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STARTUP ECOSYSTEM: THE LONG-TERM VALUE OF A SUSTAINABLE DEVELOPMENT STRATEGY FOR UKRAINE

Ukraine is a country with immense potential for entrepreneurship, but it faces significant challenges that can hinder the growth of its entrepreneurial ecosystem. This article explores the challenges that Ukrainian entrepreneurs face and how they can be overcome, as well as the role of government and other organizations in supporting entrepreneurship. One of the biggest challenges for Ukrainian entrepreneurs is access to funding. Ukraine has a developing financial market, and it can be difficult for entrepreneurs to secure loans or investments. This is compounded by the lack of a well-developed venture capital market, which makes it difficult for entrepreneurs to access the capital they need to grow their businesses. The article uses quantitative methods of research, modeling the influence of factors on the efficiency of the ecosystem

Keywords: reconstruction; startups; entrepreneurship; ecosystem; post-war economy; investment; venture capital; entrepreneurial culture; SMEs.

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ЕКОСИСТЕМА СТАРТАПІВ: ДОВГОСТРОКОВА ЦІННІСТЬ СТРАТЕГІЇ СТАЛОГО РОЗВИТКУ ДЛЯ УКРАЇНИ

Економіка України буде потребувати швидкого та динамічного зростання одразу після закінчення війни. Саме стартапи можуть стати одним з ефективних інструментів піднесення вітчизняної економіки у післявоєнний період. Стартапи процвітають у країнах, що розвиваються, у охоплених війною країнах і в країнах, які лише починають розвивати і стимулювати підприємницьку діяльність. Окрім цього, стартапи також стимулюють конкуренцію та заохочують людей бути більш інноваційними та креативними, оскільки нові власники бізнесу мають свіжі ідеї, якими можуть поділитися.

У статті досліджуються виклики, з якими стикаються українські підприємці, та шляхи їх подолання, а також роль уряду та інших організацій у підтримці підприємництва. Однією з найбільших проблем для

українських підприємців є доступ до фінансування. Фінансовий ринок в Україні перебуває на етапі стагнації і підприємцям може бути важко отримати кредити або інвестиції. Це ускладнюється відсутністю розвинутого ринку венчурного капіталу, що ускладнює доступ підприємців до капіталу, необхідного для розвитку їхнього бізнесу.

Мета нашого дослідження є дослідити ступінь впливу різних чинників на ефективність стартап екосистем, виявити чинники з найбільшим впливом та на їх основі здійснити пошук шляхів їх посилення для розбудови підприємництва та ефективної екосистеми післявоєнної економіки.

Для аналізу екосистеми ми розділили фактори на два види: входу та виходу з системи. До чинників входу відносяться ті, що піддаються регулюванню і впливають на її функціонування, саме: регулювання економіки через законодавчі акти, інноваційність економіки, креативність економіки, освіта та людський капітал, інвестування економіку, політичне середовище та політична стабільність, бізнес середовище та підприємницька культура.

До чинників виходу з системи відносяться результати діяльності екосистеми: кількість успішних стартап проектів на 1 мільйон населення, кількість єдинорогів на 1 мільйон населення екосистеми (тобто стартапів вартість яких оцінюється більше 1 мільярда доларів США), кількість пантеонів на 1 мільярд населення екосистеми (тобто підприємств що зробили значний прорив у своїй галузі чи значний вплив у регіоні).

Україна має потенціал стати центром інновацій та підприємництва завдяки своїй стійкості. Однак одного лише залучення інвестицій буде недостатньо для забезпечення довгострокового зростання та успіху. Нашій державі необхідно розвивати культуру інновацій та креативності, надавати пріоритет навчанню підприємництву та створювати сприятливе середовище для процвітання стартапів. Таким чином, Україна зможе розкрити весь потенціал свого людського капіталу та створити сприятливий клімат для інновацій, економічного зростання та інвестицій.

Ключові слова: стартапи; підприємництво; екосистема; повоєнна економіка; інвестиції; венчурний капітал; підприємницька культура; малий та середній бізнес.

Introduction. Ukraine's economy needs rapid and dynamic growth immediately after the end of the war. Since The National Bank of Ukraine reported that the official unemployment rate was 30%, [1] not including forced migrants. This is a very high unemployment rate and reflects the significant economic disruption and instability caused by the conflict. Real wages in Ukraine have decreased by more than 20% according to the pension fund. [2] The fall in Ukraine's GDP by the end of 2022 is estimated at 30.4% [3] This decline GDP have major implications for the country's businesses, workers, and citizens. Entrepreneurship and small businesses like startups can play a significant role in the growth of a nation, especially in developing countries and war-torn countries.

Here are a few reasons why:

Job creation: Startups are known to be significant job creators. According to the World Bank [4], small and medium-sized enterprises are responsible for creating around 60-70% of jobs in developing countries. By starting new businesses, entrepreneurs can create new job opportunities, which can help to reduce unemployment and poverty.

Innovation: Entrepreneurs are often driven by innovative ideas and are willing to take risks to bring their ideas to life. Innovation is essential for economic growth, and startups can drive innovation by introducing new products, services, and business models.

Increased competition: Startups can bring increased competition to existing markets, which can lead to more efficient and lower-cost products and services. This can benefit consumers and encourage existing businesses to become more innovative and competitive.

Foreign investment: Startups can attract foreign investment and help to diversify the economy. Foreign investors are often attracted to startups because of their potential for high growth and innovation.

Entrepreneurial culture: A thriving startup ecosystem can create an entrepreneurial culture that encourages more people to start their own businesses. This can lead to a more dynamic and innovative economy, with more opportunities for growth and job creation.

