

THE FORMATION OF THE COMPETITIVENESS OF THE ENTERPRISES OF MACHINE-BUILDING COMPLEX OF UKRAINE

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Abstract. The *purpose* is to analyse the existing approaches to determine the value of the production of innovative products and innovation in enterprises of machine-building complex of Ukraine in order to improve their level of competitiveness. *Methodology.* Statistical analysis and generalization of scientific approaches to the formation of the competitiveness of machine-building enterprises. *Results* of the of the analyzed approaches allowed to identify the cause of the imperfection of innovation policy in engineering. According to the research, the number of machine-building enterprises engaged in innovation activity, constantly shrinks; the share of innovative products in the total is only 3.5-4%, and the volume of imports of high-tech products exceeding the size of own production; the level of knowledge-intensive industrial production is only 0.3%. All this slows down the process of creating competitive products and as a result, the failure to provide highly own products to other industries, take a niche world of mechanical engineering. *Practical implications.* Ensure accelerated economic growth of the country as the defining condition for implementation of the European integration aspirations of Ukraine in the short term requires the intensification of innovative activity of the machine-building enterprises. The current state of innovation activity of enterprises in Ukraine is characterized by a number of negative factors: the internal environment of the majority of machine-building enterprises does not correspond to the market conditions of managing: high energy productions, the growth of the degree of wear and tear of fixed assets and reduce investment to update them, the lack of introduction of advanced production and resource-saving technologies, reducing innovation activity due to lack of financial resources significantly affect the level of the competitive machine-building enterprises. *Value/originality* systematic approaches to determining the impact of innovation on the level of competitiveness of the machine-building enterprises on the external and internal markets.

Key words: innovative products, indices of volumes of production engineering, indexes of competitiveness of production engineering, competitive advantages, innovation activity.

JEL Classification: B49, C10, G31

1. Introduction

Strategy for economic and social development of Ukraine provides that the priority of State policy at the present stage is a structural realignment of the industry, the transition to innovation model of economic growth. The existing scientific and technical potential of the machine-building industry appears in the structure of industrial production and export, which so far is dominated by products with a low level of processing. Therefore, the task of ensuring maximum competitiveness and efficiency of the national economy was in the rank of a national priority: developed a long-term program of strategic development of «Ukraine-2020». (Decree of the President of Ukraine about Ukraine's sustainable development Strategy-2020 from January 12, 2015 5/2015). Base to improve

competitiveness and increase the export potential of the country must become an innovative technical and technological renewal of production, implementation of energy-saving and innovative models of economic development, increasing the release of technological science intensive production.

2. Research analysis and problem statement

Research on factors that influence the formation of the competitiveness of machine-building enterprises, their list and analyse the content of authors such as N. Bahvalova, N. Vivčarin, A. Getman, N. Horbal, I. Dolzhansky, T. Zagorna and Kramarenko, O. Kuzmin, M. Maslov, M. Raděva, I. Sabadir'ova, D. Červan'ov, V. Shapoval. However, in the study of the problem of not

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enough attention paid to exactly the value of innovative products of machine-building enterprises, which today is one of the main factors to strengthen their own positions among competitors and the possibility of entering the world market.

In such circumstances, there is a need to systematize their approaches to determining the impact of innovation on the level of competitiveness of the machine-building enterprises on the external and internal markets.

3. Research results

The development of the innovation sphere makes machine-building enterprises to intensify innovation activity, above all for the development and maintenance of its competitive advantage and ensure success.

Innovative products vary according to the degree of novelty. To assess the effectiveness of innovations in the Ukrainian statistics to identify two levels: new to the market and new products for the company. In 2015 industrial enterprises have implemented 3136 innovative types of products, of which 548 – new exclusively for market, 2588 – new only for the enterprise. Out of the total number of embedded products 966 – new types of machines, equipment, devices, machines, etc.

The largest company, it affected the metallurgical production (56,3%), manufacture of basic pharmaceutical products and pharmaceutical preparations (11,5%), food products (8,3%), machinery and equipment, not classified under other equipment (5,4%).

