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THE ANALYSIS OF INNOVATIVE ACTIVITY OF MACHINE-BUILDING ENTERPRISESIN THE PERIOD OF GLOBAL CRISIS ANDWAYS OF DETERMINING THESTRATEGIC DIRECTIONS OF THE DEVELOPMENT OF UKRAINE'S INDUSTRY

The financial and economic crisis has had a negative impact on investment and innovation климатеУкраины and on the results of activities of domestic industrial enterprises. The article analyses the dynamics of the main indicators of innovative activity of machine-building enterprises in 2005-2011 Conducted a study of the distribution of financing of innovation activity of industrial enterprises for the sources, as well as the distribution of the total costs of the industrial enterprises of the directions of innovative activity. On the basis of the carried out research in the article have been identified key issues facing domestic industrial enterprises, as well as perspective directions for the activation of innovative activity of the enterprises of a machine-building complex. Maintenance of stable functioning and further development of machine-building enterprises is possible only through the realization of complex measures, aimed at technological modernization of production processes, effective use of energy resources, reduction of import dependence, restructuring of the economy and effective state support.

Keywords:innovation, innovationactivities, innovativeactivity, developmentstability, manufacturing, machinebuildingsector.

Raising of the problem*. Ukraine's integration into the world economy is not possible without ensuring effective development of the industrial complex of Ukraine. The last decade is characterized by a period of inefficient investment and innovation policy, unbalanced competition policy and appreciable negative monopoly impact. Currently, the industry is in a rather difficult socio-economic situation.*

Today, the primary task is to recreate the domestic industrial complex through its restructuring and system modernization up to the modern standards of the scientific and technological progress and the post-industrial development. Industry structure of the national economy has to approach the standards of developed countries. Ensuring of stable functioning of the industry will lead to "recovery" of the economy of Ukraine and generate conditions for further development during the global economic crisis.

Analysis of recent research and publications. *The problems of innovative activity, researches of various aspects of the innovative process and developing recommendations for enhancing innovative activity of the industrial enterprises in Ukraine have been paid enough attention by such scientists as O. Amosha, L. L. Antonjuk, S. P. Baranovska, V. M. Geets, J. A. Zhalilo, N. B. Kirich, L. I. Fedulova and others. However, despite the significant amount of researches and considering the current unstable state of innovative activity of the machine-*

building enterprises of Ukraine constant fluctuations of innovative activity which are mainly caused by the economic crisis and a lack of support from the government require further research in this problem area.

The main material. *Analyzing the current governmental programs of the economy activation for 2013-2014 [1], of the development of national production [2], the development of the national machine building sector for agriculture for the period of 2007-2010 [3], the development of the national machine building sector for the 2006-2011 [4] and others, we can conclude that they are based on the introduction of a mechanism of stimulating of innovative development and resource preservation, manufacturing modernization, innovative capacity improving, channeling of the investment resources of the state on implementation of new models of resource preserving and energy efficient techniques and technologies, organization of up-to-date staff training and encouraging the involvement of the private capital [1; 2; 4].*

Innovative activity is one of the main conditions for the modernization and restoration of industry and national economy, the so-called transition to a new stage of development, in which the national machine building sector has to play one of the main roles.

Machine building sector is one of the most important, powerful and promising industries, providing comprehensive mechanization, automation and robotics labor-intensive production processes. The level of machine building sector is one of the indicators of the economic and industrial development of the country, which stipulates scientific and technological progress as of its own enterprises as in all industry sectors of enterprises. Machine building sector plays a decisive role in the creation and development of material and technical base of the national production through the introduction of scientific and technical progress and improving primarily engineering and technology. The sector is characterized by a high concentration of manufacturing [2].

The Ukrainian machine building sector has 20 specialized branches, including 58 sub-industries that are created according to the needs of the national economy. Currently it contains more than 1,600 enterprises of aviation, rocketry, sea and river vessels, machinery and equipment of heavy, light and food industry, agriculture, transport and traffic engineering, electrical engineering and instrumentation of general and special purpose, home appliances and electrical household appliances manufacturing etc. With a total range of the machine building sector there were hundreds of thousands of product items. In the structure of export share of the machine building sector it was 9.9 % in 2011 and 10.2 % in 2012 [2].

