market size, institutional development, research capacity, and economic position within Europe. The aim is not to suggest that any of these countries has already achieved a status equivalent to that of Silicon Valley, but to assess their respective strengths and constraints in developing innovation ecosystems with comparable characteristics.

The study addresses the following central research question: Which structural and institutional characteristics make Poland, Estonia, Czechia, and Romania more or less prepared to develop a Silicon Valley-style innovation ecosystem? To address this question, the study adopts a theoretical and comparative approach, examining institutional quality, research and development (R&D), human capital, higher education, tax competitiveness, foreign investment, and geographical and economic advantages.

By bringing these dimensions together within a common comparative framework, the study contributes to the broader discussion of innovation-led development. Rather than treating innovation as the product of a single economic variable, it examines how structural conditions may interact to facilitate or constrain the development of innovation ecosystems. The analysis is qualitative and comparative; it neither estimates causal relationships nor establishes a definitive statistical ranking of the selected countries.

The remainder of the article is organised as follows. Section 2 reviews the literature on the Silicon Valley model and innovation development in Central and Eastern Europe and identifies the research gap. Section 3 outlines the research design and comparative framework. Section 4 examines the selected countries across key institutional, economic, educational, and geographical dimensions. Section 5 discusses the implications of the comparative findings. The final section presents the conclusions, limitations, and directions for future research.

## 2. Literature Review

### 2.1 Silicon Valley model

The concept of Silicon Valley has long attracted the attention of scholars seeking to understand why certain regions become global centers of innovation while others do not. Early research emphasized the importance of industrial adaptability, network-based relationships, and institutional flexibility in shaping regional technological development. In one of the earliest systematic analyses of Silicon Valley, Saxenian (1989) described how dense interactions among firms, research institutions, and skilled professionals created an environment capable of responding rapidly to technological and market changes.

Building on this foundation, Saxenian (1994) argued that Silicon Valley's success cannot be explained solely by the presence of technology companies or financial resources. Rather, its competitive advantage emerged from a unique combination of collaboration, knowledge sharing, entrepreneurial culture, and strong professional networks. This perspective shifted attention away from traditional explanations of regional development and toward the role of social and institutional ecosystems in fostering innovation.

A complementary perspective was introduced by Florida (2002), who emphasized the importance of the "creative class" in generating economic growth and technological progress. According to this view, regions that attract highly educated, creative, and diverse populations are more likely to become centers of innovation. Human capital therefore becomes not only a consequence of development but also one of its primary drivers.

The international dimension of innovation ecosystems was further explored by Saxenian (2006), who demonstrated how highly skilled migration contributes to the global diffusion of technological knowledge. Her analysis showed that innovation networks increasingly operate across national borders, allowing successful regional models to influence economic development far beyond their original geographic locations. This argument is particularly relevant when examining whether elements of the Silicon Valley model can be observed in emerging innovation hubs outside the United States.

More recently, Kushida (2024) revisited the Silicon Valley model in the context of contemporary technological and economic transformations. The study highlights that modern innovation ecosystems are shaped not only by entrepreneurship and technological capability but also by institutional quality, policy frameworks, and global connectivity. These insights provide an important theoretical basis for evaluating whether countries such as Poland exhibit characteristics commonly associated with Silicon Valley-type development.

This body of literature suggests that successful innovation ecosystems are rarely the product of a single factor. Instead, they emerge through the interaction of human capital, institutional quality, entrepreneurial culture, research capacity, and international economic integration. These dimensions provide the conceptual foundation for assessing Poland's potential position as an emerging innovation leader in Eastern Europe.

## 2.2 Innovation in CEE

The development of innovation ecosystems in Central and Eastern Europe has attracted considerable scholarly attention since the collapse of the socialist system. Unlike Western European economies, many countries in the region entered the transition period with institutional weaknesses, limited market experience, and innovation systems that were heavily dependent on centralized state planning. As a result, the transformation process involved not only economic restructuring but also the reconstruction of national innovation capacities.

One of the foundational contributions to this discussion is the work of Radosevic (1998), who examined how innovation systems in post-socialist countries evolved during the transition period. The study argues that the collapse of centrally planned economies created significant institutional disruptions, leading to the erosion of existing innovation structures. At the same time, it opened opportunities for the emergence of new market-oriented institutions and innovation networks. This perspective remains essential for understanding the structural challenges that continue to influence innovation performance across the region.