The effectiveness of innovation spending in 2015 amounted to 1.7 UAH/USD, that is 1 UAH innovation expenditure accounted for 1,7 UAH sales of innovative

products. In 2014 the corresponding rate was 3.3 UAH/USD, this shows that the rates of growth of volumes of realization of innovative products in comparison with the growth of innovative expenses, which were carried out mainly for the purchase of machinery, equipment and software and the acquisition of other external knowledge services (Fig. 1).

In 2015 for enterprise innovation were spent 13,8 billion UAH, including for the purchase of machinery, equipment and software – 11,1 billion UAH, for internal and external research and development – 2,0 billion UAH, acquisition of other external knowledge (acquiring new technologies) – 0,1 billion USD and 0,6 billion UAH – for education and training of personnel for the development and adoption of new or significantly improved products and processes, the activity on the market introduction of innovations and other works associated with the creation and implementation of innovations (other expenses). The main source of financing of innovative expenses remain the own funds of enterprises – 13427,0 million UAH (or 97,2% of total expenditure on innovation).

The funds of the State budget received 11 enterprises, and local budgets – 15, the total volume of which amounted to 589,8 million UAH (0.7%); the money of domestic investors received 9 enterprises, foreign – 6, in General, their volume totalled 132,9 million UAH (1,9%); the loans availed itself of 11 enterprises, the amount of which was 113,7 mln. (0.8%).

With the aim of improving and accelerating industrial processes in the Ukrainian industrial enterprises within the 2015 created and implemented the latest technology: 181 Enterprise acquired 1131 new technology, of

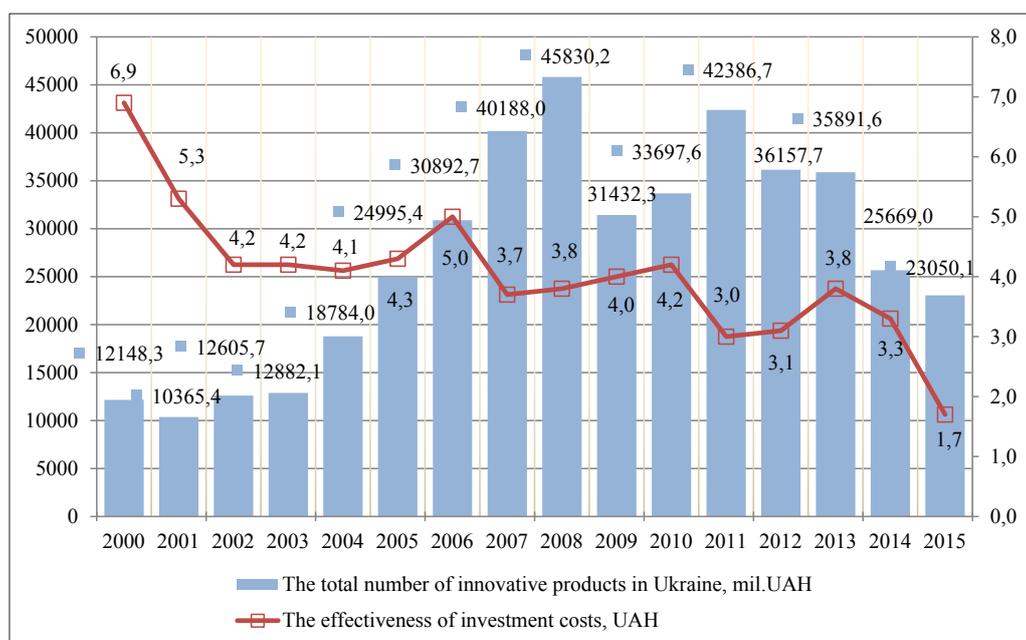


Fig. 1. Dynamics of the volume of sales of innovative products and the efficiency of innovative expenses

Source: Developed by the author on the basis (Statistic information)

which 66 – outside Ukraine. Out of the total number of technologies purchased 439 by setting out of which 43 – outside Ukraine; 393 – as a result of research and development (12); 120 – contracts on acquisition of patents, licenses the use of inventions, industrial designs, utility models (8); 37-agreements on the acquisition of technology and know-how (3); 129 – together with the purposeful taking on the work of skilled professionals (Pisarenko, 2015).

