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**IMPROVING COMPETITIVE POSITIONS BY OPTIMIZING  
INTERNAL ACTIVITY INDICATORS  
УЛУЧШЕНИЕ КОНКУРЕНТНЫХ ПОЗИЦИЙ ПУТЕМ  
ОПТИМИЗАЦИИ ВНУТРЕННИХ ПОКАЗАТЕЛЕЙ  
ДЕЯТЕЛЬНОСТИ**

***Summary.** Despite the fact that competitiveness is a market function, competitive advantages are formed in accordance with the internal indicators of business activity. Since the metallurgical industry of Ukraine provides a sufficient share of the gross domestic product of the economy, the development of these enterprises, their position in the domestic and foreign markets have always been and will remain the subject of interest in economic science. To determine the competitive position of enterprises in the metallurgical industry, a comparative characteristic of individual enterprises and the industry leader of PJSC ArcelorMittal Kryvyi Rih is presented. It has been shown that with a decrease in unit costs, an increase in labor productivity in recent years, the profitability of enterprises needs to be optimized, since the economic situation in the country and the world is rapidly deteriorating. Personnel can provide opportunities to improve the competitive advantages of the enterprise by initiating measures to improve the use of available resources. The provision of the enterprise with necessary labor resources, their rational use, and high level of labor productivity contribute to an increase in production volumes, efficient use of production*

*capacity, cost reduction and profit growth - that is, all the main indicators of the competitive advantages of an industrial enterprise. Based on the study, it was found that the level of wage growth is higher than the level of decrease in the number of employees of enterprises, while the increase in the level of wages fully corresponds to an increase in labor productivity. At the same time, an increase in the efficiency of personnel use is due to a greater extent to a decrease in its number mainly due to outsourcing and less to an increase in the cost of commercial products. This may indicate a decrease in the development indicators of the subject of activity, since in the future a similar trend may lead to the loss of highly qualified personnel and worsening activity indicators. Therefore, it is recommended that measures to increase profits from sales by improving the quality, assortment, market, use of existing facilities and cost optimization.*

**Key words:** *competitive positions, metallurgical industry, unit costs, marketable products, personnel efficiency*

**Аннотация.** При том, что конкурентоспособность рыночная функция, конкурентные преимущества формируются в соответствии с внутренними показателями деятельности субъектов хозяйствования. Так как металлургическая отрасль Украины обеспечивает достаточную часть валового продукта экономики, развитие этих предприятий, их позиция на внутреннем и внешнем рынках всегда были и остаются предметом интереса экономической науки. Для определения конкурентных позиций предприятий металлургической отрасли представлена сравнительная характеристика отдельных предприятий и лидера отрасли ЧАТ «АрселорМиттал Кривой Рог». Показано, что при уменьшении удельных затрат, увеличении производительности труда за последнее время прибыльность предприятий нуждается в оптимизации, так как экономическая ситуация в стране и мире стремительно ухудшается. Обеспечить возможности улучшения конкурентных преимуществ

*предприятия может персонал через инициирование мероприятий по улучшению использованию ресурсов. Обеспеченность предприятия необходимыми трудовыми ресурсами, их рациональное использование, высокий уровень производительности труда способствуют увеличению объёмов производства продукции, эффективному использованию производственной мощности, снижению себестоимости и увеличению прибыли – то есть всех основных показателей конкурентных преимуществ промышленного предприятия. На базе проведенного исследования выявлено, что уровень возрастание заработной платы выше чем уровень уменьшения численности персонала предприятий, при этом рост уровня заработной платы полностью соответствует возрастанию производительности труда. При этом рост эффективности использования персонала обусловлен в большей мере снижением его численности в основном за счет аутсорсинга и меньше всего увеличением стоимости товарной продукции. Это может свидетельствовать о снижении показателей развития субъекта деятельности, так как в будущем подобная тенденция может привести к потере высококвалифицированных кадров и ухудшению показателей эффективности деятельности предприятия. Поэтому рекомендованы мероприятия по увеличению прибыли от реализованной продукции за счет улучшения качества, ассортимента, рынка сбыта. Также необходимо отметить, что с резервов повышения уровня конкурентных преимуществ важное место занимает объём товарной продукции в денежном выражении. В свою очередь из этого следует необходимость оптимизации себестоимости произведенной продукции. Снижение себестоимости произведенной продукции без потерь качества продукции возможно за счет оптимизации постоянных затрат.*

