

**ECONOMIC PROBLEMS OF THE FUNCTIONING  
OF METALLURGICAL ENTERPRISES OF UKRAINE****Shmygol N. M., Varlamova I. S., Suleymanov S. S.***Zaporizhzhia National University  
Ukraine, 69600, Zaporizhzhia, Zhukovsky str., 66*

amagov\_0107@gmail.com

**Key words:**

metallurgy, enterprise, problems, prospects, functioning, steel market, competitiveness, modernization.

The article states that the development of the metallurgical industry and the use of existing production capabilities with maximum efficiency are one of the strategic directions of the state's economic policy. It is substantiated that despite a significant number of advantages metallurgical enterprises have a number of economic problems that reduce the level of competitiveness of products and do not allow to enter the international markets. It is proved that metallurgy is the leading industry among other industries in Ukraine and the economy of the country as a whole, which affects the state of economic and social development of the state, since the emergence of complex situations in the operation of metallurgical enterprises is automatically projected onto the balance of the labour market and the standard of living of the population. A comparative analysis has been carried out and the place of Ukraine on the world steel market and the EU market has been determined, which have shown that the national metallurgy shows a decrease in steel production, while in the EU there is an opposite trend, that is, production volumes that are consistent with world-wide laws are increasing. It also confirms the presence of problems in the functioning of metallurgical enterprises in Ukraine, despite the presence of significant natural resource potential. The main problems and obstacles of functioning and future development of metallurgical enterprises have been outlined: the use of outdated technologies; low labour productivity and high material and energy production; increase in the share of products with a low level; high dependence of the metallurgical industry on world prices and on the trends of the world metallurgical production development; low competitiveness of products of national metallurgy enterprises; insufficient quality and non-conformity of products to world standards.

**ЕКОНОМІЧНІ ПРОБЛЕМИ ФУНКЦІОНУВАННЯ  
МЕТАЛУРГІЙНИХ ПІДПРИЄМСТВ УКРАЇНИ****Шмиголь Н.М., Варламова І.С., Сулейманов С. С.***Запорізький національний університет  
Україна, 69600, м. Запоріжжя, вул. Жуковського, 66***Ключові слова:**

металургійна галузь, підприємство, проблеми, перспективи, функціонування, ринок сталі, конкурентоспроможність, модернізація.

Визначено, що розвиток металургійної галузі та використання наявних виробничих можливостей із максимальною ефективністю є одним із стратегічних напрямів економічної політики держави. Обґрунтовано, що незважаючи на значну кількість переваг, металургійні підприємства мають низку економічних проблем, які знижують рівень конкурентоспроможності продукції та не дозволяють виходити на міжнародні ринки. Доведено, що металургія є провідною базовою галуззю серед решти видів промисловості України та економіки країни загалом, яка впливає на стан економічного й соціального розвитку держави, адже виникнення складних ситуацій у функціонуванні металургійних підприємств автоматично проектується на збалансованість ринку праці, рівень життя населення. Здійснено порівняльний аналіз та визначено місце України на світовому ринку сталі та ринку ЄС, який показав, що національна металургія демонструє зменшення виробництва сталі, тоді як в ЄС спостерігається протилежна тенденція, тобто зростають обсяги виробництва, що відповідає загальносвітовим закономірностям. Це також підтверджує наявність економічних проблем у функціонуванні металургійних підприємств в Україні, незважаючи на наявність значного природно-ресурсного потенціалу. Виокремлено основні проблеми та перешкоди функціонування та майбутнього розвитку металургійних підприємств: використання застарілих технологій; низька продуктивність праці та висока матеріало- та енергоємність виробництва; зростання частки продукції з низьким рівнем; висока залежність металургійної галузі від світових цін та від тенденцій розвитку світового металургійного виробництва; низька конкурентоспроможність продукції національних підприємств металургії; недостатня якість та невідповідність продукції світовим стандартам.