Innovation is a factor of creating competitive advantage. In modern conditions in the world markets are changing competitive conditions that result in a dynamically changing competitive advantage. In the creation of innovative products, including high-tech equipment and the latest technology, occupies an important place the machine-building industry.

The enterprises of the machine-building complex of Ukraine ensure the modernization of farms, meet consumer demand of the population for AIDS and appliances, household, and is the basis of economic and defensive potential of the country. Analysis of the level of development of mechanical engineering in Ukraine

showed that for 2011-2015 is observed a gradual slowdown of the industry, as evidenced by the index of volume of production engineering (Gladka, 2016) (Table 1) and the volume of sales of machine-building enterprises of Ukraine (Fig. 2).

The dynamics of the above-mentioned indicators showing a decrease in the index of volume of production engineering for 2011-2014 from 115,4% to 79,4%. But in 2015 observed growth indicator up 85,9% relative to previous years, despite the reduction in turnover.

The commodity structure of exports of machinery products, indicates that in the structure of exports machinery industry dominated by specific quantity of metal machines and mechanisms, electrical equipment, which is about 57%, of which 30% falls on the boilers, machines, vehicles and mechanical devices, 27% for electrical machines and equipment. The second place is occupied by vehicles, which share is 41%, of which 32% – rail tramway locomotives and road-building equipment, 5% – ground vehicles, except railway, 1% – floating marine and river transportation, 3% of aeronautical and space vehicles.

On the structure of Ukrainian imports machinery, the largest share of the take up boilers, machines, vehicles and mechanical devices 63,8%, of which the electrical machinery accounted for 28%, boilers and mechanical devices – 36%. The second place is occupied by vehicles, the share of which is 31.2 USD%, in structure of which 27%-means of ground transport. In General, recent years up to half of imported supplies the on-equipment, vehicles and other equipment. Calculated ratios of structural shifts show you if changes in the commodity structure of exports as ($K_{str_exp} = 0,10$) and import

Table 1

Indexes the volume of product engineering for 2011-2015 years

Years	The volume Indexes of production engineering (in % to the previous year)
2011	115,4
2012	96,7
2013	86,4
2014	79,4
2015	85,9

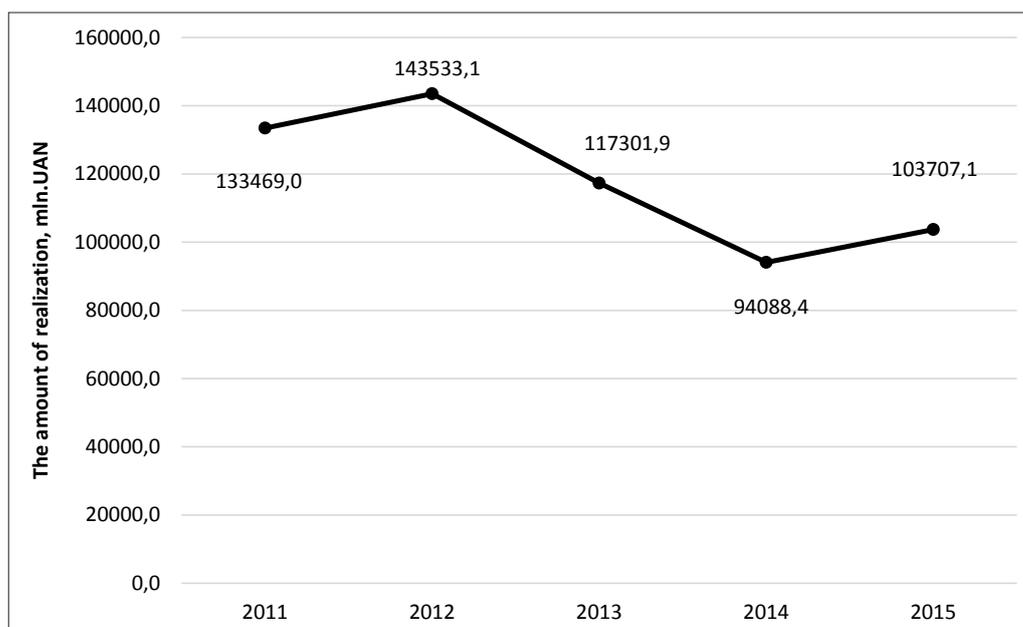


Fig. 2. Dynamics of volume of sales machine-building enterprises of Ukraine for 2011-2015

Source: Developed by the author on the basis (Statistic information)

($Kstr_{mp} = 0,05$) products machinery over the past ten years.