More recent research has shifted attention toward the challenges associated with the digital and green transitions. In this context, Brožková, Prokop, and Muñoz-Puche (2025) analyze innovation ecosystems in Central and Eastern Europe through the lens of the "twin transition" framework. Their study emphasizes that long-term competitiveness increasingly depends on the ability of countries to simultaneously advance digital transformation and environmental sustainability. Using the quintuple-helix perspective, the authors demonstrate that successful innovation ecosystems require effective interaction among government institutions, universities, businesses, civil society, and the natural environment.

According to Piatkowski (2018), the country's development since the early 1990s was driven by institutional reforms, market liberalization, investment in human capital, and integration into European economic structures. These changes enabled Poland to transition from a centrally planned economy to one of the fastest-growing economies in Europe.

The literature suggests that innovation performance in Central and Eastern Europe is shaped by a complex combination of historical legacies, institutional development, research capacity, and adaptation to contemporary technological challenges. Although countries in the region share a common post-socialist background, their innovation trajectories have diverged considerably over time. Some countries have developed stronger innovation ecosystems, attracted greater foreign investment, and achieved higher levels of technological competitiveness than others. These differences make Central and Eastern Europe an especially useful setting for examining which countries most closely resemble the characteristics of a Silicon Valley-type innovation hub.

The literature suggests that innovation ecosystems are best understood as interconnected systems rather than as collections of independent economic indicators. Although research capacity can contribute to technological progress, its broader economic impact depends on a range of complementary factors, including skilled labour, effective institutions, university–industry linkages, access to finance, and opportunities to commercialise new knowledge. International investment and a favourable business environment may also support innovation; however, their effects depend in part on the capacity of domestic firms and institutions to absorb and apply external knowledge. This perspective is particularly relevant to Central and Eastern Europe, where countries have followed distinct development trajectories despite sharing certain historical and institutional legacies. Accordingly, it provides a theoretical foundation for comparing national innovation ecosystems across multiple dimensions.

## 2.3 Research gap

The development of innovation ecosystems in Central and Eastern Europe is closely intertwined with economic transformation, institutional development, research and development (R&D) capacity, and international investment. Although existing research has identified a range of economic and institutional determinants of innovation, a comprehensive, comparative assessment is needed to evaluate the extent to which countries in the region could develop into Silicon Valley-style innovation hubs.

A robust assessment of innovation ecosystems must therefore extend beyond technological advancement and R&D expenditure to encompass institutional quality, foreign investment attraction, human capital, university research capacity, entrepreneurial activity, and geographical and economic advantages. This multidimensional framework enables a systematic identification of country-specific strengths and weaknesses and provides a more comprehensive basis for comparing national prospects for innovation-driven economic development.

Against this background, this study undertakes a comparative analysis of the innovation ecosystems of Poland, Estonia, Czechia, and Romania. Its primary objective is to assess the potential of these countries to support the emergence of a Silicon Valley-style innovation hub in Eastern Europe through an examination of their institutional, economic, and research-related characteristics. Rather than treating innovation ecosystem development as a function of a single indicator, the study conceptualizes it as the product of multiple interrelated economic and institutional factors.

The contribution of this study lies in its integrated comparative perspective rather than in the construction of a new statistical index or the estimation of causal effects. By examining institutional, research-related, educational, fiscal, and geographical dimensions together, the study seeks to clarify how different national advantages and constraints may shape innovation ecosystem development. This approach also distinguishes between possessing favourable conditions for innovation and having the entrepreneurial, financial, and institutional mechanisms required to translate those conditions into commercially successful technological activity.

## 3. Methodology

This study employs a theoretical and comparative research design to assess the potential for the emergence of a Silicon Valley-style innovation hub in Eastern Europe. The analysis focuses on Poland, Estonia, Czechia, and Romania, enabling a systematic comparison of their economic modernization, innovation capacity, and technological development.

The study examines the structural characteristics of the national innovation ecosystems in these four countries, focusing on innovation policy, institutional development, foreign investment attraction, research and development (R&D) capacity, human capital, higher education institutions, and broader economic conditions. The analysis draws on international databases and reports, including resources from Transparency International, Trading Economics, the World Bank, and official European Union statistical sources. These sources provide a basis for comparing national economic and institutional characteristics and identifying factors that may influence the development of innovation ecosystems.

The selection of Poland, Estonia, Czechia, and Romania is intended to capture variation in national economic scale, institutional conditions, research capacity, and regional economic positioning. The cases are not treated as a statistically representative sample of all Central and Eastern European countries. Instead, they are selected to facilitate a structured comparison of different national contexts and to explore how their respective strengths and constraints relate to the broader characteristics of a Silicon Valley-style innovation ecosystem.