In the machine building sector about 15 % of industry assets and over 21 % of industry employees are centered (over 585 thousand people in 2012, excluding data of small firms). The machine-building enterprises today produce about 3.5 thousand items of machinery and equipment, including about two thousand modernized and more than 500 new models of machinery and equipment for agriculture. Technical facilities are being made or can be made, allow to

mechanize up to 85 % of work in agriculture. More than 90 % of enterprises of general and special machine building sector are joint stock companies. State-owned enterprises are mainly of strategic importance for the national economy and security. They also need involvementof considerable investments [1; 2].

Considering the potential of the machine-building enterprises and a strategic necessity of the developing of this complex for the economy of Ukraine, an implementation of a set of actions that will ensure stable operation of the machine building sector and industry in general is needed. Sustainable development of enterprising should be based on a modern innovative platform. The innovative activity of industrial enterprises in Ukraine is insufficient, and the pace of implementation is rather low. The number of enterprises that implemented innovations and theirs share in the total number of industrial enterprises in the period of 2000-2011 is shown in fig. 1.

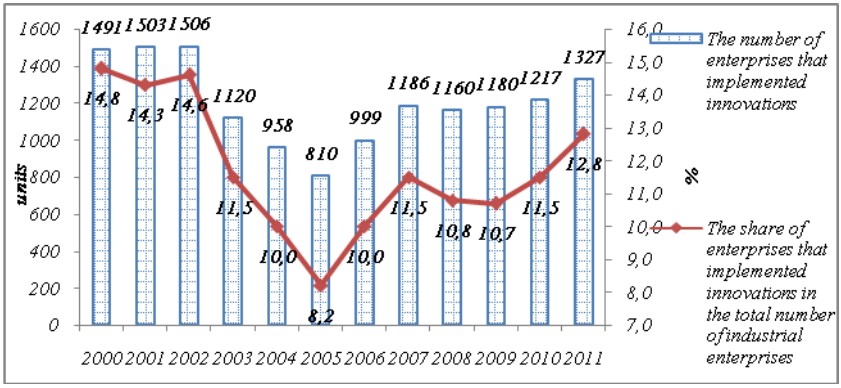

Fig. 1. Thedynamicsofinnovativeactivityofthe industrialenterprisesfortheperiodof 2000-2011 [7]

As shown in Fig. 1, for the period of 2000-2011, the number of industrial enterprises that implemented innovations decreased from 1491 units in 2000 to 1327 units in 2011,i. e. by 11 %. The share of enterprises that implemented innovations in the total number of industrial enterprises decreased from 14.8% in 2000 to 12.8 % in 2011,i. e. 2% of the total. The positive trend in the period 2008-2011, which showed an increase of number of the industrial enterprises that implemented innovations of 1160 units in 2008 to 1327 units in 2011,i. e. 12.58%, which in turn led to an increase in the proportion of enterprises that implemented innovations in the total number of industrial enterprises from 10.8% in 2008 to 12.8% in 2011i. e. 2%. Number of the machine-building enterprises that implemented innovations in the period of 2005-2011 is shown in Fig. 2.

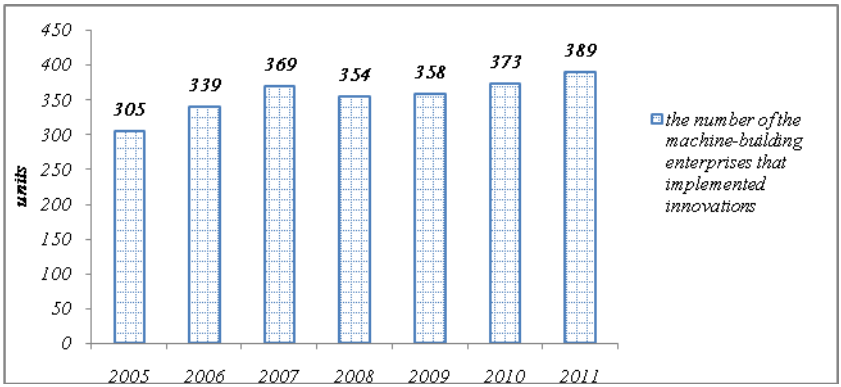

Fig. 2. The dynamics of innovative activity of the machine-building enterprises for the period of 2005-2011 [7]