Changes primarily related to the significant increase in the volume of exports of railway locomotives and electric machinery and increasing imports of means of transport. The low competitiveness of the machine-building complex of Ukraine specifies the geographical structure of exports. Despite the fact that the Ukrainian machine-building products are exported to more than 60 countries, mainly is competitive only in the markets of the CIS, including Russia, Belarus, Kazakhstan. The export is carried out mainly for such commodity groups as boilers, machines and equipment, electrical machinery and equipment, railway and tramway locomotives, road-building equipment with respect to the geographical structure of import, the main exporters of the product engineering to the Ukraine is a country of the European Union that supply, above all high-tech products with a high degree of added value (Balabanova, 2013).

As regards the domestic engineering, which had always been oriented for export, in recent years the export decrease of the Ukrainian machine-building products with 5670416,3 thousand USD in 2010 to 3940855,8 ths. USD in 2015. The level of competitiveness of domestic products of machine-building industry characterizes the indexes of competitiveness in the external market, namely: is index of relative comparative advantages of RCA (Relative Comparative Advantage Index), an index of relative export competitiveness RXA (Relative Export Advantage Index), an index of relative dependence on import of RMP (Relative Import Penetration Index), an index of relative trade advantage RTA (Relative Trade Advantage Index).

The dynamics of these indicators is presented in Table 2. The most accurate indicators that reflect the competitive advantages of national machine-building complex on the external market is the index of relative trade advantage (RTA) and the index of relative comparative advantage (RCA), a negative value which during the 2011-2015 years attests to their lack of (advantages). Also the low competitiveness of the industry confirms the index of relative export competitiveness (RXA), which during the 2010-2015 is within the interval $[0;1]$, indicating the lack of a competitive industry in foreign markets.

The index of relative dependence on import (RMP) during the period does not exceed the unit and is accepted. The competitive advantages of foreign production machinery can be explained by the presence of a huge experience in the creation of machines and units and the use of modern technologies that reduce production time and reduce costs, improve quality and allow you to implement projects on a turnkey basis. As well, the advantage of foreign machine builders over the Ukrainian is the possibility of execution of orders in credit with deferred payment, that is almost impossible

to implement in the current context of development of the Ukrainian economy.

Table 2

Dynamics of indexes of competitiveness of production engineering of Ukraine in the external market

Indexes of competitiveness	2011	2012	2013	2014	2015
Index RXA	0,532	0,592	0,503	0,501	0,521
Index RCA	-1,231	-1,359	-1,420	-1,530	-1,232
Index RMP	0,709	0,771	0,721	0,711	0,701
Index RTA	-0,177	-0,179	-0,219	-0,262	-0,192

The main reasons for the low level of competitiveness of Ukrainian machine-building workers are the following:

- slow pace of scientific and technical progress;
- the lack of material resources for the expansion of the product range, improving its quality;
- update of fixed assets in enterprises and the introduction of new technologies;
- significant tangible costs anticipated in the development of industries and the related necessity according to Ukrainian standards, legislative and regulatory framework to the requirements of the European standards, norms and rules;
- practical and material is not the willingness of many of the subjects of the technical re-equipment of enterprises, introduction of modern technologies and equipment, modern quality management systems and product certification;
- environmental problems, which include: the absence of the conditions and the interest of the producers to the problems of the environment and production of clean foods;
- insufficient level of continuous training of specialists with quality, including executives.

These features have a very low level of competitiveness of domestic enterprises in the machinery industry, which needs an immediate solution for the effective functioning of enterprises and the economy as a whole (Gladka, 2016).