The comparative analysis aims to identify the principal strengths and structural constraints of each country's innovation ecosystem. Beyond R&D expenditure and foreign investment, the analysis considers institutional quality, human capital, university research capacity, entrepreneurial activity, and geographical and economic conditions. This multidimensional approach enables innovation potential to be assessed across several interrelated dimensions and facilitates the identification of differences among national development models.

The comparison is organised around a common set of analytical dimensions: institutional quality, research and development capacity, human capital and higher education, tax competitiveness, foreign investment, and geographical and economic conditions. For each dimension, the analysis considers its potential relevance to innovation ecosystem development and examines the available country-specific evidence. Because the underlying indicators may refer to different years and use different measurement approaches, they are interpreted in their respective contexts rather than combined into a single numerical score. The analysis therefore supports a qualitative comparison of national characteristics but does not establish causal effects or a definitive overall ranking.

The study does not seek to statistically estimate the causal effects of individual economic factors on innovation activity. Rather, it evaluates the innovation ecosystems of the selected countries through a theoretical and comparative framework. By examining their institutional, economic, and research-related characteristics, the study assesses and compares the potential of Poland, Estonia, Czechia, and Romania to support the emergence of a Silicon Valley-style innovation hub in Eastern Europe.

# 4. Comparative Analysis of Poland and Regional Competitors

## 4.1 Institutional Environment

Institutional quality is widely regarded as one of the key foundations of innovation-driven development. A transparent regulatory environment, effective public institutions, and lower levels of corruption contribute to a more predictable business climate and encourage both domestic and foreign investment. These factors are particularly important for technology-oriented industries, which depend on long-term investment, research activities, and entrepreneurial initiatives.

Within Eastern Europe, considerable differences can be observed in institutional performance. According to the 2024 Corruption Perceptions Index, Russia and Azerbaijan were ranked 154th out of 180 countries, Belarus ranked 114th, and Ukraine ranked 105th. Among European Union member states, Hungary recorded one of the weakest performances, ranking 82nd. By contrast, Estonia ranked 13th globally, making it the best-performing country in Eastern Europe according to this indicator.

These differences are important because institutional quality influences investor confidence, business activity, and the overall innovation environment. Countries with stronger institutions generally provide more favorable conditions for entrepreneurship, technological development, and foreign investment. Among the countries examined in this study, Estonia demonstrates the strongest institutional performance, while Poland and the Czech Republic also maintain more favorable institutional conditions than many countries in the wider Eastern European region.

From the perspective of innovation-led development, the Corruption Perceptions Index suggests that institutional quality remains one of the factors distinguishing the leading candidates for a Silicon Valley-type ecosystem in Eastern Europe.

## 4.2 Tax Competitiveness

Tax policy is frequently discussed as one of the factors influencing business competitiveness and investment attractiveness. Although low corporate tax rates alone are not sufficient to create a Silicon Valley-type innovation ecosystem, they may contribute to a more favorable environment for entrepreneurship, business expansion, and foreign investment.

Across Eastern Europe, corporate income tax (CIT) rates vary considerably. Countries with relatively higher corporate tax rates include Slovenia and Estonia (22%), Slovakia and the Czech Republic (21%), as well as Azerbaijan and Russia (20%). By contrast, several countries have adopted more business-friendly tax regimes. Hungary has the lowest corporate income tax rate in Europe at 9%, followed by Bulgaria (10%), Moldova (12%), Lithuania and Georgia (15%), and Romania (16%).

These differences reflect alternative approaches to economic development and investment policy. Lower tax rates may increase a country's attractiveness to investors and businesses, while higher rates are often associated with broader fiscal and social policy objectives. Nevertheless, the experience of Eastern Europe suggests that tax competitiveness alone does not determine innovation performance. For example, Estonia maintains one of the highest corporate tax rates in the region (22%) while simultaneously demonstrating strong innovation and institutional indicators.

Among the countries examined in this study, Poland occupies a middle position with a corporate income tax rate of 19%. This places the country below Estonia and the Czech Republic, but above Romania. As a result, Poland combines moderate tax competitiveness with other factors that may support innovation-led development, including market size, foreign investment attraction, and growing technological capacity.

## 4.3 Universities and Human Capital

Every Eastern European country possesses universities with significant academic potential and research capacity. The region is home to a number of internationally recognized higher education institutions, including Moscow State University in Russia (105th globally), Charles University in the Czech Republic (265th), the University of Tartu in Estonia (301st), and Baku State University in Azerbaijan (688th). If universities ranked within the world's top 1,000 institutions are considered indicators of educational quality, then most Eastern European countries possess a relatively strong higher education foundation.