As shown in Fig. 2, for the period of 2005-2011, the number of the machine-building enterprises that implemented innovations increased from 305 units in 2005 to 389 units in 2011,i. e. 21.59%. The dynamics of innovations introductionin industry for the period of 2000-2011 is shown in Fig. 3.

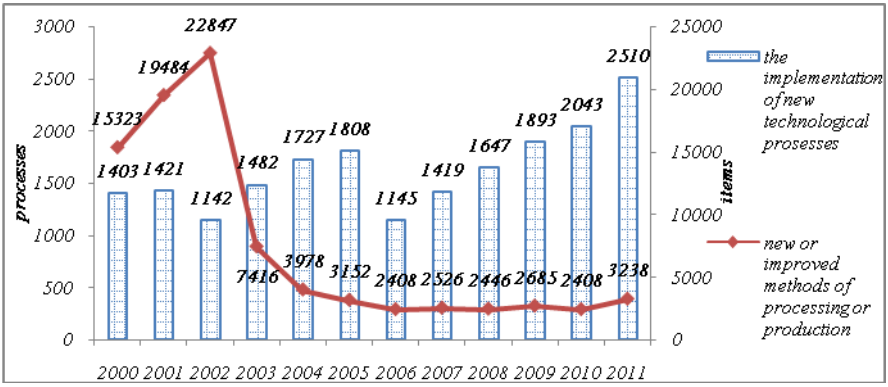

Fig. 3. The dynamics of innovations introduction by industrial enterprises for the period of 2000-2011 [7]

Number of industrial enterprises that implemented innovations increased from 1217 units in 2010 to 1327 units in 2011,i. e. 8.29%. Along with this there was increase in the proportion of enterprises that implemented innovations during this period, from 11.5 % to 12.8 %,i. e. 1.3 %. In the engineering industry there was an increase in companies that implemented innovations from 373 units. in 2010 to 389 units. in 2011,i. e. 4.11%. In 2011, the number of industrial enterprises that introduced new or improved methods of processing or production

increased from 522 units in 2010 to 605 units in 2011,i. e. 13.72%, of which the number of enterprises that introduced new or improved low-waste, energy saving and waste-free processing techniques and production increased from 161 units in 2006 to 240 units in 2011, i. e. 32.92%. The number of industrial enterprises that mastered the production of innovative products increased from 615 units in 2010 to 731 units in 2011,i. e. 15.87%. During the period of 2006-2011 there was a positive dynamics of the introduction of new technological processes by the industrial enterprises in 1145 processes 2006 to 2510 processes in 2011,i. e. 54.38%. And the development of new products titles from 2408 items in 2006 to 3238 items in 2011,i. e. 25.63%. The dynamics of realization of the industry innovative product for the period of 2005-2011 is shown in Fig. 4.

