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Challenges and Perspectives of the Startup Ecosystem for the Development of Innovative Economy in Georgia

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ABSTRACT:
The processes of introduction of technology and innovation ecosystem in the economic development of the country have attracted special attention in the global world in the conditions of pandemic and post-pandemic. Accordingly, the research focuses on the formation and development models of modern start-up ecosystems, processes and determinants that ensure their transformation into innovations and the transfer of resources for economic development in the regions. The aim of the paper is to determine the main directions that will contribute to the development of startup ecosystems, taking into account global trends and state-specific practices; The research is based on the methods of grouping, comparison, analogy, analysis, generalization and systemic-structural approaches. As a result of the research, startup ecosystems were defined as an institutional mechanism that is open to the expansion of intersectoral networks and changes the competitive market environment in favor of the architecture of a stable innovative economy. The examples of Estonia, Spain, and Britain show the potential of developing a national startup ecosystem model that prioritizes long-term development, state technical self-sufficiency, and the ability to expand to new markets.

Keywords: innovative economy, ecosystems, technoparks, startups, innovations, R&D, economic development

1. Introduction

Increased production waste, traffic emissions have dramatically worsened the environmental conditions and ecological situation. Problems of environmental safety have manifested themselves in the emergence of new viruses that have created a significant threat to public health. The large-scale spread of the global pandemic coronavirus COVID-19 has brought the world economy to a standstill, and the global world has been engulfed in economic recessions. The stoppage of economic activity and socio-cultural events has dramatically increased the number of unemployed: Greece - 55%, Spain - 52%, other European countries - 20-22%, Georgia - 31%. All this was added to the large-scale process of devaluation, and the traditional economy for the first time found itself weak in

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the face of a global pandemic. The traditional economy has brought the relationship and interdependence of production and environmental conditions to a critical limit.

During the global pandemic and in the post-pandemic years, the world found itself under the influence of demographic, technological and economic factors. Covid has made even more urgent the question of replacing the existing economy with an innovative economy, hoping that the innovative economy, unlike the traditional economy, will reduce environmental risks, ecological losses, expand the scale of the market, where it will increase the role of technologies - especially digital technologies - that change the structure of the economy and business models.

According to Steve Blank (2019), there are several types of startup ecosystems. These include:

- Life startups, which are self-employed individuals.
- Small business startups, which have a small income and are aimed at families.
- Large-scale startups, which have the potential to grow into large companies.
- Marketable startups, which are designed for resale.
- Startups of large companies, which either make it big or fail. Social startups, which aim to make a difference in the world and are mission-driven.

As we can see, startup is related to different definitions. The concept of startup is related to scientific, technical and technological innovations. In the encyclopedic dictionary of business, innovation is defined as the introduction of new technologies, progressive forms of work organization and management in production, assimilation of new types of products. This term is often used synonymously with the word "invention" and is associated with the technological perfection of production processes, however, innovation is a broader concept than invention. It implies the commercial use of the invention (Kankadze, 2022). According to the World Bank (2010), innovation is the process of new technologies and methods that can bring significant benefits to society, because new technologies and methods improve both existing products and production processes and services.

Considering everything mentioned above, a startup is a recently developed innovative business idea that needs to be turned into a company. Its primary objective is to use a particular innovative business model and take certain risks in order to make a social impact on the environment (Abuselidze, 2024). However, according to Romer (1990), the person who created a new technology often does not receive most of the benefits, which reduces the incentive to create technology. In this regard, a number of recommendations have been received and their prevention depends on the wisdom of the government. In particular, the preamble of the Venice patent right of 1474 indicates precisely that no one else can take away the honor of an inventor who creates mechanisms for the common good (Mokyr, 1990).

According to Cohen, Nelso and Walsh (2000), patents are not necessarily the best way for firms, because patenting an invention requires a detailed public description, which is the best opportunity to create analogues. However, patents are useful if legal sanctions against copying of the invention can be enforced.

The role of technology in achieving production growth is growing day by day and belongs to the generally recognized hypotheses. The role of technology mainly refers to the process of obtaining revenue growth from production in the organization. By changing the

function of workplaces, technologies are also changing the organizational structure. A certain level of technical activity of the organization determines different management and coordination requirements for the organizational structure. In such a situation, it is necessary to allocate several priorities. In particular, the creation of a model of innovation that will contribute to the expansion of the possibility of attracting capital in small and medium-sized businesses; developing strategies in the field of data processing, which will use new technologies; Stimulating companies to increase business operational sustainability, etc.

The National peculiarities of the country, the level of development of the education and economy determine the choice of a national innovative model (Gechbaia and Qoqiauri, 2019; Ivashova et al., 2022). In order to achieve the development of the startup ecosystem, along with technologies, the accumulation of physical and human capital is also important. If half of the tasks of a profession are automated, it will reduce the labor demand on human capital and thus reduce the cost of manufactured goods. This will increase the demand for manufactured goods enough to compensate for the decrease in labor demand, and it may even lead to a net increase in the demand for labor. In this model, the economy produces a unique final good by combining tasks in the production function - some tasks can be technologically automated, while others can only be performed by humans.

According to the Authors (Acemoglu and Autor, 2011; Acemoglu and Restrepo, 2018) model, the impact of automation on occupational demand is ambiguous. However, back in 2017, in a survey conducted by the Boston Consulting Group, the respondents of which were 3,000 analysts and managers of the largest business companies in 112 countries, the majority of respondents considered the use of artificial intelligence to develop their own business (83%) and intelligence as the basis for gaining an advantage in a competitive environment (84%) (Columbus, 2017).

The growth of the startup ecosystem will support the formation of new businesses, the generation of money via tangible goods and services, the decrease of poverty, and, ultimately, the advancement of social and economic conditions. States have created a number of supporting policies, such as incentives for launching new businesses and bringing more items to market, to accomplish this. These policies mostly consist of project finance and tax incentives. Therefore, it is important to clarify what role fiscal policy plays in the development of the startup ecosystem in Georgia. Therefore, several hypotheses were defined:

Hypothesis 1. Tax policy in Georgia provides proper stimulation for the development of startups and technoparks.

