

INNOVATIVE ENTREPRENEURSHIP AND START-UPS FOR THE ECONOMY STABILIZATION: WORLD EXPERIENCE AND APPLICATION IN UKRAINE

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The study of innovative entrepreneurship is relevant for the Ukrainian economy and society, which suffer from underuse of intellectual and natural potential of the country. We assume that traditional forms of business organization have, for the most part, reached their full potential. As a result of the necessity to stabilize the national economy, fundamentally new, inventive kinds of entrepreneurship are emerging. This is the form and content originality that startups have displayed. Despite the existence of hundreds of studies in the field of innovation and startups undertaken by specialists from other countries, there are gaps in the analysis of the prospects and constraints of such activities in Ukraine. The question of whether creative entrepreneurship has the potential to stabilize and strengthen the Ukrainian economy must be addressed.

The purpose of this study is to actualize the problem of Ukrainian innovative entrepreneurship and its organizational form – startups – companies which start a fundamentally new production. It is primarily concerned with finding and assessing opportunities and barriers to such operations in Ukraine. The purpose of the identification and evaluation is to determine the influence of the innovation sphere on entrepreneurship stabilization and economic certainty.

We shall concentrate on a few key concepts without which the study's goal will be impossible to attain. Innovation, innovative entrepreneurship, country models of innovative development, and startups are examples of these concepts. We shall define the main in the content of the above topics without focusing on specifics.

Innovative activity is an **activity** which has such defining features:

- it is aimed at creating a new or significantly improved product, technological process, method of providing services;
- it is directly related to the improvement of knowledge, research and development of innovative ideas, embodied in fundamentally new products, services, technologies which are in demand by consumers.

Innovative entrepreneurship is a special type of economic activity focused on innovation, which has the following characteristics:

- provides a permanent search for new opportunities and is focused on the implementation of new projects;
- faces relatively high risks in the initial stages of implementation, so it provides organizational and economic safeguards and higher responsibility of the initiators;

- is motivated by the prospect of receiving innovative (significantly higher than average) profits or other benefits;
- creates significant competitive advantages in the market.

The success of innovation activity is determined by the economic policy of governments, the state of national markets, and the level of macroeconomic stability. In view of this, there are grounds for distinguishing the concept (and the corresponding phenomenon) of «**national models of innovative development**». Information about the most well-known and clearly defined models is illustrated in Fig. 1.

Fig. 1 illustrates three models of innovative development, adapted to the specific conditions of individual countries.

The multichanneling and variety of funding and incentive sources is a significant benefit of developed countries' rapid innovation development. In the United States, Japan, and Western Europe, funding for research and development (R&D) and innovation is characterized by a mix of different sources. There is a case to be made for differentiating such innovation finance channels from acceptable sources. (Fig. 2).

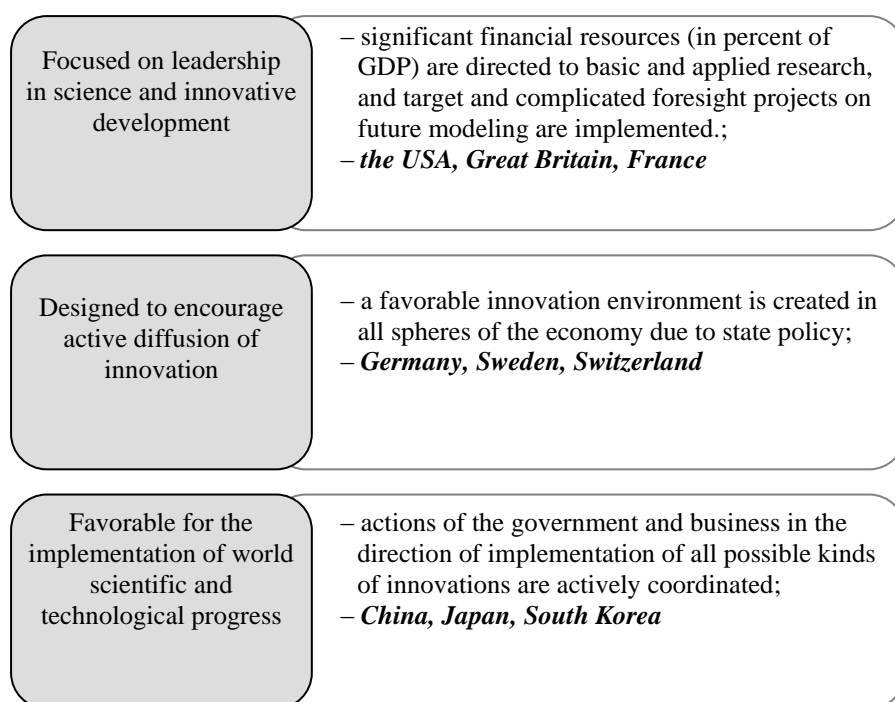


Fig. 1. Models of innovative development of economically developed countries

Source: developed by the authors based on [1]

Fig. 2 illustrates five research funding channels, covering domestic, collectively and privately created, as well as external sources.