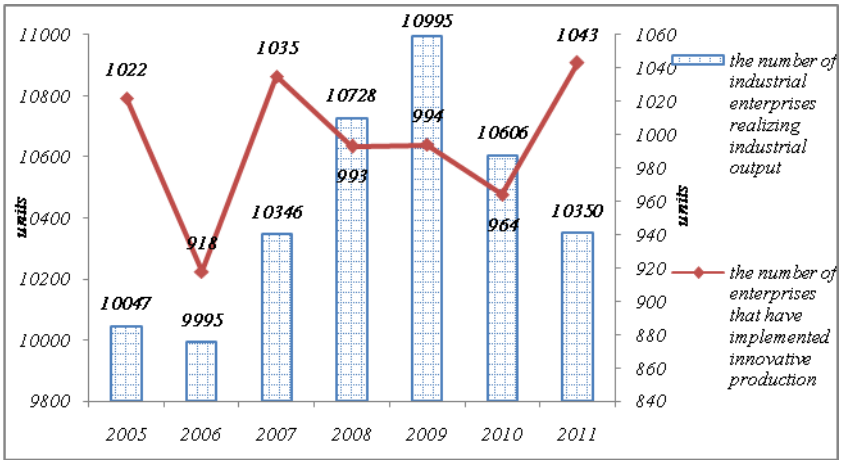

Fig. 4. The dynamics of realization of the industry innovative product for the period of 2005-2011 [5; 6; 7]

Analyzing fig. 4, it can be noted that comparing to the 2009 year data the number of industrial enterprises realizing industrial output in 2011 decreased by 5.87 %, but in amount of realized innovative production by the industrial enterprises in this period there was a positive trend from 994 units in 2009 to 1043 units in 2011,i. e. by 4.7%. During the period of 2009-2011 the number of engineering companies that have implemented industrial products decreased from 1925 unitsin 2009 to 1811 units in 2011, i. e. 5.92 %. There was a modest increase in machine-building enterprises that have implemented innovative production of 323 units in 2009 to 351 units in 2011,i. e. 7.98%, including products that are new to the market. It amounted from 153 units in 2009 and 139 units in 2011, and products that were new to the company amounted from 231 units in 2009 to 264 units in 2011. The dynamics of realization of innovative product of the machine-building enterprisesoutsideUkraine for the period of 2005-2011 is shown in fig. 5.

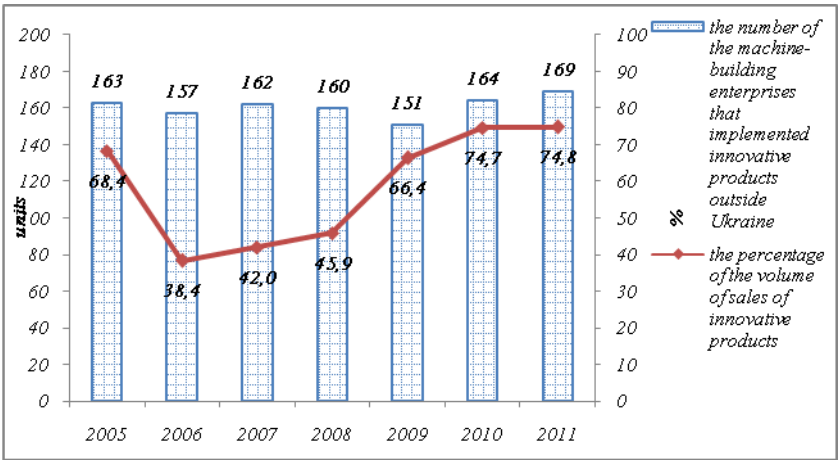

Fig. 5. The dynamics of realization of innovative product of the machine-building enterprises outside Ukraine for the period of 2005-2011 [5; 6; 7]

As shown in fig. 5, for the period of 2005-2011 the number of the machine-building enterprises that implemented innovative products outside Ukraine has not changed significantly, from 163 units in 2005 to 169 units in 2011, but the percentage of the volume of sales of innovative products outside Ukraine to the total volume of industrial products increased from 68.4% in 2005 to 74.8% in 2011,i. e. 6.4% that in money dimension is 6265.40 mln UAHin 2005 to 8434.34 million in 2011,i. e. an increase of 2,168.94 mln UAH. From the perspective of the enterprise development it is advisable to study the situation on the market of financing innovative activities of industrial enterprises. Distribution of total innovation financing sources for the period of 2005-2011 is presented in table 1.