**Ключевые слова:** конкурентные позиции, металлургическая отрасль, удельные затраты, товарная продукция, эффективность персонала

**Statement of the problem.** One of the strategic conditions for ensuring the effective functioning of a business entity is its competitiveness through the implementation of competitive advantages. The competitiveness of the enterprise is mainly considered as a market function, including sales volumes (or the company's share in total sales), price and quality. At the same time, in conditions of overproduction, less attention is paid to the need to increase production volumes and the main attention is paid to the possibilities of increasing profitability through improving the quality and optimizing the selling price of the product of activity. Since ensuring the improvement of product quality is often associated with the need for additional investments, which are not always available to enterprises, the main factor in the formation of a competitive price is the company costs.

**Analysis of recent research and publications.** Significant contribution to the understanding of the essence of competition and competitive advantages, theory and mechanisms of implementation of competitive strategies in modern conditions, the place of production of Ukrainian corporations in international markets have been made by foreign and Ukrainian scientists: Porter M., Antoniuk L.L., Bagrova I.Z., Gaiduk V.A., Danilova E.I., Voichak A.V. [2], Dolzhanskyi I.Z., Zagorna T.O., Lagutin V. [3], Varnalii Z.S. [4], Dovbush R.A., Zozulia A. L., Otenko I.P., Kuzmin A.E. and others.

At the same time, the peculiarities of markets, conditions of enterprise functioning, types of their products creates the need to find new ways of ensuring improvement of competitive positions.

**The purpose of the article** is to investigate the possibility of optimizing the costs of a metallurgical enterprise by regulating their non-productive part in order to improve competitive advantages.

**The main material.** Understanding the essence of economic competition mainly consists in competition between business entities in order to obtain, thanks to their own achievements, advantages over other entities, as a result of which

consumers have the opportunity to choose between several sellers [1]. At the same time, a competitive advantage is an advantage that provides income that exceeds the industry average level and helps to gain strong market positions, which could be the key to the successful existence and development of a company [2].

According to most researchers, the competitive advantage is achieved through the competitive potential of the entities. And in order for the company to be confident in the successful activity in the market, it is necessary to form competitive advantages.

Up to date, business structures in Ukraine function in a difficult economic situation. Crises in the economy affect the development of almost all enterprises. Deterioration of technical and technological state of production, crisis of payments, passive investment activity, loss of traditional markets all lead to idle capacity, which negatively affects the development of competition in the country [3; 4].

It is clear that only competitive enterprises can function effectively in market conditions. The common indicators characterizing the level of preferences of metallurgical enterprises can be the results of their economic activity (Table 1).

*Table 1*

**Key performance indicators of metallurgical enterprises**

Enterprise	2014	2015	2016	2017	2018	Deviation, %	
						2018/2017	2018/2014
Cost of commodity products, thousand UAH.							
ArcelorMittal Kryvyi Rih	36143842	41695670	50746030	60837002	63993043	+5,2	+77,1
Zaporizhstal	20470607	21136000	30280015	31395478	54018342	+72,1	+163,9
Dniprospecstal	3879258	6855586	6292096	8186385	9634666	+17,7	+148,4
Evraz-DMP of Petrovskogo	5174932	6158689	6749039	9448727	10499600	+11,1	+102,9
Dniprovskiy MC of Dzerzhynskogo	13808617	16272694	14527481	14584900	62464803	+328,3	+352,4
Cost of sales, thousand UAH.							
ArcelorMittal Kryvyi Rih	33908591	45141096	47924608	56562119	54675902	-3,3	+61,2
Zaporizhstal	16402862	23741477	23724243	38309499	49414580	+29,0	+201,3
Dniprospecstal	4077658	5642052	5543947	7151107	9111430	+27,4	+123,5
Evraz-DMP of Petrovskogo	5440674	7192077	9850690	14846405	10927343	-26,4	+100,8