The necessity and expediency of promoting innovative entrepreneurship at the price of budget funds is evident from the experience of the United States, Japan, Germany, the United Kingdom, France, and Canada. The state's innovation policy is the most important mechanism for such financing. Governments fund 20 to 50 percent

of national research and development investment in mature market economies. The share of spending on research and innovation in total government spending is small. But it remains stable for 20 years and is 6-7% in the United States, in Germany, France, Britain and Italy – 4-5%, in Japan – 3-5% [1].

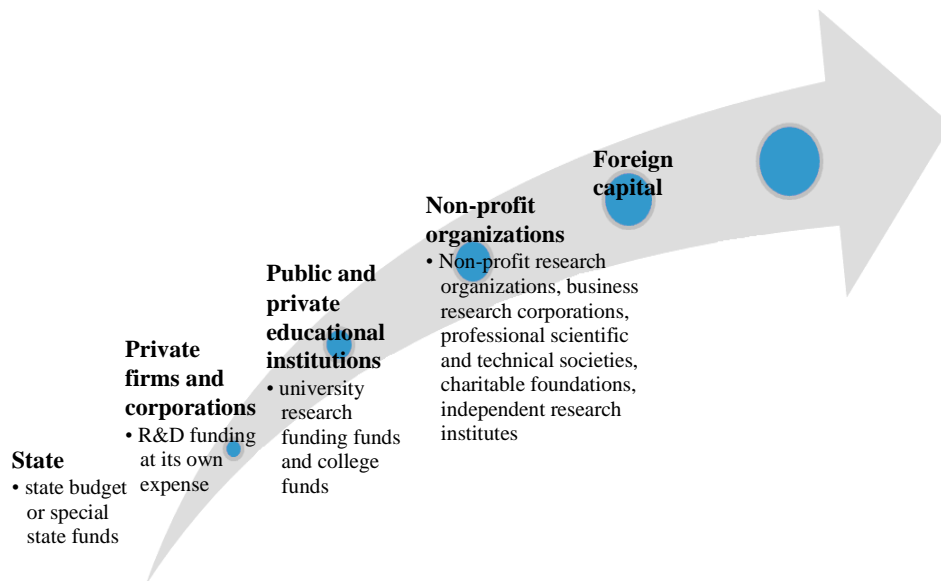


Fig. 2. The main sources of funding innovation activity in developed countries

Source: authors' own

Banks, pension funds and insurance companies can become an important source of financing innovative venture capital in economically developed countries. But in different countries the share and influence of these sources are different.

World experience shows the efficiency of **venture financing**, which involves **direct investment at an early stage** of projects in high-tech areas. As is well known, such financing can be a lifeline for companies that don't have easy access to bank loans. Small and medium-sized business venture capital has aided technological advancement in biotechnology, information technology, semiconductor electronics, and computer technology. Venture financing has become most widespread in the United States, Germany, the United Kingdom, Japan, and the Netherlands. While IT businesses receive the lion's share of venture funding in the United States, venture capital in Western Europe is pretty evenly dispersed across industries and sectors. The analysis of the international experience of the innovative economies formation and the innovative business organization gives the bases for isolation of such important moments of innovative activity, as: factors that aided innovative activity (stimulating factors); factors that slowed down innovation (restraining factors); organizational forms (institutions of support) of innovative activity. The highlighted aspects of innovation activity are presented in the analytical Table 1.

The analytical Table 1 provides information on favorable and unfavorable for innovation factors of influence. They have appeared in the activities not only of the world's innovation leaders, but also of the countries of rapid progress in the field of

innovation. Both can be identified as innovative insiders. The experience of developing organizational structures (stimulating institutions) of innovations is very valuable for countries with innovative outsiders. After all, it is institutions that ensure that stimulus elements have an effect.

In many nations, «startups» are a proven and true form of innovative industry. The meaning of this notion can be interpreted in a variety of ways. It's critical for researchers and practitioners in countries that borrow startup experience to consider various aspects of this content. As a result, we concentrate on the uniqueness of content interpretation.

Table 1. Factors and institutions of innovation

Factors that have stimulating effect	Factors that have a destimulating effect	Organizational forms (institutions) of innovation activity support
<ul style="list-style-type: none"> – consistent and long-term innovation policy of the state with clearly defined goals and tools; – rational use of innovation potential for the formation of a new type of economy – innovation; – systematic interaction of the private, research, and educational sectors; – targeted support of important for the formation of innovation potential activities which can not be developed on the basis of own resources; – implementation of innovation commercialization programs; – expedient in view of national interests attraction of foreign investments of transnational corporations; – legislation on the protection of intellectual property rights and its consistent implementation; – systematic study and adaptation of the best international experience. 	<ul style="list-style-type: none"> – relatively low share of private business in R&D financing (France, Sweden, the Netherlands, India); – detachment of small business from innovation (France, Sweden, the Netherlands, Japan); – «brain drain» – migration of skilled workers (France, Germany); – territorial disparities in innovation development (Germany, India, China, France, Norway); – rapid aging of the population (European Union countries); – underdeveloped venture capital markets (Denmark, Germany); – organizational and legal obstacles to the commercialization of innovations (India, Germany, Brazil); – «over-bureaucratization» of procedures related to business activities (India, Brazil, Asian countries). 	<ul style="list-style-type: none"> – special organizations and bodies responsible for innovation policy definition and implementation (almost all countries); – active interaction with other countries in technology exchange (almost all countries); – creation of innovation clusters (France, Germany); – implementation of major innovations in cooperation with multinational corporations (Sweden, France, the Netherlands, India, Japan); – organizational support of free education aimed at identifying and promoting talented youth (Germany, Norway); – use of «innovation vouchers» (the Netherlands, Great Britain, Germany).