Among the countries examined in this study, several universities also perform well in international rankings. Charles University in the Czech Republic ranks 265th globally, while the University of Tartu in Estonia ranks 362st. Poland is represented by leading institutions such as the University of Warsaw (271th

globally) and Jagiellonian University (303th globally), both of which maintain strong academic reputations and research output. In Romania, Babeș-Bolyai University ranks 761st globally and represents one of the country's leading higher education institutions.

From the perspective of innovation-led development, the presence of strong universities and research institutions is particularly important. Universities contribute not only to scientific research and knowledge creation but also to the development of highly skilled human capital. In this sense, the educational and research capacity of Eastern European countries represents an important advantage in the competition to develop innovation ecosystems comparable to those associated with Silicon Valley.

### 4.4 Geographic and Economic Advantages

Geography is often overlooked in discussions of innovation and economic development, yet it can play an important role in shaping long-term growth opportunities. Countries located close to major economic centers generally benefit from stronger trade relations, investment flows, infrastructure networks, and knowledge exchange. As a result, geographic position can influence a country's ability to attract businesses, talent, and capital.

In the European context, proximity to highly developed economies such as Germany, France, and Italy provides important advantages. Countries that are closely integrated with the European Union's economic core often benefit from easier access to markets, investment, and regional value chains. By contrast, countries located farther from major European economic centers may face additional structural challenges in attracting investment and integrating into international innovation networks.

Among Eastern European countries, Estonia, the Czech Republic, Slovenia, Latvia, and Lithuania are often cited as examples of countries that have benefited from favorable geographic and economic positioning. Poland also occupies a strategically important location at the intersection of Western and Eastern Europe, providing access to major European markets while serving as a regional hub for trade, investment, and business activity.

Taken together, geographic location does not determine innovation performance on its own. However, when combined with favorable institutions, human capital, and economic policies, it can strengthen a country's ability to develop a competitive innovation ecosystem. From this perspective, Estonia, the Czech Republic, and Poland emerge as some of the strongest candidates in the regional competition to develop Silicon Valley-type characteristics.

### 4.5 Entrepreneurship and Commercialisation

A competitive innovation ecosystem requires more than strong universities, substantial research investment, and supportive institutional conditions. It also depends on effective mechanisms for translating new knowledge into marketable products, services, and scalable businesses. Entrepreneurship, access to early-stage finance, university–industry collaboration, and business support infrastructure are therefore key dimensions for assessing a country's capacity to develop a Silicon Valley-style innovation ecosystem.

The relationship between research and commercialisation warrants particular attention. Scientific and technological capabilities can generate new ideas, but their economic impact depends partly on whether entrepreneurs and firms have access to the expertise, finance, networks, and institutional support needed to bring innovations to market. Thus, research inputs and university rankings alone provide an incomplete basis for assessing an innovation ecosystem. The analysis must also consider the mechanisms that link knowledge creation to business development.

For the countries examined in this study, entrepreneurship and commercialisation should be evaluated using comparable evidence on start-up activity, venture capital availability, university–industry collaboration, technology transfer, and the growth of technology-oriented firms. These indicators can help determine whether national strengths in education, institutional quality, and research are accompanied by effective mechanisms for translating knowledge into economic value. Until such evidence is available and assessed systematically, conclusions about which country most closely approaches the Silicon Valley model should remain provisional.

## Discussion

The concept of Silicon Valley has evolved considerably since the term was first introduced by Don Hoefler in 1971 to describe the concentration of semiconductor and technology firms in Northern California. Today, the term is used more broadly to describe regions characterized by strong innovation ecosystems, technological entrepreneurship, research excellence, international investment, and a highly skilled workforce.

Although there is no universally accepted formula for creating a Silicon Valley-type ecosystem, the literature generally highlights several common characteristics. These include supportive public policies, strong institutions, internationally competitive firms, leading universities and research centers, favorable geographic conditions, and the availability of highly qualified human capital. The findings of this study provide an opportunity to evaluate how closely the selected Eastern European countries reflect these characteristics.

The comparative analysis demonstrates that Estonia currently exhibits the strongest overall innovation performance among the countries included in the sample. Estonia records the highest Innovation Index score, the strongest institutional quality indicators, and the highest average level of foreign direct investment. These findings support the argument that effective institutions and openness to international investment can contribute to the development of innovation-oriented economies.