Ukrainian entrepreneurs face significant challenges, there are initiatives and organizations working to address these challenges and create a more supportive ecosystem for entrepreneurship. With the right support and resources, Ukrainian entrepreneurs have the potential to drive economic growth and create a brighter future for Ukraine.

Access to funding remains a significant challenge for Ukrainian entrepreneurs and startups. Ukraine has a developing financial market, and it can be difficult for entrepreneurs to secure loans or investments.

However, there are initiatives aimed at addressing this challenge, such as the emergence of angel investor networks and the creation of government funding programs. For example, the Ukrainian Startup Fund [5], which was created in 2018, provides seed funding to early-stage startups, and the National Entrepreneurship Development Fund [6] provides loans and grants to small and medium-sized businesses.

Despite these initiatives, more needs to be done to create a supportive funding environment for startups in Ukraine.

Funding is just one of the many critical factors that contribute to the success of a startup ecosystem, there are also other factors such as access to talent, market size, and cultural attitudes towards entrepreneurship that can also have a significant impact on the success of startups.

Therefore, it is important to consider a wide range of factors when analyzing the Ukrainian startup ecosystem, and to develop strategies that address the unique challenges and opportunities facing Ukraine's startup ecosystem.

Since the economy of Ukraine is integrated into the world economy, we consider it expedient to conduct an analysis in terms of the key factors of different ecosystems of the world, dividing them into input factors, that is, those regulated by the government and stakeholders, and output or resulting factors.

The division of factors into inputs and outputs provides a comprehensive framework for analyzing the startup ecosystem. By analyzing the inputs, policymakers and stakeholders can identify areas where improvements can be made to support the growth of startups. By analyzing the outputs, researchers can measure the effectiveness of the ecosystem and determine if improvements to the inputs have resulted in increased success for startups.

The inputs include regulation of the economy through legislative acts, innovativeness of the economy, creativity of the economy, education and human capital, investment economy, political environment and political stability, and business environment and entrepreneurial culture. These inputs play a critical role in creating a supportive environment for startups to thrive.

The outputs from the system include the number of successful start-up projects per 1 million population, the number of unicorns per 1 million ecosystem population (i.e. startups valued at more than \$1 billion), and the number of pantheons per 1 billion population of the ecosystem (i.e. enterprises that have made a significant breakthrough in their field or a significant impact in the region). These outputs provide a measure of the success of the ecosystem and can help to identify areas where improvements are needed.

Next, we compared the input and output indices, where we saw a clear dependence between the indices and calculated a power function describing the dependence between the variables.

The correlation index confirmed the close relationship between inputs and outputs.

The initial data were taken from the reports of the World Bank [4], Startup Blink [7] and other international organizations [8,9,10]

The purpose of the article. The purpose of our study is to investigate the extent to which various factors influence the effectiveness of startup ecosystems, to identify the factors with the greatest impact, and, based on them, to find ways to strengthen them for building entrepreneurship and an effective ecosystem in the post-war economy.

Results. Ukrainian entrepreneurs face significant challenges, there are initiatives and organizations working to address these challenges and create a more supportive ecosystem for entrepreneurship.

We focused analyze on the main component's ecosystem, here they are:

- Regulation of the economy through legislative acts (In1, tab. 1) [4]: This includes laws and regulations related to business formation, intellectual property rights, taxation, and other areas that can impact the ability of startups to operate and grow.

- Innovativeness of the economy (In2, tab. 1) [11]: This refers to the degree to which the economy is able to produce and adopt new technologies and innovative products or services. A highly innovative economy can create opportunities for startups to develop new and disruptive business models.

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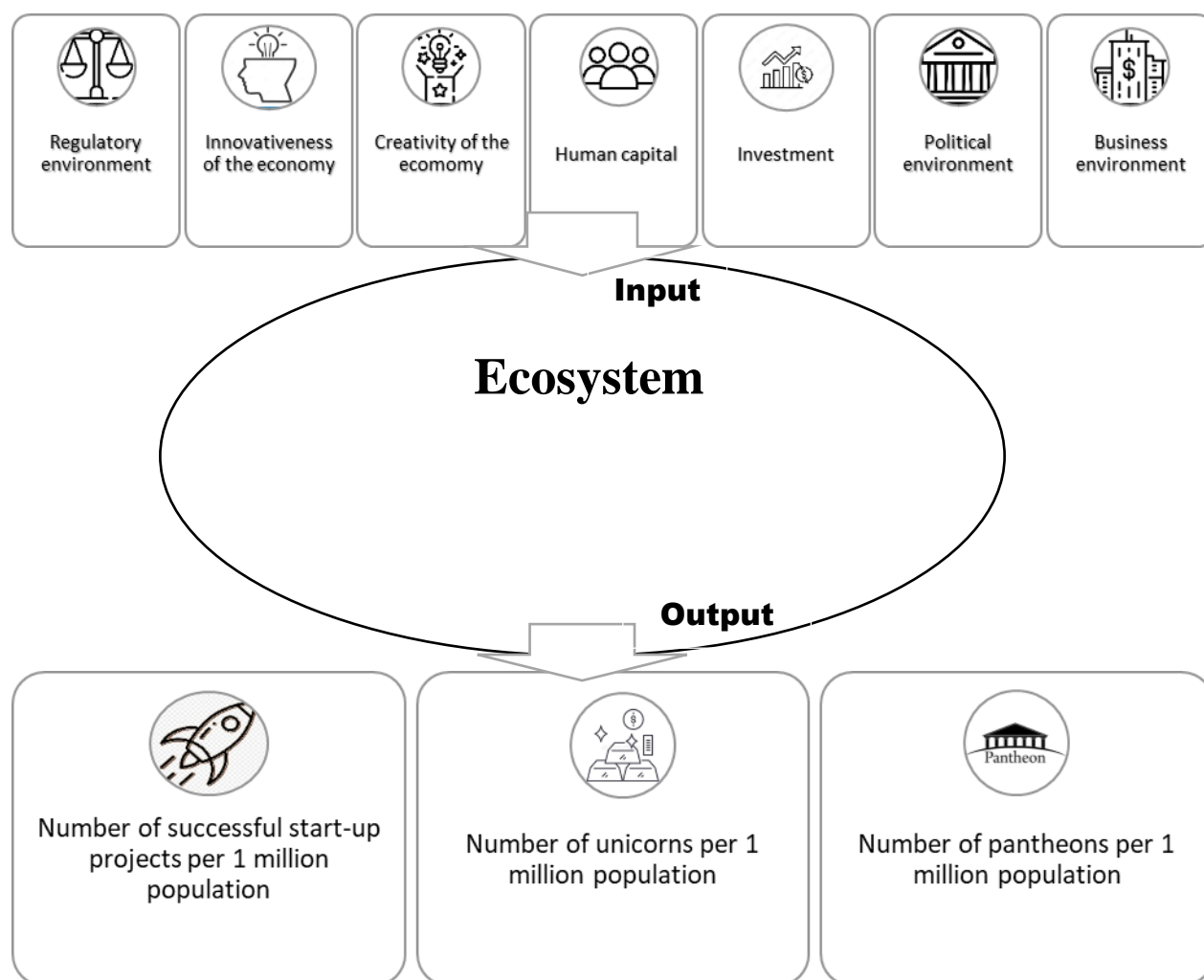


