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Common and Unique Features in the Development of Startup Ecosystems in Latvia, Ukraine, and Georgia

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Abstract

This research presents a comprehensive analysis and comparison of the startup ecosystems in Latvia, Ukraine, and Georgia. It identifies the key factors that foster their development and growth, and highlights the primary obstacles and challenges that confront startups in these countries. The authors used the following methods to achieve these objectives: correlation and regression analysis to examine funding trends and success factors, comparative analysis of key ecosystem parameters, as well as methods of analysis and synthesis. The novelty of the study lies in its identification of the most important factors that influence startup development in the three countries, the construction of a correlation and regression model of startup financing, and the comparative analysis of startup ecosystems. Comparing the startup ecosystems of the three countries revealed both common and unique features of each country, emphasizing how differences in political, economic, and cultural conditions shape startup development.

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Introduction

A startup is a newly established, innovation-driven commercial venture that utilizes diverse financial structures such as angel investment, venture capital, and government grants. It operates within a regulatory and policy framework shaped by government incentives and support, and thrives through dynamic relationships among stakeholders, including founders, investors, employees, customers, and public institutions, to rapidly scale and disrupt markets. Many developed countries offer programs to attract talented entrepreneurs by granting residency permits. Typically, startup founders benefit from favorable conditions for conducting commercial activities and obtain long-term residency permits for themselves and their family members (Kim, Kim, and Jeon 2018).

The startup ecosystem is a dynamic network of interacting actors (entrepreneurs, companies, investors), organizations (incubators, accelerators, research institutions, universities), and processes (innovation, education, entrepreneurial support), all supported by political, economic, social, and cultural conditions that foster the birth, growth, and development of startups. This ecosystem includes not only access to capital and customers but also supporting infrastructure, qualified talent, knowledge, and technology, as well as legislative and regulatory frameworks that promote innovation and entrepreneurship (Fritsch 2019).

This definition takes into account a broad spectrum of elements necessary for startups to flourish and is sufficiently universal to be applicable to any country, regardless of its political regime and economic conditions. It emphasizes a systemic approach to understanding the startup ecosystem, focusing on the importance of balanced development of all system components to stimulate innovation and entrepreneurial activity (Bedianashvili 2017; 2018; Menshikov et al. 2022).

The theoretical framework of the study provides a basis for analyzing and interpreting the collected data and contributes to a deeper understanding of the area under investigation. From a practical point of view, there are currently no models capable of accurately predicting the development of startups. Therefore, the novelty of this article lies in the development of a correlation and regression model of startup financing, which can be used to predict the indicator.

The remainder of this paper is structured as follows. Part 2 presents a comprehensive literature review, situating the study within existing research and theoretical frameworks on startup ecosystems. Part 3 outlines the methodology, including the research design and case selection criteria. Part 4 reports the results of the analyses conducted. Part 5 offers an in-depth examination of the development of startup ecosystems in Latvia, Ukraine, and Georgia. Part 6 discusses the limitations of the study, while Part 7 concludes.

Literature review

A literature review reveals that the concept of ecosystems in the context of business and innovation was first popularized by Moore (1993) in his article "Predators and Prey: A New Ecology of Competition," published in the Harvard Business Review. Moore drew an analogy between natural ecosystems and business environments. This idea was later adapted and extended to analyze startup ecosystems encompassing entrepreneurs, investors, research institutions, universities, and government agencies.

Researchers' interest in startup ecosystems has significantly increased in recent years. To illustrate this trend, we can examine the representation of startup ecosystems in the Scopus database.

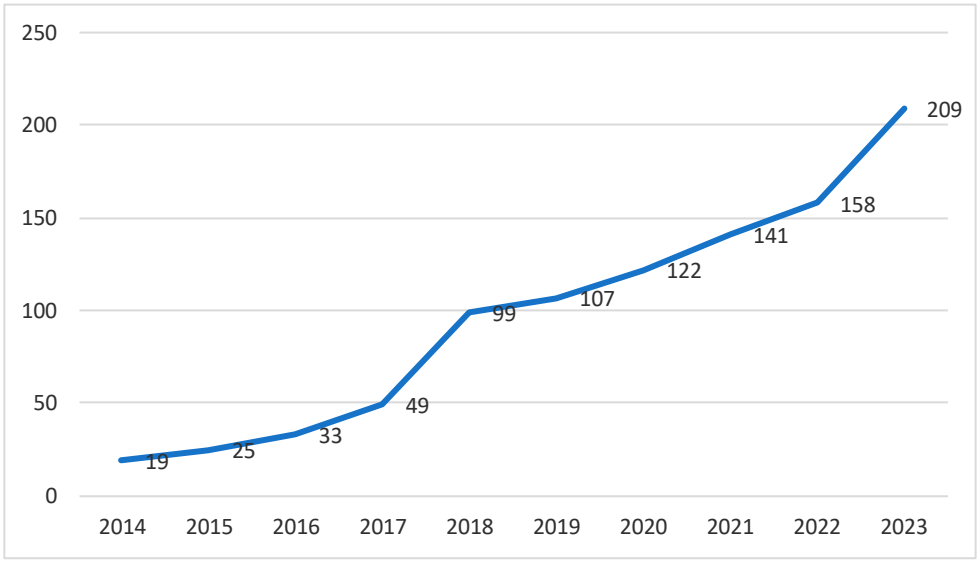

Figure 1. Number of papers (by year) that contain the words "Startup Ecosystems" in the title, abstract, or keywords in the Scopus database, 2014–2023

Source: authors' elaboration based on the Scopus database.

The results presented in Figures 1 and 2 confirm the significant and growing interest of researchers across various scientific fields in "Startup Ecosystems". Publications indexed in the Scopus database particularly surged in 2023, with the number increasing elevenfold compared to 2014, reaching 209. The majority of these publications are associated with business, management, and accounting (525), computer science (300), economics, econometrics, and finance (243), engineering (241), and social sciences (137).

