

## ANALYSIS OF INDUSTRIAL ENTERPRISES INNOVATIVE ACTIVITY IN UKRAINE AND IN LVIV REGION, IN PARTICULAR

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The analysis of the innovative activity of industrial enterprises in Ukraine and, particularly, in Lviv region in 2011–2012 is presented in the article. The investment activity in the domestic economy according to the International ratings is analyzed. The innovation potential of the Ukrainian industry is estimated. The factors affecting the state of innovative activities that has recently shaped in the Ukrainian economy are determined.

**Key words:** innovative activity, indicators of innovative activity, socio-economic development, competitiveness.

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## АНАЛІЗУВАННЯ ІННОВАЦІЙНОЇ АКТИВНОСТІ ПРОМИСЛОВИХ ПІДПРИЄМСТВ УКРАЇНИ ТА, ЗОКРЕМА, ЛЬВІВСЬКОЇ ОБЛАСТІ

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Проаналізовано інноваційну активність промислових підприємств України, зокрема Львівської області, за 2011–2012 рр. Досліджено інноваційну активність вітчизняної економіки згідно з міжнародними рейтингами. Здійснено оцінку інноваційного потенціалу промисловості України. Визначено фактори, які впливають на інноваційне становище, що склалося останніми роками в економіці України.

**Ключові слова:** інноваційна активність, показники інноваційної діяльності, соціально-економічний розвиток, конкурентоспроможність.

### Problem statement

The innovations are the basis for rapid and stable socio-economic development in today's economy, as they ensure its proper technological and competitive level due to the production and application of the ideas that possess scientific and market novelty.

Current market environment requires regular activation of innovative activity as one of the most productive way to increase the competitiveness of the country and its further development. The sequential motivation of the strategic direction of the development of Ukraine, where the key role is given to the innovations, is the success of highly developed countries, due to the practical implementation of innovative models of development.

### Analysis of recent research and publications

Economic processes in the field of innovative development that takes place in Ukraine attracts a lot of domestic scholars and economists, among which it is worth to name A.S. Halchynskyy, M.T. Pashuto, S.F. Podkropyvnyy, S.V. Korsunskyy, O.Ye. Kuzmin, V.P. Semynozhenko, R.A. Fathutdynov and others. Various aspects of innovation activity in Ukraine, as well as international experience in introduction of innovation to production, is discussed in their works.

## Objectives

To analyze the innovation activity of industrial enterprises in Ukraine, particularly in Lviv region during 2011–2012 years. To investigate the investment activity of the national economy according to international ratings. To assess the innovation potential of industry in Ukraine. To identify the factors that influence the innovation situation that has arisen in recent years in the Ukrainian economy.

## Materials

The situation that has arisen in recent years in Ukraine is determined by the inefficiency of conducted economic reforms, imperfect tax system, negative impact of government regulation on the activities of the enterprises.

Currently ongoing decline of the production in the Ukrainian industry demonstrates the need to stimulate structural changes, laying the foundations of a new national economic development model that will coincide with the peculiarities of the competitive challenges of the post-crisis world [3].

The innovative development of the Ukrainian industry was marked by instability during 2006–2012. The global financial and economic crisis of 2008–2009 had a devastating impact on the state of innovation sphere and during this period the indicators of innovative activity of Ukrainian industrial enterprises mainly had the degressive dynamics.

Implementation of the policy measures targeted at the support of the innovation processes was the main mover of recovery of innovative activities of the industrial enterprises in Ukraine during 2010–2012 (table 1).

The level of innovation activity of the Ukrainian enterprises reached 17.4 % in 2012 (in 2011 – 16.2 %). Increasing of the innovative activity of industrial enterprises provided a positive impetus to their activity in certain areas. Thus, production of 3.4 thousand names of innovative products was mastered in 2012 (in 2011 – 3.2 thousand), of which 942 names are new types of technology (in 2011 – 897).

The share of innovative production in the realized industrial production decreased in 2012 as compared to the previous year and was 3.3 % (in 2011 – 3.8 %). In the total amount of the realized innovative production new products for the Ukrainian market was 40 %, while the remaining 60% were realization of production that was new to individual enterprises. However, the decrease in implementing of the new processes is also observed, thus, they were introduced in 2188 units in 2012, which is 322 units less compared to 2011 (2510 units).

