Kiran Sood
Chitkara University, Punjab
ORCID: 0000-0001-6177-5318
E-mail: kiran.sood@chitkara.edu.in

Mansur Barkhudarov İsa
Azerbaijan State University of Economics (UNEC); Azerbaijan
ORCHID: 0000-0001-5698-3569
E-mail: mansur_barkhudarov@unec.edu.az;

Aysel Garagozova Mansur
Azerbaijan State University of Economics (UNEC); Azerbaijan
ORCHID: 0009-0004-0248-4528
E-mail: aysel.garagozova@unec.edu.az

A Comparative Analysis of Digital Entrepreneurship via Startups in the South Caucasus and Central Asian Countries

Abstract
This study investigates the impact of digital entrepreneurship on economic growth in the South Caucasus and Central Asian countries, with a particular focus on startup ecosystems. By conducting a comparative analysis, the research examines the current state of digital entrepreneurship, identifies existing challenges, and evaluates each country's position and advantages within the regional digital entrepreneurship landscape. The study employs an analysis-based approach to assess the effects of digital entrepreneurship on key economic indicators, including GDP, employment, and innovation. Findings reveal that intercountry collaboration is essential to foster regional development, and the establishment of platforms for knowledge exchange, startup promotion, and investment flow between the South Caucasus and Central Asian countries is recommended. The study provides evidence-based insights and strategic recommendations to guide policymakers, entrepreneurs, and academics in enhancing the effectiveness and efficiency of digital entrepreneurship across the region.
Keywords: innovation ecosystem; venture capital; startup ecosystem; digital transformation; innovation clusters; human capital.

Introduction

Digital entrepreneurship is characterized as a form of entrepreneurship that relies on the application of digital technologies, online platforms, data analytics, and innovative business models in managing economic activities. According to Satish Nambisan, a leading researcher in this field, "the question of who can engage in entrepreneurial activity on digital platforms and ecosystems is resolved by considering both platform-related and entrepreneurship-related factors" (Satish Nambisan (2017) vol. 41, issue 6, Digital Entrepreneurship: Toward a Digital Technology Perspective of Entrepreneurship, pg:16). From this perspective, entities engaging in entrepreneurial activities on digital platforms must be proficient both digitally and in terms of entrepreneurial management. In other words, they must possess adequate knowledge and skills. This implies that a modern digital entrepreneur should be capable of responding promptly and flexibly to the challenges of the digital society.

Another expert, Daniel J. Isenberg, emphasizes that "Governments alone cannot build ecosystems. Only the private sector has the motivation and perspective to create self-sustaining, profit-oriented markets. Therefore, governments should engage the private sector early and allow it to have or acquire a significant stake in the success of the ecosystem" (Daniel J. Isenberg (June 2010), How to Start an Entrepreneurial Revolution, pg:4).

Isenberg's argument highlights that entrepreneurial ecosystems are not artificially constructed solely through government programs. While the government can provide support through legislation, tax incentives, and infrastructure, the private sector is the primary force that sustains the ecosystem, introduces dynamism, and creates real markets. The private sector's motivation to generate profit and compete naturally drives ecosystem development. Therefore, the government must engage the private sector early and provide opportunities for decision-making, initiatives, and leadership. In short, "the government creates the conditions, but it is the private sector that truly builds and sustains the ecosystem."

Regarding the role of policy, Mason & Brown argue that "policy has a dual effect on the development of digital entrepreneurship. First, efforts to stimulate high-growth entrepreneurship cannot be limited to top-down initiatives aimed solely at framework conditions. Bottom-up efforts, including engagement with non-governmental actors, are also required. Second, a different set of policies is needed than those aimed at general business formation. Policies focused solely on increasing the number of new firms have limited impact, as only a very small number of firms achieve significant growth" (Prof. Colin Mason and Dr. Ross Brown (January 2014), Entrepreneurial ecosystems and growth-oriented entrepreneurship, pg:8).