Dniprovskiy MC of Dzerzhynskogo	13171601	14948958	13192677	16247711	31748171	+95,4	+141,0
Net profit, thousand UAH.							
ArcelorMittal Kryvyi Rih	-1180487	1384750	2704116	5061847	9509163	+87,9	+1005,5
Zaporizhstal	1120611	2088900	4690082	3348549	4719209	+40,9	+321,1
Dniprospecstal	-880640	-706563	-403651	53676	-428449	-998,2	-51,3
Evraz-DMP of Petrovskogo	-2626462	-1091965	-322753	2381687	2946457	+23,4	+7165,5
Dniprovskiy MC of Dzerzhynskogo	-1868359	-1389476	-2717065	-13220929	-28795591	-117,8	-1441,2

Source: formed by the authors based on [5]

The estimation of absolute indicators of activity of metallurgical enterprises shows that the industry has been ambiguous for the last five years. Particularly negative was noted at the Dniprovskiy MC of Dzerzhynskogo (Kamianskoe) where all analyzed years were unprofitable for the enterprise, which is confirmed by the level of cost increase for five years (+141%), which is the largest among the considered enterprises with the highest level of production value increase. (+352.4%).

For comparison of competitive advantages, the relative indicators of activity of the enterprise are better. One of the main ones can be considered the amount of expenses for 1 UAH of commodity products (Fig. 1).

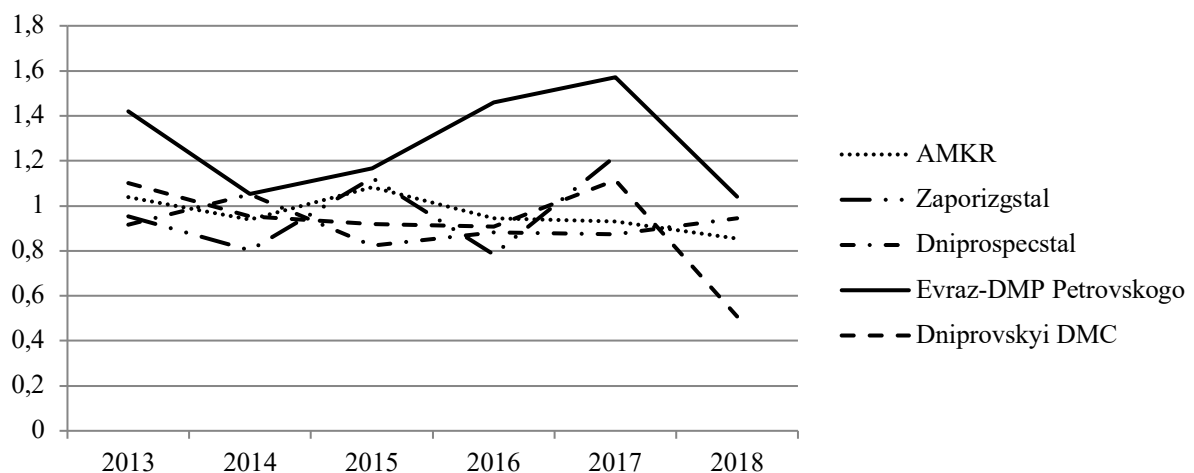


Fig. 1. Dynamics of expenses for 1 UAH value of commodity products, UAH/UAH

According to Fig. 1 it is shown that the largest amount of expenses for 1 UAH of commodity products for the analyzed period was at Evraz-DMP

Petrovskogo in 2017 - 1.5713 UAH/UAH, and the lowest in 2016 this indicator was at Zaporizhstal - 0.7835 UAH/UAH. In 2018, the situation with the change in the unit cost has improved for ArcelorMittal Kryviy Rih, Evraz-DMP Petrovsky and Dneprovsky MC Dzerzhinskogo, but still businesses need to constantly look for opportunities to optimize costs and improve competitive cost advantages.

