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## ANALYSIS OF DIVERSIFICATION ON MACHINE-BUILDING ENTERPRISES: INNOVATIVE APPROACH

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**Abstract.** The concepts "diversification" and "innovative activity" are considered in the article. The development of diversification of machine-building enterprises of Lviv Region is investigated through the analysis of their innovation activities. The following indicators of innovative activities of Lviv Region enterprises are analyzed: the number of companies that have implemented new technological processes and developed the innovative types of products; number of implemented technological processes in machine-building enterprises; the output of realized innovative products of machine-building enterprises.

**Key words:** diversification, innovative approach, innovative activities, the output of realized innovative products.

**Introduction.** The significant task of the domestic economy of Ukraine is to provide the possibilities for economic development of industries and machine-building in particular. The machine-building complex provides the production of various machines, apparatus, devices, equipment, vehicles etc., that contributes to the effective development of other industrial branches. The provision of the development of the machine-building sector in a current period and in a future is possible in case the innovative activities at business entities are activated (promoted).

The research theme is actual as in a free market economy enterprises carry out their activities in an environment that is characterized by the high level of competition. As a consequence the enterprises should adjust their activities to the permanent changes.

In order to carry out the innovative activities on the enterprises effectively it is necessary to utilize the natural, labor and financial resources rationally and also to consider the positive and negative impact of such factors as: social,

economic, legislative, scientific, technical and political ones, etc. Besides it should be noted that one of the factors that motivates enterprises to develop and introduce the innovations actively is the diversification. Due to the diversification the enterprises are developing. The development, modernization and the introduction of new types of commodities and technological processes are the results of such businesses' development.

### Analysis of the literature on the problem.

Among the scientists who investigated the innovative activities of the enterprises are such scholars as: B.Dadashev, O. Kantajeva, L. Antonyuk, Yu. Bazhala, P. Bubenko, O.Vasylenko, V. Me'l'nychenko, T.Dudar, V. Landyka, L. Fedulova, M. Denysenko, R. Fatkhudinov, I. Rudakov, P. Zavlin etc. In addition, a great number of the scientific papers are dedicated to the investigation of the diversification as means of the development of innovative activities, namely: O. Tsogla, O. Kuzmin, V. Trubchanin, K. Bilets'ka, G. Perekhod'ko, M. Korin'ko.

T.Dudar and V.Mel'nychenko treat innovative activities as the activities related to the implementation of the results of the scientific researches, production of new goods and services [1]. The scientists distinguish such basic types of innovative activities on industrial enterprises as: the development and the introduction of a new or an improved commodity, technology, organizationally-technical decisions and mastering of the process related to the production [2].

In the opinion of M. Korin'ko the diversification is "an innovative process of the versatile development of businesses by means of the resources redistribution, penetration into the other production branches and joining the markets of new commodities

and services with the purpose to decline risk and increase profit" [3, p. 13]. On the basis of this determination the diversification, first of all, is considered to be an innovative process that provides for the development of new types of products, inducing enterprises to introduce the innovations (machines, equipment, vehicles, devices and other).

Tsogla O. offers such determination of diversification – “it is an industrial and economic process that due to the mastering of new commodity markets, expansion of the nomenclature of goods and services, distribution of investments between the different of business participants, gives an opportunity to overcome the dependence on one type of activity or products, enables the reduction of enterprise’s risk and provides the adaptation of enterprise to the dynamic changes of the environment, and in prospect competitiveness and financial stability” [4, p. 432]. As a result of such interpretation of the concept it is possible to define the basic directions of diversification: production, sale and investments.

During the realization of diversification on enterprises there are changes in innovative processes, namely: improvement and development of technique, technology, instruments, equipment etc. [4]. A company can diversify its activities both in related and unrelated completely new industries, that will activate innovative activity [5].

**The purpose of the paper.** The main purpose of the article is to investigate the development of diversification on the machine-building enterprises of Lviv Region on the basis of the analysis of their innovative activities.