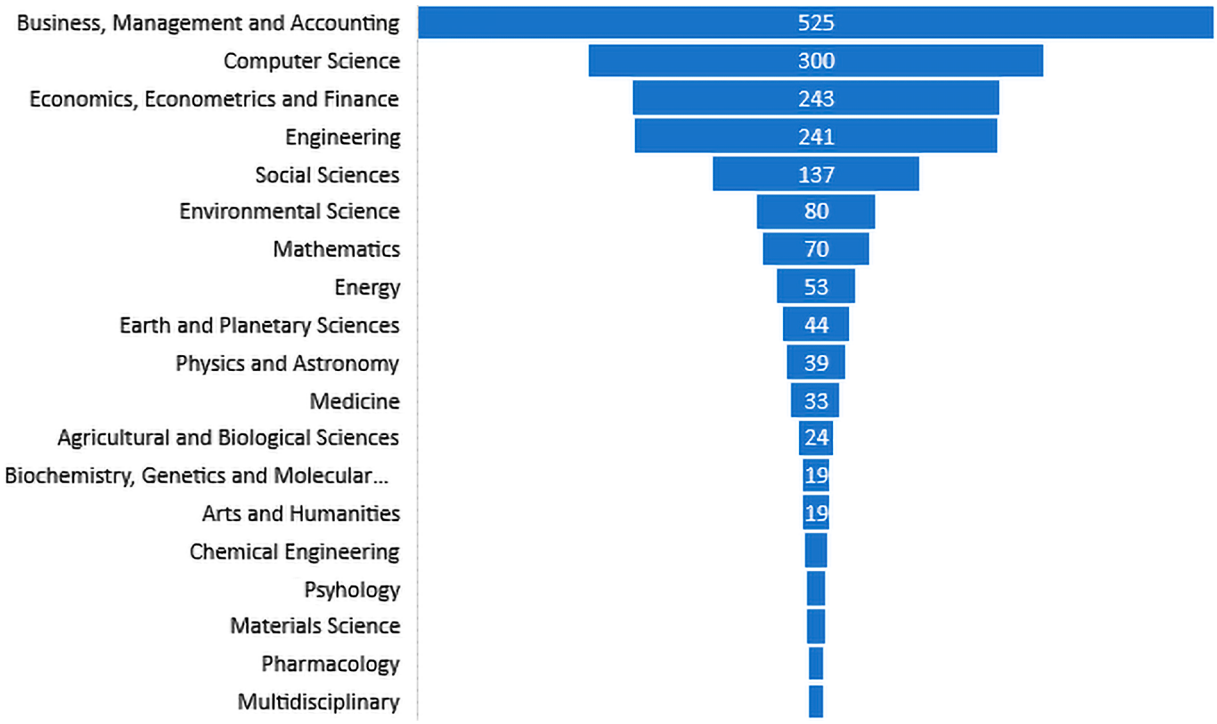

Figure 2. Number of papers (by field of science) that contain the words "Startup Ecosystems" in the title, abstract or keywords in the Scopus database

Source: authors' analysis based on the Scopus database.

The findings of this study align with prominent global frameworks of startup ecosystem development. For instance:

- Isenberg's (2011) model of entrepreneurship ecosystems emphasizes the interdependence of domains such as policy, finance, culture, support, human capital, and markets. Our study confirms the relevance of these dimensions, particularly in highlighting the role of government policy (e.g., GITA in Georgia, the Ukraine Startup Fund, and Latvia's innovation programs). However, unlike Isenberg's focus on organic and bottom-up development, some of the ecosystems studied (notably Georgia) show a heavier reliance on top-down government initiatives, reflecting a more centralized adaptation.
- Autio et al. (2014) highlight the dynamic capabilities of ecosystems and emphasize knowledge spillovers and entrepreneurial agency. In this respect, Ukraine's ecosystem, especially its wartime pivots toward defense and cybersecurity innovation, illustrates Autio's notion of adaptive ecosystems that respond to environmental shocks. However, the limited commercialization and weak university–industry links in Georgia suggest slower ecosystem evolution, diverging from Autio's framework of self-reinforcing capabilities.
- Stam's (2015) Entrepreneurial Ecosystem Theory focuses on ten core elements, including formal institutions, leadership, connectedness, talent, and demand. Latvia aligns closely with Stam's emphasis on "systemic conditions" (e.g., regulatory frameworks, finance, support services), and exhibits a relatively higher level of ecosystem maturity. In contrast, Georgia lacks critical elements such as experienced entrepreneurs and deep

funding networks, highlighting the importance of interconnectedness and entrepreneurial recycling that Stam deems vital.

Overall, while our regional case studies reflect the broad applicability of global theories, they also point to unique hybrid dynamics shaped by post-socialist transitions, EU accession trajectories, and geopolitical risks. The ecosystems in Latvia, Ukraine, and Georgia combine elements from global models but evolve under constraints that require context-specific strategies.

For a high-quality analysis of startup ecosystems in different countries, there exist numerous research papers, articles, and books that can serve as excellent examples. The most frequently cited book, Brad Feld's (2012) "Startup Communities: Building an Entrepreneurial Ecosystem in Your City," considers startup communities as a blueprint for what it takes to build a supportive entrepreneurial community.

One of the most cited articles is by Lee and Shin (2018), entitled "Fintech: Ecosystem, business models, investment decisions, and challenges". It examines how Fintech brings about a new paradigm in which information technology is driving innovation in the financial industry.

There are various models for developing startup ecosystems, each with its own specifics and approaches to stimulating innovation and entrepreneurship. A model's effectiveness depends on multiple factors, including economic conditions, political environment, cultural aspects, and resource availability. Some of the most well-known and commonly used models for developing startup ecosystems are presented below (Ziakis, Vlachopoulou, and Petridis 2022):

1. Silicon Valley Model (Open Innovation Model). This model is characterized by a high level of network interaction among startups, investors, research institutions, and technology companies. It fosters a culture of open innovation, where knowledge and ideas are freely shared and combined. Advantages: It facilitates the rapid development and commercialization of innovations. Disadvantages: It requires strong infrastructure and access to capital.
2. Israeli Model (Startup Nation). Characterized by a high level of entrepreneurial activity, strong government support, and active utilization of military research and development in civilian innovations. Advantages: Strong integration of science and business, government support. Disadvantages: High competition, dependence on exports.
3. Scandinavian Model (Social Innovations). Focused on social entrepreneurship and innovations aimed at addressing social issues. Characterized by a high level of government support and collaboration between the private and public sectors. Advantages: Development of sustainable and socially oriented businesses. Disadvantages: May be less oriented towards the global market.
4. Bangalore Model (Focus on Outsourcing and IT). Based on the development of the IT sector and outsourcing, strong technical education and availability of skilled IT professionals. Advantages: Attracts international investments and promotes the development of the IT industry. Disadvantages: May lead to a one-sided development of the economy.