Source: authors' own based on [1]

The term «startup» is commonly connected with the name of a tiny company called «Start Up», which was formed in the United States by two Stanford University students. These are W. Hewlett and D. Packard, the founders of the world-famous Hewlett-Packard Corporation in the field of information technology. As a result, when the term «startup» is used, it refers to a business that makes a significant breakthrough in a specific field, implements a fundamentally innovative concept, and expands swiftly.

A startup, according to Steve Blank, a well-known American entrepreneur who founded eight successful businesses, is an organization «established to develop a repeating and scalable business model». This definition focuses on the start of what others repeat and spread.

Recognized venture capitalist Paul Graham, who became the founder of Y Combinator and Yahoo! Store and wrote the book «Hackers and Artists», noted the

following: it is «a company designed for rapid growth» [3]. This definition emphasizes the fact of dynamic business development.

Eric Ries, the American initiator of the Lean Startup movement and a specialist in the field of high-tech business management, notes that «a startup is a human institution designed to create a new product or service under the conditions of critical uncertainty». This definition is interesting because it focuses on the novelty of the product and the need to act under uncertainty conditions.

The work «The Startup Owner's Manual: The Step-By-Step Guide for Building a Great Company» by Steve Blank and Bob Dorf [5] provides several definitions of startups:

- a startup is a process of entering the market of a newly created company in a short time and, as a rule, with minimal investment;
- a startup is not a scaled-down version of a large company, but an organization that is looking for a profitable business model that can be scaled;
- a startup is a form of business which involves testing not only the financial capabilities of its initiators, but also their endurance, agility and courage;
- a startup is a project to implement a set of untested hypotheses with extremely high risks.

The most appropriate definition for us is that a startup is a newly created company that forms its business on the basis of innovations (innovative technologies), has limited resources, and is focused on the rapid development and conquest of a new market segment. At a first glance, every newly created company can be called a startup. But this interpretation is wrong. What fundamentally distinguishes a startup from a normal newly created enterprise is reflected in Fig. 3.

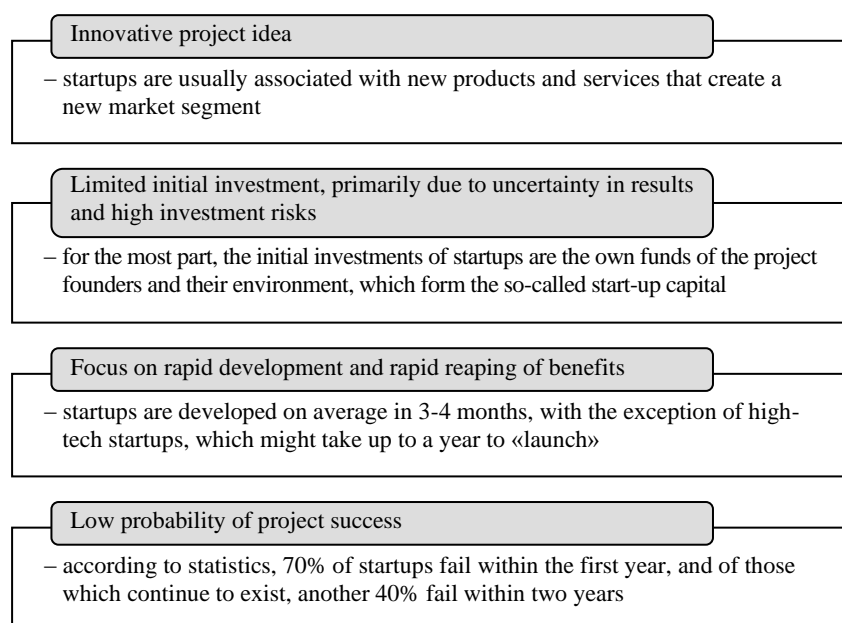


Fig. 3. Key differences between startups and regular companies

Source: authors' own

The essential idea given in Fig. 3 is that a startup differs from a regular newly created company by at least four features, namely: project innovation, lack of investment due to high riskiness of the project, focus on rapid growth and low probability of success.

In addition to these four features of content, a startup, as a form of business, has certain features of the so-called «life cycle». The full «life cycle of a startup», in our opinion, covers the following 5 stages (Fig. 4). The vast majority of startups cease to exist in the first three stages.

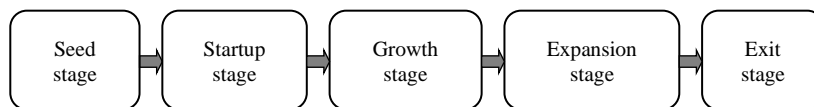


Fig. 4. The «life cycle» of startups

Source: authors' own based on [6]

Illustrated in Fig. 4 stages of the startup «life cycle» have the following features:

- «*seed stage*» involves the formation of start-up capital after the preparation of a paper version of the business project;
- «*start-up stages*» are the beginning of practical activities and market positioning;
- «*growth stage*» is characterized by the achievement of normal (expected) values of key economic indicators: output, sales, profits, etc.;
- «*expansion stage*» means the growth of the scale of the case through additional investment in staff, fixed capital, office space, etc., as well as obtaining high «innovative» profits which compensate for previous risks and correlate with the uniqueness (innovation) of the product;
- «*exit stage*» is associated with the completion of the «life cycle» of a startup, which can be combined with the acquisition of «ordinary» company, with the mass reproduction of previously innovative ideas by other entrepreneurs, as well as exit from the founders and sale of their shares.