**The presentation of the main research material.** Having worked out a lot of scientific literature we will analyze the diversification on machine-building enterprises considering innovative approach. Hence, on the basis of statistical data we will analyze the diversity of innovative activity on machine-building enterprises of Lviv Region for the period of 2009–2012. The introduction of new types of products and up-to-date technological processes could be related to as spheres of diversification if we consider the innovative activities of the enterprise.

Fig. 1 illustrates the amount of machine-building enterprises of Lviv Region which were introducing new technological processes and

mastering innovative types of products during 2009–2012.

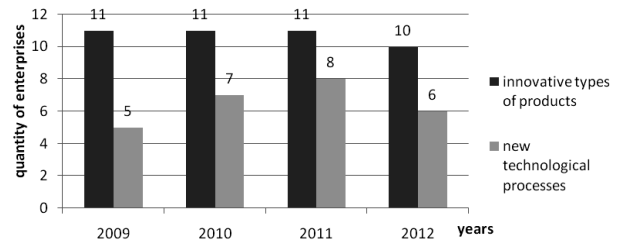


Fig. 1. The amount of machine-building enterprises of Lviv Region which were introducing new technological processes and mastering innovative types of products during 2009-2012 [6]

According to the statistical information the quantity of the enterprises which were introducing the technological processes during 2009–2012 was increased, but in 2012 their number was reduced to 6. Concerning the mastering of innovative types of products we should mark a stable tendency during 2009-2011 and the reduction of the amount of enterprises (mines 1enterprise) in 2012.

The innovative types of product include mastering of:

- machines, devices, vehicles, equipment;
- materials, goods, products.

As a consequence, it is possible to distinguish such kinds of diversification of innovative types of products as: productive (materials, goods, products) and technical (machines, devices, vehicles, equipment). In statistical annual catalogue the development of machine-building complex is represented by three basic constituents [6]:

- production of machines and equipment;
- production of electric, optical and electronic equipment;
- production of transport vehicles and equipment.

The production of machines and equipment includes the production of agricultural machines, machine-tools, appliances, general-purpose vehicle, machines for metallurgical, mining and building industry; and machines intended for processing of products of agricultural industry. The production of electric, optical and electronic equipment presupposes the manufacturing of office, accounting, electronic machines and apparatus, equipment for radio, television connection, medical devices and instruments, exact measuring and optical devices, clocks. The production of transport vehicles and

equipment includes the manufacturing of vehicles, railway, tramcar locomotives, rolling stock, bicycles, motor cycles, the construction of air, space, aircrafts and ships [7, p. 76].

The dynamics of mastering of innovative types of products by enterprises during 2009–2012 in accordance with the constituents of machine-building complex is illustrated in Table 1.

First we will analyze how enterprises are mastering machines, equipment, vehicles and devices (Table 1). Mastering of production of technical innovations (machines, equipment, vehicles, devices) comparatively with 2011 has slightly changed, in particular, there was a reduction by 48,2%. It is related to the decrease in output of machines, equipment, devices, vehicles in the field of an electric, electronic and optical equipment by 78,9%, and also in the field of machine-production and equipment by 66,7%. However in 2012 a situation

got better. It was confirmed by the increase in mastering of production of technical innovations by 20%.

The next step is to analyze the dynamics of mastering of product innovations (materials, products, goods) by enterprises of machine-building industry. A positive tendency is characteristic feature of a period 2009–2011. It was caused by the considerable increase of production of product innovations in the field of electric, electronic and optical equipment. However, rapid reduction in mastering of production of product innovations on the enterprises of machine-building complex in 2012 may be explained by complete absence of realization of innovative activity in the field of vehicles and equipment, and also by reduction of innovative activity of enterprise sectors by 41,2% in the field of electric, electronic, optical equipment and by 50% in the field of machines-building and equipment.