5. Chinese Model (State Governance and Investments). Characterized by a strong government role in stimulating and financing innovations and entrepreneurship, as well as active support for high-tech sectors. Advantages: Rapid scaling and development of key technologies. Disadvantages: May restrict entrepreneurial freedom and innovation due to strong government control.

Methodology

This study employs a comparative case study design, utilizing both qualitative and quantitative methods to analyze the startup ecosystems of Latvia, Ukraine, and Georgia. The case study method was used due to the respective countries' contrasting development trajectories and the opportunity to explore an under-researched group of countries.

Case selection

Latvia, as an EU member, benefits from access to European funding and focuses on niche technologies such as fintech and Greentech. Ukraine represents a large economy with a strong IT sector that is currently facing the challenges of war and institutional instability. Georgia, by contrast, is a small economy that has implemented liberal reforms, with strengths in tourism and agrotechnology but constrained by a limited domestic market.

The novelty of this comparison lies in identifying the role of geopolitics, economic scale, and EU integration in shaping startup ecosystems. While most research concentrates on established hubs in the U.S., the EU core, or Asia, this study examines "peripheral" European economies with different levels of stability to uncover both universal and unique barriers to innovation. Furthermore, it builds on the authors' previous research on startup development in these countries, continuing the line of inquiry established in earlier publications (Menshikov et al. 2024; Simakhova et al. 2024; Menshikov, Ruza, and Simakhova 2025).

Analytical approach

A comparative method was used to analyze the common and unique features of startup ecosystems in the selected countries. Key parameters for qualitative and quantitative comparisons include access to financing, level of government support, cultural characteristics, and innovation activity. This approach helps to understand which factors contribute to success or pose challenges in the development of startups in each country.

Results

To analyze the dynamics of startup funding in Latvia and Ukraine, a correlation and regression analysis was conducted for 2014–2024 (In the regression analysis, the years: 2014, 2015, 2016, ..., 2024 are replaced by the corresponding numbers: 1, 2, 3, ..., 11). The underlying dataset is presented in Tables 1–4 and Figures 3–6. Georgia was omitted from the analysis because its economic structure and contextual conditions differ markedly from those of Latvia and Ukraine.

In Latvia, the impact of the time factor on startup financing cannot be statistically confirmed, while factors such as inflation (INF) and unemployment rate (UN) have a more significant effect. In Ukraine, these factors play a statistically insignificant role in terms of financing startups.

Table 1. Funding for Latvian startups, 2014–2024

Indicator	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Funding for Latvian startups, € millions	50	63.6	41.9	59.2	7	15.5	22.7	247.3	90.8	50.0	34.3
Funding per 1,000 inhabitants, €	25,078.0	32,161.4	21,382.6	30,480.1	3,632.3	8,099.0	11,944.5	131,229.1	48,313.7	26,631.9	18,416.7

Note: In 2021, a spike of €247.3 million was observed during the COVID-19 period. This value is visually identifiable as an outlier; however, its robustness has not been tested.

Source: authors' elaboration based on Startin.lv 2023; 2024.

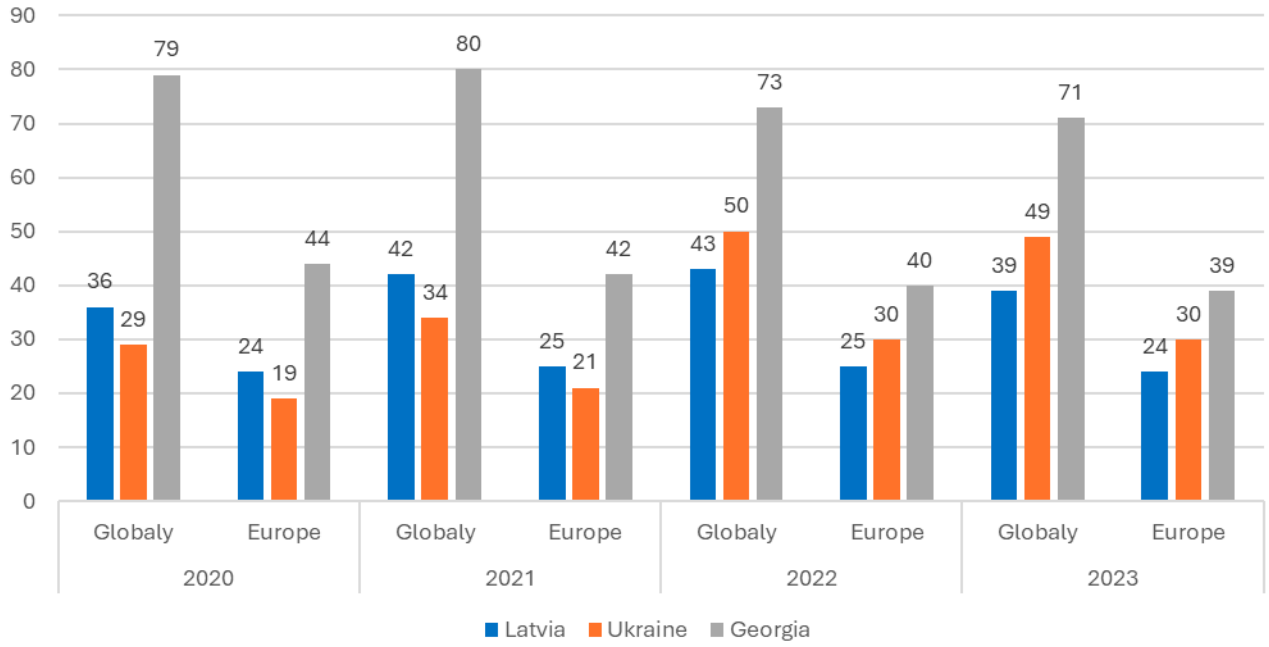

Figure 3. The dynamics of financing Latvian startups per 1,000 inhabitants, 2014–2024.

Source: authors' elaboration based on Startin.lv 2023; 2024.

Table 2. The dynamics of inflation and the unemployment rate in Latvia, 2014–2024

Indicator	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Average inflation rate (annual %)	0.62	0.17	0.14	2.93	2.53	2.81	0.22	3.28	17.31	8.94	1.27
Unemployment rate (% of total labor force)	10.85	9.87	9.64	8.72	7.41	6.31	8.1	7.51	6.82	6.47	6.72

Source: World Bank Group n.d.