Other classifications of stages of the startup «life cycle» are used in the scientific and journalistic literature. Despite the differences in approaches, however, we can state the following:

- startups take on the risks of uncertainty in the initial stages of their existence;
- those of startups that do not cease to exist in the initial stages, in the later stages add certainty to other forms of business and the entire national economy.

Based on the results of the analysis of the world experience of startup development, researchers make generalizations based on indisputable facts.

First, government support for innovation plays a key role in increasing the number of startups and their successful development. The EU management in general and the governments of Germany, France, Finland, Austria, Ireland, Sweden, and Norway, in particular, are implementing support programs for startups. These innovative enterprises are provided with credit and tax benefits, grants for students, promising graduates of educational institutions, for individual entrepreneurs, creating a favorable environment for venture investors. New EU members – Poland, the

Czech Republic, Lithuania, Hungary – have also become active participants in the process of supporting innovative entrepreneurship [7].

Second, government policies of insider countries – leaders and activists in the innovation sphere – share a number of characteristics. This is a clear division of powers between state, regional, and local governments that prevents duplication of functions, implementation in global innovation processes based on international cooperation, including technology transfer, and reforming legislation to meet the needs of innovative enterprises [8].

Third, successful startups are those that are founded to address the most pressing needs, or those that help to develop and support such needs. This is demonstrated, for example, by data from the site «StartupRanking», which ranks startups around the world. The ranking of startups is based on the so-called SR rating, which reflects the importance of the startup on the Internet (SR Web rating) and its social impact (SR Social). Table 2 presents the 10 most famous startups, according to the «StartupRanking» in 2020.

Table 2. Top 10 startups in the world ranking according to «StartupRanking»

Rank	Startup	Founded in	SR rating	Description	Country rank
1	500px	2009	89, 794	The premier photography community for accumulating the best images on the Internet	Canada
2	Canva	2012	89, 645	Graphic design software	Australia
3	Coursera	2012	88,178	Free online courses from the best universities	the USA
4	Duolingo	2011	88,171	Free language education for the whole world	Guatemala
5	Freelancer	2009	88,085	The world's largest freelance and crowdsourcing market	Australia
6	Teespring	2011	87, 665	A platform that allows everyone to create and sell high quality products	the USA
7	Giphy	2013	87, 636	Animated GIF search	the USA
8	Telegram	2013	87,607	Messaging application	Russia
9	IFTTT	2010	87,382	Getting large amounts of information by combining existing online services – Facebook, Twitter, etc.	the USA
10	TransferWise	2010	87,362	Money transfers on the Internet, sending money abroad	Great Britain

Source: grouped by the authors [9]

According to the information given in Table 2, the most successful startups in 2020 operated in such areas as photo and graphic editing, online courses and platforms for education, remote work through remote access, sales of goods through online platforms, GIF-animation, creation of databases for consumers needs, online money transfers.

Fourth, there are typical reasons for the failure of startups, many of which are related to mistakes in managing innovative businesses. The generalizations about these reasons made by CB Insights are given in Fig. 5.

As evidenced by the information presented in Fig. 5, the main reason for the «failure» of startups – 42% of the total – was that they were not aimed at meeting real needs. Hence it is possible to conclude that the idea of a startup can not significantly «outpace» the needs of consumers.

The modern Ukrainian economy is not an innovative economy. The country belongs to the group of innovative outsiders. One of the main reasons for this state of affairs, in our opinion, is the ruling class's desire to maintain the traditional resource-based, non-innovative economic model. Despite this, startups are developing in Ukraine and a growth trend has formed.

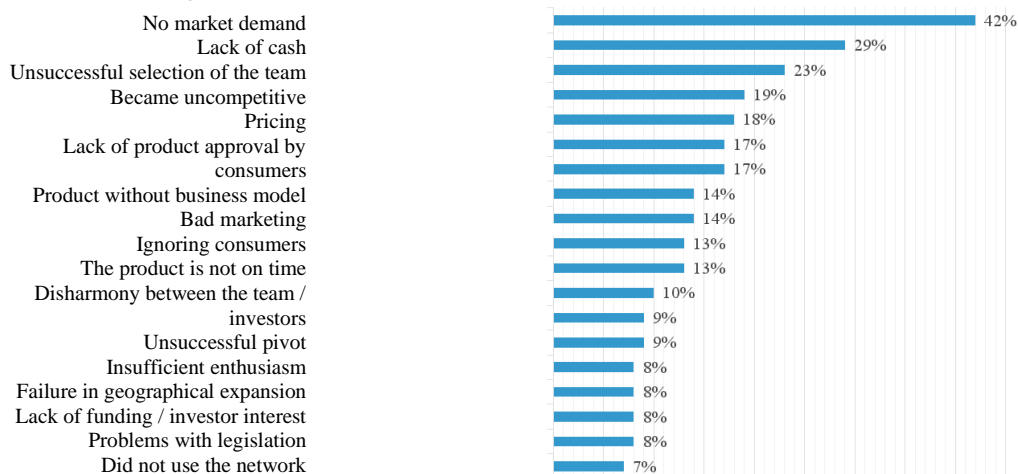


Fig. 5. Identifying the root reasons of startup failures

Source: authors' own based on [10]

There are grounds for such generalizations regarding the development of the innovation segment of the Ukrainian economy and Ukrainian startups.