Fig. 1. *Ecosystem inputs and outputs*

Source: compiled by the authors.

Creativity of the economy (In3, tab. 1) [12]: This refers to the ability of individuals and organizations in the ecosystem to generate new ideas and solutions. A creative ecosystem can foster a culture of entrepreneurship and support the development of innovative startups.

- Education and human capital (In4, tab. 1) [15]: This includes factors such as the quality of education and training programs, the availability of skilled workers, and the ability of entrepreneurs to access talent and expertise.

- Investment economy (In5, tab. 1) [4]: This refers to the availability and accessibility of financing for startups, including venture capital, angel investing, and other sources of funding.

- Political environment and political stability (In6, tab. 1)[4]: This includes factors such as the level of corruption, the predictability of government policies, and the stability of the political system. A stable and predictable political environment can create a more supportive ecosystem for startups.

- Business environment and entrepreneurial culture (In7, tab. 1)[4]: This includes factors such as the ease of doing business, the level of bureaucracy, and the overall culture of entrepreneurship in the ecosystem. A supportive business environment and strong entrepreneurial culture can help to attract and retain startups and entrepreneurs

Once the most critical factors have been identified, researchers can explore ways to strengthen them. For example, if access to funding is identified as a critical factor, policymakers could work to create more funding opportunities for startups, such as grants or tax incentives. If access to talent and resources is

identified as a critical factor, policymakers could work to improve education and training programs to provide entrepreneurs with the skills and knowledge they need to succeed.

Ultimately, the goal of this research is to create a more effective ecosystem for startups and entrepreneurship in a post-war economy.

The division of factors into inputs and outputs provides a comprehensive framework for analyzing the startup ecosystem. By analyzing the inputs, policymakers and stakeholders can identify areas where improvements can be made to support the growth of startups. By analyzing the outputs, researchers can measure the effectiveness of the ecosystem and determine if improvements to the inputs have resulted in increased success for startups.

To calculate the input index for a startup ecosystem, we need to take into account various factors or inputs that contribute to the effectiveness of the ecosystem.

The input index general we will calculate using the formula:

$$I_{in} = \sum_{i=1}^7 I_{n_i}$$

The resulting score will provide a measure of the ecosystem's overall strengths and weaknesses, based on the various factors that contribute to its effectiveness. By monitoring this score over time, policymakers and other stakeholders can track progress and identify areas for improvement.

Table 1

Characteristics of ecosystem inputs

	Countries (Ecosystems)	I_{n_1}	I_{n_2}	I_{n_3}	I_{n_4}	I_{n_5}	I_{n_6}	I_{n_7}	I_{in}
1	Singapore	0,987	0,493	0,385	0,615	0,925	1,000	0,890	5,295
2	Israel	0,677	0,558	0,306	0,481	0,804	0,721	0,551	4,098
3	USA	0,894	0,608	0,484	0,599	0,763	0,781	0,753	4,882
4	Luxembourg	0,824	0,34	0,503	0,448	0,428	0,901	0,814	4,258
5	Estonia	0,864	0,412	0,382	0,427	0,962	0,820	0,780	4,647
6	Ireland	0,854	0,47	0,355	0,489	0,228	0,817	0,706	3,919
7	Finland	0,957	0,596	0,39	0,606	0,385	0,886	0,631	4,451
8	United Kingdom	0,904	0,557	0,559	0,615	0,632	0,769	0,560	4,596
9	Norway	0,956	0,392	0,346	0,536	0,176	0,903	0,756	4,065
10	Lithuania	0,81	0,273	0,258	0,375	0,348	0,79	0,560	3,414
11	Switzerland	0,924	0,671	0,563	0,624	0,590	0,892	0,858	5,122
12	Sweden	0,886	0,629	0,507	0,626	0,493	0,861	0,550	4,552
13	Canada	0,915	0,393	0,387	0,577	0,680	0,844	0,654	4,45
14	Slovenia	0,828	0,385	0,233	0,477	0,038	0,774	0,420	3,155
15	France	0,839	0,455	0,525	0,573	0,399	0,765	0,707	4,263
16	Netherlands	0,873	0,579	0,494	0,574	0,339	0,866	0,868	4,593
17	Portugal	0,767	0,333	0,381	0,494	0,101	0,777	0,330	3,183
18	Germany	0,793	0,548	0,523	0,641	0,254	0,804	0,696	4,259
19	Australia	0,908	0,322	0,378	0,617	0,283	0,841	0,566	3,915
20	Belgium	0,785	0,444	0,326	0,562	0,225	0,77	0,590	3,702
21	Denmark	0,853	0,519	0,462	0,594	0,347	0,907	0,724	4,406
22	UAE	0,855	0,233	0,264	0,558	0,358	0,755	0,894	3,917
23	South Korea	0,677	0,547	0,551	0,664	0,166	0,819	0,619	4,043
24	Austria	0,932	0,435	0,38	0,588	0,155	0,845	0,708	4,043