Table 3. Regression results: dynamics of financing Latvian startups

Regression Statistics	
Multiple R	0.831226
R Square	0.690937
Adjusted R Square	0.613671
Standard Error	8,470.199
Observations	11

Variable	Coef.	Std. Err.	T	P > |t|	[95% Conf. Interval]	
Intercept	−36,524.5	17,699.61	−2.06357	0.072954	−77,339.8	4,290.918
INF	2,469.046	601.5466	4.104497	0.003416	1,081.877	3,856.215
UN	6,022.767	2,026.412	2.972134	0.017813	1,349.854	10,695.68

Source: authors' elaboration based on Startin.lv 2023; 2024.

The estimated regression equation is:

$$Y^{\wedge} = -36{,}524.45 + 2{,}469.05 \cdot INF + 6{,}022.77 \cdot UN.$$

The model is statistically significant at the 5% level and explains approximately 69% of the variation in startup financing. Adjusted R^2 indicates moderate explanatory power. Both inflation and unemployment exert a positive and statistically significant influence:

A one-unit increase in inflation is associated with an average rise of ~2,469 units in startup financing (holding unemployment constant).

A one-unit increase in unemployment is associated with an average rise of ~6,023 units (holding inflation constant).

The intercept is not statistically significant, which is common, as a value of zero for both predictors does not necessarily hold economic meaning.

From an economic perspective, higher unemployment may encourage individuals to pursue entrepreneurial activity out of necessity, thereby driving startup creation. Similarly, inflationary pressures can redirect capital toward more profitable sectors, stimulating demand for innovative and resource-saving solutions.

However, given the small sample size, these findings should be interpreted with caution. For predictive or policymaking purposes, additional data and more comprehensive models would be necessary.

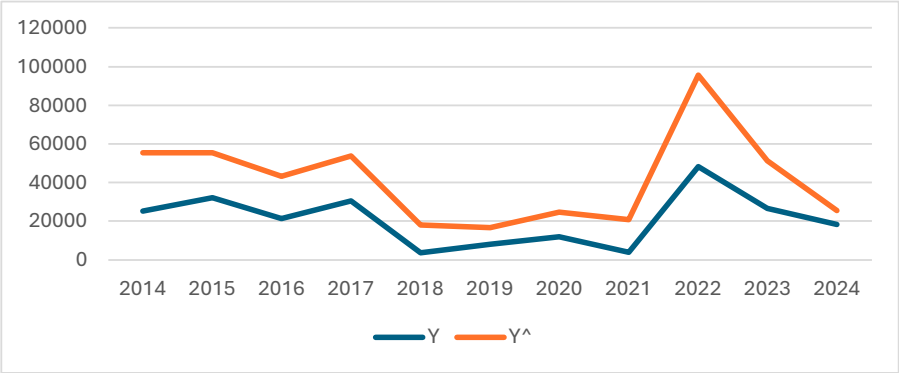

Figure 4. The dynamics of financing Latvian startups per 1,000 inhabitants, 2014–2024 (predicted Y^ and fact Y)

Source: authors' elaboration based on Startin.lv 2023; 2024.

Table 4. Investments in Ukrainian startups, 2014–2024

Indicator	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Investments in Ukrainian startups, € millions	32	132	72	235	274	484	501	705	208	194	428
Per 1,000 inhabitants, €	687	2,873	1,580	5,161	6,055	10,764	11,210	15,917	5,058	5,129	11,299

Source: authors' elaboration based on Forbes Ukraine 2023; 2025.

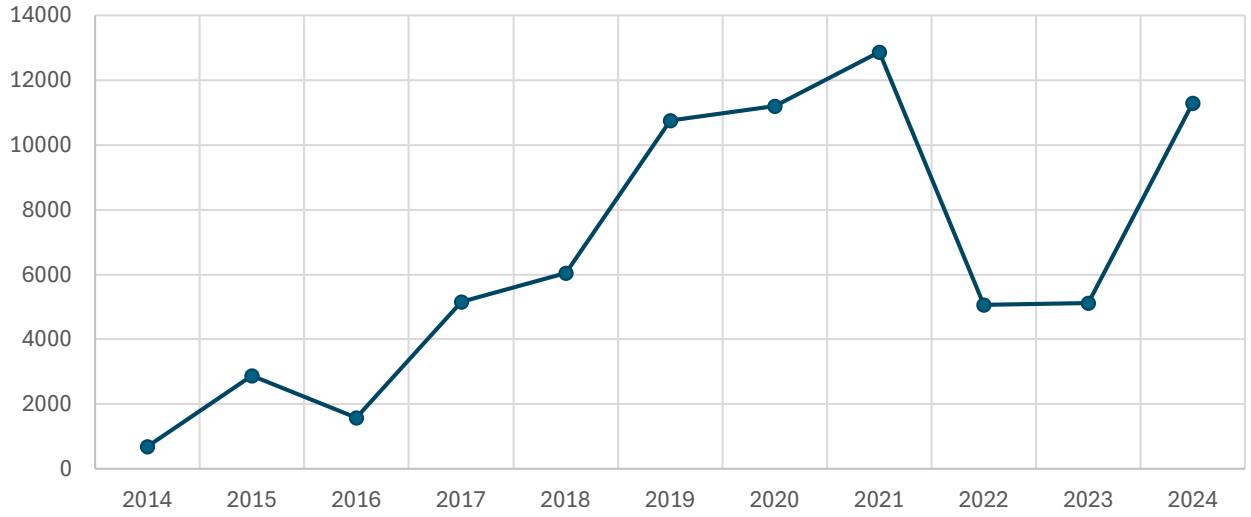

Figure 5. The dynamics of financing Ukrainian startups per 1,000 inhabitants, 2014–2024

Source: authors' elaboration based on Forbes Ukraine 2023; 2025.

Table 5. Regression results: dynamics of Ukrainian startup financing

Regression Statistics	
Multiple R	0.626906
R Square	0.393012
Adjusted R Square	0.325568
Standard Error	3,917.481
Observations	11

Financing of startups	Coef.	Std. Err.	t	P > |t|	[95% Conf. Interval]	
Intercept	−1,813,572.71	754,132.1	−2.40487	0.0396	−3,519,537	−107,607
T	901.663	373.517	2.414	0.039	56.708	1,746.618

Source: authors' elaboration based on Forbes Ukraine 2023; 2025.

The regression equation for Ukraine is:

$$Y^{\wedge} = -1{,}813{,}572.71 + 901.66 \cdot T.$$

A one-unit increase in the predictor variable T is associated with an average increase of about 902 units in the dependent variable. The effect of T is both positive and statistically significant.