Management of metallurgical enterprises determines the greatest value of the enterprise its personnel. Because it is the staff that can provide the enterprise with an opportunity to improve the use of resources by initiating measures to improve the competitive advantage of the enterprise. It is possible to make a significant impact on the performance of the plant only when various aspects, such as career development, recruitment and selection, motivation, certification, partnership are combined into a single program.

At the moment of its development, for example, OJSC "ArcelorMittal Kryviy Rih" is moving from the traditional personnel management practice to personnel management through the creation and development of an effective functional strategy, which will be more fully related to the general goal (strategy) of the plant. The creation and development of an effective personnel management strategy is a promising opportunity to attract and develop workers who meet the modern requirements of the enterprise.

The results of economic activity depend primarily on the efficiency of labor use. The provision of the enterprise with the necessary labor resources, their rational use, and a high level of labor productivity contribute to an increase in production volumes, the efficient use of equipment, machinery, mechanisms, cost reduction and profit growth - that is, all the main indicators of the competitive advantages of an industrial enterprise.

Considering in more detail the number of personnel, the payroll fund and the average monthly salary for metallurgical enterprises (Table 2), it can be seen that the highest number of employees on payroll in 2014 and 2018 is observed at



ArcelorMittal Kryviy Rih - 28731 and 20763 persons respectively. The second and third place are occupied respectively by "Zaporizhstal" and DMP named after Dzerzhinsky.

*Table 2*

**Average number of personnel, persons**

Enterprises	Payroll		Deviation	
	2014	2018	Absolute	Relative, %
ArcelorMittal Kryviy Rih	28731	20763	-7968	-27,7
Zaporizhstal	15334	10440	-4894	-31,9
Dniprospecstal	5744	5224	-520	-9,1
Evrax-DMP Petrovskogo	5517	4405	-1112	-20,2
Dniprovskiy MC Dzerzhynskogo	11397	9147	-2250	-19,7

At the same time, it should be noted that of all the compared enterprises, the highest level of staff reduction in five years occurred at Zaporizhstal - 31.9%. The decrease in ArcelorMittal Kryviy Rih in five years was 27.7%, which is only 4.2% lower than in Zaporizhstal. Table 3 presents data on labor productivity and the average monthly wage of workers.

*Table 3*

**Comparative characteristics of labor productivity dynamics  
and levels of remuneration for the period 2014-2018 years**

Enterprises	Changing labor productivity, %	Changes in wages, %
ArcelorMittal Kryviy Rih	+145,0	+106,9
Zaporizhstal	+287,6	+98,7
Dniprospecstal	+174,1	+124,6
Evrax-DMP Petrovskogo	+154,1	+127,5
Dniprovskiy MC Dzerzhynskogo	+31,6	+136,8

Concerning the average monthly wage on the industrial enterprises of the metallurgical industry it is possible to tell that its highest level in 2014 was at Zaporizhstal, and in 2018 at ArcelorMittal Kryviy Rih - 14119 UAH. It should be noted that, in accordance with economic law, the ratio between productivity and

wages, most enterprises have increased wages while increasing productivity, which has a positive effect on the competitive advantages of enterprises. The exception is the Dzerzhinsky DMC, where labor productivity increased by 31.6% and wages by 136.8%.

Thus, the elements of formation of a competitive advantage of the enterprise can be the cost per unit of production and productivity.

To identify the reserves of competitive advantage formation in the enterprise, which is the industry leader - ArcelorMittal Kryviy Rih used factor analysis of labor productivity based on the structure of the personnel of the enterprise. The main purpose was to identify how productivity changes in relation to staff reductions by the following structure: core workers, support and maintenance workers, managers, employees and specialists.