25	China	0,527	0,568	0,493	0,531	0,287	0,673	0,746	3,825
26	Spain	0,741	0,381	0,368	0,477	0,128	0,718	0,544	3,357
27	Chile	0,67	0,251	0,236	0,339	0,126	0,719	0,606	2,947
28	Czech Republic	0,753	0,447	0,299	0,433	0,530	0,761	0,421	3,644
29	Greece	0,705	0,283	0,24	0,454	0,050	0,66	0,291	2,683
30	Brazil	0,632	0,248	0,245	0,362	0,172	0,528	0,241	2,428
31	Thailand	0,47	0,3	0,252	0,298	0,125	0,626	0,480	2,551
32	Ukraine	0,616	0,329	0,198	0,366	0,014	0,465	0,341	2,329
33	India	0,641	0,338	0,243	0,383	0,388	0,599	0,563	3,155
34	Mexico	0,55	0,243	0,247	0,336	0,079	0,505	0,391	2,351
35	Japan	0,911	0,526	0,389	0,527	0,242	0,866	0,498	3,959
36	Solumbia	0,63	0,205	0,179	0,274	0,105	0,562	0,446	2,401
37	Turkey	0,488	0,274	0,415	0,389	0,079	0,553	0,364	2,562
38	Italy	0,775	0,452	0,413	0,468	0,064	0,637	0,357	3,166
39	Malaysia	0,661	0,315	0,274	0,410	0,162	0,779	0,624	3,225
40	Indonesia	0,218	0,19	0,186	0,224	0,139	0,616	0,821	2,394
41	Iceland	0,885	0,397	0,464	0,464	0,485	0,867	0,660	4,222
42	Latvia	0,814	0,294	0,272	0,366	0,107	0,753	0,493	3,099
43	New Zealand	0,967	0,36	0,384	0,549	0,178	0,901	0,632	3,971
44	Bulgaria	0,748	0,354	0,383	0,305	0,049	0,586	0,343	2,768
45	Cyprus	0,828	0,419	0,402	0,393	0,435	0,735	0,463	3,675
46	Hungary	0,737	0,397	0,259	0,413	0,055	0,720	0,403	2,984
47	Poland	0,711	0,318	0,298	0,425	0,046	0,671	0,306	2,775
48	Argentina	0,441	0,19	0,242	0,305	0,04	0,543	0,443	2,204
49	Romania	0,775	0,348	0,207	0,290	0,023	0,579	0,268	2,49
50	Georgia	0,809	0,191	0,134	0,300	0,028	0,670	0,643	2,775

Source: compiled by the authors.

The outputs from the system include the number of successful start-up projects per 1 million population, the number of unicorns per 1 million ecosystem population and the number of pantheons per 1 million population of the ecosystem.

1. The number of successful start-up projects per 1 million population is a critical output indicator for a startup ecosystem. This indicator reflects the number of new businesses that have successfully entered the market and are contributing to economic growth. Successful startups create jobs, drive innovation, and can have a significant impact on the local economy.

$$I_s = \frac{N_s}{P}$$

where, N_s – number of successful start-up projects

P - population of the ecosystem

A high number of successful startup projects per 1 million population is an indication of a healthy and vibrant ecosystem. This indicates that the startup environment is supportive, and entrepreneurs have access to the resources and support they need to launch and grow their businesses. A low number of successful startup projects per 1 million population, on the other hand, may indicate that the ecosystem is struggling, and there may be barriers to entry or limited access to resources.

Policymakers can use this indicator to identify areas where improvements can be made to support startups. For example, if the number of successful startup projects is low, policymakers may need to focus on improving access to funding, providing business incubation support, or creating more supportive policies for startups. By focusing on this output indicator, policymakers can ensure that the ecosystem is creating a pipeline of successful startups that can drive economic growth and job creation in a post-war economy.

2. The number of unicorns per 1 million people is another critical output indicator for a startup ecosystem. This indicator reflects the success of startups in the ecosystem and their ability to attract significant investment and grow into successful, high-value companies.

$$I_u = \frac{N_u}{P}$$

where, N_u – number of the number of unicorns - enterprises whose value is estimated at more than 1 billion dollars;

P - population of the ecosystem

Unicorns are typically seen as a barometer of the overall health and strength of a startup ecosystem, and a high number of unicorns per 1 million people is an indication of a vibrant and successful ecosystem. Unicorns can attract further investment and talent to the ecosystem, driving further growth and innovation. They also serve as role models for other startups and entrepreneurs, inspiring them to aim high and strive for success.