Mason & Brown argue that the development of digital entrepreneurship cannot rely solely on top-down government decisions. Policy must simultaneously support both the framework conditions (infrastructure, legislation, financial environment) and bottom-up initiatives (startup communities, universities, accelerators, private sector). They also emphasize that a general "increase the number of startups" policy is ineffective, as real economic growth is generated by a small number of high-growth firms. Therefore, policy should focus specifically on fostering startups with high growth potential.

It is important to highlight that the theoretical foundation of the digital economy is based on Schumpeter's concept of innovation and "creative destruction." According to this theory, technological innovations and new business models are the primary drivers of economic growth. Schumpeter notes, "If we try to imagine how or how it will work in the process of creative destruction of perfect competition, we are confronted with an even more disappointing 'result.' This should not surprise us, since all the essential facts of this process are not included in the general scheme of economic life that provides traditional propositions about perfect competition" (Joseph A.Schumpeter Capitalism, Socialism and Democracy (1975), pg: 81).

Based on Schumpeter's perspective, digital entrepreneurship is a field where technological innovations and new business models emerge rapidly. The concept of creative destruction shows that old technologies and traditional business models are replaced by new digital solutions. This process not only stimulates economic growth but also creates market entry and rapid growth opportunities for startups. In other words, startups play the role of "creative destruction" in the digital entrepreneurship environment by transforming old systems, implementing innovations, and enhancing economic dynamism. Schumpeter's theory thus provides an important theoretical foundation for understanding the development of the digital economy and startup ecosystems.

According to another group of researchers, Brynjolfsson & Mcafee, "The success of technological entrepreneurs demonstrates how technology and the use of personal talents can create significant wealth" (Erik Brynjolfsson & Andrew McAfee, *The Second Machine Age*, 2014, p. 49). They argue that digital technologies increase labor productivity and create new economic opportunities, but they can also lead to structural changes in the labor market.

The demand for digital skills varies across sectors. Overall, responding SMEs identified the most urgent training needs in digital marketing and SEO (42%), digitization of daily operations (36%), and data analytics (33%) (Figure1) (SME digitalization for competitiveness The 2025 OECD D4SME Survey, pg:12).

Demand for skills related to energy consumption optimization or fintech services was low, with less than 10% of respondents prioritizing these areas, and there were minimal sectoral differences (Marco Bianchini and Marta Lasheras Sancho (10 April,2025), SME digitalization for

competitiveness The 2025 OECD D4SME Survey,12).

Figure 1. Areas Where Businesses Most Desire Training
Source. *(SME digitalization for competitiveness The 2025 OECD D4SME Survey)*

Figure 1 shows that the corporations participating in the survey most frequently indicated a need for training in digital marketing and CEO (Central Engine Optimization), digitization of daily operations, data analytics, and cybersecurity. At the same time, there are significant skill gaps in e-commerce integration, continuous improvement of customer service, and supply chain optimization, whereas the demand for training in automation, robotics, and fintech services is comparatively lower. These results indicate that developing digital skills has become a top priority for businesses in many countries, and investment in human capital particularly professional training in CEO, digitization, data analytics, and cybersecurity is a key factor for the sustainable development of digital entrepreneurship.

From a theoretical generalization perspective, it should be noted that despite the various approaches in recent research on entrepreneurship and digital entrepreneurship, there is a consensus among scholars that digital entrepreneurship has irreversible and significant development potential. It is also worth noting that, as in other developing regions of the world, research on digital entrepreneurship in the South Caucasus and Central Asia has increased in recent years.

According to data provided by the World Bank in 2022, the digitalization of the Logistics Corridor between the South Caucasus and Central Asia has been implemented as a key initiative for promoting digital solutions. It is noted that, "This activity will help clients explore different options for digitalizing the corridor and provide recommendations for further digitalization of trade and transport operations along the corridor between the South Caucasus and Central Asia. At the end of this ASA (Advisory Services and Analytics), clients in Azerbaijan, Georgia, and Kazakhstan can expect to have a service model vision to determine the implementation path along the corridor. This will initiate concrete efforts to address the information-sharing gaps along the corridor" (World Bank (2022), Annual Review Towards Green, Resilient and Inclusive Digitalization, pg:66; Muradov, et.al, 2025).