First. In the second half of 2010s, there was a rapid increase in investment in startups. According to the study conducted by the Ukrainian Venture Capital and Private Equity Association (UVCA), the dynamics of investment was as follows (Fig. 6).

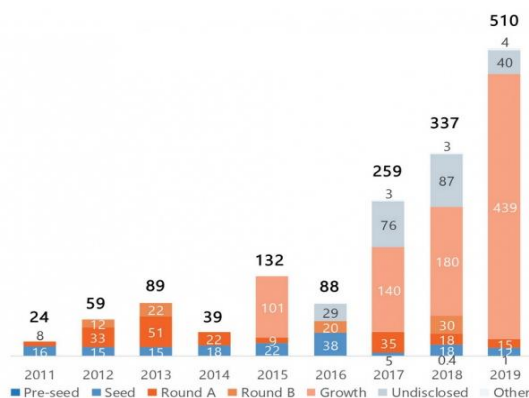


Fig. 6. Investments in Ukrainian startups for the period 2011 – 2019 (million USD)

Source: developed by the authors [11]

According to the data in Fig. 6, investment in Ukrainian startups surged nearly threefold in 2017 (the first year of considerable stabilization of the Ukrainian economy) compared to 2013 (the last year before the Russian-Ukrainian war). In 2019, startup investments grew 1,5 times in a year.

Second. At least seven sources of funding for startups are used in Ukraine, and they are listed in importance in this order [12; 13]:

- *personal money* – own savings of startup initiators;
- *money of friends and relatives* – funds borrowed from a small circle of close people with the aim to organize a family business;
- *crowdfunding* – public funding through specialized platforms, in content similar to charity for a constructive idea;
- *bank loan for the development of entrepreneurial ideas* (formally – the current program called «Affordable loans 5-7-9%»);
- *business angels* – single independent investors at the very beginning of project development, sometimes with the participation in management;
- *state participation in financing* (Ukrainian Startup Fund);
- *venture financing* – the use of fund investor capital for high-risk projects, often under unfavorable launch conditions.

Unfortunately, in Ukraine, public funding, as well as venture capital and bank participation, have not yet proven to be crucial sources of startup finance. This is what sets the Ukrainian economy apart from other innovative economies.

Third. In general, Ukraine has created a legal framework for the organization of innovation activity and the operation of startups. But it lacks concreteness, effectiveness and political will to implement it. The main legislative acts are presented in Table 3.

Table 3. Legislative field for startups in Ukraine

№	Legislative act	Scope of regulation
1.	The Law of Ukraine On Investment Activity enacted on September 18, 1991. №1560-XII [14]	Determines the general legal, economic and social conditions of investment activity in Ukraine
2.	The Law of Ukraine On Entrepreneurship enacted on February 7, 1991 p. №698-XII [15]	Determines the general legal, economic and social principles of entrepreneurial activity (entrepreneurship) of citizens and legal entities on the territory of Ukraine, establishes guarantees for freedom of enterprise and its state support
3.	The Law of Ukraine On the regime of foreign investment enacted on March 19, 1996. №93/96VR [16]	Determines the general features of the foreign investment regime on the territory of Ukraine, based on the goals, principles and provisions of the legislation of Ukraine
4.	The Law of Ukraine On Innovation enacted on July 04, 2002. №40-IV [17]	Determines the legal, economic and organizational principles of state regulation of innovation in Ukraine, establishes forms of state stimulation of innovation processes and aims to support the development of innovation economy of Ukraine
5.	The Law of Ukraine On Science Parks enacted on June 25, 2009 №1563-VI [18]	Regulates legal, economic, organizational relationships related to the creation and operation of science parks, and aims to intensify the processes of development, implementation, production of innovative products and innovative production
6.	The Law of Ukraine On Copyright and Related Rights enacted on December 23, 1993. №3792-XII [19]	Protects personal (non-property) and property rights of authors and their successors related to the creation and use of works of science, literature and art (copyright), and the rights of performers, producers of phonograms and broadcasting organizations (related rights)
7.	The Law of Ukraine On protection of rights to inventions and utility models enacted on December 15, 1993. №3687-XII [20]	Regulates the relationships that arise from the acquisition and exercise of intellectual property rights to inventions and utility models in Ukraine
8.	The Law of Ukraine On protection of rights to marks for goods and services enacted on December 15, 1993. №3689-XII [21]	Regulates the relationships that arise from the acquisition and exercise of trademark ownership for products and services in Ukraine
9.	The Law of Ukraine On Personal Data Protection enacted on June 01, 2010. №2297-VI [22]	Regulates legal relationships dealing with the protection and processing of personal data, with the goal of safeguarding man's and citizen's fundamental rights and freedoms, particularly the right to privacy in relation to the processing of personal data

Source: developed by the authors based on [23; 24]

From the analysis of the Ukrainian legislation it follows that, creating the general conditions of entrepreneurial activity and conditions of investment, it does not regulate special conditions of startup activity. The last of these regulations was adopted 10 years ago. Therefore, the regulatory framework does not reflect modern conditions and special needs of entrepreneurs-innovators.