A low number of unicorns per 1 million people may indicate that the ecosystem is struggling to attract significant investment, or that startups are struggling to scale and grow into large, successful companies. Policymakers can use this indicator to identify areas where improvements can be made to support startups, such as providing access to more funding or improving the overall business environment.

By focusing on this output indicator, policymakers can ensure that the ecosystem is creating a pipeline of successful and high-value companies that can drive economic growth and job creation in an economy.

3. The number of pantheons per 1 million population is another important output indicator for a startup ecosystem. Pantheons are companies that have made significant breakthroughs in their field or have had a significant impact in the region, and are typically seen as role models and sources of inspiration for other startups and entrepreneurs.

$$I_p = \frac{N_p}{P}$$

where, N_p – number of pantheons - companies that have made a significant impact in their field, for example, like Goodle or Nokia;

P - population of the ecosystem

Having a high number of pantheons per 1 million population indicates that the startup ecosystem has a history of creating successful and impactful companies, and is able to support startups in their growth and development. These pantheons may have a strong track record of innovation and excellence, and can act as drivers of economic growth and job creation.

On the other hand, a low number of pantheons per 1 million population may indicate that the ecosystem is struggling to support the growth and development of startups, and is not creating a pipeline of successful and impactful companies. Policymakers can use this indicator to identify areas where improvements can be made to support startups, such as increasing access to funding or improving the business environment.

Overall, the number of pantheons per 1 million population is a useful output indicator for evaluating the long-term success and impact of a startup ecosystem.

The output index general we will calculate using the formula:

$$I_{out} = I_u + I_p + I_s \frac{\sum_{i=1}^n I_u + \sum_{i=1}^n I_p}{\sum_{i=1}^n I_s}$$

These indicators are related to the results or outcomes of ecosystem activity. The output index general is designed to provide a sense of the overall success and impact of the startup ecosystem, based on a range of key indicators. By monitoring these indicators over time, policymakers and other stakeholders can assess the effectiveness of their efforts to support entrepreneurship and identify areas for improvement.

Table 2

Characteristics of ecosystem Outputs

№	Countries (Ecosystems)	Population	Startups	Unicorns	Pantheons	I _s	I _u	I _p	I _{out}
1	Singapore	5,5	1006	15	3	182,9	2,727	0,545	32,099
2	Israel	9,5	1696	25	9	178,5	2,632	0,947	31,715
3	USA	333,4	37240	609	145	111,7	1,827	0,435	19,865
4	Luxembourg	0,6	132	1	0	220,0	1,667	0,000	36,339
5	Estonia	1,3	416	2	1	320,0	1,538	0,769	52,740
6	Ireland	5,1	582	6	0	114,1	1,176	0,000	19,161
7	Finland	5,5	652	5	3	118,5	0,909	0,545	20,137
8	United Kingdom	67,5	7243	50	10	107,3	0,741	0,148	17,800
9	Norway	5,4	369	4	0	68,3	0,741	0,000	11,510
10	Lithuania	2,8	501	2	0	178,9	0,714	0,000	28,913
11	Switzerland	8,8	1213	6	2	137,8	0,682	0,227	22,633
12	Sweden	10,5	1114	7	5	106,1	0,667	0,476	17,863
13	Canada	38,6	4023	22	1	104,2	0,570	0,026	17,021
14	Slovenia	2,1	129	1	0	61,4	0,476	0,000	10,157
15	France	67,9	2522	30	3	37,1	0,442	0,044	6,340
16	Netherlands	17,6	1276	7	3	72,5	0,398	0,170	11,994
17	Portugal	10,8	337	4	1	31,2	0,370	0,093	5,381
18	Germany	83	2613	30	9	31,5	0,361	0,108	5,431
19	Australia	25,9	1804	9	2	69,7	0,347	0,077	11,402
20	Belgium	11,6	522	4	1	45,0	0,345	0,086	7,523
21	Denmark	5,9	568	2	0	96,3	0,339	0,000	15,511
22	UAE	9,4	335	3	0	35,6	0,319	0,000	5,936
23	South Korea	51,7	679	14	3	13,1	0,271	0,058	2,399
24	Austria	9	364	2	0	40,4	0,222	0,000	6,596
25	China	1412,3	5287	172	20	3,7	0,122	0,014	0,726
26	Spain	47,4	2676	5	3	56,5	0,105	0,063	9,066
27	Chile	19,6	339	2	1	17,3	0,102	0,051	2,879
28	Czech Republic	10,5	283	1	0	27,0	0,095	0,000	4,343
29	Greece	10,6	202	1	0	19,1	0,094	0,000	3,098
30	Brazil	215,3	1179	16	1	5,5	0,074	0,005	0,942
31	Thailand	71,7	180	4	0	2,5	0,056	0,000	0,451
32	Ukraine	36,5	448	2	0	12,3	0,055	0,000	1,989
33	India	1417,2	3815	70	5	2,7	0,049	0,004	0,477
34	Mexico	127,5	446	6	0	3,5	0,047	0,000	0,598
35	Japan	125	2018	5	9	16,1	0,040	0,072	2,656
36	Solumbia	51,9	336	2	1	6,5	0,039	0,019	1,078
37	Turkey	85,3	490	3	1	5,7	0,035	0,012	0,952
38	Italy	58,9	1072	2	0	18,2	0,034	0,000	2,902
39	Malaysia	33,9	282	1	1	8,3	0,029	0,029	1,370

40	Indonesia	275,5	363	8	0	1,3	0,029	0,000	0,237
41	Iceland	0,4	148	0	0	370,0	0,000	0,000	58,312
42	Latvia	1,9	111	0	0	58,4	0,000	0,000	9,207
43	New Zealand	5,2	191	0	0	36,7	0,000	0,000	5,789
44	Bulgaria	6,8	247	0	0	36,3	0,000	0,000	5,725
45	Cyprus	1,3	41	0	0	31,5	0,000	0,000	4,970
46	Hungary	10,3	229	0	0	22,2	0,000	0,000	3,504
47	Poland	41	658	0	0	16,0	0,000	0,000	2,529
48	Argentina	46,1	500	0	0	10,8	0,000	0,000	1,709
49	Romania	19,9	212	0	0	10,7	0,000	0,000	1,679
50	Georgia	3,7	27	0	0	7,3	0,000	0,000	1,150

Source: compiled by the authors.

