

INNOVATIVE ACTIVITY IN UKRAINE: ANALYSIS OF PROBLEMS OF FORMATION AND PROSPECTS OF DEVELOPMENT**Korinnyi S.O., Khudoley L.V.***Zaporizhzhia National University
Ukraine, 69000, Zaporizhzhia, Zhukovsky str., 66*

s.korinnyi@gmail.com, lina_kozobash@ukr.net

ORCID ID 0000-0002-9394-7986, 0000-0003-0910-6816

Key words:

innovation, analysis, enterprise, development, innovative activity

The article analyzes the innovative activity of industrial enterprises in the areas of executed innovations and borne costs of research and development by types of work. It is proved that the current economic situation in Ukraine is characterized by low level of usage of scientific knowledge, extremely slow increase of innovative production. The share of research and development (R&D) expenditures in the gross domestic product (GDP) of the European Union (EU) and Ukraine is analyzed. It is noted that in the EU countries there is a strong tendency of increasing the R&D expenditures, as evidenced by the increase in the share of R&D in GDP, while in Ukraine this indicator is stably declining. It is determined that the innovation infrastructure in Ukraine is still underdeveloped, it does not cover all the links of the innovation process and does not have a systematic approach to providing relevant services in the field of innovation. An analysis of industrial enterprises that implement innovations has been carried out and it is shown that their quantity is being decreased in recent years. The reasons that impede the execution of innovative activity at domestic enterprises have been identified. The institutional problems that hinder the development of innovation activity of enterprises are highlighted. It is determined that the absence of an effective stock market in Ukraine as a source of capital and an investment tool prevents the solution of the problem of lack of funds for R&D as a whole, both for Ukrainian producers and for foreign investors.

ІННОВАЦІЙНА ДІЯЛЬНІСТЬ УКРАЇНИ: АНАЛІЗ ПРОБЛЕМ ФОРМУВАННЯ ТА ПЕРСПЕКТИВИ РОЗВИТКУ**Корінний С.О., Худолей Л.В.***Запорізький національний університет
Україна, 69600, м. Запоріжжя, вул. Жуковського, 66***Ключові слова:**

інновації, аналіз, підприємство, розвиток, інноваційна діяльність.

Проаналізовано інноваційну діяльність промислових підприємств за напрямами проведених інновацій та витрат на виконання наукових досліджень і розробок за видами робіт. Установлено, що сучасна економічна ситуація в Україні характеризується низьким рівнем використання наукових знань, вкрай повільним нарощуванням інноваційного виробництва. Проаналізовано питому вагу витрат на виконання наукових досліджень і розробок у ВВП країн ЄС та України, зазначено, що в країнах ЄС спостерігається тенденція нарощення обсягів витрат на виконання наукових досліджень і розробок, про що свідчить зростання частки НДР у ВВП, тоді як в Україні цей показник знижується. Визначено, що інноваційна інфраструктура ще недостатньо розвинена, не охоплює всіх ланок інноваційного процесу і не має системного підходу до забезпечення відповідними послугами у сфері інноваційної діяльності. Проведено аналіз промислових підприємств, що впроваджували інновації, та встановлено, що їх кількість протягом останніх років зменшується. Установлено причини, що перешкоджають здійсненню інноваційної діяльності на вітчизняних підприємствах. Виділено інституційні проблеми, що стримують розвиток інноваційної активності підприємств. Установлено, що вирішенню проблеми нестачі коштів на НДР взагалі українським виробникам, а також іноземним інвесторам, заважає відсутність ефективного фондового ринку в Україні як джерела капіталу та інструменту інвестування.

Statement of the problem

Prospects for the development of a country in the world economy are conditioned by the competitiveness of the

national economy. Deepening of globalization processes, actualization of competitive rivalry, formation of competitive advantages create new requirements for public policy in the direction of increasing and creating

conditions for ensuring the competitiveness of economic entities.

Sustainable economic development in the long term is primarily due to the introduction of foreign experience of innovative activities of highly developed countries, the usage of factors aimed at supporting the development of advanced achievements of domestic technology, science and technics.

Innovative factors are decisive in the system of increasing the competitiveness of the economy of a country and serve the acceleration, permanence of the innovation process and development, efficiency of functioning of the innovation system. Innovative development is the only prerequisite for ensuring the economic independence of Ukraine, and may bring the possibility to bridge a gaping gap with leading competitive states.

