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BOOSTING UKRAINE'S INNOVATIVENESS: TRANSITION OF UKRAINE TO INNOVATION-BASED ECONOMY

Abstract. The article contains analysis of the current state of innovativeness in Ukraine and key factors of the innovativeness that have been analyzed. Considering the given data, statistics, and indices, recommendations regarding the improvement of business environment and innovativeness, which would be a key factor in the transition of the domestic economy to the one based on innovativeness, have been developed.

Keywords: *innovativeness, economic growth, innovative economy, market economy, global innovation index.*

Topicality of the research. In the modern world, innovativeness is a key factor to the rapid and sustainable economic growth. Innovativeness, in turn, consists of a large set of factors that define the overall ability to innovate. Ukraine's economy has been characterized by a sluggish growth through the years of its independence, and

many harmful factors have had a negative impact on the domestic business, thus being a significant and, perhaps, essential obstacle to the country's development.

Problem exploration level. A large number of the Ukrainian scientists have been engaged in the research of the Ukraine's innovativeness issue. In particular, the most notable authors are D. Kozhusko, O. Maslak [1], Y. Dorosenko [2], L. Fedulova [3], I. Yegorov [4], N. Smentyna [5].

Aim of the research. This research is aimed to analyze the available data regarding innovations in Ukraine, compile it, define the strengths and weaknesses of Ukraine in the terms of innovativeness, and give recommendations for the improvement of Ukraine's innovation and business environment. **Scientific novelty** of this research lies in defining directions for the improvement of the innovativeness of Ukraine.

Research working out. Innovativeness, which means an ability to develop products (usually by the means of realization of scientific discoveries and innovative, "breakthrough" ideas) that may be demanded by the people and mass-produce them, has been a core of economic development since the First Industrial Revolution. In particular, one may observe how the realization of new business ideas in the United States in the 19th and 20th centuries – namely, railway connection across the country, extraction and use of oil and later petroleum, the discovery of steel and the use of it in construction, electrification of the country, and mass-production of cars – had in result led to the dominant position of this country in the world and a growing wealth of its citizens.

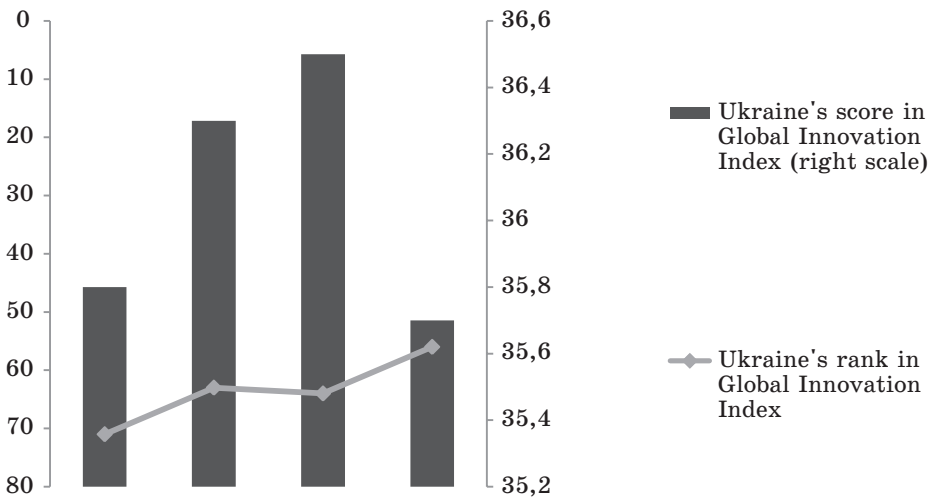
During the years of its independence, Ukraine has been heavily reliant on its industrial Soviet heritage, which was a part of a large economic complex of the USSR, and highly reluctant to transform its economy. The country could barely produce any products without cooperation with other post-USSR countries, and especially with the biggest former Soviet republic and the USSR successor – Russian Federation. Moreover, the mutual industrial economic complex aimed to pursue the goals of the Soviet leaders and high-rank communist officials in the state-regulated, planned economy, rather than to satisfy the demand of citizens within the country. On the top of it, almost all plants and factories built in the Soviet time were highly energy-inefficient, which made those enterprises highly uncompetitive in the conditions of market economy.