There is a clear dependence between the input factors and the output factors of the ecosystem of different countries, and a calculated trend line shows this, then it suggests that the chosen factors are relevant and have a significant impact on the success of startup ecosystems (fig. 2)

If the trend line shows a strong positive correlation between the input factors and output factors of the startup ecosystem, it indicates that the higher the total indicator of stimulating factors I_{in} , the faster I_{out} will grow.

$$I_{out} = 0,024 * I_{in}^{4,3093}$$

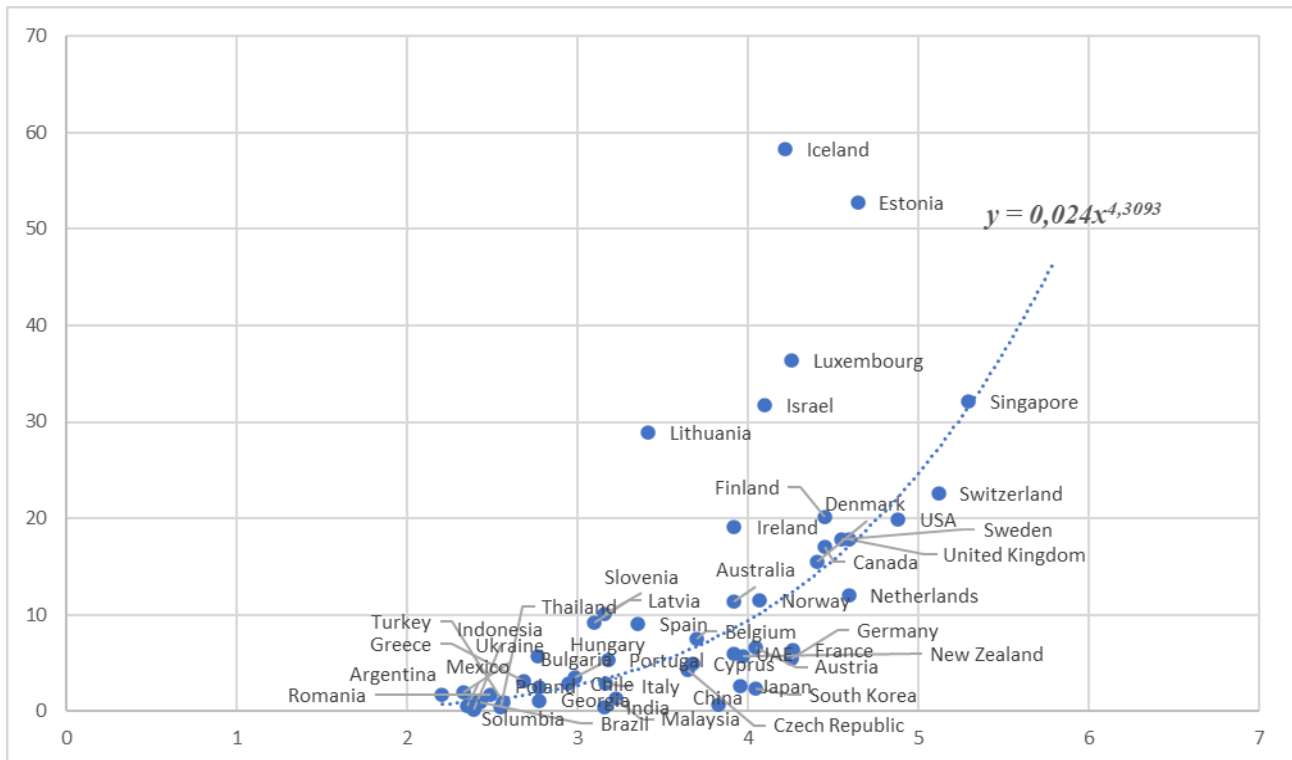


Fig. 2. The dependence between inputs I_{in} and outputs I_{out} of ecosystems of different countries is depicted.

Source: compiled by the authors.

The top 10 ecosystem leaders according to the output index are Iceland, Estonia, Luxembourg, Singapore, Israel, Lithuania, Switzerland, Finland, the USA, and Ireland.

It is worth noting that these countries have different strengths and characteristics that have contributed to their success. For example, Singapore has a highly developed financial and business ecosystem, while Israel has a strong focus on innovation and a thriving startup culture. The USA, as a large and diverse country, has multiple thriving startup ecosystems across different regions.

These countries are considered to have the largest generation of successful startup projects, growing unicorn companies, and pantheons per inhabitant of the ecosystem.

It is interesting to note that among the 10 leaders, there are 7 European countries, 1 North American country, and 2 Asian countries. This suggests that successful startup ecosystems can be found across different regions of the world, and that there is no one-size-fits-all approach to building a successful ecosystem. Rather, countries can learn from the experiences and strategies of other successful ecosystems, while adapting them to their own unique contexts and challenges.