Furthermore, "Digital partnerships will be developed and proposed with emerging and developing economies. These partnerships, for example, in Central Asia (covering Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan), will be jointly financed with Member States through Team Europe Initiatives (TEIs) in which the Bank seeks to engage. These partnerships can be further supported through the creation of a digital connectivity fund" (European Bank; *The EBRD's Approach to Accelerating the Digital Transition; 2021–25*, 2021, p. 26).

The partnership for digital inclusion led the United Nations Development Program (UNDP), with its long-standing experience in digital development, to co-host a high-level Digital Event on the Sustainable Development Goals (SDGs) alongside the International Telecommunication Union

(ITU), aiming to accelerate the use of digital technologies in support of the SDGs. The event, held during the SDG Action Weekend, brought together over 500 participants, including high-level representatives from governments, the private sector, civil society, and international organizations, with additional participants joining online (European Central Bank (2021), The EBRD's approach to accelerating the digital transition: 2021-25, pg;26). Among the participating countries from the South Caucasus and Central Asia were Azerbaijan, Uzbekistan, Turkmenistan, Tajikistan, Kazakhstan, Georgia, and Kyrgyzstan. One of the programs available to partner countries is the "Venture Capital Investment Program," which is expected to play a significant role in advancing digital entrepreneurship. Nevertheless, the limited venture capital market and the shortage of human capital remain key barriers.

Although the impact of digital entrepreneurship on economic growth has been extensively studied in the international literature, there is very limited research on the comparative analysis of emerging digital entrepreneurship in the South Caucasus and Central Asian countries. In particular, systematic studies examining the relationship between digital entrepreneurship indicators and GDP growth, empirical comparisons of startup ecosystem metrics, and the effect of regional innovation policies are almost nonexistent. In this regard, the present study aims to fill this gap and empirically assess the economic impact of the startup ecosystem in the region.

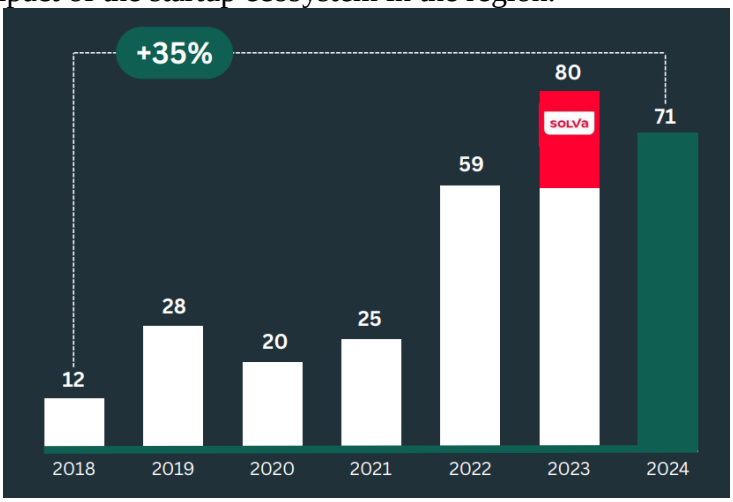

Figure 2. Kazakhstan venture capital volume, 2018-2024, $M

Source. RISE Research' database, surveys and interviews with VC market players

In 2024, Kazakhstan's VC volume is $71M, down from $80M in 2023, primarily due to a $20M outlier deal (Solva). Excluding this, the market reflects a more consistent positive trend. Since 2018, when VC volume was $12M, the market has grown at an average annual rate of ~35%, demonstrating steady expansion (Rice Research (march 2024), Venture Capital in Central Asia 2nd edition).