The quasi transformation of the Ukrainian economy had led to the formation of an eroded, so-called "market" economy with few incentives for entrepreneurs and a strong reluctance of the state to facilitate all kinds of businesses. Instead, it had led to the crony capitalism, where those close to the authorities and officials were able to exploit the resource left from the USSR. Unfortunately, the situation has not drastically changed up to now. The crony-capitalism index, compiled by the Economist Group, shows that Ukraine occupied the fourth place in this ranking, left behind only by Hong Kong, Russia, and Malaysia, which means that the majority of the sectors of the Ukrainian economy are corrupted and highly dependant on the decisions of authorities [6].



Picture 1. Nominal GDP of Ukraine in 1987-2015 [7]

Dragon Capital, an investment bank based in Ukraine, carried out a research that shows the main obstacles for foreign investments in Ukraine [8]. The survey shows that the major obstacles are: widespread corruption (8,5 points), lack of trust in judiciary (7,5 points), military conflict with Russia (6,1), unpredictable currency and unstable financial system (6), restrictive capital and F/X controls (5,5), complicated tax administration (5), and cumbersome legislation (5). At the same time, foreign investors suggest to hire new judges, prosecute high-rank officials for corruption, follow the IMF program, liberalize foreign exchange controls, complete several transparent privatizations, streamline tax administration, and overhaul domestic infrastructure. In our opinion, most of the suggested actions will help to boost innovativeness too, since business environment and innovativeness are tightly interconnected.



Picture 2. Ukraine's performance according to the Global Innovation Index in 2013-2016 [11]

Even though the military conflict with Russia may appear to be a problem, it does not have a critical impact on business in central and western regions of Ukraine. The example of Israel shows that even while being at war the country is able to be economically prosperous and innovative – it is included in the top 5 of the world's most innovative countries and is able to brag about a high level of GDP per capita (\$32,827 in 2015) [9, 10]. Unlike Ukraine, which has a vast territory, a large share of the Israel's territory appears to be under fire in case of war, which makes the argument that the combat actions may be a significant obstacle to the economy's transformation and rise of innovativeness inessential.

In order to find out how it is possible to boost the innovativeness of Ukraine, one has to investigate in which state this aspect of business is up to date. A reliable means for analyzing the innovativeness of the country is analysis of the country's place in the Global Innovation Index, which is compiled by the World Intellectual Property Organization, INSEAD, and Cornell University. This index shows that, despite the fact that Ukraine has been promoted to a higher rank during 2013-2016, its actual score has been dropped in 2016 behind the mark of 2013. This actually means that there is no progress in a matter of the country's innovativeness, and the promotion takes place due to the fall of other countries in the index.

This index is the average of three scores: Innovation Output Sub-index, Innovation Input Sub-index, and Innovation Efficiency Ratio. According to the 2016 data, Ukraine's rank is 40, 76, and 12 accordingly. Those three sub-indices contain a large set of data in such categories like institutions, human capital and research, infrastructure, market sophistication, knowledge and technology outputs, and creative outputs. All these categories include certain factors that result in a certain score for each country. Even though there are plenty of data, and so it is difficult to assess all of the scores, we are able to analyze the scores for the categories on the whole. As well, the index points out certain strengths and weaknesses of each country, which gives an opportunity to find out what has to be improved.

**Ukraine's rank and score in different categories
of the Global Innovation Index in 2016 [11]**

Table 1

Category	Ukraine's Score	Ukraine's Rank
Institutions	48.7	101
Human Capital and Research	40.8	40
Infrastructure	32.3	99
Market Sophistication	42.1	75
Business Sophistication	30.6	73
Knowledge and Technology Outputs	34.1	33
Creative Outputs	31.0	58

The first table in this article actually displays where Ukraine on the whole is better at bringing innovations to the market. Unfortunately, the data show a grim picture: Ukraine's score is somewhat satisfactory only in such categories like knowledge and technology outputs, human capital and research, and creative outputs. At the same time, the current state of the institutions and infrastructure is a critical obstacle to the boost of the country's innovativeness. Indeed, the given ranking highlights that whereas private businesses bring innovations to the market, the state's role is actually important but underperformed.