### Statement of the problem

The development of the metallurgical industry and the use of existing production capabilities with maximum efficiency are one of the strategic directions of the state's economic policy. The priority is also determined by the fact that metallurgical enterprises provide a significant share of revenues to the state budget, which, of course, affects its balance. In addition, the share of the metallurgical complex in GDP is about 1/3 of its total volume. Of particular importance for the metallurgical industry is for industrial regions in terms of providing jobs for the population. The peculiarity of the development of the metallurgical industry is the need for investment resources, both internal and external, for the modernization of production in accordance with the requirements of the present.

Despite a significant number of advantages, metallurgical enterprises have a number of economic problems that reduce the level of competitiveness of products and do not allow access to international markets. After all, metallurgical enterprises of Ukraine lag behind the world production at the technical-technological level and as a result of considerable consumption of energy resources, as well as environmental pollution. In addition, the issue of modernization of production needs to be addressed, since its absence can lead to the loss of markets, both internal and external, as a result of the worsening of the competitive advantages of national enterprises. In this connection, there is a need to distinguish between the problems of the operation of metallurgical enterprises in Ukraine and the search for qualitatively new reserves and the mechanism for their effective use in order to achieve the world level of development.

### Analysis of recent studies and publications

The significance of the development of the metallurgical industry has been confirmed by a large number of scientific works of scientists in terms of problems and future trends.

The analysis of problems and prospects of the development of metallurgical enterprises is represented by scientific works of such scientists as A. Amosha, O. Borisenko, O. Minaeva, V. Podgirnoy [1-2], and others.

Practical studies on the assessment of the potential of metallurgical enterprises are presented in the works of V. Mazur, O. Klenin, S. Kulitsky, V. Bolshakov [3-6], and others. Scientists A. Sokolov, O. Paskhaver, L. Verkhovodova, O. Kataev [7-8] paid considerable attention to the problems and perspectives of the development of ferrous metallurgy and outlined ways of increasing the competitiveness of metallurgical enterprises in the national economy.

Despite a considerable amount of theoretical and practical research, the more in-depth analysis of the problems of functioning of the metallurgical enterprises of Ukraine in the conditions of the intensification of competition and the need to find new markets is needed.

### The main material of the research

Metallurgy is the leading base industry among other industries of Ukraine and the economy of the country as a whole, which affects the state of economic and social development of the state. Metallurgy is a priority sector in terms of export potential, as a significant part of the products of this industry is supplied to other countries of the world. It positions the industry as an important supplier of foreign currency.

It should be emphasized that the solution of important socio-economic issues is connected with the stability of the development of metallurgy, the increase of production volumes and the growth of the competitiveness of enterprises in the industry.

The analysis of the world steel market at the international level makes it possible to distinguish the main problems of its functioning and prospects of development. Consider the volumes of steel production for the period 2013-2017 (Table 1).

The analysis of statistical data in Table 1 showed that steel production volumes in most regions of the world were decreasing in the period of 2013-2016, while in 2017 manufacturing was increasing in all regions of the world, except for the CIS countries. In our opinion, the decrease in production in the CIS countries was due to the decrease in the level of competitiveness of products, the use of outdated technologies, the lack of modernization and the imperfection of legislation on regulating the activities of metallurgical enterprises.

Table 1 - Volumes of steel production in the context of separate regions of the world for the period of 2013-2017, million tons

The region of the world	Years old				
	2013	2014	2015	2016	2017
EU (28)	166,4	169,3	166,1	162,0	163,8
Other countries of Europe	38,6	38,4	36,8	37,6	42,2
countries CND	108,4	106,1	101,6	102,1	100,9
North America	119,0	121,1	110,9	110,6	115,8
South America	45,8	45,0	43,9	40,2	43,7
Africa	16,0	14,9	13,7	14,1	15,1
Middle East	27,0	30,0	29,4	31,5	34,5
Asia and Oceania я	307,2	322,4	314,8	313,1	338,3
China	822,0	822,3	803,8	807,6	831,7
World	1650,4	1669,5	1620,0	1627,0	1690,5

Note: Submitted by the author according to [9]

Let's consider the share of world regions in steel production for the period 2013-2017 and analyse the main trends (Table 2).