Hypothesis 2. Georgia's tax policy cannot provide adequate stimulation for the development of startups and technoparks.

Hypothesis 3. Financing of startups and technoparks is sufficient for the development of the startup ecosystem.

Hypothesis 4. Financing of startups and technoparks cannot ensure the development of the startup ecosystem.

2. Literature review

"Determinants of innovation outcomes: The role of institutional quality describes the importance" of the existence of the level of institutional quality in the development processes of the innovative economy in the region (Sharma, et al., 2022). "Relationships among organizational culture, open innovation, innovative ecosystems, and performance of firms: Evidence from an emerging economy context", describes the process of innovation economy and business development in a country, which is determined by the question of interrelationship between innovation ecosystems, organizational culture, management and firms (Scaliza, et al., 2022). "Sustainable, technological, and innovative challenges post Covid-19 in health, economy, and education sectors", is a study according to which new and innovative technologies have been used in professional activities. The issues of functioning of companies and public institutions during the period of pandemic and economic crisis, managerial decisions made by them and acceleration of the introduction of innovative technologies in the field of production and services were studied (Bortoló, et al., 2023).

According to Zhang, et al (2022), the Russia-Ukraine war prompted countries to seek new, innovative ways to extract oil, gas and natural gas, and also accelerated the transition of countries to new energy, which ensures an increase in the degree of independence of states. According to these studies, it is determined that the political crisis accelerated the development of the global innovative economy in the field of energy, which led to the transfer of countries to a new stage of development and the maintenance of their financial stability during the period of the given crisis. According to Barnikol & Liefner (2022), sorting advanced economic innovations and classifying them according to areas provides a better understanding and understanding of the mentioned issue for the business sector. The process of developing advanced economic innovations contributes to the growth of the economic potential in the region and its effective use. Kuzior et al. (2023) defend the methods of development at the national, international, and corporate levels and offer directions for the informatization of the circular economy's macroeconomic tendencies. Businesses may use new technology to find new sales and distribution channels, develop organizational structures, decide production structures in compliance with legal requirements, and increase service quality in addition to real-time product volume adjustments to demand. According to Sonnier & Grit (2022), the factors that ensure the creation of a mission-oriented innovation system for the circular economy should be considered. These include: collaborative governance and policy frameworks, holistic planning and design, innovation ecosystems and R&D investments, circular business models and entrepreneurship, education and public awareness, cross-sectoral collaboration and partnerships, monitoring, evaluation and continuous improvement.

It was presented the role of innovative technologies and approaches in the direction of sustainable economic development of cities and municipalities, which implies the creation of an innovative economy and the transition to a circular economy.

A study conducted by Ullah et al., (2023) evaluates the impact of innovative information and communication technologies related to the environment in the energy transition process on financial development using available data from 1990 to 2020; The development of innovations contributes to the formation of an innovative ecosystem in

the region, which leads to the acceleration of economic growth and raising the production functionality to a new level. According to Li et al. (2023), with the growth of global economic uncertainties, China has entered a crucial period, when it became necessary to change the development model, optimize economic structures and search for new ways.
It was found that the digital economy has a significant positive impact on corporate innovation, which leads to the growth of the development of the innovative economy of the state and the digitization of the functioning of corporations, which also implies the introduction of innovative technologies in the field of production.
According to Xiong and Dai (2023), green financial investments, together with technological innovation and renewable energy, have a profound impact on sustainable development, which ultimately contributes to the acceleration of the growth of the innovative economy and the development of new financial directions. The level of development and innovative potential of the financial system is the most important determining factor of the economic progress and prosperity of any country (Abuselidze and Beridze, 2019; Abuselidze and Meladze, 2023). The financial system's innovation and the power of its networks and sectors influence other factors that drive innovation by providing a unique stimulus, but they also reveal the flip side of these factors. The development of the innovative system is significantly influenced by the effective financial policy of the state (Abuselidze and Mamuladze, 2020; Abuselidze and Meladze, 2024). According to Mekvabishvili (2016), the state should take the lead in capitalizing on the development of an innovative economy and encouraging the construction of a contemporary form of innovative economy. The state innovation policy plays a crucial role in shaping the innovative development of the region. It lays out the objectives of state and regional entities engaged in innovative activities, as well as the primary avenues of innovation, management strategies, and regulatory instruments (Abesadze, 2017). According to Kuzior et al. (2022), argue that when considering innovative development as a source of change, the concept of the circular economy affects the tools used in the process of introducing new technologies and their dissemination. The introduction of circular technologies is guided by external economic trends and the creation of external demand for these technologies, which increases the costs of modernization and slows down the pace of innovation development. This can lead to a decrease in the competitiveness of the industry and a loss of motivation for scientific research into new generation circular technologies. Furthermore, the focus on preserving the raw and industrial nature of the economy in order to meet existing environmental standards may hinder the development of innovative solutions. According to Catala et al. (2023), the function of creating social value goes beyond the individual level and reaches the meso and macro levels, such as strengthening people-oriented sustainability, inclusiveness and sustainability in the form of social innovation, new organization development. According to Zhang and Xu (2023), technological innovation is considered as the main driver of economic growth and financial development. The symbiotic relationship between technological progress, innovation and a stable stock market is highlighted. According to Fu and Zhu (2022), the research results suggest that total natural resource rent and financial risk index are negatively related to sustainable development, while technological innovation has a positive association. The impact of the total natural resource rent and financial risk index decreases with increasing quantiles, indicating that higher levels of the