Table 3

Degree of Correlation between Ecosystem Inputs and Outputs

Indicator	In1	In2	In3	In4	In5	In6	In7	Iin
Correlation index Array with I out	0,471	0,333	0,374	0,288	0,719	0,557	0,449	0,622
Correlation index Array with Is	0,468	0,316	0,370	0,274	0,698	0,551	0,439	0,608
Correlation index Array with Iu	0,366	0,438	0,291	0,387	0,757	0,476	0,469	0,625
Correlation index Array with Ip	0,258	0,507	0,242	0,327	0,719	0,321	0,289	0,527

Source: compiled by the authors.

In Tables 3 to demonstrate a positive correlation between the investment index and successful exits from the ecosystem. This relationship is logical, as investment is a crucial factor in the growth and success of startups, and a well-developed investment ecosystem can lead to increased funding opportunities and resources for startups.

Additionally, the power of influence of the investment index is above the average set of all factors, further confirming the importance of investment in the success of startup ecosystems. This may indicate that investment plays a significant role in driving other factors that contribute to successful outcomes for startups, such as innovation, job creation, and economic growth.

That being said, highlighting Ukraine's recent successes and resilience in the face of adversity can be a powerful tool in building investor confidence and generating interest in the country's startup ecosystem. It is important for Ukraine to leverage its unique strengths and competitive advantages in attracting investment, while also addressing any challenges or weaknesses that may exist.

Today Ukraine has a strong brand and reputation due to its recent successes and heroism in the fight against the invader. This can be leveraged to attract investment and support for startup projects.

However, it is important to note that while a strong brand can be a valuable asset, it is not the only factor that investors consider when making investment decisions.

This can include promoting entrepreneurship, innovation, creativity and improving the regulatory framework for businesses.

Innovation and creativity are not limited by financial resources, but rather are fueled by ideas, knowledge, and human capital. By fostering a culture of innovation and creativity, ecosystems can attract and retain talented individuals who can contribute new ideas and approaches to solving problems. This can help to create a virtuous cycle, where innovation and creativity drive economic growth and attract more investment.

Therefore, while investment is important, it is not the only factor that determines the success of a startup ecosystem. Ecosystems that prioritize innovation and creativity can leverage these unlimited resources to create a competitive advantage and drive long-term growth.

Education and upbringing play a crucial role in shaping the character traits of future entrepreneurs. Creativity, independent thinking, and perseverance are not just inherent qualities, but can also be nurtured and developed through proper training and experience. Educational institutions should focus not only on imparting technical skills but also on developing an entrepreneurial mindset and soft skills that are essential for success in the startup ecosystem.