China was the key player in the world steel market, since its share in 2017 was 49.2% of the global level. The second leader was Asia and Oceania, which held 20% of the world steel market in 2017.

The third position was occupied by EU-28 countries with a share of 9.7%. CIS countries and North America controlled the market share of 6-7%, while regions such as the Middle East, other countries of Europe and South America – 2-3%. The smallest market share belonged to Africa – 0.9%. Note that this trend was observed for the period of 2013-2017.

Table 2 - Volumes of steel production in the context of individual regions of the world for the period 2013-2017,% of world volume

The region of the world	Years old				
	2013	2014	2015	2016	2017
EU (28)	10,1	10,1	10,3	10,0	9,7
Other countries of Europe	2,3	2,3	2,3	2,3	2,5
countries CND	6,6	6,4	6,3	6,3	6,0
North America	7,2	7,3	6,8	6,8	6,9
South America	2,8	2,7	2,7	2,5	2,6
Africa	1,0	0,9	0,8	0,8	0,9
Middle East	1,6	1,8	1,8	1,9	2,0
Asia and Oceania	18,6	19,3	19,4	18,8	20,0
China	49,8	49,3	49,6	49,6	49,2
World	100,0	100,0	100,0	100,0	100,0

Note: calculated by the author according to [9]

In our opinion, in order to determine the role of Ukraine in the world steel market in general and in the European market in particular, it is necessary to consider the share

of Ukraine in the production of steel at the world level and in the EU countries (Table 3).

Table 3 - Comparison of volumes of steel production in Ukraine, the world and EU-28 for the period of 2013-2017, million

Region / Country	Years old				
	2013	2014	2015	2016	2017
EU (28)	166,4	169,3	166,1	162,0	163,8
Ukraine	32,8	27,2	23,0	24,2	21,3
World	1650,4	1669,5	1620,0	1627,0	1690,5

Note: calculated by the author according to [9]

The comparative analysis and determination of Ukraine's place in the world steel market and the EU market has shown that the national metallurgy shows a decrease in steel production, while in the EU there is an opposite trend, that is, production volumes that are consistent with world-wide laws are increasing. This also confirms the presence of problems in the functioning of metallurgical

enterprises in Ukraine, despite the presence of significant natural resource potential.

Taking into account the vector of European integration, in our opinion, a comparative analysis of the share of Ukraine and EU-28 in world steel production is necessary (Fig. 1)

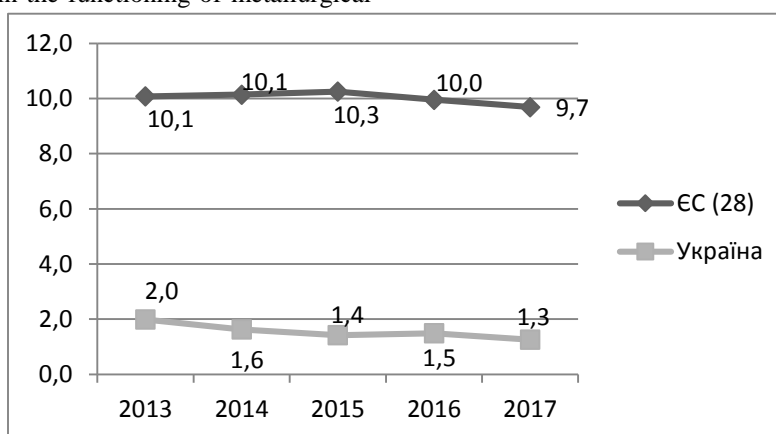


Fig. 1. The share of EU-28 and Ukraine in the total world steel production,%  
Note: built by the author alone

Fig. 1 clearly shows that Ukraine is significantly behind the EU-28 for the share of steel production at the world level. If the EU-28 in 2017 occupied 9.7% of world steel production, then Ukraine had only 1.3%, that was 5.5 times less. The analysis of calculations has shown the existence of common trends, which has manifested itself

in reducing the share of EU-28 and Ukraine in the period 2013-2017.