To accomplish the above, we used the integral method of factor analysis and presented an indicator of labor productivity in the form of the following model:

$$F = \frac{X}{Y + Z + G}, \quad (1)$$

where  $F$  – labor productivity, thousand UAH/person;  $X$  – volume of commodity products, thousand UAH.;  $Y$  – the number of main workers, persons;  $Z$  – the number of auxiliary and service workers, persons;  $G$  – the number of managers, employees and specialists, persons.

In the study of the influence of individual factors on the change in the indicator of labor productivity  $\Delta F$  determined:

- the impact of changes in production on the change in labor productivity by the formula:

$$\Delta F_x = \frac{\Delta X}{\Delta Y + \Delta Z + \Delta G} \times \text{Ln} \left| \frac{Y_1 + Z_1 + G_1}{Y_0 + Z_0 + G_0} \right|, \quad (2)$$

where  $\Delta X$  – change in the volume of commodity products, thousand UAH;  $\Delta Y$  – change in number of main workers, persons;  $\Delta Z$  - change in the number of

auxiliary and service workers, persons;  $\Delta G$  – change in the number of managers, employees and specialists, persons.

- the impact of changes in the number of main workers on the change rate of labor productivity by formula:

$$\Delta F_y = \frac{\Delta F - \Delta F_x}{\Delta Y + \Delta Z + \Delta G} \times \Delta Y, \quad (3)$$

- the impact of changes in the number of auxiliary and service workers on the change rate of labor productivity by formula:

$$\Delta F_z = \frac{\Delta F - \Delta F_x}{\Delta Y + \Delta Z + \Delta G} \times \Delta Z; \quad (4)$$

- the impact of changes in the number of managers, officials and experts on the change rate of labor productivity is determined by the formula:

$$\Delta F_G = \frac{\Delta F - \Delta F_x}{\Delta Y + \Delta Z + \Delta G} \times \Delta G. \quad (5)$$

To perform the calculation of the impact of individual components on the productivity of ArcelorMittal Kryvyi Rih for 2017-2018 years, we used the following in Table 4 structure of personnel of the enterprise for the corresponding period.

*Table 4*

**Analysis of personnel ArcelorMittal Kryviy Rih use**

Indicators	2017	2018	Deviation	
			absolute	%
Commodity products, thousand UAH.	60837002	63993043	3156041	5,19
Number of employees, persons including:	23256	20763	-2493	-10,72
Key workers	16146	15429	-717	-4,44
auxiliary and service workers	2812	1497	-1315	-46,76
managers, officials and experts	4297	3836	-461	-10,73
Labor productivity, thousand UAH/person	2615,9	3082,1	466,2	+17,82

Thus, during 2017-2018 ArcelorMittal Kryviy Rih reduces the number of employees by 2493 persons, namely the number of key workers decreases by 717 persons, auxiliary and servicing by 1315 persons and the number of managers,

officials and experts decreases by 461. In relative terms, the largest decrease is observed in auxiliary and service workers - 46.76%.

The results of factor analysis performed using formulas 1-5 are presented in table 5.

*Table 5*

**Results of factor analysis of labor productivity at PJSC "ArcelorMittal Kryviy Rih" for 2017-2018**

Indicator	Calculation	The result of the calculation, thousand UAH/person
$\Delta F$	$\Delta F = \frac{63993043}{15429 + 1497 + 3836} - \frac{60837002}{16146 + 2812 + 4297}$	$\Delta F = +466,2$
$\Delta F_x$	$\Delta F_x = \frac{3156041}{-717 + (-1315) + (-461)} \times Ln \left  \frac{20763}{23256} \right $	$\Delta F_x = 143,321$
$\Delta F_y$	$\Delta F_y = \frac{466,2 - 143,321}{-717 + (-1315) + (-461)} \times (-717)$	$\Delta F_y = 92,862$
$\Delta F_z$	$\Delta F_z = \frac{466,2 - 143,321}{-717 + (-1315) + (-461)} \times (-1315)$	$\Delta F_z = 170,311$
$\Delta F_G$	$\Delta F_G = \frac{466,2 - 143,321}{-717 + (-1315) + (-461)} \times (-461)$	$\Delta F_g = 59,706$
Verification	$143,321 + 92,862 + 170,311 + 59,706$	466,2