Table 1

Dynamics ofthetotalfinancingofinnovative activityofindustrialenterprises bysourcesfortheperiodof 2005-2011 (%) [5, 6, 7]

Indicator	*Year*						
	2005	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
Personalfunds	*87,7*	*84,6*	*73,7*	*60,6*	*65,0*	*59,3*	*52,9*
Stateandlocalbudgetfunds	*0,8*	*1,9*	*1,4*	*2,9*	*1,7*	*1,2*	*1,1*
Nationalinvestors'funds	*1,4*	*0,4*	*0,2*	*1,4*	*0,4*	*0,4*	*0,3*
Foreigninvestors'funds	*2,7*	*2,9*	*3,0*	*1,0*	*19,0*	*30,0*	*0,4*
Loans	*7,1*	*8,5*	*18,5*	*33,7*	*11,8*	*7,8*	*38,3*
Funds from other sources	*0,3*	*1,7*	*3,2*	*0,4*	*2,1*	*1,3*	*7,0*

Table 1 shows that the structure of the distribution of the total financing of innovative activity of the industrial enterprises for the period of 2005-2011 has been substantially changed, namely in 2011 the main source of financing innovation were own funds the amount of which was 52.9% (7585.55 mln UAH) vs. 87.7% (5045.39 mln UAH) in 2005,i. e. 34.8% less. There was an increase in the

amount of loans from 7.1% (409.69 mln UAH) in 2005 to 7.8% (626.11 mln UAH) in 2010 to 38.3% (5489.49 mln UAH) in 2011,i. e. 31.2% and 30.5% respectively. 50 enterprises got loans in 2011 [8]. Comparing with 2010 there was an alarming decrease in foreign investors funding from 30% (2411.40mln UAH) to 0.4% (56,87mln UAH) in 2011,i. e. 29, 6%. This figure is the lowest for the period of 2005-2011. 11 companies benefited from getting was foreign investors funds in 2011, the domestic investors funding got by 14 companies was 45.39 mln UAH [8]. In the amount of financing the innovative activity of the machine-building enterprises for the period of 2010-2011 the following distribution is observed:

- Increase of share of own funds from 2334.73 mln UAH in 2010 to 2376.53 million,i. e. 1.76%;

- Increase of share of stateandlocalbudgetsfunds from 14.84 mln UAH in 2010 to 86.36 mln UAH in 2011, i. e. 82.82%;

- Decrease of share of foreigninvestorsfunds from 14.46 mln UAH and 63.79 mln UAH in 2010 to 6.81 mln UAH and 13.94 mln UAH in 2011, i. e. 52.9% and 78.15%;

- Increase of share of loans from 10.21 mln UAH in 2010 to 31.58 mln UAH in 2011, i. e. 67.67%.

The author believes that this allocation of the total financing of the innovative activity of the industrial enterprises for the period of 2005-2011 is threatening because foreign investors' funds in 2011 are almost absent. That gives rise to say about inefficient current business environment, namely the lack of transparent mechanisms of regulating economic activities, corruption in government bodies, biased judiciary in decision-making and so on. This negative process stops the flow of investment into Ukraine's economy and causesa distrust of foreign investors in our country in the financing of innovative activity of industrial enterprises.The distribution of total expenditures in the fields of innovative activity for the period 2007-2011 is shown in the table 2.

Table 2

Distribution of total expenditures in the fields of innovative activity for the period 2007-2011 (%)[5; 6; 7]

Indicator	*Years*				
	2007	*2008*	*2009*	*2010*	*2011*
InternalSRW	*7,3*	*8,0*	*8,0*	*10,2*	*5,8*
External SRW	*1,8*	*2,4*	*2,7*	*2,2*	*1,7*
Acquisitionofmachinery, equipmentandsoftware	*68,9*	*63,9*	*62,6*	*62,8*	*73,2*
Acquisitionofotherexternalknowledge	*3,0*	*3,5*	*1,4*	*1,8*	*2,3*
Otherexpenses	*19,0*	*22,2*	*25,3*	*23,0*	*17,0*

Analyzing Table. 2 it can be argued that in the period 2007-2011 a positive trend of growth of expenditure on the purchase of industrial machinery, equipment and software decreases from 62.6% (4974.74 mln UAH) in 2009 to 73.2% (10,489.09 mln UAH) in 2011, i. e. 10.6% (5514.35 mln UAH). This fact indicates updating assets rather than replacing old technologies with new ones. With the correct investment in new technologies an increase of high-quality and competitive products production can be expected in 2015 already. There was a decrease in the cost of internal and external SRW from 8 % (633.34 mln UAH) and 2.7% (213.37 mln UAH) in 2009 to 5.8% (833.29 mln UAH) and 1.7% (246.63 mln UAH) in 2011, i. e. by 2.2% and 1% respectively. Comparing with 2009 there was a decrease in other expenses from 25.3% to 17%, i. e. 8.3%.