Analysis of recent studies and publications

Many scientific works of foreign and domestic scientists and economists are devoted to the research of problems related to innovation and innovative activity. Among them the most outstanding authors are: Cherep A., Drucker P., Foster R., Hayek F., Glazieva S., Koyuda P. [3], Kovalenko O. [4], Polishchuk O. [1], Mensha G., Porter M., Sheiko I. [3], Shpikulyak O. [2], Van Dein J., Valdaitsev S., Vodochek L., Lviv D. and others.

Polishchuk O. gives the following interpretation of innovative activity – a process aimed at developing innovations, realizing the results of completed scientific research or certain scientific and technological achievements into a new or improved product on the market, a new or improved technological process, used in practical activities, as well as related research and development processes [1].

Shpikulyak O. describes an innovation activity as a special kind of activity, which, based on the results of scientific researches, ensures creation of fundamentally new products, new services, which result in creation of what never appeared before [2].

Koyuda P. And Sheiko I. understand as innovative activity an activity aimed at the development, use and commercialization of scientific, technical and technological results (innovations) of the innovation process for production of products, expansion of the nomenclature (product range), implementation of the new technology (organization of management or improvement etc.) and sales of competitive goods (works, services) to obtain economic efficiency [3].

Kovalenko O. defines innovative activity as a procedure of creation and introduction of new goods and services,

development and introduction of new industrial technologies that will be the basis of production activity of the firm in the future, and commercial realization of newly created products (services) will provide future income and will shape the competitive position of companies [4].

Chorna M., Ilyashenko S., Kantaeva O., Kuzmin I., Petrova I., Santo B., Schumpeter J. Vasilenko V. and others devoted their researches to estimating of economic efficiency of innovative projects.

Objectives of the article

The purpose of the article is to analyze the state and the prospects of the development of the innovative activity of Ukraine.

The main material of the research

Innovative activity is currently one of the main areas of economic growth, which can provide not only additional competitive advantages for enterprises, increase their potential and help to solve economic, social and other problems, but also to ensure the rapid growth of the national economy in the long run. According to experts, scientific and technological progress as a source of economic growth in the near future will provide up to 90% of the real increase in production (today it is 65-70% in developed countries) [5].

In this regard, the development of innovative activity is of utmost importance for both – enterprises and the economy of Ukraine, since the development and implementation of innovations allow Ukrainian producers to compete as well as domestically and globally.

Nowadays state of innovative activity in Ukraine is defined by the majority of scientific experts as a crisis and among that does not correspond to the current level of innovation processes in the countries for which innovative development is a priority of economic strategy.

According to the analysis of the state of innovative activity in Ukraine, it can be determined that the innovation infrastructure is not yet sufficiently developed, does not cover all the links of the innovation process and does not have a systematic approach to providing relevant services in the field of innovation activity.

Thus, the latest official statistics show a gradual decline in the innovation activity of enterprises in such a strategically important sector of the national economy as industry (Table 1).

Table 1 – Innovative activity of industrial enterprises in the areas of innovation

	2010		2015		2018	
	Total	% to the total amount of industrial enterprises	Total	% to the total amount of industrial enterprises	Total	% to the total amount of industrial enterprises
Amount of enterprises engaged in innovation	1462	13,8	824	17,3	759	16,2
including spending money on						
internal R&D	224	2,1	151	3,2	130	2,8
external R&D	124	1,2	70	1,5	62	1,3
acquisition of machinery, equipment and software	840	7,9	467	9,8	500	10,6
acquisition of other external knowledge	100	0,9	32	0,7	43	0,9
other	518	4,9	210	4,4	173	3,7

Source: generated by authors on the basis of [7]

At this stage, it is not enough to respond quickly to ever-changing market trends, but the use of new technologies, their introduction, strategic and innovative cooperation should be the basic elements for building an efficient and high-tech economy.

Innovation policy is a holistic approach that is based on both the creation and the practical use of knowledge, and

in which the commercial impact of new technologies is essential.

The current economic situation in Ukraine is characterized by a low level of use of scientific knowledge and technologies, an extremely slow increase in innovative production (Table 2).

Table 2 – Expenditures on research and development by type of work

Years	Total, in actual prices (UAH)	Including		
		basic scientific research (UAH)	applied scientific research (UAH)	scientific and technical (experimental) developments (UAH)
2010	8107,1	2175,0	1589,4	4342,7
2011	8513,4	2200,8	1813,9	4498,7
2012	9419,9	2615,3	2023,2	4781,4
2013	10248,5	2698,2	2061,4	5488,9
2014	9487,5	2452,0	1882,7	5152,8
2015	11003,6	2460,2	1960,6	6582,8
2016	11530,7	2225,7	2561,2	6743,8
2017	13379,3	2924,5	3163,2	7291,6
2018	16773,7	3756,5	3568,3	9448,9

Based on information in Table 2 it can be concluded that during the last 5 years there has been a decline in the innovation activity of state. Comparing 2011 and 2014, it can be seen that during this period the total cost of innovation has halved. From the one side it can be connected with the impact of world economic crisis, but from the other side it is a deep problem of Ukrainian economy, even a “sickness”.