impact of the total natural resource rent and financial risk index have a greater negative impact on sustainable development. And conversely, the positive impact of technological innovation on sustainable development also decreases with higher quantiles. Hausmann and Johnston (2014) emphasize the critical importance of innovation in modern economies and argue that investment in research and development (R&D) is essential for firms and countries to innovate and compete effectively in the future. They support the elimination of innovation deficits by identifying factors contributing to low levels of innovation. Wang (2022) provides strong evidence that capital account liberalization has a positive effect on technological innovation, especially in industries that rely heavily on external finance. The author argues that capital account liberalization helps to ease the financial constraints faced by firms, thereby promoting innovation. It also highlights the distinct effects of capital market liberalization and outward foreign direct investment (FDI) on innovation. While capital market liberalization facilitates access to external finance and reduces financial constraints, outward FDI enhances domestic finance from foreign operations, which encourages innovative activities. Kaplinsky and Kraemer-Mbula's (2022) concept of endogenous innovation, the recognition of different types of technological change, the development of techno-economic theory, and the combination of positive and normative analysis are all cited to support the argument for an inclusive innovation agenda in developing countries. Freeman's views emphasize the social construction of technology, the importance of shaping innovation, and the need for equitable and sustainable growth.

3. Results and Discussion

3.1 Analysis of the Global Index of Technology and Innovation Ecosystem

A country's level of innovation is determined through the Global Innovation Index by the World Intellectual Property Organization (WIPO) and Cornell University. It reflects the trends and opportunities in the direction of innovation in the world according to 132 countries.

The GII analysis of the global index of innovation is produced by taking into account two sub-indices - innovative costs (Input) and products (Outputs). For the analysis, we rely on up to 80 indicators according to 5 thematic categories. In particular:

1. Investment in human capital: this indicates the amount of money allocated to the nation's labor force;
2. Research and Development: The capacity of the nation to conduct research and development, as well as its capacity to draw in funds that may be converted into commercial goods and support economic expansion, are both examined in this area;
3. Production infrastructure - this determines the level of success in commercially viable products and services;
4. Technical workforce - this indicator shows the country's technical development and technical talent;
5. Political dynamics - assesses the impact of technology on the extent to which country policymakers and other stakeholders have participated in creating regional prosperity.

In the Global Innovation Index, the country data is considered in different economic groups: high, upper and lower middle and low income countries. By analyzing the available

data according to the relevant coefficients, the following countries occupy the positions of the leaders of the technology and innovation ecosystem (Figure 1).

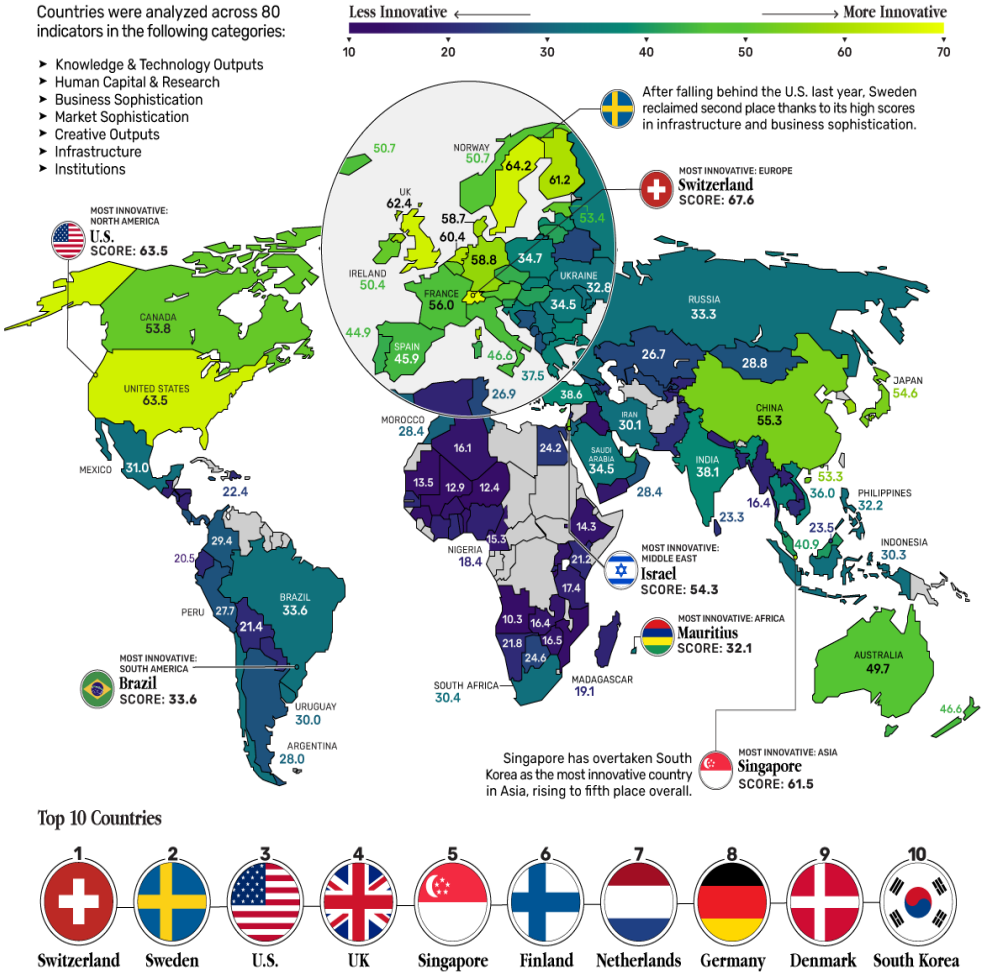

Figure 1: Countries with technology and innovation ecosystem in the world, 2023
Source: World Intellectual Property Organization, (2023).

In Figure 1, the ranking is based on seven main indicators of the country's competitiveness and capabilities, and the total score for all seven components is 100.