The study covers the South Caucasus and Central Asia regions. Considering data availability and similarities in economic structures, the following countries were selected:

- **South Caucasus:** Azerbaijan, Georgia, Armenia
- **Central Asia:** Kazakhstan, Uzbekistan, Kyrgyzstan, Turkmenistan

The impact of digital entrepreneurship on economic growth in these countries is evaluated comparatively. A panel data model is used to assess the effect of digital entrepreneurship on economic growth:

Component	Indicator / Variable	Description
Dependent Variable	GDP	**Gross Domestic Product (GDP Growth Rate)**
Independent Variables	HUM	Human Capital Indicator (Digital Skills, Higher Education Level)
	INV	Innovation Indicators (GII Index, R&D Expenditures)
	DS	Digital Entrepreneurship Indicator (Startup Indices + Number of Digital Businesses)
	ICT	Digital Infrastructure Indicators
Model Specification	Panel Data Model	$GDP_{it} = \alpha + \beta_1 DS_{it} + \beta_2 INV_{it} + \beta_3 ICT_{it} + \beta_4 HUM_{it} + \epsilon_{it}$
Study Scope	South Caucasus Countries	Analysis of the digital entrepreneurship ecosystem and its impact on economic growth

Table 1. Variables and Model Specification for Assessing the Impact of Digital Entrepreneurship on Economic Growth in the South Caucasus

In recent years, Azerbaijan has demonstrated significant progress in digital transformation and innovation, largely driven by government initiatives. Programs such as *Startup Azerbaijan*, the *E-Government* platform, the Innovation Agency, and the activities of technoparks have played a pivotal role in supporting the development of the startup ecosystem. Key sectors, including digital payments, fintech, and e-commerce, are experiencing rapid growth. Despite these advances, challenges remain, particularly regarding the limited availability of venture capital and the degree of integration of Azerbaijani startups into the global entrepreneurial ecosystem. While the country has established the necessary institutional framework to foster digital entrepreneurship, human capital constraints, insufficient digital skills, and the relatively small size of the domestic market continue to limit the scalability and global competitiveness of startups.

A comparative analysis across the South Caucasus region indicates a reliance on government-led initiatives for digital transformation, yet venture financing and the development of a robust global startup culture remain nascent. In Azerbaijan, Baku functions as a key technological hub, with its *Startup Center* and designated innovation zones driving activity in energy technologies, fintech, and digital services. Georgia distinguishes itself with an open economic environment, favorable foreign investment legislation, and active startup support programs, with Tbilisi emerging as a regional technology center. Nevertheless, both countries face limitations related to human capital and the availability of skilled technological personnel. Armenia, by contrast, demonstrates a strong startup ecosystem, particularly in IT and software development, supported significantly by diaspora investments and international incubation programs. However, economic and political instability, geopolitical risks, and a constrained domestic market pose significant impediments to further development.

The Central Asian context presents a more heterogeneous landscape. Kazakhstan occupies a leading position in digital entrepreneurship, with initiatives such as *Astana Hub* providing internationally recognized platforms for innovation. The country's digital strategy is closely integrated into its long-term 2050 development plan, with strong sectors including fintech, logistics technologies, and government digitalization. Uzbekistan's startup ecosystem is rapidly evolving in response to broader economic reforms, supported by *IT Park Uzbekistan*, digital education programs, and targeted tax incentives. Key sectors such as e-commerce and digital banking are expanding, although the ecosystem remains in an early development stage relative to Kazakhstan. Kyrgyzstan maintains a small but active IT community, with relative strengths in crowdfunding, online services, and the freelancing sector, yet limited infrastructure and financial resources constrain further growth. Tajikistan exhibits early-stage development in digital entrepreneurship, with government programs promoting digital services hampered by low internet penetration, underdeveloped infrastructure, and insufficient technological skills among the workforce. Turkmenistan demonstrates the most limited development of digital entrepreneurship in the region. Although government programs in information and communication technologies exist, restrictive regulations, scarce economic resources, and a small

domestic market significantly hinder the establishment and growth of startups, leaving sectors such as online services and e-commerce largely underdeveloped.