Fourth. In Ukraine in 2019, the state created a special body that is designed to take care of the activities of startups – the Ukrainian Startup Fund (USF). This can be interpreted as the fact of taking real steps to support innovation.

The goals and priorities of the USF can be inferred from information on the formal features of the fund, areas of funding, and the amount of funds it operates.

Formal characteristics of USF are presented in Table 4.

Table 4. The main characteristics of the Ukrainian Startup Fund

List of characteristics	Contents of characteristics
Ownership	State
Initiator of creation	Cabinet of Ministers of Ukraine
The mission of the fund	support for innovative projects and assistance to the most talented Ukrainian entrepreneurs in creating successful global companies
Terms of financing	<ul style="list-style-type: none"> – financing only Ukrainian business; – in the form of grants, not through equity participation (from 25 to 50 thousand dollars); – financing companies in the initial stages of development (pre-seed and seed); – financing promising and innovative ideas of technology startups that demonstrate the high potential of global commercial success
Selection process	on a competitive basis: companies are evaluated and selected by a board of independent investment experts
Fund objectives	<ul style="list-style-type: none"> – support for innovation; – promotion of entrepreneurship; – economic development; – increase in investments; – job creation; – raising awareness
Target sectors	<ul style="list-style-type: none"> – artificial intelligence (AI); – augmented reality (AR / VR); – big data (BigData); – blockchain; – cybersecurity; – defense; – medicine and health care; – travel; – financial technologies (FinTech); – educational technologies (EdTech); – robotics; – professional services; – software as a service (SaaS); – production; – e-commerce of Internet of Things (IoT)

Source: developed by the authors based on [25].

According to the Table 5, the Ukrainian Startup Fund aims to improve not only the special conditions for the development of startups, but also the general conditions for the development of entrepreneurship. An indisputable positive effect of its activity is a transparent and public competition of projects. The fund finances each

startup that won the competition and is at the early stages of development, in the amount of 25 thousand dollars. A startup operating at later stages can receive \$50,000 from the fund. Therefore, one startup that has not stopped operating and is showing growth may have support in the amount of 75 thousand dollars.

In 2019 – 2020, the Fund financed the following Ukrainian startups at the initial stages of their formation (Table 5).

Table 5. Ukrainian startups funded in 2019-2020 by the Ukrainian Startup Fund (up to USD 25,000)

№	The company name	The content of a startup	Direction of funding of the USF
1.	iCorn	The platform brings together farmers, buyers of agricultural products, transport companies, elevators, laboratories, banks and insurance companies related to agribusiness	Artificial intelligence, blockchain, agricultural technologies, Fintech / Legaltech
2.	Caretech Human	Continuous automatic health monitoring and early detection of diseases at home	Healthcare, Artificial Intelligence
3.	Cittart	Marketplace, designed as a mobile application, where any artist can easily place an art object for sale, and the buyer – place an order	Big data, blockchain, retail
4.	Sprybuild	3D printers, polymers, and software for industrial customers, allowing them to mass-produce items cheaply and quickly	Industry
5.	IOON	The first portable device that turns ordinary water into a powerful antimicrobial sanitizer that can be used anywhere and at any time	Healthcare
6.	Dooozen.io	An online service designed to free you from routine work and increase the productivity of everyone who actively works with the LinkedIn network	Media and advertising
7.	BioBin	Mobile application to reduce environmental impact through better consumption and waste management	Energy and ecology
8.	BIOsens	The world's first device that automates sample preparation, analysis, and storage of results on the cloud, allowing for testing outside of the lab with laboratory precision	Agrotechnology
9.	Skyworker	A product that speeds up hiring IT professionals 10 times by building the own online network	Big data
10.	Pytag	Grain trading platform that uses unique algorithms to collect and process all available digital data on the grain trade market	Big data

Source: [25] information data on funded USF startups as of 05.07.2020.

The Ukrainian Startup Fund sponsored the early stages of the establishment of companies whose operations were related to agricultural management, health care, ecology, and the creation of big databases – Data Base, as indicated by the information in Table 5.

At later stages of startup development, the Ukrainian Startup Fund supported (in the amount of USD 50,000) such enterprises (Table 6).

The analysis of startups supported by the Fund at the stages of their later existence shows a fairly wide range of priorities. It covers online services, agribusiness, ecology, medicine, energy, legal advice, and e-government, etc.