In the global innovation index, it is important to evaluate the place of Georgia in the ranking of post-Soviet countries. Analyzing the ratings of post-Soviet Eastern Partnership countries (Ukraine, Belarus, Moldova, Georgia, Armenia and Azerbaijan) and post-Soviet EU member states (Latvia, Estonia and Lithuania), Estonia takes the top spot in the ranking with 54.5 points (16th place), Lithuania with 43 points. (34th place) and Latvia 39.7 points (37th place), which Georgia ranks behind, but ahead of such countries as

Azerbaijan 23.3 points (89th place), Belarus 26.8 points (80th e place), Armenia 28 points (72nd place).

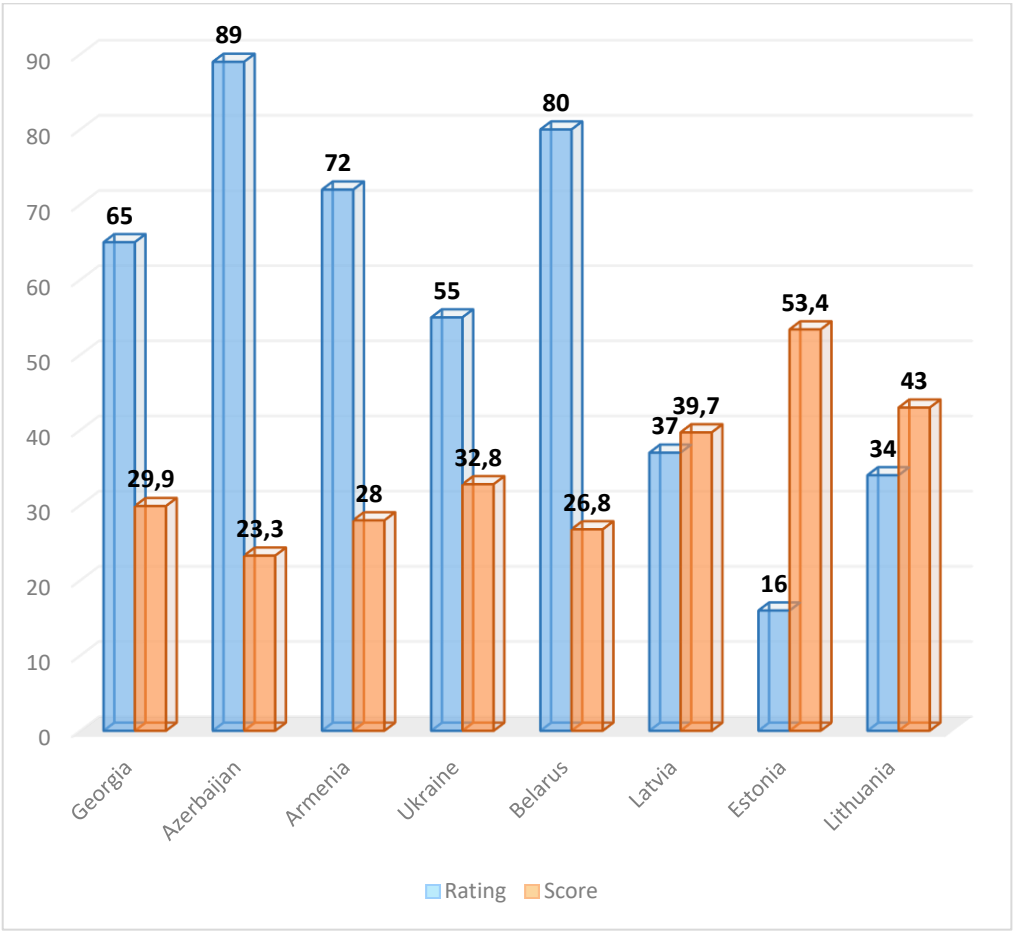

Figure 2. Ranking of post-Soviet countries in the Global Innovation Index (2023)
Source: Compiled by the authors based on the World Intellectual Property Organization (WIPO) Global Innovation Report 2023.

Through specific indicators, the index showed Georgia's strengths and weaknesses in terms of innovative development. According to the data of 2022, the tariff policy in the country, the indicator of the ease of hiring and firing employees, the ease of granting loans, and the high rate of foreign direct investments in relation to the GDP should be noted among the positive aspects. On the other hand, the disadvantages include the indicator of logistics capabilities (infrastructure category), the scarcity of expenditures on research and development financed by the private sector (business development category), the scarcity of high-tech production and intellectual products (knowledge and technology category). A significant disadvantage is the students' low scores on the PISA scale in reading, mathematics and science. Also, the number of highly rated universities is small, which indicates the low quality of education (IDFI, 2022) (Figure 3).

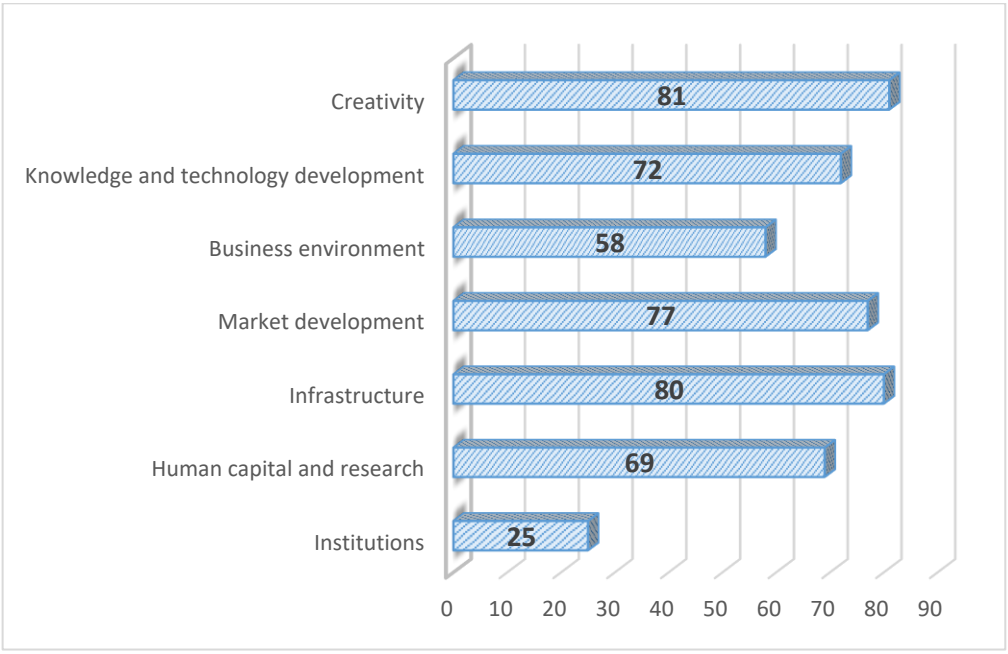

Figure 3. Innovativeness assessment criteria (score)
Source: Compiled by the authors based on the World Intellectual Property Organization (WIPO) Global Innovation Report 2023.