Overall, the analysis indicates that while government initiatives have laid the foundation for digital entrepreneurship across the South Caucasus and Central Asia, systemic challenges—including human capital shortages, limited access to finance, underdeveloped infrastructure, and geopolitical risks—remain critical constraints. Countries such as Azerbaijan and Kazakhstan demonstrate relatively advanced ecosystems, yet further efforts are needed to enhance venture financing, integrate startups into global markets, and develop sustainable mechanisms for scaling digital enterprises. The regional patterns suggest that targeted policy interventions, investment in skills development, and the creation of robust innovation ecosystems are essential for fostering competitive and resilient digital entrepreneurship landscapes in the South Caucasus and Central Asia

Criteria	South Caucasus	Central Asia
Level of Startup Infrastructure	Developing	High in Kazakhstan, Medium/Initial in Others
Government Support	Strongly	Strong, Especially in Kazakhstan and Uzbekistan
Venture Capital	Limited	More Developed in Kazakhstan
Human Capital	High Potential, Strong in Selected Areas	Increasing Level in Kazakhstan and Uzbekistan
Pace of Digital Transformation	Increasing, but Requires Systematic Transition	Rapid in Kazakhstan, Gradual in Others

Table 2. Comparative Analysis by Region

Conclusions drawn from the table:

- Digitalization is a priority in government strategies in both regions;
- Kazakhstan and Azerbaijan act as regional leaders;
- Georgia gains an advantage through a favorable foreign investment environment;
- Uzbekistan is expanding its innovation ecosystem through a wave of reforms;
- Startup culture and venture capital are still in the development phase;
- Strengthening human capital and expanding technological specialties is necessary.

A comprehensive analysis of the current state of digital entrepreneurship in the South Caucasus and Central Asian countries has revealed several trends. Firstly, the number of startups in both regions has shown an upward trend over the past five years (2020–2025). Additionally, the expansion of fintech and digital payment services, the faster development of innovation infrastructure in Kazakhstan and Azerbaijan, and the ongoing differences in investment-attraction potential are noteworthy trends.

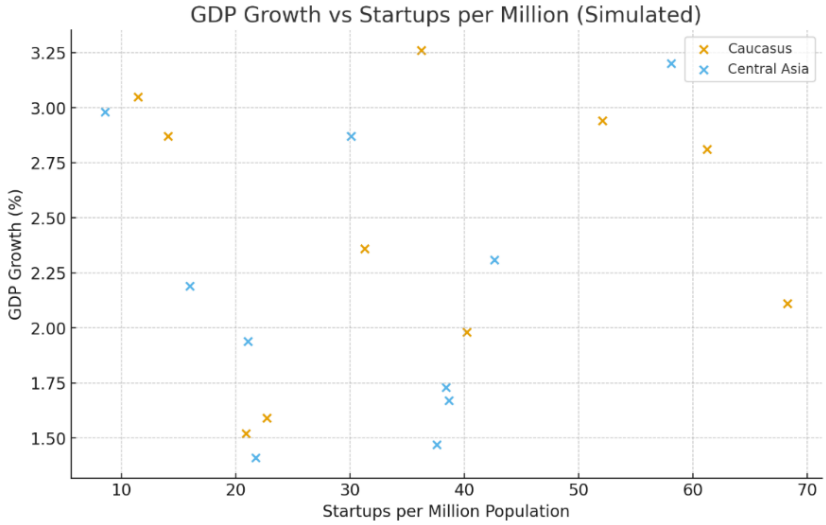

Figure 3: The Impact of Startup Projects on GDP

Startup projects affect economic growth both directly and indirectly, in terms of quantity and quality. When the impact of these projects on economic growth is assessed from quantitative and qualitative perspectives, a distinctly different picture emerges. The diagram below illustrates the relationship between startup density (the number of startups per one million people) and the annual GDP growth rate in the South Caucasus and Central Asian countries.