The model explains about 39.3% of the variability in the dependent variable, which is considered a moderate explanatory power. The overall regression model is statistically significant at the 5% level

Since the intercept is large and its value when T = 0 may lack a meaningful real-world context, the focus should remain on the slope. The regression findings are associational, as further diagnostic checks like autocorrelation were not performed.

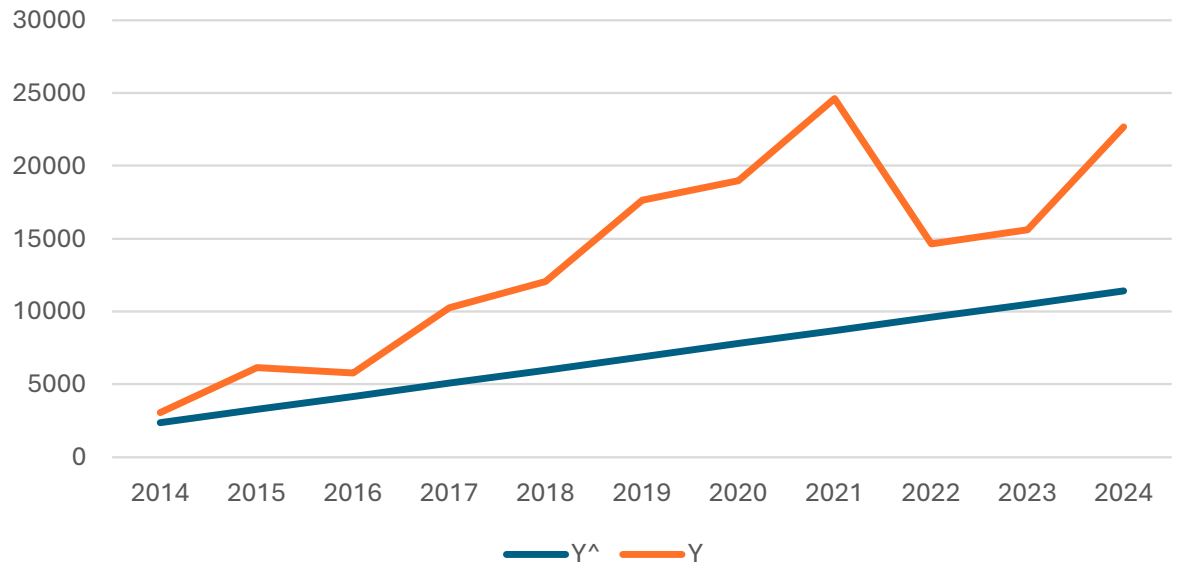

Figure 6. The dynamics of financing Ukrainian startups per 1,000 inhabitants, 2014–2024 (predicted Y^ and fact Y)

Source: authors' elaboration based on Forbes Ukraine 2023; 2025.

The trend lines indicate a positive trajectory in the financing and development of startups in Latvia and Ukraine. However, using a regression model to predict startup funding in these countries has important limitations that should be considered to avoid drawing erroneous conclusions. The main limitations include ignoring external factors, as the models are built only on the time axis, without taking into account influences such as the political situation (especially in Ukraine due to the war) and changes in international funding or donor initiatives to implement new startup funds. Additionally, the model assumes that past trends will continue into the future, automatically extrapolating past trends even if they are no longer relevant.

Development of startup ecosystems in Latvia, Ukraine, and Georgia

Comprehensive, well-thought-out, and long-term support for the development of innovative startups based on an ecosystem approach has proven its effectiveness worldwide. The success of ecosystem development depends on a whole range of factors. Startup Genome, one of the world's leading consulting companies specializing in innovative entrepreneurship, identifies the following key factors based on for evaluating startup ecosystems:

- Efficiency: Measured by indicators such as exit value (startup sales) over the past two and a half years, the number of successful startup launches, the number of startups reaching a valuation of 1 billion U.S. dollars, as well as the speed at which companies reach IPO/SPAC level or sell their business.
- Funding: Determined not only by the amounts invested in startups but also by the number of investors operating within the ecosystem and the accessibility of funding for startups at early stages of development.
- Market reach: Determined by a combination of factors, including the contribution of startups to the country's GDP, the ratio of major business sales to the volume of investments in the ecosystem, and national policies regarding the commercialization of intellectual property.
- Talent: Evaluated based on the number of students and postgraduates, the number of higher education institutions, and their international ranking (Startup Genome 2021).

The Startup Blink Research Center published the Global Startup Ecosystem Index for 2023 (Figure 7). Since 2017, the project has been tracking the state of the startup economy, describing growth dynamics and the main trends (Startup Blink 2025). Among the countries featured in the report are the startup ecosystems of Latvia, Ukraine, and Georgia, with all three countries ranking within the top 100 ecosystems in the world.

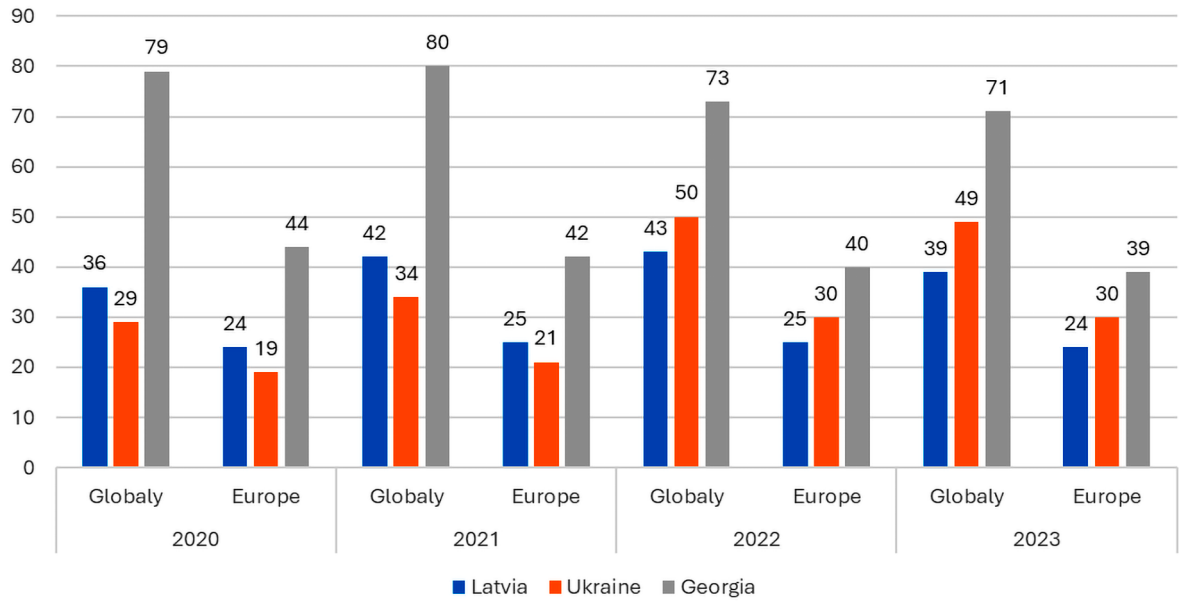

Figure 7. Global Startup Ecosystem Index 2023

Source: authors' elaboration on Startup Blink 2025.