According to the 2023 report, Georgia's data improved in categories such as institutions/institutional arrangements, business environment, human capital, knowledge and technology-based products, creative/creative products and infrastructure. It moved from 74th place (27.9 points) in the ranking to 65th place (29.9 points) (WIPO, 2023).
Human capital is one of the most important factors of economic growth and innovation. Continuous innovation cannot be sustained by technology alone. The investment made in the direction of introducing innovative knowledge and technologies has economic and social effects. Spending on education now is one of the most important ways to earn a higher income in the future. It increases the productivity of the employee, which has a positive impact on both the company's and the employee's salary, and all together leads to a macroeconomic effect - economic growth. Improvements in management techniques and advances in science and technology are closely related to personnel qualification. In modern conditions, it is important to use innovative methods in all fields. That is why it is important to develop human capital, especially in relation to startups (Tsiklashvili et al. 2023).
Georgia's score in the global innovation index is characterized by a downward trend in dynamics, although in 2023 it increased by 2 units compared to 2022, and compared to 2019 by 7 units, and compared to 2014 it decreased by 4.63 units (Figure 4).

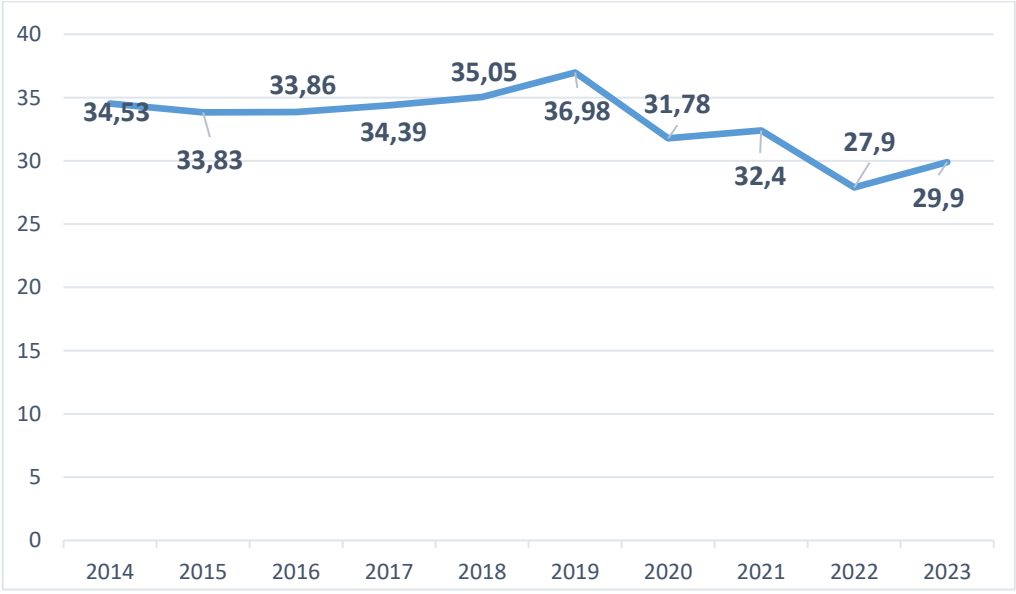

Figure 4. Georgia's score in the global innovation index
Source: Compiled by the authors based on the World Intellectual Property Organization (WIPO) Global Innovation Report 2023.

According to the experience of developed countries, the role of the startup ecosystem is important in the economic and social development of the country. Most of the countries pay great attention and prioritize the development of innovative technologies, which is an important factor for economic development. Single organizations, industries or even countries are faced with a choice - to embrace the benefits of modern technologies and innovations or to slow down the pace of growth and become non-competitive entities.

3.2 Challenges of tax regulation of development of startups and technology parks

In the modern world, in order to promote the innovative development of the economy, special attention is paid to the stimulation of startups and technological parks by tax mechanisms, since this is the only possibility to overcome the expected economic stagnation. In the conditions of intense competition, technoparks and start-up companies, using scientific and technical knowledge and technologies, offer the market new products, at the expense of which it is possible to maintain the stable development of the economy. For the development of startup companies, it is particularly important to stimulate not only them, but also their main investors through tax instruments, for example, with the help of government, incubators, and accelerators as well as private investments such as seed, angel, venture, and private equity funds, the Indian startup ecosystem has grown rather quickly (David, Gopalan, & Ramachandran, 2021).

In countries with developed economies, tax incentives are available only to those startup companies that meet the requirements established by law. For example, in Spain, a start-up company that meets the conditions defined by the law, including the implementation of innovative projects, has tax benefits in the profit tax (Spain startups Law, 2022). In

some countries, tax incentives are established for both start-up companies and their main investors, business angels and venture funds. Benefits for start-up companies are mostly presented in income and profit tax, and for start-up investor business angels in income tax, if they buy shares of start-up companies.