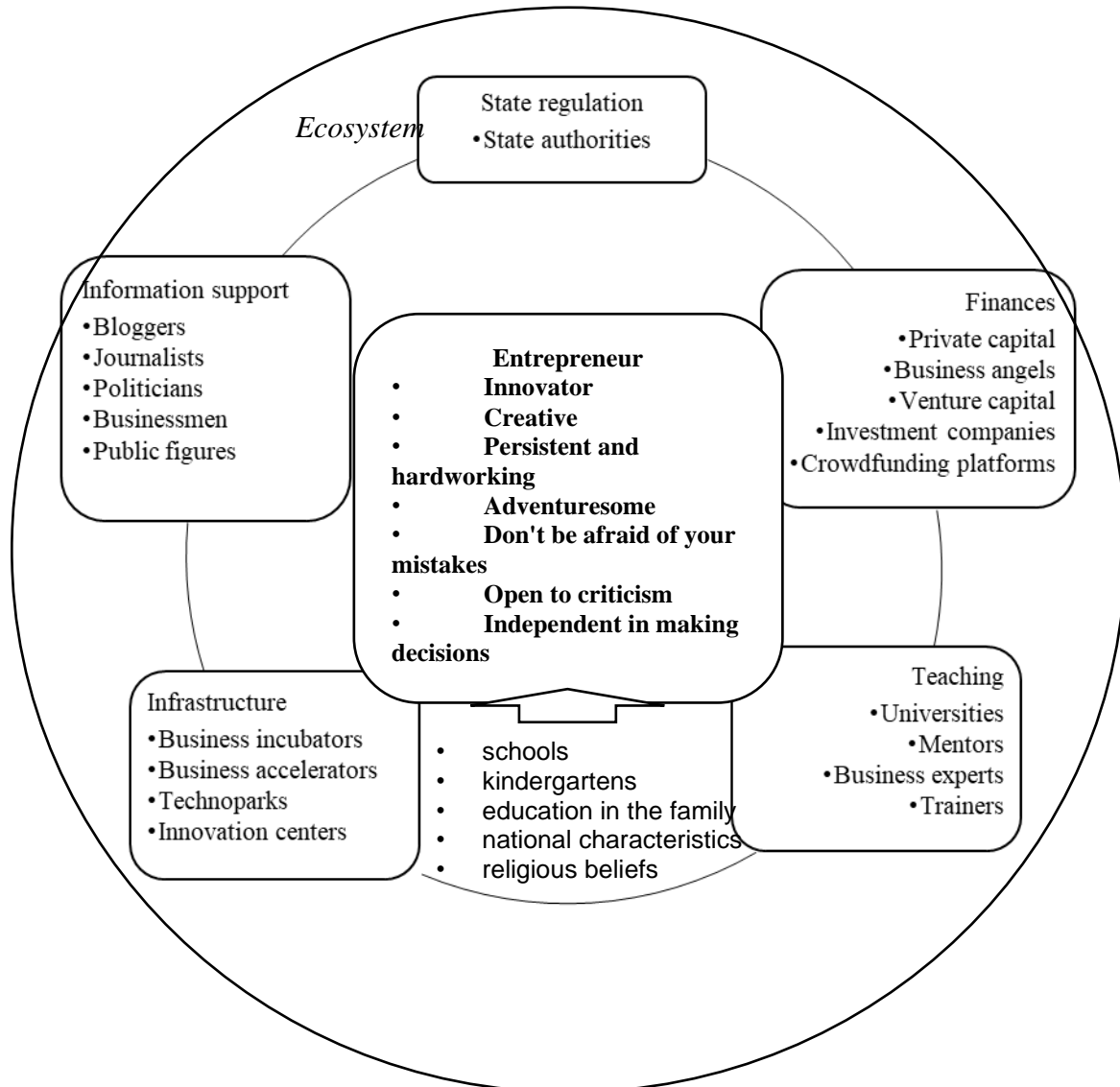


Fig. 3 Ecosystem components

Source: compiled by the authors.

The entrepreneurial mindset and character traits are crucial for the success of startup projects. While some of these traits may be innate, many successful entrepreneurs acquire them through life experience and education. These traits enable entrepreneurs to identify and pursue innovative business opportunities, overcome obstacles, and take calculated risks. Moreover, an entrepreneur's ability to be open to criticism and learn from their mistakes is vital for their personal and professional growth, as well as for the success of their startup project.

Creating a supportive environment that encourages risk-taking, experimentation, and innovation is equally important. This can be achieved through policies and initiatives that promote entrepreneurship and

provide resources and infrastructure for startups to grow and succeed. It's important to create an ecosystem where entrepreneurs feel supported and empowered to take risks and pursue their ideas, without fear of failure or criticism.

Introducing creativity, independent thinking, and problem-solving skills at a young age can help prepare individuals for the challenges of entrepreneurship. This can be done exposure to diverse experiences, and a supportive environment that encourages risk-taking and learning from failure.

Including schools and kindergartens in the development of a startup ecosystem can have several potential benefits.

For example: Building a pipeline of talent: By focusing on education at an early age, ecosystems can help to build a pipeline of talented individuals who are interested in entrepreneurship and innovation. This can help to create a sustainable source of talent for startups and other companies in the ecosystem.

Fostering a culture of innovation: By introducing entrepreneurship and innovation at an early age, schools and kindergartens can help to foster a culture of innovation and creativity that can help to drive the success of the ecosystem over the long term.

Promoting diversity and inclusion: By including schools and kindergartens in the development of the ecosystem, it is possible to promote diversity and inclusion by ensuring that all members of society have access to the resources and support needed to succeed in entrepreneurship.

Overall, by expanding the components of the ecosystem to include schools and kindergartens, it is possible to create a more holistic and inclusive approach to ecosystem development that can help to drive long-term success.

Conclusions. Ukraine's economy needs rapid and dynamic growth immediately after the end of the war. The war has caused significant damage to the economy, with a sharp decline in GDP, real wages, and high unemployment. To achieve rapid and dynamic growth, Ukraine will need to focus on several key areas.

We propose to implement the reconstruction of the post-war economy of Ukraine in a long-term and short-term strategy.

They address important aspects of economic development and provide a holistic approach to rebuilding the country's economy. Let's discuss each strategy in more detail:

Short-term strategy:

Attracting investments for start-up projects through various means is one approach to foster economic growth. Leveraging tools like venture capital investment, angel investors, crowdfunding platforms, and direct foreign investments can provide the necessary capital for budding entrepreneurs and startups. Emphasizing the Ukraine brand as a strong and extraordinary country in Eastern Europe can help attract investors' attention and confidence in the region's potential. Promoting Ukraine as a progressive center can be achieved through marketing campaigns, showcasing success stories, and highlighting the country's competitive advantages.

Long-term strategy:

Nurturing an entrepreneurial personality and cultivating qualities inherent in strong entrepreneurs is a second strategy. Developing innovativeness, creativity, entrepreneurial thinking, and a willingness to take measured risks are essential for fostering a thriving entrepreneurial ecosystem. Starting from schools and kindergartens to instill these qualities early on is a proactive approach. By incorporating entrepreneurship education programs into the curriculum, students can be exposed to entrepreneurial concepts, problem-solving skills, and real-world experiences. This can help create a pipeline of future entrepreneurs and innovators.

Structural changes in infrastructure:

The importance of stable laws and a stable political situation is crucial for implementing sustainable changes. Demonstrating a commitment to democracy and a transparent governance system can instill confidence in both domestic and foreign investors. Implementing stable laws that protect property rights, encourage fair competition, and provide a favorable business environment is essential. Additionally, creating an ecosystem that supports entrepreneurship and innovation requires a supportive regulatory framework, streamlined bureaucracy, and access to resources such as mentorship, incubators, and accelerators.

Overall, proposed strategies encompass the key elements necessary for the reconstruction of the post-war economy in Ukraine. By focusing on attracting investments, nurturing entrepreneurial qualities, and implementing structural changes, Ukraine can lay a solid foundation for sustainable economic growth and development.

In conclusion, Ukraine has the potential to become a hub for innovation and entrepreneurship, thanks to its recent successes and resilience. However, attracting investment alone will not be sufficient to drive long-term growth and success. Ukraine needs to foster a culture of innovation and creativity, prioritize entrepreneurship education, and create a supportive environment for startups to thrive. By doing so, Ukraine can unleash the full potential of its human capital and create a virtuous cycle of innovation, economic growth, and investment.

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