When performing factor analysis using an index model, it must be remembered that the latter is a combination of a multiple and additive model. Using this method allows you to get more accurate calculation results of the influence of factors relative to the methods: chain substitutions, absolute and relative differences.

Thus, the growth of the labor productivity index by 466.2 thousand UAH/person at PJSC "ArcelorMittal Kryviy Rih" in 2017-2018 was caused by the decrease in the number of personnel of the enterprise, but not unfortunately the increase in the amount of received income from their activity. This is a negative factor, as it indicates a decrease in the development indicators of the analyzed enterprise. In the future, such a trend may lead to the loss of highly

qualified personnel and deterioration of the performance indicators of the enterprise.

In turn, the decrease in the number of employees of the enterprise is due to the outsourcing policy that operates at the enterprise. This is especially reflected in the support and service units.

When considering the formation of a strategy for ensuring the competitive advantages of PJSC "ArcelorMittal Kryvyi Rih", it is advisable to note that the fact of growth in labor productivity is a positive phenomenon. The higher the labor productivity indicator, the higher the level of competitive advantages.

It should also be noted that an important place of the reserves to increase the level of competitive advantages is the cost of production. In turn, this implies the need to optimize the cost of production.

Reducing the cost of production without loss of product quality is possible by optimizing fixed costs. In our opinion, these include expenses related to the efficient use of personnel - expenses for telephone communications, mailing, trainings, and seminars; for services of third-party organizations for the repair of fixed assets; on transportation of employees to the place of work and back; on insurance of risks associated with the production process.

**Conclusions and prospects for further research.** A comparison of the competitive advantages of enterprises in the metallurgical industry showed that the industry has recently been in a state of crisis. Moreover, one of the main internal indicators of competitive advantages is the cost per 1 UAH of marketable products in almost all enterprises for the period 2014-2018 decreased by an average of 10%. To provide the enterprise with the opportunity to improve the use of resources to optimize production costs by initiating measures to improve the competitive advantage of the enterprise can be its staff and, accordingly, productivity, and the motivation for this is the level of wages. An analysis of the dynamics of these indicators showed that the excess of the intensity of wage growth in comparison with the decrease in the number of personnel of enterprises,

while the increase in the level of wages fully corresponds to the increase in labor productivity. Factor analysis of the productivity of the leader of the metallurgical industry revealed that the increase in the efficiency of personnel use is due to a greater extent to the decrease in the number of staff and the smallest increase in the value of commodity products.

To prevent the loss of competitiveness and improve competitive advantages, we can recommend conducting additional research and developing measures to improve competitive advantages - to improve the quality and range of products (to ensure sales growth and possibly sales prices), to optimize product sales markets, improve capacity utilization, cost reduction and improvement of the personnel motivation system (to optimize operational and fixed costs).

### **References / Литература**

1. On Protection of Economic Competition: Law of Ukraine 2001 document 2210-III, as of 13.02.2020, based on – 440-IX. URL: <https://zakon.rada.gov.ua/laws/show/2210-14>
2. Voichak A.V., Kamyshnikov R.V. Competitive advantages of the enterprise: essence and classification. Marketing in Ukraine. 2015. №2. P. 50-53.
3. Lagutin V. State Competition Policy: Implementation Mechanisms. Journal of KNTEU. 2016. № 4. P. 22-37.
4. Varnalii Z.S. Competition and entrepreneurship: a monograph. K.: Znannia of Ukraine, 2015. 463 p.
5. URL: <https://smida.gov.ua/>