Table 6. The Ukrainian startups funded in 2019 – 2020 by the Ukrainian Startup Fund (in the amount of 50 thousand US dollars)

№	Company name	Startup content	The USF funding direction
1.	Norm	Device with built-in power supply and machine learning technology for efficient and healthy operation	Energy and ecology, artificial intelligence
2.	NuWork	CRM system for hiring employees	Big data, artificial intelligence
3.	FlashBeats	Mobile application for creating light shows at music and sports events	Lifestyle
4.	FINMAP	Online service for financial accounting in small and micro businesses	Fintech/Legaltech, educational technologies, retail
5.	Allzap	A platform for creating online stores selling auto parts and a market place	Media and advertising, Retail
6.	GeoDesign	Analytical online service that provides information about the benefits and risks of opening a shop / cafe / hairdresser or other establishments depending on the location	Big data, retail
7.	FRAMIORE	Formation of a women's clothing brand with its own garment production and R&D center for research, development and innovation of textile products and technologies	Energy and ecology, industry, retail
8.	BIOC	Nanopolymerization technology that allows to bind starch at the molecular level and obtain a biocompound (or bioplastic) with excellent physical and mechanical properties	Industry
9.	Cardiolyse	Platform for automatic interpretation of electrical signals of the heart at rest and Holter monitoring of the medical level to identify 19 types of arrhythmias and accurately detect most heart abnormalities	Healthcare
10.	Mate academy	Online University of IT Professions	Educational technologies
11.	ChoiZY	Career guidance online platform that helps teenagers choose a profession and professionals to share experiences with young people	Educational technologies
12.	Legal Nodes	A legal marketplace that helps technology businesses resolve legal issues around the world	Educational technologies
13.	SolarGaps	Blind system with solar cells that generate electricity	Energy and ecology
14.	SMART-MAK LTD	Development, production and sale of products and services for monitoring the consumption of any resources	Big data, Energy and ecology
15.	Agrifinance Online	Through an integrated and transparent online ecosystem, Ukraine's agricultural market players' network formation	Fintech / Legaltech, agrotechnology
16.	HarvesTrack	Hardware and Software (IoT) solutions to control the harvesting process and prevent grain theft during harvest	Agrotechnology
17.	AeroDrone	Unmanned aerial vehicles with high payload and long flight duration	Agrotechnology
18.	FieldBI	Comprehensive analytical and expert system to improve solutions for all market participants	Agrotechnology
19.	Unicorn Nest	Search for the most relevant investors based on the own investor base and the formation of a standard for fundraising	Fintech / Legaltech
20.	ПравоМен	Automated assistant for domestic legal issues, including the formation of documents and clarification of the capabilities of e-services created by the state	Fintech / Legaltech

Source: [25] information data on funded USF startups as of 05.07.2020.

In total, from the time of its foundation in 2019 to mid-2020, the Ukrainian Startup Fund financed 30 technologically innovative enterprises for a total of 1,25 million USD. Moreover, in terms of the number of funded enterprises and the amount of funding, preference is given to the following areas: agricultural technologies (5

startups and 225 thousand US dollars), energy and ecology (4 and 175, respectively), large databases – Big Data (4 and 150, respectively).

Analyzing the main vectors of funds and the potential of the state fund to support startups, we have grounds for the following generalizations:

- unfortunately, neither the list of goals of the state fund nor the list of actually funded startups includes those that are directly related to the military-industrial complex (MIC). The latter is unnatural for a country at war;
- the direction of cybersecurity, the relevance of which increases with increasing economic uncertainty, the growing number of cyber attacks on various portals and databases, including government, is not discussed;
- the total amount of the funds is small enough and such that it cannot significantly change the situation in the innovation sphere.

Fifth. Despite the fact that Ukraine remains an innovative outsider and does not have the necessary support for the development of startups, the intellectual and human potential of the country creates the preconditions for the development of innovative entrepreneurship. The main Ukrainian startups are emerging in the field of IT technologies. According to StartupRanking, 10 startups were the leading ones in Ukraine in 2019-2020. They specialize in creating and promoting websites, optimization and testing for developers, and online services software. Every year Ukraine strengthens its position in the international IT arena. According to Ukrainian UVCA experts, the country is becoming an R&D hub for foreign companies. In Ukraine, the groundwork for so-called «innovative breakthroughs» is being laid. The latter are the ones who build the image of the future and help to shape it today. According to the ADVICE Audit Consulting Group, Ukraine has produced startups that have the potential to transform the world. Among the change agents are [26]:

- *Carbominer* – startup for the extraction of carbon dioxide from the air with the aim to sell it to industrial greenhouses;
- *Ecotyre* – startup for processing used car rubber tires and metal impurities they contain;
- *Atmosphere* – startup for accurate weather forecasting within limits not exceeding 200 meters from the service consumer;
- *Minect.ai* – startup with the technology of remote demining of the Donbass territories mined by the occupiers, through the interaction of drones and explosive detection equipment – ground radars, metal detectors, thermal imagers, etc.;
- *Greenbin.app* – a startup that provides low waste recycling costs through the use of an attractive incentive system for product consumers;
- *Seadora* – a startup aimed at saving the oceans by minimizing fish waste and directly encouraging fishermen.

There is a list of Ukrainian startups that can lay the foundations today for a model of an attractive and favorable future for people. These include fifteen startups (Table 7).