The World Steel Association (World Steel Association) has built a forecast for production volumes on the steel market for 2018-2019 (Fig. 2).

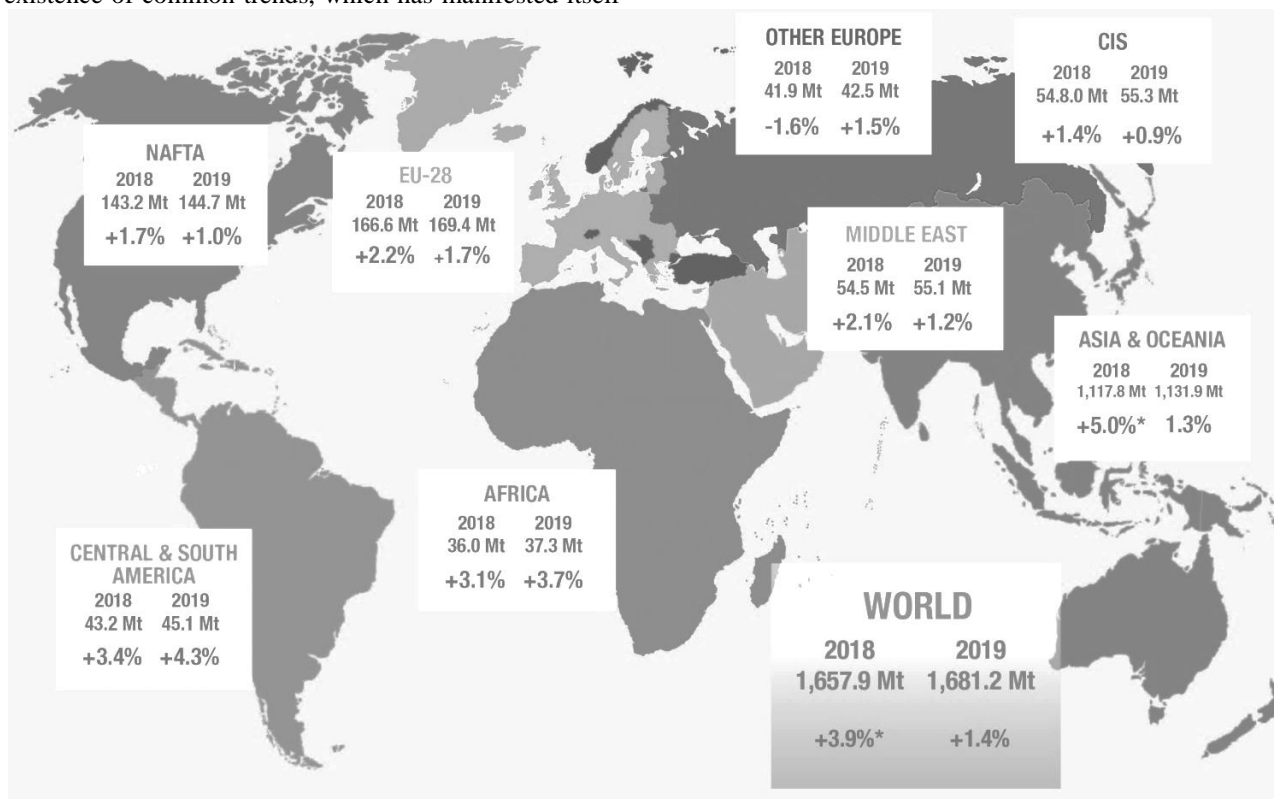


Fig. 2. Projection of steel production in the world by regions 2018-2019, million tons  
 Note: constructed by the author according to [9]