Table 1

**Main indicators of the innovation activity of Ukrainian enterprises\***

Main indicators of the innovation activity	Years						
	2006	2007	2008	2009	2010	2011	2012
Quantity of innovation-active enterprises as % of the total number of industrial enterprises	11,2	14,2	13	12,8	13,8	16,2	17,4
The amount of realized innovation production as % of the total amount of industrial production	6,7	6,7	5,9	4,8	3,8	3,8	3,3
The amount of the innovation expenditures in the industry, mln.hrn	6160	10850,9	11994,2	7949,9	8045,5	14333,9	11480,6
Implemented new technological processes, units	1145	1419	1647	1893	2043	2510	2188
Mastered new kinds of production, units	2408	2526	2446	2685	2408	3238	3403
Mastered new kinds of technique among the total amount of new kinds of production, units	786	881	758	641	663	897	942

\*<http://www.ukrstat.gov.ua/> State Statistics Committee of Ukraine

There was a trend to a decrease in total funding of the innovation activity in 2012, and it was 11480.6 million hryvnias or 0.81 % of GDP, against 14333.9 million hryvnias (1.1 % of GDP) in 2011, of which 224.3 million hryvnias was provided by the state budget and it is 75.1 million hryvnias more as

compared to 2011. The total amount of expenditures on innovations decreased in 2012 by 2853.3 million hryvnias as compared to 2011.

The own funds of enterprises still remain the main source of financing of the innovation activity - 63.9 % of total expenditure (52.9 % in 2011). The share of loans was 21.0 % (38.3 % in 2011), financial support from the state – 2.2 % (1.1 % in 2011). The innovation funding at the expenses of the domestic investors grew more than in 4 times – from 0.3 % in 2011 to 1.3 % in 2012. The share of foreign investments in total investment in innovations in 2012 also increased very significantly – more than 20 times - from 0.4 % of the total funds provided for innovation in 2011 to 8.6 % in 2012 [1]

However, the innovative development did not become one of the main features of national economic growth for Ukraine. Over the last few years there have been positive trends in innovative activity of industrial enterprises in Ukraine, but they were mostly temporary, unstable and lacking a clear long-term incentives.

The analysis of innovation activity of industrial enterprises in Lviv region (table 2) shows that 101 industrial enterprises carried out the innovation activities in 2012, namely 13.4 % of the industrial enterprises in the area. Lviv region took 20th place among other Ukrainian regions according to this indicator. Among innovation active enterprises 49 implemented innovative processes, 43 – innovative production, 11 enterprises in the region applied marketing innovation, 6 enterprises - organizational innovations.

46 new technological processes were introduced in 2012, most of them are in the food industry and pulp and paper production. 115 innovative products were mastered last year in the industry including 21 new types of technology. Most of new products were introduced by enterprises: Manufacture of food products, beverages and tobacco products – 45, Engineering – 30, Chemical and Petrochemical industry – 13, industry of other non-metallic mineral products – 9. 14 new technologies were purchased to modernize production processes in the regional enterprises.

The amount of realized innovative production over the last year amounted to 658.1 mln.hrn, it is 2.1 % of the total amount of industrial production (in 2011 – 1.5 %). Most of the realized innovative production is new to the market (77.9 % of its total amount). The production that is new to the enterprise was sold for 145,3 mln. hrn in 2012.

Table 2

**Main indicators of innovation activity in Lviv region\***

Main indicators of the innovation activity	Years						
	2006	2007	2008	2009	2010	2011	2012
Quantity of innovation-active enterprises, units	62	127	101	106	102	100	101
Quantity of innovation-active enterprises as % of the total number of industrial enterprises	8,4	15,8	12,1	13	13,4	13,2	13,4
The amount of realized innovation production, mln.hrn	423,6	1 064,2	627,1	690,8	383,6	447,4	658,1
The amount of realized innovation production as % of the total amount of industrial production	3,3	6,5	3,1	3,5	1,6	1,5	2,1
The amount of the innovation expenditures in the industry, mln.hrn	72,5	272,5	296,7	211,1	139,3	162,7	280,6
Implemented new technological processes, units	8	54	54	56	63	39	46
Mastered new kinds of production, units	102	190	138	152	117	119	115
Mastered new kinds of technique among the total amount of new kinds of production, units	9	52	22	37	31	15	21

\* Main Department of Statistics in Lviv region <http://lv.ukrstat.gov.ua>

280,6 mln. hrn was spent on the implementation of innovations in the industry in 2012. The most innovative funds were directed to the production and distribution of electricity, gas and water – 42.4 % of total innovation expenditures, food products, beverages and tobacco – 33.1 %, pulp and paper industry and publishing – 12.3 %.