Table 7. Fifteen Ukrainian eco-startups of world importance

№	The name of the eco-startup	Content of activity
1.	Recycle Map	Interactive map of recycling points of different types of waste
2.	FoodBIOPack	Biodegradable and edible packaging, utensils and cutlery
3.	Ecoisme	Electricity saving system
4.	RE-leaf PAPER	Paper from fallen leaves
5.	Effa	Disposable toothbrush made of recycled paper
6.	Re-beau	Recycled plastic jewelry
7.	Flushwave	Technical water reuse system
8.	Go To-U	International platform with free charging stations for electric cars
9.	SolarGaps	Blinds with solar panels
10.	Stock-factory	Online platform for the sale of problematic goods (damaged packaging, approaching expiration date), which helps to reduce the destruction of goods in retail chains
11.	UGrid	Service for building energy micro-networks that will help reduce the use of fossil energy sources and avoid overpayment for energy supply
12.	TOKA	Network of gas stations
13.	Nuka	Eternal notebook and eternal pencil
14.	Water Cloud UA	Device for water intake from air
15.	Jollylook	Eco-friendly camera made from recycled paper and cardboard for instant photos

Source: systematized by the authors based on [27-29].

The startups listed in Table 7 are concerned with ecology, well-being and formation of attractive prospects, confidence in the future and economic and social certainty. It is not only about Ukrainian citizens, but also about citizens of other countries, because it is about solving global environmental issues.

Sixth. Ukraine is increasing its collaboration with international organizations that promote innovation and help businesses. For example, in 2020, the Ukrainian Startup Fund took part in the creation of AC LAB21, a collaborative online platform aimed at supporting effective solutions to the global crisis with a focus on Eastern Europe. The Memorandum of Cooperation has already been signed with the Solid5 International Venture Fund, the FeelGoodLabs business accelerator, the Center for Entrepreneurship of the Ukrainian Catholic University, and other participants interested in the development of innovation in Ukraine. International cooperation provides new opportunities for Ukrainian startups that have not obtained government support to receive funding from international organizations [25]. Existing barriers to receiving and using foreign money for innovation by Ukrainian entrepreneurs must be removed to reap the benefits of international cooperation.

Seventh. Many barriers to innovation have developed in the Ukrainian economy and society. The SWOT analysis of the conditions for the development of Ukrainian startups, in our opinion, should reveal that restrictions are more important than promotion factors. These limitations are highlighted in all innovation studies. Unfortunately, there are no studies to substantiate the hierarchy of deterrents. It is this «negative ranking» of influencing factors that could create a basis for making sound management decisions. Taking into account the opinion of other researchers, we formulate assumptions about the following hierarchy of the most important factors constraining innovation:

- weakness (limited resources, unstructured nature, etc.) of the Ukrainian investment market [30];
- lack of state support for innovation due to the lack of innovation policy [31] and lack of political will to implement it;
- careless attitude to the resource, first of all qualified personnel potential of the country [32];
- vulnerability of property rights in general and intellectual property rights in particular [33].

With regard to the existence of many factors hindering innovation and the lack of a consistent innovation policy of Ukrainian governments, the studies in the field of substantiation of appropriate tools to stimulate innovation become relevant. In our opinion, the recommendations on the use of such specific incentive tools deserve attention and approval [34]:

- «*mapping*» of the *Ukrainian startup ecosystem*, which will create a state-run open Internet portal providing all the information needed for entrepreneurs, researchers, investors, and everyone interested in innovation;
- *public-private* partnership in providing the necessary level of education and integration of entrepreneurs into international networks and communities for the use of innovative experience;
- combination of *education in the field of IT technologies and entrepreneurship* for the acquisition and use of «digital skills» in practice;
- use of *startup visas – residence permits for foreign initiators of startups*;
- *mentoring (training, educational) programs for entrepreneurs* with the aim to transfer innovative experience on an ongoing basis.

Conclusions: According to the results of the study, the following generalizations can be made:

- the understanding of the impact of innovative entrepreneurship and its form – startups – on the certainty of the national economy is based on the awareness of the relationships of such concepts (phenomena) as: innovation activity – innovative entrepreneurship – startups – innovative national development model. The government's (state) innovation policy, with its inherent aims, priorities, and influence mechanisms, is a reflection of the innovative development model;
- the typical tools for implementing the innovation model of development by innovative insider countries are: a stable share of innovation expenditures in the state budget, active financing of startups by venture funds and commercial banks, and constant participation in international cooperation in innovation sphere and technology transfer. The role of the mentioned tools to promote innovation has not become decisive in the Ukrainian model of innovation;
- a startup, as a form of innovative entrepreneurship, differs from other forms by such properties as: the emergence in connection with the idea of fundamentally new products, services, technologies, low probability of success and significant risks of closure, lack of investment resources, focus on rapid growth and rapid market

acquisition. It is these features that become decisive in assessing the impact of startups on economic uncertainty;

– innovative entrepreneurship (startups) has an impact on economic uncertainty in at least three ways: a) In the widespread replication of creative ideas, startups take on large investment risks and operate as a shock absorber for another (non-innovative) entrepreneurship, b) startups arise and operate in areas related to global issues in the fields of ecology, energy, health, the state of which threatens humanity, and provide their full or partial solution, c) thanks to startups image of the future, in the creation of which they participate directly today, becomes clearer and more comprehensive;

– the restriction of innovation activity, passivity (inaction) of the state in the innovation sphere or ineffective imitation of activity by central and local authorities means increasing the scale of uncertainty of the national economy. Subject to political will, the Ukrainian government should develop and implement a strategy for the formation of the so-called «startup ecosystem of Ukraine» with elements of influence already tested in countries with innovative development models.

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