This decrease was due to the reduction of almost all items of expenditure: the cost of acquiring new technologies – in 2010 and 2014 amounted to UAH 141,6 million and UAH 47,2 accordingly; costs for the

purchase of machinery and software in the reporting year compared to 2011 decreased by 48.8%.

There is an opposite tendency in the EU countries. An increase in the amount of research and development costs, as evidenced by the increase in the share of R&D in GDP. From 2012 to 2018, the EU average this indicator has increased by 0.1%. In Ukraine, it has decreased by 0.3% (Table 3).

According to the State Statistics Service of Ukraine, there is a steady downward trend in the amount of scientists in Ukraine. The main reason for such a huge decline in scientific staff is called “brain drain” [8].

Table 3 – Share of expenditures on research and development in GDP

	2012	2013	2014	2015	2016	2017	2018	2019
EU	1,93	1,97	2,01	2,02	2,03	2,04	2,03	...
Bulgaria	0,56	0,53	0,60	0,63	0,79	0,96	0,78	...
Estonia	1,58	2,31	2,12	1,72	1,45	1,49	1,28	...
Spain	1,35	1,33	1,29	1,27	1,24	1,22	1,19	...
Latvia	0,61	0,70	0,66	0,61	0,69	0,63	0,44	...
Lithuania	0,78	0,90	0,89	0,95	1,03	1,04	0,85	...
Germany	2,71	2,80	2,87	2,82	2,87	2,92	2,94	...
Poland	0,72	0,75	0,88	0,87	0,94	1,00	0,97	...
Romania	0,46	0,50	0,48	0,39	0,38	0,49	0,48	...
Slovakia	0,62	0,66	0,80	0,82	0,88	1,18	0,79	...
Slovenia	2,06	2,42	2,57	2,58	2,37	2,20	2,00	...
Hungary	1,15	1,19	1,26	1,39	1,35	1,36	1,21	...
Czech Republic	1,34	1,56	1,78	1,90	1,97	1,93	1,68	...
Ukraine	0,75	0,65	0,67	0,70	0,60	0,55	0,48	0,45

For today, Ukraine is among the leaders of the donor countries in supply of intellectual resources. In accordance with the statistics of the State Migration Service of Ukraine over the last three years, it can be seen that almost 30 thousand people have gone abroad for permanent residence. The magnitude of this problem is increasing, having a significant impact on the development of education, science, the economy itself and our society.

Attention should also be paid to the significant impact of the military conflict on the emigration sentiment of the population, since the onset of military conflict in eastern Ukraine the tendency for migration has increased by 45%, as one of the main reasons for intellectual migration is the desire for more favorable conditions for work and life. The “outflow of minds” causes considerable damage to the potential of our country.

Appealing to the research of Baranik Z. and Romanenko I., it can be stated that our state has typical features of destruction of intellectual capital, which has a negative impact on the socio-economic development and demographic situation in the country. This leads us to a deep crisis, because the demographic factor should be considered as one of the determining factors for ensuring stable development of the country [9].

Given serious (even despite the large-scale outflow of intelligence abroad) scientific potential and the scope of patenting inventions, the first major problem that hinders the implementation of R&D results into production is the lack of incentives. If fierce competition, binding state standards (such as ecological or environmental parameters of production), the need for energy savings play a role abroad, Ukraine's only incentive was and remains an uncertain chance to sell the invention abroad. If in the West intellectual property is an integral part of the capital of an enterprise, there is no well-established standardized mechanism for its valuation in Ukraine. Even if they are taken into account, they represent an ultimately small share of the total value of the firm.

According to the Surveys of the State Statistics Service, most Ukrainian entrepreneurs (regardless the field of activity) are not interested in long-term projects. Due to the considerable risk of non-repayment of funds (because the deterioration of the investment climate in the country), they only invest in inventions that pay off in 3-5 years. In contrast, Western investors are concerned not only with profits or with money return, but also with the social effect of their investments. In addition, the amount of enterprises introducing innovations decreases every year (Table 4).