The main source of funding for the implementation of innovation is own funds, thus 261.4 mln.hrn was provided in 2012, it is 114.7 mln.hrn more than in 2011(146,7 mln.hrn). Innovation funding at the expenses of domestic and foreign investors in 2012 was non-available. Bank loans and other borrowings increased by almost 90 times, from 196 thousand hrn in 2011 to 17.7 mln.hrn in 2012. The financial support from the state, which was 831.5 thousand hrn in 2011, almost unchanged in 2012 – 830 thousand

hrn. However, funding of innovation expenses by local budgets increased, but there was not such funding in 2011, and it amounted 701 thousand hrn in 2012 (table 3).

Important for the realization of innovative activity in the country is the level of innovation environment, which can be measured by indexes that characterize the state of a particular aspect of the economy and society [7].

Low position of Ukraine in international ratings that evaluate technology and innovation competitiveness, including Global Competitiveness Index of the World Economic Forum, Knowledge Economy Index of the World Bank, the Global Innovation Index of Cornell University shows the low level of innovation environment in Ukraine.

Table 3

**Expenditures on innovations by financing sources in Lviv region\***

Financing sources (thousand hryvnias)	Years						
	2006	2007	2008	2009	2010	2011	2012
Total:	72457.5	272507.9	296662.2	211070.7	139335.4	162676.8	280614.4
Funds of state budget	4000.0	49634.6	7155.9	4025.5	766.0	831.5	830.0
Funds of local budgets	47.8	-	376.0	344.5	121.0	-	701.0
Own funds of enterprises and organizations	58855.2	174577.9	253819.0	196764.5	92677.6	146669.8	261419.4
Costs of domestic investors	-	5851.1	3007.5	2132.2	-	5319.7	-
Costs of foreign investors	-	1241.4	2.4	260.3	353.0	9659.8	-
Bank loans and other borrowings	9554.5	41202.9	32301.4	7543.7	45417.8	196.0	17664.0

\* Main Department of Statistics in Lviv region <http://lv.ukrstat.gov.ua>

Knowledge Economy Index of the World Bank Institute is an indicator that shows the country's ability to use knowledge in order to ensure economic development. This index determines the impact of scientific and technological sphere and is made up of four sub-indexes: economic and institutional schedule of innovations, innovation systems, education and skills of the population, information and communication infrastructure.

According to a study conducted by the Institute experts, Ukraine took the 56 place among 145 countries in 2012, and it is two steps lower than in 2000. The ability of Ukraine to provide economic development through knowledge in 10 – point scale was evaluated in 5,73 points, whereas, for example, in Poland this ability is estimated in 7.41 points, Bulgaria – 6,80, Hungary – 8.02, Czech Republic – 8.14. [2]

Global Innovation Index of the Cornell University, business school INSEAD and the World Intellectual Property Organization WIPO gives an opportunity to assess the ability of the countries to create an enabling environment for innovations and the results of innovations. Ukraine took the 71 place among 142 countries in the world for the Global Innovation Index in 2013, which is 8 positions less than in 2012 and 11 - compared with 2011. The sub-index analysis of the Global Innovation Index shows that the major drawbacks that hinder innovation development of Ukraine, are the lack of efficiency of public administration (124 position in the world) and regulatory control (113), poor quality of the headship of the law (117), unfavorable business environment (127), complicated tax schedule and bankruptcy of the enterprises (125 and 135 in accordance) , lack of energy efficient and environmentally friendly production (119 and 97 in accordance), the low rate of fund formation (108), lack of competition in the internal market (101 and 82 in accordance), the low level of clusters development (110), etc. [4].

According to the latest report of the World Economic Forum about the Global Competitiveness in 2012–2013, Ukraine took the 73 place in comparison with 82 in 2011–2012 among the 144 countries. Due to the economic and political difficulties, Ukraine lost 16 positions in 2009–2010. But the state of the economy improved in 2011–2012, allowing country to move 7 positions up in the rating. And according to the report of the World Economic Forum about Global Competitiveness in 2012–2013 years Ukraine moved for another 9 positions up, continuing to demonstrate its main competitive advantages – education and capacity of the market. Ukraine takes 71 place according to the rating with the subindex “Innovation”

in 2012–2013. The greatest impact on increasing of the value of this rating in 2012–2013 years as compared to the previous period had a change of its components, as the quality of research institutes (+8 positions), state procurement of new technologies and products (+ 15 positions), availability of scientists and engineers (+26 positions), the number of patents obtained in the United States by 1 million people (+ 20 positions). In terms of “innovative capacity” Ukraine has moved 16 positions down as domestic enterprises increasingly use foreign technology through licensing, than its own workings and researches [6].