The figure shows that in both regions, as startup density increases, there is a positive trend in GDP growth. In the South Caucasus countries (Azerbaijan, Georgia, Armenia), overall startup density is higher, and in certain years, higher economic growth rates are observed. In Central Asian countries (Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan), although startup density is relatively lower, the growth trend is positive and appears correlated with economic development. Overall, the graph indicates that the development of digital entrepreneurship and the increase in startups are positively associated with economic growth, supporting the research hypotheses.

Conclusion

The research findings indicate that in the South Caucasus and Central Asia, digital entrepreneurship is one of the key mechanisms positively influencing economic growth. Startup activity, the expansion of digital investments, the development of innovation infrastructure, and the enhancement of human capital are statistically correlated with GDP growth. The South Caucasus features a more diversified startup environment and a well-developed innovation ecosystem, whereas Central Asian countries particularly Kazakhstan and Uzbekistan are undergoing rapid digital transformation under their leadership. This highlights the existence of different approaches in shaping the digital economy models of these regions. The study demonstrates that digital entrepreneurship, especially startup ecosystems, makes a significant contribution to economic growth in both regions. Empirical and comparative analyses show that startup density, the proliferation of digital platforms, and innovation infrastructure (venture capital, accelerator centers) can accelerate socio-economic development. Establishing a regional cooperation model is advisable, and platforms should be created to enhance startup contributions, investment flows, and knowledge exchange between the South Caucasus and Central Asia. Additionally, training programs to develop digital skills (e.g., coding, data analytics, digital marketing) should be expanded, and strong incentives should be provided to establish venture capital funds and attract both local and foreign investors to the region.

Reference

1. *Nambisan, S. (2017). Digital entrepreneurship: Toward a digital technology perspective of entrepreneurship. Journal of Business Venturing, 41(6), 16.*
2. *Isenberg, D. J. (2010, June). How to start an entrepreneurial revolution. Harvard Business Review, 4.*
3. *Mason, C., & Brown, R. (2014, January). Entrepreneurial ecosystems and growth-oriented entrepreneurship, 8.*
4. *Schumpeter, J. A. (1975). Capitalism, socialism and democracy (p. 81). Harper & Row.*
5. *Brynjolfsson, E., & McAfee, A. (2016, January 25). The second machine age (p. 49). W. W. Norton & Company.*
6. *Bianchini, M., & Lasheras Sancho, M. (2025, April 10). SME digitalization for competitiveness: The 2025 OECD D4SME survey (p. 12). OECD. https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/04/sme-digitalisation-for-competitiveness_3116862a/197e3077-en.pdf*
7. *Muradov, A., Ahmadov, F., Hajiyeva, N., Sood, K., & Grima, S. (Eds.). (2025). Sustainable Development and Green Innovation: Managing Risk through Interdisciplinary Approaches and Policy Strategies. Emerald Group Publishing.*

8. *World Bank. (2022). Annual review: Towards green, resilient and inclusive digitalization (p. 66). World Bank. https://documents1.worldbank.org/curated/en/099800307152412262/pdf/IDU136626fc5100dc1403d182371253d10b5db00.pdf?utm_source=chatgpt.com*
9. *European Bank for Reconstruction and Development. (2021). The EBRD's approach to accelerating the digital transition: 2021–25 (p. 26). EBRD. file:///C:/Users/User/Downloads/EBRD-digital-approach-2021-25.pdf*
10. *United Nations Development Programme. (2023). Annual report 2023 (p. 17). UNDP. https://www.undp.org/sites/g/files/zskgke326/files/2024-03/annual-report-2023.pdf?utm_source=chatgpt.com*
11. *Rice Research. (2024, March). Venture capital in Central Asia (2nd ed.).*