The Czech Republic also performs strongly, particularly in terms of research and development expenditure. The country's leading position in R&D investment reflects a long-standing commitment to scientific research, technological development, and industrial modernization. This may help explain its consistently high innovation performance throughout the study period.

Poland presents a different development model. While it does not lead the selected indicators, it maintains relatively balanced performance across innovation, institutional quality, research expenditure, and investment attraction. In addition, Poland benefits from a large domestic market, strategic geographic location, growing technology sector, and increasing integration into European and global innovation networks. These factors suggest that Poland remains one of the most important innovation actors in the region despite not ranking first in every category.

The comparative analysis reveals distinct development trajectories among the innovation ecosystems of the selected Eastern European countries. Estonia demonstrates particularly strong performance in innovation and institutional quality, whereas the Czech Republic stands out for its research and development (R&D) capacity. Poland, meanwhile, benefits from a relatively balanced combination of economic scale, foreign investment attractiveness, geographical advantages, and expanding technological capabilities. These findings suggest that the development of a competitive innovation ecosystem depends not on any single economic indicator but on the interplay of multiple structural factors. In particular, institutional effectiveness, research capacity, human capital, investment conditions, and the ability to translate knowledge into commercially viable innovations constitute key dimensions for assessing the region's potential to foster a Silicon Valley-style innovation environment. However, the comparative evidence does not establish a single, definitive model for the region. Rather, it indicates that each country has distinct strengths and faces specific challenges in strengthening its innovation ecosystem.

Eastern Europe does not currently possess a single undisputed equivalent of Silicon Valley. Instead, Estonia, the Czech Republic, and Poland emerge as the strongest candidates, each demonstrating different strengths. Estonia stands out in terms of innovation performance and institutional quality, the Czech Republic excels in research capacity, and Poland benefits from scale, market size, and growing technological potential. Consequently, the emergence of a Silicon Valley-type ecosystem in Eastern Europe should be viewed as a regional and multidimensional process rather than the achievement of a single country.

## Conclusions

This study examined the question of which country is emerging as the Silicon Valley of Eastern Europe by analyzing innovation performance and selected economic and institutional determinants in Poland, Estonia, the Czech Republic, and Romania during the period 2013–2022.

The comparative analysis indicates that the development of innovation ecosystems in Eastern Europe is shaped by the interplay of research and development (R&D) capacity, institutional quality, foreign investment, and broader economic and structural conditions. A comparison of Poland, Estonia, the Czech Republic, and Romania highlights the importance of knowledge creation, institutional effectiveness, and investment attraction in fostering innovation-driven development. These factors, however, do not operate in isolation. Their contribution to national innovation ecosystems is also contingent on the broader economic environment,

human capital, university research capacity, and the ability to translate knowledge into commercially viable technologies. This multidimensional perspective underscores the need for a comprehensive framework to assess which countries are best positioned to develop innovation ecosystems comparable to that of Silicon Valley.

The comparative analysis identified substantial differences among the countries examined. Estonia recorded the highest average Innovation Index score, the strongest institutional performance, and the highest level of foreign direct investment, making it the strongest overall performer in the sample. The Czech Republic also demonstrated considerable innovation capacity, particularly through its leading position in R&D expenditure. Poland occupied an intermediate position, combining relatively balanced performance across the selected indicators with a large domestic market, favorable geographic location, and increasing integration into European and global innovation networks.

The comparative findings underscore the complexity of innovation-driven development and the limitations of assessing national innovation ecosystems using a narrow set of economic indicators. Differences among the selected countries suggest that innovation capacity is shaped by the interplay of structural factors, institutional conditions, and country-specific characteristics. Accordingly, research and development (R&D) capacity, investment attraction, institutional effectiveness, human capital, and the broader business environment should be considered jointly when assessing the potential for innovation ecosystem development. This multidimensional perspective provides a more comprehensive basis for understanding how Eastern European countries can strengthen their technological competitiveness and advance towards the emergence of Silicon Valley-style innovation hubs.

The results suggest that Eastern Europe does not currently have a single undisputed equivalent of Silicon Valley. Instead, Estonia, the Czech Republic, and Poland emerge as the principal candidates, each possessing distinct strengths. Estonia stands out through innovation performance and institutional quality, the Czech Republic through research capacity, and Poland through its economic scale, strategic location, and technological potential. Consequently, the emergence of a Silicon Valley-type ecosystem in Eastern Europe should be understood as a multidimensional and evolving regional process rather than the achievement of a single country.