In Georgia, the tax legislation does not impose special conditions for the regulation of innovative activities, however, it regulates entrepreneurial activities that apply to all business entities, including startup companies. The regulatory norms of innovative activities reflected in the Tax Code are presented in the following form:

I. The reinvested part of the profit will be exempt from tax. In this case, the company must meet the following conditions: not to distribute profits, not to incur expenses that are not related to economic activity, not to provide goods or services free of charge, not to issue cash and not to incur representative expenses in an amount greater than the threshold amount established by the Tax Code.
II. Exemption from taxation of profit received by delivery of information technologies created by a legal entity of the virtual zone outside the borders of Georgia.
III. For business entities with the status of "international company", tax benefits are provided, which provides for the reduction of profit and income taxes to 5% (Tax Code of Georgia, 2023). These benefits apply to IT companies and maritime services.

A person with the status of international company has the right to provide the following services:

a) software release;
b) releasing of computer games;
c) releasing of other software;
d) computer programming, consulting and related activities;
e) computer programming activities;
f) consulting activities in the field of computer technology;
g) computer management activities;
h) other activities related to information technologies and computer services;
i) production and / or delivery of digital products, including software support and delivery of updated versions of software;
j) website development and / or delivery;
k) web hosting, remote maintenance of software and hardware;
l) software and related updates;
m) provide images, texts and information to ensure access to a database;
n) remote system administration;
o) online delivery of allocated memory capacity;
p) grant access to or download software (including purchasing / accounting software or antivirus software) and updates;
q) banner ads blocking programmes;
r) download drivers, such as software that connects computers to peripherals (such as a printer);
s) automatic online installation of filters on websites;
t) automatic online installation of firewalls;
u) commercial and maintenance services by a shipowner and/or those related to shipownership (Government of Georgia, 2020).

The Tax Code of Georgia does not establish separate regulatory norms for technoparks, which are presented in the form of integration of scientists, inventors and manufacturing companies. Part of the technoparks also has a universal laboratory of industrial innovation "Fab Lab", which create new technologies, supply them to interested companies and promote the generation of inventions and ideas. The number of technoparks in the country is quite high, although their activity is low, therefore, in order to stimulate innovative activities, it is advisable to exempt the services provided by technoparks from income, profit and value added taxes.

In Turkey, technoparks are only eligible for VAT exemptions on software-related projects. The fact that all activities in Technopark are exempt from VAT, however, could spur further interest in this area. Thus, this case will aid Turkey's growth of the national economy, rise in knowledge generation, and make Turkey competitive in the global arena (Orçun, 2019; 2021).

In Georgia, the tax legislation also does not provide tax benefits for the main investors of start-up companies, business angels and venture funds. Due to the fact that business angels and venture funds that can invest money in start-ups are not represented in Georgia in the classical form, it is appropriate for them to take advantage of tax benefits in income and profit taxes.

In Georgia, tax benefits for innovative activities are presented only in the form of tax credits or allowances for research and development or other innovative activities, the share of receiving enterprises was 6.5% by 2020, and by 2022 this figure was reduced to 1.1% (Table 1).

Table 1: The distribution of tax incentives and allowances received by enterprises by categories

	2020	2021	2022
Used tax incentives or allowances	6,5%	2,6%	1,1%
Of which:			
Tax credits or allowances for R&D or other innovation activities	24,4%	27,6%	35,1%
Tax credits or allowances for all other types of activities	75,6%	72,4%	64,9%
Total	100,0%	100,0%	100,0%

Source: National Statistics Office of Georgia. 2023

The share of enterprises that implemented innovative activities in the direction of new or improved products, which have not yet been introduced, was 2% by 2020, and 1.6% by 2022 (Figure 5).

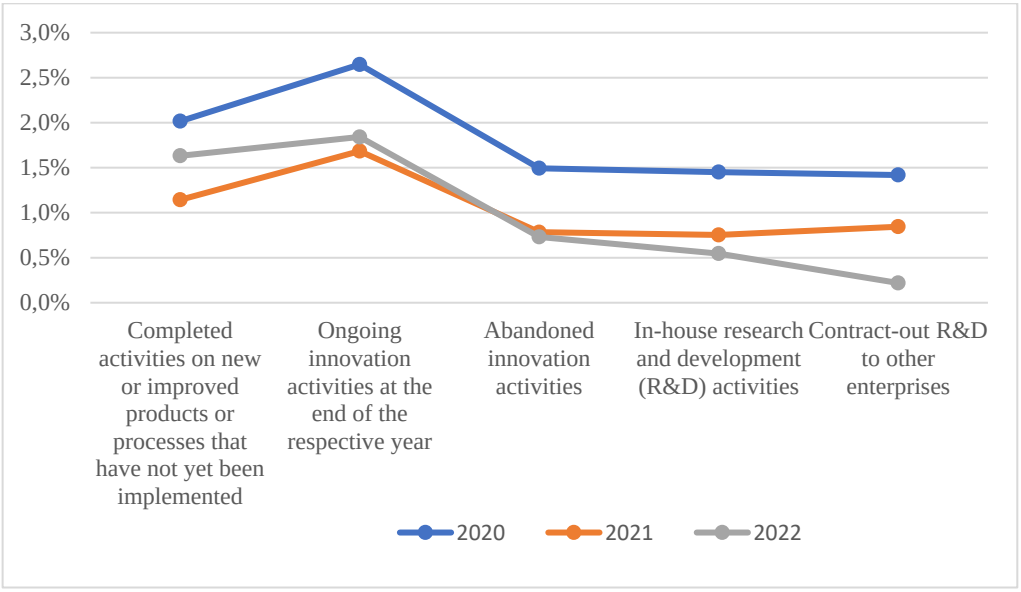

Figure 5: The share of enterprises have implemented the following types of innovative activities.
Source: National Statistics Office of Georgia. 2023.

By 2022, only 0.5% of enterprises had their own research and development (National Statistics Office of Georgia. 2023). As can be seen from the Figure 5, all types of innovative activities after 2020 are permanently decreasing, which indicates that business entities lack the motivation to carry out innovative activities. The analysis of statistical data proves that the current mechanisms of tax regulation were not sufficiently effective, therefore it should be expanded with benefits established according to specific taxes.