Table 4 – Amount of industrial enterprises introducing innovations

	2010		2015		2018	
	Total	% to the total amount of industrial enterprises	Total	% to the total amount of industrial enterprises	Total	% to the total amount of industrial enterprises
Total	1217	11,5	723	15,2	672	14,3
including						
implemented innovative processes	522	4,9	400	8,4	456	9,7
of them						
low-waste, resource-saving	203	1,9	155	3,3	198	4,2
introduced innovative products	615	5,8	414	8,7	358	7,6
of them						
new types of machines, equipment, appliances, apparatus	194	1,8	162	3,4	143	3,0

As showed in the Table 4, the amount of industrial enterprises introducing innovations during 2010-2018 decreased, despite a slight increase in their share in the total number of industrial enterprises.

Considering the structure of innovative activity of industrial enterprises, it can be noted that in general, in recent years the share of enterprises implementing

innovative processes, has increased. This includes eco-technologies (from 4,9% to 9.7% of the total amount of industrial enterprises) and the share of enterprises introducing innovative products almost did not increase (by 1,8%, from 2010 to 2018).

The amount of innovative technological processes also has a negative tendency to decline (Table 5).

Table 5 - Implementation of innovations at industrial enterprises, unit

	2010	2015	2018
Quantity of new technological processes implemented	2043	1217	1831
including			
low-waste, resource-saving	479	458	611
Quantity of names of introduced innovative types of products	2408	3136	2387
including			
new types of machines, equipment, appliances, apparatus	663	966	751

Table 5 shows data on the volume of innovations implemented (new technological processes and innovative types of products) of industrial enterprises for the period 2010-2018.

According to the information indicated in the Table 6, the volumes of new technological processes implemented at industrial enterprises in 2018 are higher by 614 units, compared to 2015, but lower by 212 units as compared to 2010. However, if compared to previous years, the

amount of eco-innovations implemented in 2018 have increased by 130%. At the same time, the number of names of innovative products introduced, including new types of machines, equipment, appliances, apparatus, was the highest in 2015.

The State Statistics Service of Ukraine conducted a survey among non-innovative enterprises to find out the reasons for not implementing innovative activities (Table 6). The results are depressing.

Table 6 – Distribution of non-innovative enterprises for reasons that impeded innovation processes

Reasons	%
Lack of reasons to execute innovations	83,00
including	
low demand for innovation in the market	10,20
due to previous innovations	8,70
due to the low competitiveness of the enterprise in the market	5,90
lack of good ideas or opportunities for innovation	9,30
Potential implementation of innovations is hampered by significant factors	17,00
including	
lack of funds within the enterprise	9,70
Lack of credit funds or private equity	5,00
high costs for innovation	9,00
lack of skilled workers	2,00
lack of cooperation partners	1,40
difficulties in obtaining state aid or subsidies for innovation	6,50
uncertain demand for innovative ideas	2,80
high level of competition in the market	5,30
legislative / regulatory acts that create additional burdens	5,80

Thus, the main factor hindering innovation is the lack of objective reasons to innovate. Thus, 83% of enterprises are not engaged in innovative processes due to low demand for innovation in the market, due to low competition of enterprises in the market, etc.

Only 17% of enterprises do not innovate due to significant factors, such as lack of funds, high costs, lack of skilled workers, etc.

Therefore, it can be summarized that today in Ukraine there are the following institutional problems that impede the development of innovative activity of domestic enterprises:

- closure of the State Innovation Fund (in its place a state-owned innovation company was created, which does not have its own sources of financing and therefore it has no efficient possibilities to substantially support the implementation of the innovation policy in the state);
- lack of a scientific and methodological base for the formation of the scientific and technological sphere;
- deterioration of financial and material support of the research base of scientific institutions;
- lack of systematic measures taken by the state to realize the innovative potential of the national economy;
- state management of innovative activity is carried out without a clearly formulated strategy of scientific, technological and innovation development, consistent and balanced foreign and domestic economic policy;
- lack of an effective system of priorities for the development of scientific and technological sphere;
- lack of cooperation between scientific and industrial spheres;
- state management of innovation activity is ensured on a sectoral basis;
- lack of coordination of the subjects of innovation activity;
- insufficient financial resources to support research and implementation of innovative developments;
- outflow to other fields of activity of qualified personnel engaged in scientific development and introduction of high technologies in production;
- inefficiency of the mechanisms of legal protection of intellectual property;
- existence of a “baleful” practice of ignoring current norms of the legislation and suspending the articles of the laws related to financial support of innovative activity during the adoption of the laws on the state budget to the current or the next years;

- lack of a proper forecasting system for scientific, technological and innovative development;
- Ukrainian innovation sphere has not yet become truly attractive to domestic and foreign investors.