Future research could expand the sample of countries and incorporate additional variables such as patent activity, high-technology exports, startup density, venture capital investment, and digitalization indicators to provide a more comprehensive assessment of innovation ecosystems in the region.

## REFERENCES


1. Transparency International. (2024). *Corruption perceptions index 2024*.
2. PwC. (2025). *Worldwide tax summaries online*. PricewaterhouseCoopers.
3. QS Quacquarelli Symonds. (2025). *QS World University Rankings 2025*. QS.
4. Hoefler, D. (1971). Silicon Valley USA. *Electronic News*.
5. Tax Foundation. (2025). *California tax rates, collections, and burdens*.
6. Wikipedia Contributors. (2025). Silicon Valley. In *Wikipedia, The Free Encyclopedia*.
7. Yelp. (2025). *Top 10 best colleges & universities near Silicon Valley, California*.
8. Maddison, A. (2003). *The world economy: Historical statistics*. OECD Publishing.
9. Davies, N. (2005). *God's playground: A history of Poland, volume II: 1795 to the present*. Oxford University Press.
10. Government of Poland. (2025). *Start in Poland*. Gov.pl.
11. Polish Agency for Enterprise Development (PARP). (2025). *Polish Agency for Enterprise Development*. PARP.
12. Polish Agency for Enterprise Development (PARP). (2025). *Startup Booster Poland*. PARP.

13. LexisNexis. (2025). *Zero taxation for individuals under 26 years of age in Poland*.

14. Mihali, L. M., Potra, S., Dungan, L. I., Negrea, R., & Cioabla, A. (2022). Spin-off–university relationship. *Sustainability, 14*(14), Article 8328. https://doi.org/10.3390/su14148328