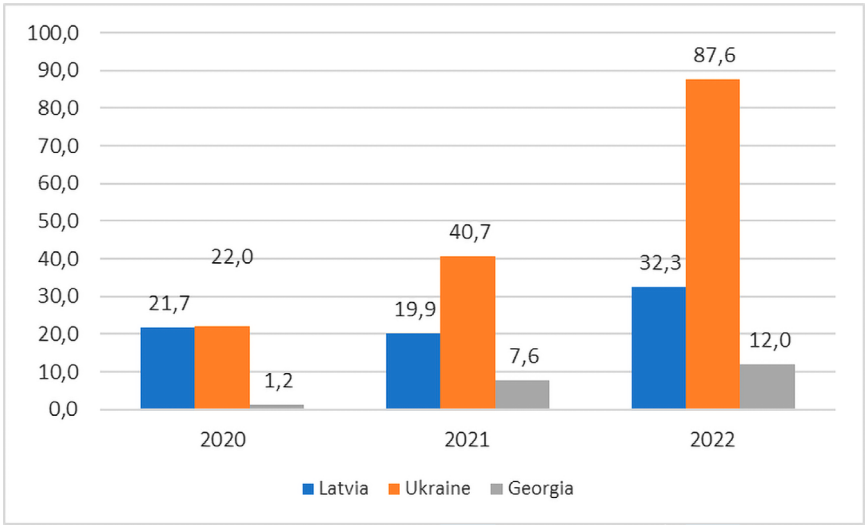

Figure 8. Funding in U.S. dollars (millions)

Source: authors' elaboration based on Startup Blink 2025.

Funding is crucial for launching startup ecosystems. In 2022, there was a significant increase in funding compared to 2021 and 2020. Funding in Ukraine in 2022 exceeds that in Latvia by 63% and in Georgia by 87%.

The Latvian startup ecosystem

The Latvian startup ecosystem comprises over 500 startup enterprises, with over half operating in the information and communication services sector and over 20% in manufacturing and professional, scientific, and technical services. In recent years, the number of people employed in startup enterprises has grown; between 2016 and 2020, the number of employees increased

by 12%, totaling 6,000 employees. Additionally, salaries in startup enterprises are nearly twice as high as the national average.

In 2022, Latvian enterprises attracted €61 million in funding, with the largest sources being "Juro", "Giraffe360", "Aerones", "Colizeum", and "SaltoX". According to the "Global Startup Ecosystem Index 2023" by StartupBlink, the Latvian startup ecosystem ranks 39th out of 150 countries worldwide. It has the potential to become a technological hub with access to the European market, as reported by the Public Relations Department of the Ministry of Economics.

To accelerate the growth of startups, the government offers extensive support, such as innovation vouchers, favorable regulations for startups, and startup visas, which are also positively evaluated by the industry. In the fall of 2022, the Strategy for the Development of the Startup Ecosystem for 2022–2025 was approved with the aim of developing a strong and unified startup ecosystem, implementing initiatives, and attracting talent to startups. In turn, the Law on Supporting Startup Activities was developed to promote the development of research projects and the commercialization of research products, while a fast-track residence permit for startup founders is being introduced. This permit allows third-country nationals to obtain the right to reside in Latvia for the purpose of establishing a startup enterprise and carrying out work to develop their own product and attract investments from qualified venture investors.

Startups play an important role in Latvia's economy by introducing innovative ideas and new technologies, facilitating the transition to a knowledge-based economy, and creating new industries. Additionally, startups cultivate a new entrepreneurial culture, focusing on long-term business models, as well as the circular and digital economies. Nevertheless, Latvia needs more startups, more employees working in them, and significantly more funding inflows.

To support the development of entrepreneurial activity and the implementation of business projects, including in the startup sector, a range of support instruments is planned for the next five years within the programs of the European Union's Structural Funds and Recovery Fund, with a total financing volume of over €500 million. This includes €183.5 million for digitization projects, €109 million to support small and medium-sized enterprises, including incentives for incubation, export, and business motivation, and over €228 million allocated for various financial instruments (including acceleration, loans, and guarantees).

In 2022, €60,000 was allocated from the state budget to support startups, specifically for organizing events. Four contracts were concluded with the Latvian Startup Association, the Latvian Business Angel Network, TechChill, and TechHub. Under these agreements, initiatives included developing and maintaining the startin.lv database, while the Latvian Business Angel Network organized 10 investment sessions for investors, presenting 62 startup companies.

The Ukrainian startup ecosystem

Despite facing economic difficulties for several years, Ukraine had managed to create an outstanding startup ecosystem, simultaneously scalable and global, even before the onset of the military conflict. This testifies to the talent and resilience of its workforce. Notable Ukrainian startups with large global user bases include People.ai, Grammarly, GitLab, Ahrefs, and Preply, all

of which are linked to a strong educational component. The main reason for Ukraine's success is the talent of its developers, sought after by many foreign companies both remotely and in local development centers.

One of the main challenges that the Ukrainian startup ecosystem will likely face is related to the unprecedented support it currently receives from other European countries, which allows Ukrainians to live and work in other countries for extended periods without returning to Ukraine. While this assistance is much needed during the war, there is no guarantee that Ukrainian technology and IT talents will return home after the war ends; yet their return will be essential to help restore the startup ecosystem to its former strength and vibrancy.