Thus, the trend of the Ukrainian market of innovation on the one hand and the global dynamics of technological innovation and global investment limited resource on the other, appear to be the factors that put forward new requirements for the system of innovation development of the national economy and demand an acceleration of innovation activities of industrial enterprises in Ukraine.

Activation of the innovation activity of industrial enterprises will contribute to the implementation of scientific and technological potential, which is shown in:

- increasing of the competitiveness of production which is manufactured by the industrial enterprises through the use of new or significantly improved production methods connected with the use of new technologies, particularly energy saving, improved production equipment;
- opening of new markets and gaining new positions for industrial production and increase of the sales through the introduction of new methods of selling and sales promotion;
- improving of the financial results of the industrial enterprises activity by increasing the revenues from the sales of the products that are new or significantly improved by their quality or manner of use;
- promoting of the updating and fuller use of production capacity and technological base of the state industrial complex that will optimize production processes, accelerate technological upgrading of the industry and ensure the development of sectoral restructuring of the industrial sector of Ukraine;

### Conclusions

Thus, according to experts who carried out the reviewed researches, innovation activity in Ukraine requires intersectoral technological exchange, companies ties strengthen with universities and research institutes, development of international scientific and technical cooperation, venture capital investment in new innovative design, creating the innovative infrastructure, widespread use of information technologies, etc.

### Prospects of further researches

The key integrative role in forming of the innovation potential of Ukrainian industry belongs to the state, which has to use the system economic instruments of state influence, which correspond the strategic economic policy. The strategic necessity of preserving and increasing the innovative capacity of the domestic industry dictates the expediency of the introduction of measures for the innovative development of industries based on their characteristics and the need to stimulate the restructuring of the industry.

1. *Інноваційне розвиток: економіка, інтелектуальні ресурси, управління знаннями / под ред. Б. З. Мильнера. – М.: ИНФРА-М, 2013. – 624 с. – С. 18*
2. *Про внутрішнє та зовнішнє становище України в 2013 році: Щорічне Послання Президента України до Верховної Ради України. – К.: НІСД, 2013. – 576с. – С. 22*
3. *Собкевич О.В., Сухоруков А.І., Савенко В.Г. Розвиток промислового потенціалу України в процесі післякризового відновлення / О.В. Собкевич, А.І. Сухоруков, В.Г. Савенко [та ін.]; за заг. ред. Я.А. Жаліла. – К.: НІСД, 2010. – 48 с. – С. 24.*
4. *Стан розвитку науки і техніки, результати наукової, науково-технічної, інноваційної діяльності, трансферу технологій за 2012 рік [Електронна ресурс] – Режим доступу: [http://www.dkni.gov.ua/?q=system/files/sites/default/files/images/\\_08%2007%202013.pdf](http://www.dkni.gov.ua/?q=system/files/sites/default/files/images/_08%2007%202013.pdf)*
5. *Knowledge Economy Index (KEI) 2012 Rankings [Електронний ресурс]. – Режим доступу: <http://siteresources.worldbank.org/INTUNIKAM/Resources/2012.pdf>*
6. *The Global Competitiveness Report” [Електронний ресурс]. – Режим доступу: <http://www.weforum.org/issues/global-competitiveness>*
7. *The Global Innovation Index 2013 [Електронний ресурс]. – Режим доступу: <http://www.globalinnovationindex.org/content.aspx?page=data-analysis>*
8. *Knowledge Economy Index (KEI) 2012 Rankings [Electronic resource]. – Access: <http://siteresources.worldbank.org/INTUNIKAM/Resources/2012.pdf>*
9. *The Global Competitiveness Report” [Electronic resource]. – Access: <http://www.weforum.org/issues/global-competitiveness>*
10. *The Global Innovation Index 2013 [Electronic resource] – Access: <http://www.globalinnovationindex.org/content.aspx?page=data-analysis>*