The forecast presented in Fig. 2 shows that Asia and Oceania will be the undisputed leader among the world's regions in terms of steel production in 2018-2019. The region's share of global production will be 67% in 2018-2019. The lowest production volumes of steel compared to world trends are characterized by Africa – 2.2% in 2018-2019. Note that the growth rate of steel production in the region-leader in 2019 is significantly lower compared to 2018 – from 5.0% to 1.3%, respectively, while the highest rates are shown by Central and South America – 3.4% in 2018 and 4.3% in 2019.

Based on the analysis of the volumes of steel production in Ukraine and its share in the world and the EU, it should be summarized that there is a tendency to decrease. The isolated patterns may be the result of the influence of negative factors on the development of metallurgy and the functioning of industrial enterprises. Among the main problems of functioning and future development of metallurgical enterprises, the following should be used:

- the use of outdated technologies and the high level of deterioration of the vast majority of fixed assets of metallurgical enterprises;

- falling demand for metallurgical products;
- low productivity and high material and energy intensity of production, due to excessive and inefficient consumption of energy resources, natural gas in particular;
- an increase in the proportion of products with a low level of processing (steel billet, pig iron, semi-finished products), which often becomes the target of anti-dumping measures of foreign authorities;
- high dependence of the metallurgical industry on world prices and on the trends of world metallurgical production development;
- low competitiveness of national metallurgical enterprises due to high cost price;
- insufficient quality and non-conformity of production to world standards: a significant part of the exported metal products has not been certified for compliance with world standards; emergence of powerful players on world markets.

On the basis of separation of problems of functioning and development of metallurgical enterprises it is possible to group them (Table 4).

Table 4 – Grouping problems of functioning and development of metallurgical enterprises

A group of problems	problems
At the state level	imperfection of the law
	lack of a clear mechanism of state regulation of the metallurgical industry
	low level of spending on science and education, as well as scientific and technical developments
	the lack of interaction of metallurgical enterprises with the enterprises of related industries
	the absence of an effective mechanism for the implementation of industry development programs
	high level of employment
	unjustified decisions of the state regarding the privatization of metallurgical enterprises
	low level of domestic consumption of metal products
Technical	structural disproportion of steel production
	obsolete equipment
	surplus of production capacity
	significant level of production retardation
Economic	deficit of working capital
	high level of receivables and accounts payable past periods
	significant expenses on raw materials, fuel and electricity
Ecological	environmental pollution by industrial emissions and waste
	violation of the ecological balance
Foreign policy	Restrictions and protectionist measures by developed countries before manufacturers of Ukrainian metal products
	the nomination of political demands and the impact on lawmaking processes during periods of different types of assistance, tranches and targeted investments
Organizational	loss of experienced personnel
	low wages, compared to EU countries
	low level of labor protection and labor discipline

Note: grouped by the author alone

In connection with this, there is a need to implement certain measures in order to solve the problems of the metallurgical industry:

- modernization of national enterprises;
- improvement of the quality of products in the metallurgical industry;
- reduction of energy consumption of products;
- search for new markets and more.

One of the important problems of the metallurgical industry is that during the favourable world market conditions, that is, the increase in demand and the rise in prices for products, national enterprises are not able to enter the international market because they do not invest money in modernization, upgrading of equipment and introduction of modern technologies.

For example, Ukraine is one of the few countries in the world where old-fashioned open-hearth melting is still used. In turn, open-hearth production is unprofitable, since it is characterized by a significant level of energy intensity and inferior to converter technology, whose preconditions are high quality products, efficiency and environmental friendliness.