Several key aspects characterize the current state and challenges of the Ukrainian startup ecosystem:

- Ukrainian startups and technology companies demonstrate a high degree of resilience and adaptability, developing solutions that assist both in wartime and peacetime. Examples include the development of software for cybersecurity, drones, and robotics.
- Ukraine has strong positions in cybersecurity and artificial intelligence.
- The war has affected the growth of security-related industries, but the Ukrainian startup fund supports projects that could be used during the war and for post-war modernization.
- The international business community shows strong support for Ukrainian startups: Google established the Support Fund for Ukraine, the EU has included targeted support for Ukraine in its Horizon Europe research and innovation program, and Network VC in the USA created a Special Venture Fund and a program to support Ukrainian startups.
- In 2019, the Ukraine Startup Fund was created, and a Strategic Vision for 2025 was developed to support early-stage startups through funding, expand access to support services, and strengthen globally competitive incubation and acceleration programs. Over 200 startups have benefited from this fund.
- The IT sector has always been a key priority for the Ministry of Digital Transformation. Ukraine offers the best platform for the latest technologies, especially for the development of defense-related solutions.

The Georgian startup ecosystem

The Georgian ecosystem is an example of successful economic modernization. The Ministry of Economy and Sustainable Development, through Georgia's Innovation and Technology Agency (GITA), and the Startup Bureau, are major government and private sector supporters. They collaborate to organize events like hackathons, training, and acceleration programs to develop skills and capacity nationwide (Startup Büro 2024). A variety of innovation centers and laboratories, including over twenty Fab-Labs, have been opened throughout the country. Other crucial platforms include the Spark platform, the Startup Factory at the University of Georgia, the Batumi Business Incubator (Batumi being the administrative center of the Autonomous Republic of Adjara, a Georgian autonomy), and Startup Grind Tbilisi. Additional hubs like the new Entrepreneurship Center of the International Chamber of Commerce and coworking

spaces such as Impact Hub in Tbilisi also play a vital role. The country also benefits from international programs like FasterCapital and the 500 Startups acceleration program, launched with the support of the World Bank.

Georgia is an attractive location for startups due to its business-friendly climate. The country features streamlined business registration, startup-friendly tax legislation, and low labor costs, all of which provide access to the European market. Over 60% of the population speaks English, and Georgia is becoming increasingly popular among expatriates and digital nomads, which will contribute to its knowledge base and talent pool in the future. Major startups include the crypto-biometric network Humanode, the e-commerce payment platform PAYZE, and the gaming platform BitSport (Startup Blink 2023).

Nonetheless, challenges remain. There is a lack of experienced entrepreneurs and a small domestic consumer market, which reflects the country's small population. This pushes local entrepreneurs toward the global market. There is also limited access to financial capital, both from foreign and domestic investors. As a result, startups mainly receive funding through government programs, competitions, and investment programs from various banks.

Despite these challenges, Georgia's startup ecosystem is actively implementing supportive initiatives, helping young entrepreneurs to develop and implement their innovative business ideas (Dempwolf, Auer, and D'ippolito 2014, p. 6; Cukier, Kon 2018; Cohen et al. 2019; Hottenrott and Richstein 2020; Crișan et al. 2021; Debets-kredīts 2023).

Common features of startup ecosystems in Latvia, Ukraine, and Georgia

Despite differences in economic development, culture, and market conditions, Latvia, Ukraine, and Georgia share several common trends typical of the development of startup ecosystems in these countries (Menshikov et al. 2024). These features reflect global trends in the world of startups and innovation:

1. All three countries demonstrate a strong orientation towards the development of technological and IT startups (Simakhova et al. 2024). This is related to the global demand for technological innovations and the availability of technically educated specialists.
2. Governments actively stimulate the development of startup ecosystems through tax incentives, grants, and financing for innovative projects.
3. These countries have active and mutually supportive startup communities that facilitate the exchange of knowledge, experience, and best practices through events, conferences, and networking meetings.
4. Startups aim to go global and attract foreign investments by participating in international acceleration programs, exhibitions, and pitch events.
5. Entrepreneurs and startups actively integrate into the global ecosystem, utilizing international crowdfunding platforms, communication channels, and sales platforms, allowing them to expand their presence and attract customers from around the world.

6. Educational programs and initiatives aimed at preparing professionals in the fields of entrepreneurship, innovation, and technology, including programs at universities and private academies, play an important role in ecosystem development.

These common features underscore that despite the diversity and uniqueness of each country, there is a shared aspiration to develop innovative entrepreneurship and create favorable conditions for the growth and advancement of startups. Comparing the opportunities for startup financing in Latvia, Georgia, and Ukraine reveals both similarities and differences in the investment landscapes of these countries. These differences are often driven by economic development, political stability, and the presence of developed innovation and entrepreneurship support infrastructure.

Latvia, as a member of the European Union, has access to various European support programs, including grants, funds, and investment initiatives. Latvian startups can receive support through EU funds: Latvia actively utilizes EU structural funds to support small and medium-sized businesses, local venture funds, and angel investors. The developing venture capital sector is supported by state initiatives to stimulate investments in innovative companies.

Ukraine is also striving to stimulate the development of startups. There is a growing number of venture funds and angel investors interested in technology and innovative startups. State support and international cooperation are evident through entrepreneurship support programs, including grants and loans, often implemented in partnership with international financial institutions.

Georgia has taken significant steps in recent years to attract investors, support its startups, and improve its investment climate. State support programs, such as the "Produce in Georgia" program, and other initiatives aimed at supporting startups and innovative projects, are in place. Additionally, international organizations actively participate in entrepreneurship support programs.

Common trends and challenges

All three countries face common challenges, such as the need to improve the legislative framework to protect investments, streamline business procedures, and strengthen institutional support for innovation. However, they also build on their unique advantages and resources to attract venture capital and develop startup ecosystems. The effectiveness of startup financing in these countries largely depends on their ability to continue integrating with global markets, improving the business climate, and creating favorable conditions for entrepreneurs and investors.

Latvia exhibits elements characteristic of the **Scandinavian model**, with strong government support for innovation and active development of infrastructure for startups, such as technology parks, incubators, and accelerators. The country also focuses on developing human capital and attracting foreign investments, making its startup ecosystem appealing to international partners.

Latvia is known for its strong innovation culture and active technology scene, particularly in sectors such as fintech, deep tech, and green innovations. The Latvian government offers

various support programs for startups, including tax incentives and funding, making the country attractive for entrepreneurs. Due to its geographical location, Latvia serves as a "bridge" between the markets of Eastern and Western Europe, creating additional opportunities for business scaling.

Ukraine's ecosystem can be partially compared to the **Bangalore model** due to its strong development in the IT sector and a significant volume of outsourcing services. The country boasts a large number of technically educated specialists and successful tech startups. It also demonstrates elements of the **Israeli model** through efforts to create innovative infrastructure and attract investments, positioning itself as both an outsourcing and product hub for many international companies. Ukraine is known for its strong IT competencies, highly skilled developers, and engineers. There are also numerous initiatives and events for startups. Many Ukrainian startups are oriented towards international development and collaboration, which enables them to successfully attract foreign investments.