According to statistical data, it is also clear that the lack of internal financial resources, lack of credit or private capital, and very high costs (Table 2) are important among the factors hindering innovative activities, which ultimately means a shortage of resources needed for the implementation of innovative activities.

Table 2: Factors hampering for innovative activities, %

	2020	**2021**	**2022**
	High impact	High impact	High impact
Lack of internal finance for innovation	21,5%	20,1%	17,4%
Lack of credit or private equity	12,1%	12,0%	10,6%
Difficulties in obtaining public grants or subsidies	8,2%	7,0%	6,5%
Costs too high	22,0%	21,7%	20,4%
Lack of skilled employees within your enterprise	5,3%	6,6%	7,1%
Lack of collaboration partners	6,9%	6,5%	7,1%
Lack of access to external knowledge	3,1%	3,2%	3,8%
Uncertain market demand for your ideas	3,3%	3,1%	3,7%
Too much competition in your market	14,7%	17,1%	20,5%

Different priorities within your enterprise	3,0%	2,8%	2,9%
Total	100,0%	100,0%	100,0%

Source: National Statistics Office of Georgia. 2023

3.3 Analysis of financing programs supporting the technology and innovation ecosystem

3.3.1 Evidence from Estonia

In order to develop the technology and innovation ecosystem in the world, Estonia implements for the startup ecosystem: supporting marketing measures; raising the qualifications of company founders and employees; familiarization of investment potential for local and foreign investors; Reducing and eliminating all regulatory obstacles that hinder the initiation and development of business activities. In addition, a stable economic environment, minimal bureaucracy, low corruption levels, protection of private property rights, adherence to the rule of law, and strong guarantees for investment security, as well as a consistent fiscal policy from the state, all contributed to the "economic miracle" that has been achieved in Estonia (Masso et al., 2011).

The success of Estonia's startup ecosystem is due to programs supporting technology and innovation ecosystems, which finance technoparks:

- „ESTBAN" - network of Estonian business angels;
- "Incubator Tallinn" - an incubator for creative enterprises and entrepreneurs;
- "Startup Estonia" - Startup Estonia, a government initiative to support startups;
- "DIGIX Digital Creative Media Incubator" - a business incubator for digital creative media startups;
- "Startup Wise guys" - investments in technological startups;
- "ESTVCA" - Estonian Private and Venture Capital Association;
- "Finance Estonia" - organization of public-private finance clusters;
- "MEKTORY" - Tallinn University of Innovative Technologies and Business Center;
- "Tallinn Science Park Tehnopol" - startup incubator and business center;
- "Funderbeam" – early-stage startup investments;
- "HEDMAN lift" - legislative support.

Estonian startups signed 45 funding agreements for 147.3 million euros in the first 9 months of 2023, 23 startups received more than one million in funding. During the first three quarters of 2022, the total investment volume was 1.2 billion euros, which included 59 financing deals. It is worth noting that 2022 was significantly influenced by Bolt's €628 million investment round. The largest investments in the first three quarters of 2023 were made by Binalyze (€17.7 million), Funderbeam (€36 million), RangeForce (€17 million), Planet42 (€14.1 million) and EFENCO (€12.3 million)).

According to the Estonian Tax and Customs Board's quarterly data, Estonian startups had a turnover of EUR 1.69 billion in the first nine months of 2023, which is 11% more than the same period in 2022 (EUR 1.52 billion). The top-grossing startups were Bolt (€904.9 million), Veriff (€53.8 million), Swappie (€47.8 million), Crezu (€24.1 million) and Viseven (€23.9 million). The biggest employers among Estonian startups are Wise (1896 employees) and Bolt (1287 employees), Swappie (461 employees), Veriff (307 employees)

and Monese (240 employees). In the first nine months of 2023, Estonian startups paid 162.5 million euros in income tax, which is 21% more than in the same period last year. The biggest payers of income tax are Bolt (€27.3 million), Wise (€26.1 million), Veriff (€7.1 million), Monese (€4.2 million) and Glia (€3.7 million).

3.3.2 Evidence from the United Kingdom

The development of the UK startup ecosystem is driven by the existence of various sources of funding for the technology and innovation ecosystem, of which the following are worth noting:

- Small funding sought from Crowdcube, Seedrs, Kickstarter;
- MarketInvoice, ThinCats, Sancus, Funding Circle, Advance Funding - startup loans;
- Business incubators;
- Venture capital financing;
- State support;
- "SEIS" - start-up enterprise investment scheme, tax relief for the investor, which reduces the investment risk.
- R&D tax credits;
- The 'Patent Box' (a piece of legislation that can provide substantial tax relief to profitable UK companies that hold an EU patent covering certain aspects of their product).
- SBRIs – (space-based infrared systems, mostly government contracts, 100% funded.
- Vouchers for innovation - TSB Bank vouchers are intended for financing innovative projects).
- Regional Growth Funds - (One of the good sources of funding is the Regional Growth Fund, which funded startups with £3.2 billion between 2011 and 2020).

As of 2023, the top 10 funded UK tech parks are as follows (Table 3):

Table 3: Top ten UK tech parks 2023

Technopark	Total funding (£)
Global Switch	4.9 billion
The Hut Group	3.9 billion
Deliveroo	1.5 billion
Prodigy Finance	1.3 billion
LendInvest	1.3 billion
OakNorth	1 billion
Telegram Messenger	850 million
Revolut	837 million
Oxford Nanopore Technologies	666.8 million
BGL Group	525 million

Source: Compiled by the authors based on the Altar (2023).

3.3.3 Evidence from Georgia

Funding of startups in Georgia is regulated by the rules of project financing by the Georgian Innovation and Technology Agency, according to which startups are divided into several groups. In particular, startups whose budget is more than 100,000 GEL belong to the first group, and startups with a budget of less than 100,000 GEL belong to the second group. In the first category of startups, 20 received the maximum funding of 100,000 GEL, which is 29.4 percent of the total amount. Among them: 21 digital technology companies (41%), 24 manufacturing companies (48%), and 6 companies in the service sector (11%).