According to the research, the number of machine-building enterprises engaged in innovation activity, constantly shrinks; the share of innovative products in the total is only 3,5-4%; the volume of imports of high-tech products exceeding the size of own production; naukoemnosti level of industrial production – 0,3%.

This imperfection of innovation policy in machinery slows down the process of creating competitive products and as a result, the failure to provide highly own products to other industries, take a niche world of mechanical engineering. To improve the situation, we need great tools, most of which are at the expense of investments.

Today the technical base of the machinery of the country is characterized by negative trends. Note too large a percentage of the fixed assets: in General, in the field of over 63% in manufacture of machinery and equipment – 60,8%, electric, electronic and optical equipment – 52,7%, manufacture of vehicles and equipment is another 14,6%. One of the ways to overcome negative tendencies of technological lag machine-building enterprises – increased funding for the purchase of new machinery, equipment and software, as well as conducting and stimulating research.

Currently, the proportion of funds directed at technological updates, approximately 70% of the total funds, and on scientific research and development research works is only 10%. (Scientific and innovative activity in Ukraine, 2014. Stat., Bo.).

4. Conclusions

In our country there are directions to overcome adverse conditions regarding the competitiveness of machine-building enterprises: the need for policy to support competitive enterprises and decisive relief from enterprises – of bankrupt enterprises; support of

new competitive advantages of enterprises, which aim is the creation of high-tech products with innovation; strict conducting the Antimonopoly Policy. This requires the development of a modern competitive environment, the current financial and banking system, the implementation of a real government support and establishment of innovative-investment processes.

Systematization of the above approaches, found that the active development of any industry, but especially such technologically system as engineering, largely depends on the susceptibility of its businesses to innovation: a consequence of the implementation of innovation activities is its significant influence on the results of the operation of enterprises in the direction of expanding the range of products, maintaining and expanding traditional markets and capture new in Ukraine and abroad, keeping up-to-date domestic and international rules and standards of production, increase flexibility and improve working conditions, increase production capacity and efficiency of existing, reduce pollution, reduce energy costs, replacement of the removed from the production of outdated products, reducing material costs.

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Оксана ЗБИРАННИК

ФОРМИРОВАНИЕ УРОВНЯ КОНКУРЕНТОСПОСОБНОСТИ ПРЕДПРИЯТИЙ МАШИНОСТРОИТЕЛЬНОГО КОМПЛЕКСА УКРАИНЫ

Аннотация. *Целью работы* является анализ существующих подходов к определению значения производства инновационной продукции и внедрение инноваций на предприятиях машиностроительного комплекса Украины с целью повышения их уровня конкурентоспособности. *Методика.* Статистический анализ и обобщение научных подходов к формированию уровня конкурентоспособности машиностроительных предприятий. *Результаты.* Проанализированы подходы позволили выявить причину несовершенства инновационной политики в машиностроении. По результатам исследований количество машиностроительных предприятий, занимающихся инновационной деятельностью, постоянно уменьшается; доля реализованной инновационной продукции в общем объеме составляет лишь 3,5-4%, а объем импорта высокотехнологичной продукции значительно превышает размеры собственного производства; уровень наукоемкости промышленного производства всего 0,3%. Все это тормозит процесс создания конкурентоспособной продукции и как следствие – неспособность обеспечить другие отрасли экономики высокоэффективной собственной продукцией, занять определенную нишу мирового машиностроения. *Практическое значение.* Обеспечение ускоренного экономического роста страны как определяющее условие реализации евроинтеграционных стремлений Украины в краткосрочной перспективе требует интенсификации инновационной активности машиностроительных предприятий. Современное состояние инновационной активности предприятий в Украине характеризуется рядом негативных факторов: внутренняя среда большинства

машиностроительных предприятий не соответствует рыночным условиям: высокая энергоемкость производства, рост степени износа основных средств и уменьшение инвестиций в их обновление, недостаточное внедрение прогрессивных производственных и ресурсосберегающих технологий, снижение инновационной активности из-за нехватки финансовых средств существенно сказываются на уровне конкурентоспособности машиностроительных предприятий. *Значение/оригинальность* систематизированы подходы к определению влияния инноваций на уровень конкурентоспособности машиностроительных предприятий на внешних и внутренних рынках.