15. Trading Economics. (2025). *Poland unemployment rate*.

16. Dudkowiak & Kopeć. (2025). *Corporate income tax in Poland*.

17. Statistics Poland (GUS). (2024). *Economic activity of enterprises with foreign capital in 2022*. Statistics Poland.

18. University of Warsaw. (2025). *University of Warsaw*.

19. Statistics Poland (GUS). (2025). *Foreigners performing work in Poland in December 2024*. Statistics Poland.

20. Study in Poland. (2025). *Ever more foreign students at Polish universities*.

# Appendix

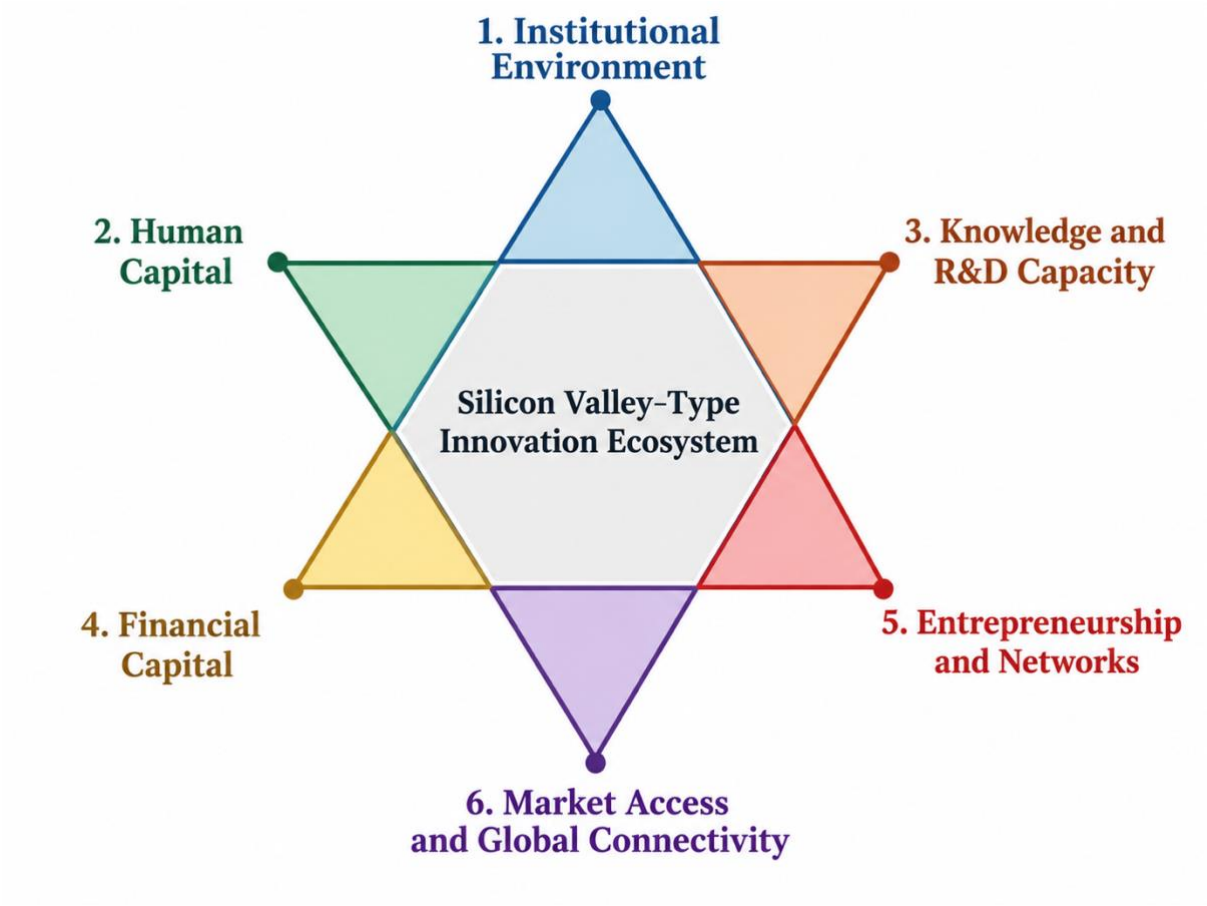



***Fig. 1.*** *Conceptual Framework for a Silicon Valley-Type Innovation Ecosystem.*

**Note:** The framework provides the analytical foundation for the subsequent country comparison. Each dimension captures a distinct but interconnected component of an innovation ecosystem. The comparative analysis examines how the four countries perform across these dimensions, while recognising that differences in institutional capacity, economic scale, research infrastructure, and international integration may produce different pathways towards innovation-led development.

**Source:** Author's own elaboration.

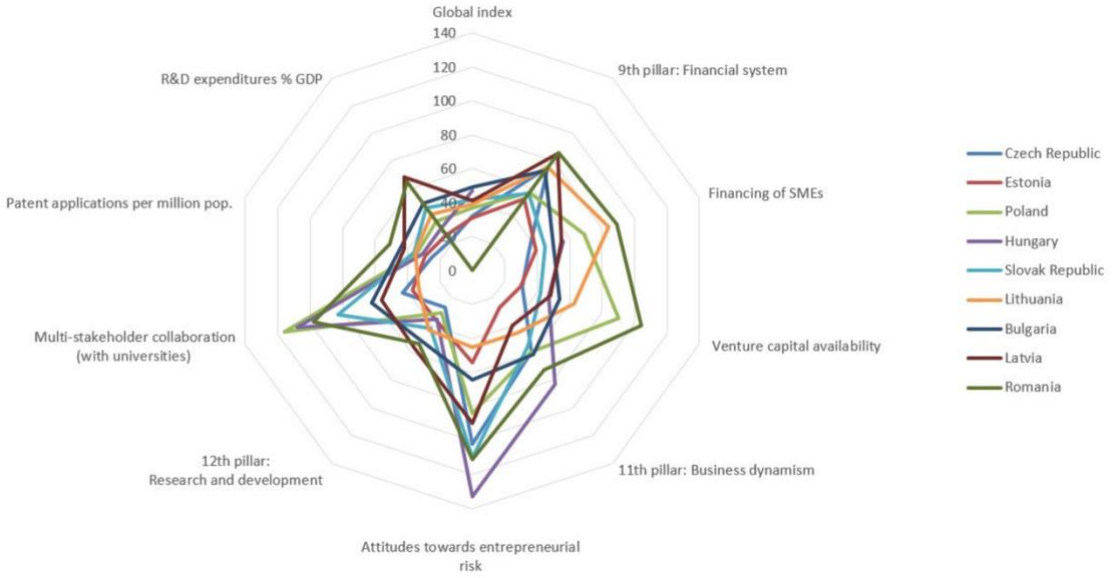



***Fig. 2.*** *Comparative Radar Analysis of Innovation Ecosystem Indicators Across Selected Central and Eastern European Countries.*

**Note.** The radar chart compares selected indicators related to the financial system, business dynamism, and research and development across Central and Eastern European countries. The indicators are presented as international rankings, where lower numerical values indicate better positions. The figure is reproduced from Mihali et al. (2022), based on data from the *Global Competitiveness Report 2019*.