The next table shows the strengths and weaknesses of Ukraine in the matter of innovativeness, and such poor results in the indicators like political stability, ease of resolving insolvency, state of cluster development, and gross capital formation point to the high inefficiency of the state. Meanwhile, the table shows that most of the strengths are brought by certain individuals and companies.

Table 2

Ukraine's strengths and weaknesses in bringing innovations to the market, according to the Global Innovation Index [11]

Strengths	Weaknesses
Expenditure on education	Political environment and stability
Government expenditure on education per pupil, secondary	Ease of resolving insolvency
Tertiary education	Global R&D companies, average expenditure top 3
Ease of getting credit	Gross capital formation (infrastructure)
Females employed with advanced degrees (4 th rank overall)	GDP per unit of energy use
R&D financed by foreign investments	Microfinance institutions' gross loan portfolio
Patent applications by origin	Investment
Utility model applications by origin (1 st rank overall)	State of cluster development
ICT services exports	Joint venture/strategic alliances deals
Industrial designs by origin	Growth rate of GDP per person engaged (i.e. labor productivity)
	National feature films produced

Unfortunately, the poor results of the country in the crucial factors for innovation development have led to one of the worst position among its neighbors, surpassing only Belarus in the terms of innovativeness. As the sub-indices of the Global Innovation Index suggest, the country is doing well in the efficiency of innovativeness (12th rank among 128 countries) and output (40th rank, which is fairly higher than the average and the total score of the country). This means that the basic input of

the country's innovativeness is too low, thus causing the necessity to improve its infrastructure, institutions, market and business sophistication.

Table 3

**The rank and score of Ukraine and its neighbors
in the Global Innovation Index in 2016 [11]**

Country	Score	Rank
Ukraine	35.7	56
Poland	40.2	39
Slovakia	41.8	37
Romania	37.9	48
Moldova	38.4	46
Hungary	44.7	33
Belarus	30.4	79
Russian Federation	38.5	43

Based on the given evidence, one may suggest the following recommendations for the improvement of the country's ability to innovate on the whole:

- Simplification of legislation (i.e. adjusting it to the needs of citizens and businesses) and overall liberalization & deregulation;
- Facilitation of the creation of investment-friendly environment in the country;
- Intensification of local competition by making the work of anti-monopoly institutions more efficient;
- Attraction of foreign direct investments and creation of regional clusters (in particular, in the Western Ukraine);
- Introduction of new technologies & know-how, which will result in the rise of labor productivity;
- Improvement of legal and judiciary system and establishment of the rule of law;
- Improvement of the existing infrastructure, which can be carried out via PPPs;
- Making the use of energy resources more efficiently, which is applicable for both state and private companies;
- Boost of the government effectiveness.

Conclusion. Based on the evidence provided above, one is able to get a clear understanding where the Ukrainian economy and the Ukrainian legal system are lagging behind the majority of developing countries. Unfortunately, Ukraine lacks crucial components to be developed (like infrastructure and institutions) in order to be innovatively successful. This research can be used for further investigations in the field of innovations and R&D.

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Підвищення інноваційності України: перехід України до інноваційної економіки

Анотація. У запропонованій статті подається аналіз поточного стану інноваційності в Україні та ключові фактори інноваційності. Виходячи із наведених даних, статистичних фактів та індексів, розроблено рекомендації щодо поліпшення бізнес-середовища та інноваційності, що, зрештою, буде одним із ключових факторів переходу вітчизняної економіки до такої, що базується на інноваційності.

Ключові слова: інноваційність, економічне зростання, інноваційна економіка, ринкова економіка, глобальний індекс інноваційності.

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Повышение инновационности Украины: переход Украины к инновационной экономике

Аннотация. В предложенной статье представлен анализ текущего состояния инновационности в Украине и ключевые факторы инновационности. Исходя из приведённых данных, статистических фактов и индексов, были разработаны рекомендации относительно улучшения бизнессреды и инновационности, что в итоге будет одним из ключевых факторов перехода отечественной экономики к такой, которая базируется на инновационности.

Ключевые слова: инновационность, экономический рост, инновационная экономика, рыночная экономика, глобальный индекс инновационности.