In 2011, 1,811 machine-building enterprises spent money on innovative activities to the amount of 2,731.69 million which is less on 114 enterprises in 2009 against 2005.96 million spent. Notably slight, but the rising number of companies that spent money on acquisition of machinery, equipment and software, from 208 companies (815.88 mln UAH.) in 2009 to 248 (1248.65 mln UAH) in 2011, i. e. 40 engineering enterprises (432.77 mln UAH). It is also worth noting that in 2011 compared with 2009 there was a gradual increase in the number of engineering companies that spent money on internal SRW 145 (142) and a reduce in spends on external SRW to 48 (54), an increase in the cost of other external knowledge 38 (31) and market innovation 61 (54), the number of companies spending on education and training of staff remained unchanged 99 (99).

Analysis of the distribution of total costs in areas of innovative activity in Ukraine in general shows a positive trend, reflecting on an increase in expenditures from 8045.5 mln UAH in 2010 to 14,333.89 mln UAH in 2011, i. e. 43.87%, including internal and external SRW of 818.53 million and 177.95 million in 2010 to 833.29 mln UAH and 246.63 mln UAH in 2011, i. e. 1.77% and 27.85% respectively. The cost for the acquisition of machinery, equipment and software increased by 51.84% from 5,051.66mln UAH in 2010 to 10,489.09 mln UAH in

2011.According to the results in 2011 the breakdown of expenditures by regions showed that the largest amount of investments was in the Crimea (4491.82 mln UAH, 31.34 % of the total cost in Ukraine), Donetsk region. (2391.26 mln UAH, 16.68 %), Dnipropetrovsk region (950.52 mln UAH, 6.63 %), Khmelnitsky region (898.52 mln UAH, 6.27 %), Kharkiv region (805.96 mln UAH, 5.62%).The smallest amount was in Vinnitsa region (44,48mln UAH, 0.31%), Cherkasy region (35,46mln UAH, 0.25%) and the Transcarpathian region (31.34mln UAH, 0.09%).

Conclusions*. Thus, on the basis of the analysis the author concludes that for large-scale and effective changes in the industrial production consistent investments and innovation policy of the industrial complex should be clearly formulated and implemented. Nowadays the innovative activity of machine-building enterprises is stagnating and the positive changes, that the machine building sector showed, were minor and did not significantly affect the overall situation. It is also necessary to note a crucial function of the state, which has an intention to ensure the stability of the production process and to help businesses get out of crisis by a set of consistent actions. The modern period of the industrial complex of Ukraine's development should be renewable, and the one that involves the rapid modernization of the industry. A formal approach to solving problems that arise in the industryis notfinished positively. The state programs of the industrial development that exist at present, unfortunately, work only on paper, and do not address a wide range of problems of the national industries theyare facing, including:*

− a lack of state support for the industry;

− ineffective economic policy;

− deterioration of investment and innovation climate in the country due to the unstable political and economic situation;

− significant interference of regulatory authorities in the economic activity of industrial enterprises;

− slow adaptation of industrial enterprises to unstable market conditions;

− dependence on imported raw materials and components for the domestic machine building sector;

− low level of innovation and new technologies implementation. As a consequence, economic incentives for attraction of innovative resources and modernization of production are not formed;

− high energy and resource consumption of industrial products;

− significant machine building sector dependence on the export potential of CIS markets;

− imperfection of the medium and long term lending producers and consumers of industrial products and high cost of credit;

− low level of as management and workers training;

− depreciation of fixed assets, etc.

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