**Source: Mihali et al. (2022, Figure 1).** https://doi.org/10.3390/su14148328

***Table 1. Pure Data***

| Years | Countries | Innovation index | CIT | Corruption index | R&D expenditure | FDI |
|---|---|---|---|---|---|---|
| 2013 | Poland | 40,12 | 19 | 60 | 0,88 | 0,25898345 |
| 2013 | Czech | 48,36 | 19 | 48 | 1,87 | 3,45386726 |
| 2013 | Estonia | 50,6 | 21 | 68 | 1,72 | 4,31393931 |
| 2013 | Romania | 40,33 | 16 | 43 | 0,39 | 2,03100514 |
| 2014 | Poland | 40,64 | 19 | 61 | 0,95 | 3,85089177 |
| 2014 | Czech | 50,22 | 19 | 51 | 1,95 | 3,83510153 |
| 2014 | Estonia | 51,54 | 21 | 69 | 1,43 | 6,58511618 |
| 2014 | Romania | 38,08 | 16 | 43 | 0,38 | 1,93728827 |
| 2015 | Poland | 40,16 | 19 | 63 | 1,00 | 3,29546178 |
| 2015 | Czech | 51,32 | 19 | 56 | 1,91 | 0,89891349 |
| 2015 | Estonia | 52,81 | 20 | 70 | 1,46 | -3,0691052 |
| 2015 | Romania | 38,2 | 16 | 46 | 0,48 | 2,42725822 |
| 2016 | Poland | 40,22 | 19 | 62 | 0,96 | 3,81608754 |
| 2016 | Czech | 49,4 | 21 | 55 | 1,67 | 5,47566421 |
| 2016 | Estonia | 51,73 | 20 | 70 | 1,24 | 3,76923256 |
| 2016 | Romania | 43,99 | 16 | 48 | 0,48 | 3,3741757 |
| 2017 | Poland | 41,99 | 19 | 60 | 1,03 | 2,37812837 |
| 2017 | Czech | 50,98 | 19 | 57 | 1,76 | 5,07066241 |
| 2017 | Estonia | 50,93 | 20 | 71 | 1,27 | 6,31892721 |

| Years | Countries | Innovation index | CIT | Corruption index | R&D expenditure | FDI |
|---|---|---|---|---|---|---|
| 2017 | Romania | 39,16 | 16 | 48 | 0,50 | 2,83273075 |
| 2018 | Poland | 41,67 | 19 | 60 | 1,20 | 3,34803924 |
| 2018 | Czech | 48,75 | 19 | 59 | 1,89 | 3,30353998 |
| 2018 | Estonia | 50,51 | 20 | 73 | 1,40 | 4,08015832 |
| 2018 | Romania | 37,59 | 16 | 47 | 0,49 | 3,03714661 |
| 2019 | Poland | 41,31 | 19 | 58 | 1,32 | 3,15455649 |
| 2019 | Czech | 49,43 | 21 | 56 | 1,92 | 4,18705738 |
| 2019 | Estonia | 49,97 | 22 | 74 | 1,62 | 9,76819365 |
| 2019 | Romania | 45,51 | 16 | 44 | 0,47 | 2,94522919 |
| 2020 | Poland | 38 | 19 | 56 | 1,38 | 3,31499059 |
| 2020 | Czech | 48,34 | 21 | 54 | 1,98 | 3,39114066 |
| 2020 | Estonia | 48,28 | 22 | 75 | 1,75 | 12,0147753 |
| 2020 | Romania | 46 | 16 | 44 | 0,46 | 1,43737356 |
| 2021 | Poland | 39,9 | 19 | 56 | 1,43 | 5,44306738 |
| 2021 | Czech | 49 | 21 | 54 | 1,99 | 4,43029525 |
| 2021 | Estonia | 49,9 | 22 | 74 | 1,76 | 20,2291129 |
| 2021 | Romania | 35,6 | 16 | 45 | 0,47 | 4,12834531 |
| 2022 | Poland | 37,5 | 19 | 55 | 1,45 | 6,00626097 |
| 2022 | Czech | 42,8 | 21 | 56 | 1,96 | 3,02937517 |
| 2022 | Estonia | 50,2 | 22 | 74 | 1,78 | 4,52988373 |
| 2022 | Romania | 34,1 | 16 | 46 | 0,45 | 3,88647349 |

**Source:** Compiled by the author based on data obtained from the Global Innovation Index, World Bank Open Data, Transparency International's Corruption Perceptions Index, and national statistical sources for the period 2013–2022.