Most of the startups funded by GITA are based on innovative digital technologies and artificial intelligence (AI) (75%), while the rest (25%) are high-tech enterprises.

Table 4: Startups funded by the Georgian Innovation and Technology Agency (GITA)

Startup name	Brief description of the startup	Financing
AWORK	Digital management of HR processes	150 000 GEL
BETTER ENERGY SOLUTION	Increasing access to renewable energy sources for companies by providing a budget-friendly and convenient service	150 000 GEL
CARUSELL	A flexible platform for buying and selling cars	150 000 GEL
CALEN AI	Helping small and medium-sized businesses to organize, plan and automate communications with customers without learning technology	150 000 GEL
COLIS	Creating a web3 cross-chain CRM that will help various decentralized applications (Dapps) interact with their users and analyze them	150 000 GEL
eCONSUL	Creating a space to help the traveler fill out, store and manage their personal information	150 000 GEL
FlexUp	Startup connects students to hospitality businesses with short daily shifts, taking pressure off core teams and fueling the best customer service era	150 000 GEL
FORMA HEALTHY	Simplifying healthy living and making weight loss an adventure	150 000 GEL
MARLIN	A technology startup designed to simplify and lower the cost of managing orders between suppliers and buyers	150 000 GEL
OMOI	Transforming an AI-based UX research MVP into a product and entering the global market	150 000 GEL
PROXYMETA LABS	Providing incubation of web3 projects in the CIS and Asia region, helping with idea generation, project planning, marketing plan development, financial issues, etc.	150 000 GEL
RANKO	The goal of the project is to create an ecosystem that will create access to affordable finance for low-income people and small business owners, as well as help banks and microfinance organizations to create digital infrastructure and improve services	150 000 GEL

SMART APP	By using cloud technologies, small and medium-sized businesses are helped to achieve efficiency	150 000 GEL
Stori AI	An AI-powered web application that enables business owners and operators, marketers and copywriters, students and teachers to create flawless and creative digital content, both text and visual, in seconds	150 000 GEL

Source: GITA, 2023

Based on the analysis of Table 4, we can see that digital technologies and artificial intelligence are prioritized in terms of financing, which is good on the one hand, and bad on the other, because less attention is paid to the field of production, which should be the opposite in the case of Georgia, production should be developed and Georgian products should be exported.

Technological development is one of the effective means of achieving success in global competition in the 21st century. Technologies are having a significant impact on business operations. No matter the size of the organization, technology directly and indirectly enables organizations to make money and produce products that meet customer demand. Technology infrastructure affects organizational culture, performance and relationships between organizations. Creating an innovative business model from competitors is the best way to differentiate a company, which through the interaction of critical factors, ensures long-term success. With the help of a business model, companies will be able to fully determine their business potential and correctly allocate existing financial, material and human resources in order to obtain additional profits.

Technological innovation in today's environment is simplified, and to achieve it there are already many systems and methodologies that facilitate the processes of creating innovations in organizations. The European Union is planning to invest millions for the training of personnel and the adoption of new technologies. Several global projects have been launched to establish the mentioned trend: "European Union Initiative - Digital Agenda For Europe, Europe 2020 Initiative"; "Initiative of the Economic Forum - Grand Coalition for Digital Jobs and others.

4. Conclusions

Based on the analysis of theoretical and practical results, it can be said that economic development is the result of the efforts of startups and entrepreneurs. Technologies are the fastest and most effective way to increase the country's GDP. The creation of new technologies requires the acquisition of capital, the nature of which varies greatly from place to place and time. The modern economy requires enormous resources in research and development (R&D), to create new products and processes. The success of the startup ecosystem in Estonia is due to the financing of technoparks, which are implemented by programs supporting technology and innovative ecosystems. In the UK, the development of the startup ecosystem is driven by the existence of various sources of funding for the ecosystem of technologies and innovations.

Therefore, it is very important how Georgia to provide a fiscal environment for investors who can invest venture capital in innovative technological advances.

As a result of research, it has been confirmed that the current tax policy for startups in Georgia, which is presented as an integration of scientists, inventors and manufacturing companies, does not have separate regulatory norms. This means that they do not receive tax breaks. It is essential to introduce tax incentives for innovative startups, such as exemption from taxation for several years after establishment. Additionally, it would be beneficial to exempt the services provided by technology parks from income taxes, profits taxes and value-added taxes to stimulate innovation. We believe that Georgia will become an attractive location not only for domestic but also for international startups.

During the research process, it was confirmed that the fiscal policy in Georgia cannot ensure the implementation of innovative activity at the disposal of business entities with sufficient financial resources. In order to promote the development of innovative activities, it is appropriate to develop result-oriented, effective fiscal mechanisms, which are better reflected on economic entities, under the conditions of financial and credit mechanisms developed for the same purpose. It is thanks to them that Tallinn is the Silicon Valley of Europe. The existence of such supporting financial programs is the most important factor in the development of the ecosystem of technologies and innovations in the Georgian market, and it is such supporting programs that will contribute to the increase in the number of technoparks in Georgia and, accordingly, the income received from them, which will contribute to economic development.

The development of the startup ecosystem in Georgia is not only essential but also crucial for the country's long-term economic prosperity and competitiveness in the global market. To secure its position in the global economic landscape, Georgia must invest in innovation and promote the startup culture, creating a favorable environment for research, development, and technological advancement. This would benefit the Georgian economy, society, and people's well-being. The world is currently undergoing a rapid technological transformation, and Georgia has an opportunity to capitalize on this trend by fostering an innovative economy that promotes technological growth.

To support the technology and innovation ecosystem, several main directions of state activities can be distinguished:

- Existence of basic systems of digital education and knowledge;
- Stimulation and support of the digital business environment;
- Simplified access to finance;
- Support for digital skills and talents;
- Strengthening of digital entrepreneurial culture.

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