In the current conditions, the key for the Ukrainian startup ecosystem is the support of the international community, attracting investments into high-tech and defense startups, as well as preserving and developing human capital. Ukraine continues to demonstrate significant potential in the high-tech field, making it attractive to international investors interested in technological innovations.

Georgia, with its actively developing entrepreneurial sector and efforts to create a favorable business environment, partially corresponds to the **Scandinavian model**, with an emphasis on supporting social entrepreneurship and innovation. State support programs for startups and initiatives to attract investments also contribute to shaping a favorable environment for startup growth. Georgia is actively working on creating favorable conditions for startups, including simplifying the tax system and providing grants and funding for aspiring entrepreneurs. Some of the most promising directions for startups in Georgia are tourism and agrotechnology, reflecting the country's natural and cultural characteristics. Georgia also attracts foreign investors and entrepreneurs interested in developing local innovative projects and expanding into new markets.

Access to international markets is a critical factor for all three countries, enabling startups to scale up, attract investment, and find new customers, while sector-specific dynamics (e.g., the development of IT, agtech, or fintech) shape competitive advantages and areas of innovation in these countries. A clear understanding of global trends and local industry specifics helps startups to adapt their products more effectively and carve out niches in the international arena.

Limitations of the study

This article examines the development of startups in Ukraine, Latvia, and Georgia, considering factors such as economic, political, and military instability, data limitations, and the reliability of forecasts. The analysis relies on startup funding data and the Global Startup Ecosystem Index, but several constraints should be acknowledged:

1. Data Limitations: For Latvia and Ukraine, funding trends were analyzed from 2014 to 2024, but data availability and accuracy may vary due to reporting inconsistencies. Georgia's startup funding data was particularly limited, restricting the depth of analysis compared to the other two countries.
2. Economic and Political Instability: Ukraine has been significantly affected by the full-scale war since 2022, disrupting economic activity, investment flows, and startup growth. Consequently, pre-war trends may not accurately reflect current conditions. Meanwhile, Georgia's political volatility and economic dependency on external factors may influence startup ecosystem dynamics unpredictably.
3. Military Conflicts: The war in Ukraine has led to capital flight, talent migration, and the destruction of infrastructure, making long-term projections highly uncertain. Georgia's unresolved territorial conflicts and regional tensions add another layer of risk for investors and entrepreneurs.
4. Reliability of Forecasts: The startup ecosystems in these countries are influenced by external shocks, making trend extrapolation unreliable.

While this study provides an overview of startup trends in Latvia, Ukraine, and Georgia, the findings should be interpreted with caution due to data gaps, geopolitical risks, and the inherent unpredictability of crisis-affected economies. Future research would benefit from more frequent and detailed data collection, as well as scenario-based modeling to account for instability.

Conclusion and recommendations

This study explores the development of startup ecosystems in Latvia, Ukraine, and Georgia using comparative, statistical, and contextual methods. The analysis reveals both structural similarities, such as the dominance of the IT sector, government support mechanisms, and a strong drive for internationalization, as well as significant differences, particularly regarding investment flow stability, data transparency, and the maturity of institutions.

Our findings partially align with the existing literature but diverge in several key areas. Like Feld (2012) and Cohen et al. (2019), we observed the pivotal role of government in shaping ecosystems. Initiatives like the Ukrainian Startup Fund, Latvia's startup visas, and GITA in Georgia are essential in early-stage development.

The dominance of IT-related startups across all three countries supports the conclusions of Simakhova et al. (2024), which emphasize digital technologies as a primary innovation driver in post-socialist economies. However, our analysis affirms the concern raised by Crisan et al. (2021) about the risks of sectoral overconcentration, especially in Georgia, where a small internal market and narrow specialization may limit long-term scalability.

The comparative perspective suggests that the scale of the economy, geopolitical conditions, and level of integration into international markets influence the resilience and growth trajectories of startup ecosystems. Ukraine's stronger statistical trend may reflect high pre-war

momentum in financing growth, while Latvia's moderate trend indicates other unmeasured drivers of ecosystem performance. Georgia's case illustrates how small-market constraints and data gaps can obscure underlying dynamics.

Rather than prescribing specific interventions, our findings point to several broad implications that merit further exploration. First, the concentration of the IT sector, while consistent with patterns in other post-socialist economies, raises questions about long-term diversification and resilience. Second, the early internationalization of startups appears to be both a growth strategy and a potential source of domestic ecosystem vulnerability, especially in contexts with significant talent outflow. Finally, strengthening the availability and quality of standardized startup and investment data is a cross-cutting priority, particularly in countries where ecosystem monitoring remains fragmented.

These insights are not definitive, but rather a starting point for policymakers, investors, and ecosystem actors to consider in light of local contexts and additional evidence. Future research could extend this work by incorporating longitudinal data, comparative analyses with other "peripheral" European economies, and qualitative interviews with founders and policymakers to deepen the link between empirical patterns and actionable strategies.

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Wspólne i specyficzne cechy rozwoju ekosystemów start-upowych na Łotwie, w Ukrainie i Gruzji

W artykule przedstawiono kompleksową analizę i porównanie ekosystemów start-upowych na Łotwie, w Ukrainie i Gruzji. Zidentyfikowano kluczowe czynniki sprzyjające ich rozwojowi i wzrostowi oraz wskazano główne przeszkody i wyzwania, przed którymi stoją start-upy w tych krajach. W tym celu zastosowano następujące metody: analizę korelacji i regresji w celu zbadania trendów finansowania i czynników sukcesu, analizę porównawczą kluczowych parametrów ekosystemu oraz syntezę. Nowatorski charakter badania polega na zidentyfikowaniu najważniejszych czynników wpływających na rozwój start-upów w trzech badanych krajach, skonstruowaniu modelu korelacji i regresji finansowania start-upów oraz przeprowadzeniu analizy porównawczej ekosystemów start-upowych. Porównanie ekosystemów start-upowych tych trzech krajów ujawniło zarówno wspólne, jak i specyficzne cechy każdego z nich, podkreślając, w jaki sposób różnice w warunkach politycznych, gospodarczych i kulturowych kształtują rozwój start-upów.

Słowa kluczowe: start-up, ekosystem start-upów, rozwój gospodarczy, Ukraina, Gruzja, Łotwa