The result of the analysis confirms that about 90% of the US budget, from 70 to 80% of the EU budgets, and about 100% of Japan’s budget are generated through the commercialization of intellectually innovative technologies. At the same time, formation of the national budget of Ukraine by the innovative activity does not exceed 10%. The major shares of the world market for high-tech products are occupied by the USA (39%), Japan (30%), Germany (16%), with Ukraine’s share being less than 0.1%.

Thus, the problems of the innovative development of Ukraine require the search for effective tools for solving them, both comprehensively, i.e. in the form of certain institutional shifts, and at regional (using platform development tools) scales.

Conclusions

In our opinion, the main problem that hinders the enterprise’s intentions to invest in its own development is the lack of available funds, including credit resources. While innovative activity requires primarily long-term loans, domestic banks mainly conduct short-term transactions between financial market entities and intermediaries, and most loans are used not to finance investment and innovative projects, but to provide “consumer” costs (debt repayment, payment of energy resources, payment of wages, etc.). The increased financial instability of the business entities and the associated high risks of credit investments do not interest banks in long-term investment.

Consequently, the low level of financing makes it difficult to obtain substantial economic returns from the scientific and technical activities in the form of completed proposals suitable for sale in production. In turn, this leads to a further decrease in the competitiveness of domestic enterprises and products of domestic industrial sector in the world market, which causes a chain reaction – the purchase of imported goods and the decline in the production of similar domestic goods.

Considering the problem of lack of funds for R&D in general, both for Ukrainian producers and foreign investors, the lack of an effective stock market in Ukraine, as a source of capital and an investment tool, also prevents forcing development of innovative activities, as for now and for near future.

References

1. Polishchuk O.O. (2010). Sutnist poniattia “innovatsiina diialnist” yak sotsialno-ekonomichnoi katehorii [The essence of the concept of “innovation” as a socio-economic category]. *Ekonomichniy visnyk Donbasu – Economic Bulletin of Donbass*, 3 (21), 169–171 [in Ukrainian].

2. Shpikuliak O.G., Mazur G.F. (2014). Innovatsiina diialnist u mekhanizmi stymuliuvannya ahropromyslovoho vyrobnytstva [Innovative activity in the mechanism of stimulation of agricultural production]. Zbirnyk naukovykh prats Tavriiskoho derzhavnoho ahrotekhnolohichnoho universytetu (ekonomichni nauky) – Proceedings of the Tavrida State Agrotechnological University (Economic Sciences), 4, 73-77 [in Ukrainian].
3. Koyuda P.M., Sheik I.A. (2013). Efektyvnist ekonomichnoi diialnosti pidpriemstv: teoriia ta praktyka [Efficiency of economic activity of enterprises: theory and practice]. Kharkiv: Kompaniia SMIT [in Ukrainian].
4. Kovalenko O.V. (2015). Problemni aspekty stanovlennia innovatsiinoi systemy Ukrainy v konteksti teorii tekhnolohichnoho rozvytku [Problematic Aspects of Becoming an Innovative System of Ukraine in the Context of the Theory of Technological Development]. Efektyvna ekonomika – Effective Economics, 3, 31[in Ukrainian].
5. Lepetyukha N.V., Lipskaya A.S. (2018). Suchasnyi stan innovatsiinoi diialnosti promyslovykh pidpriemstv Ukrainy [The current state of innovation activity of industrial enterprises of Ukraine]. Ekonomika ta upravlinnia natsionalnym hospodarstvom – Economy and management of the national economy, 18, 150-158 [in Ukrainian].
6. Database-Eurostat. (n.d.). ec.europa.eu. Retrieved from <https://ec.europa.eu/eurostat>
7. State Statistics Service of Ukraine. Research and development in 2018. (n.d.). ukrstat.gov.ua. Retrieved from <http://ukrstat.gov.ua/> [in Ukrainian].
8. Polkovnychenko S.O. (2015). Assessment of the situation of «brain drain» from Ukraine in modern conditions [Assessment of the situation of brain drain from Ukraine in modern conditions]. Naukovyi visnyk Polissia – Polesie Scientific Bulletin, 2, 81–86 [in Ukrainian].
9. Baranik Z.P., Romanenko I.O. (2014). Intelktualna mihratsiia naseleння Ukrainy: statystychnyi aspekt [Intellectual migration of the population of Ukraine: statistical aspect]. Naukovyi visnyk Khersonskoho derzhavnoho universytetu – Scientific Bulletin of Kherson State University, 6, 262 [in Ukrainian].