*Table 1*

**Mastering of innovative types of products by the enterprises of Lviv Region during 2009–2012 [6]**

Machine-building industries	Indexes, number			
	2009	2010	2011	2012
Machines, devices, vehicles, equipment				
Production: machines and equipment	4	3	1	5
electric, electronic and optical equipment	17	19	4	10
vehicles and equipment	3	7	10	3
Machine-building in general	24	29	15	18
Materials, products, goods				
Production: machines and equipment	4	3	4	2
electric, electronic and optical equipment	-	4	17	10
vehicles and equipment	3	7	-	-
Machine-building in general	7	14	21	12

*Table 2*

**Introduction of new technological processes on the machine-building enterprises of Lviv Region during 2009–2012 [6]**

Machine-building industries	Indexes, number				Absolute deviation, number		
	2009	2010	2011	2012	2010	2011	2012
Production: machines and equipment	4	3	1	3	-1	-2	2
electric, electronic and optical equipment	1	4	7	3	3	3	-4
vehicles and equipment	3	3	1	-	0	-2	-
Machine-building in general	8	10	9	6	2	-1	-3

**Quantity of innovative output of machine-building enterprises  
of Lviv Region during 2009–2012 [6]**

Machine-building industries	Indexes, thousands hryvnias				Average rate of increase, %
	2009	2010	2011	2012	
Innovative for markets					
Production: machines and equipment	1422,1	1223,0	1725,0	1631,0	14,7
electric, electronic and optical equipment	809,2	10117,0	15602,4	4496,3	455,6
vehicles and equipment	173662,2	4111,1	17524,0	5114,8	-97,1
Machine-building in general	175893,5	15451,1	34851,4	11242,1	-93,6
Innovative for enterprises					
Production: machines and equipment	5071,5	8081,6	6966,9	6114,3	20,6
electric, electronic and optical equipment	21043,0	37229,9	1345,7	930,6	-95,6
vehicles and equipment	19371,9	105671,9	7895,5	2965,7	-84,7
Machine-building in general	45486,4	150983,4	16208,1	10010,6	-78,0

Statistical data determining the amount of the introduced technological processes by the enterprise structures of machine-building complex during 2009–2012 are given in Table 2.

As it is illustrated, the quantity of introduced technological processes increased by 25% during 2009–2010. However, in 2012 comparatively with 2010 the amount of implemented technological processes decreased by 40%. The maximum amount of technological processes was introduced by enterprises which are engaged in the production of electric, electronic and optical equipment.

Table 3 presents the quantity of innovative output of machine-building enterprises of Lviv Region during 2009–2012.

Innovative products can be worked out for the first time both for an enterprise and for a market. As a result, the data concerning the development of innovative products which are new for a market is estimated. Taking into account the indicated information, in 2012 by comparison to 2009 there is implicit reduction of quantity of realization of innovative products by 93,6 %. It can be explained by the fact that the machines-building and equipment production enterprises realized their innovative products only for 208,9 thousand hryvnias more, enterprises which specialize in

production of electric, electronic and optical equipment - for 3687,1 thousand hryvnias more, however the organizations specialized in the production of transport vehicles and equipment rapidly decreased realization of innovative products for 168547,4 thousand hryvnias.

Now we will analyze the dynamics of realization of innovative products, which are new for an enterprise. Machine-building enterprises most realized innovative products in 2010, that was for 150983,4 thousand hrn. However in 2012 there may be noticed the reduction of products realization for 140972,8 thousand hrn. Such reduction of quantity of realization of innovative products can be explained by the fact that enterprises specialized in the production of machines and equipment realized innovative products for 1967,3 thousand hrn. less, enterprises specialized in the production of electric, electronic and optical equipment for 36299,3 thousand hrn. less, moreover the organizations specialized in the production of transport vehicles and equipment sharply decreased the realization of their innovative products for 102706,2 thousand hrn.

**Conclusions.** On the basis of research of innovative activities of machine-building enterprises of Lviv Region we may draw the

conclusion that diversification measures can be analyzed on the basis of the amount of introduction of technological processes, mastering of productive and technical innovations and production of goods, that can be new for a market or enterprise. It is advisable to emphasize that due to the introduction of diversification as motivation for the development of innovative activities of organizations the increase of their competitiveness in internal and foreign markets can be observed. It induces enterprises to join an international market, to increase their profit and to ensure the scientific and technical development of our country.

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