The experience of key players in the market of metallurgical products proves that in order to achieve a high level of efficiency and effectiveness, it is necessary to combine the modernization of the talisman production with the improvement of the range of products. In the conditions of intensification of competition on the world market of metallurgical products for national enterprises, it is necessary to search for new markets from the point of view of geographical and product orientation. An

important European perspective is the European market, where the presence of national metallurgy enterprises is minimal. However, the time to enter the European market requires time, since it is unnecessary to introduce modern technology and technology, study the European market, comply with European standards and improve the legislation and financial instruments for export refunds. The identified areas are strategic in terms of the time period of their implementation. In our opinion, as an important direction, it is worthwhile to highlight the transition of national metallurgical enterprises from the sale of raw materials to the export of high value-added finished products.

### Conclusions

On the basis of the research, it should be summarized that metallurgy is a strategic sector in Ukraine, as the

country has a significant natural resource potential that allows it to be a worthy competitor not only in the European but also in the world markets. At the present stage, national metallurgical enterprises are dealing with a large number of economic problems, both internal and external.

Thus, at the present stage, to solve the key economic problems for the metallurgical industry, the questions of metallurgy are actualized, optimization of production costs, modernization of production, expansion of product assortment and improvement of its qualitative characteristics in order to achieve a high level of competitiveness. Strategic priorities for the operation of metallurgical enterprises should be the production of competitive products for domestic consumption and for implementation in foreign markets.

### References

1. Amosha, A.I., Bolshakov, V.I., Minaev, A.A., Zaloznova, Yu. S., Zbarazskaya L.A., & Makogon, Yu. V. et al. (2013). *Ukrainskaya metallurgiya: sovremennyye vyzovy i perspektivy razvitiya* [Ukrainian Metallurgy: Modern Challenges and Development Prospects]. Donetsk: Institut ekonomiki promyshlennosti [in Russian].
2. Borysenko, O.Ye. (2013). Analiz ta otsinka zabezpechennya osnovnyimi resursamy vyrobnychoyi diyal'nosti metalurhiynykh pidpryyemstv Ukrayiny [Analysis and evaluation of the main resources of production activity of metallurgical enterprises of Ukraine]. *Ekonomika promyslovosti – Economy of the industry*, 1-2, 28-39 [in Ukrainian].
3. Mazur, V. (2010). Metalurhiya Ukrayiny: stan, konkurentospromozhnist ta perspektyvy [Metallurgy of Ukraine: Status, Competitiveness and Prospects]. *Dzerkalo tyzhnya – Mirror of the week*, 8, 8-9 [in Ukrainian].
4. Kulytskyy, S. (2016) Ukrayinska chorna metalurhiya: stan, problemy, perspektyvy [Ukrainian ferrous metallurgy: state, problems, perspectives]. *Ukrayina: podiyi, fakty, komentari – Ukraine: events, facts, comments*, 5, 44-65 [in Ukrainian].
5. Klenin, O.V. (2010). Vdoskonalennya protsesiv upravlinnya vidtvorenyam osnovnoho i oborotnoho kapitalu metalurhiynykh pidpryyemstv Ukrayiny [Improvement of the processes of control of reproduction of the basic and working capital of metallurgical enterprises of Ukraine]. *Modelyuvannya rehionalnoyi ekonomiky – Modeling regional economics*, 1, 160-167 [in Ukrainian].
6. Bolshakov, V.I., Tuboltsev, L.H. (2014). Chorna metalurhiya i natsionalna bezpeka Ukrayiny [Chornaya metallurgy and national security of Ukraine]. *Visnyk NAN Ukrayiny – Bulletin of the National Academy of Sciences of Ukraine*, 48-58 [in Ukrainian].
7. Paskhaver, O., Verkhovodova, L., Suplin, L. (2004). *Formuvannya velykoho pryvatnoho kapitalu v Ukrayini* [Formation of large private capital in Ukraine]. Kyiv: Milenium [in Ukrainian].
8. Katayev, O. (2012). Rezervy tekhnichnoho pereozbroyennya enerhomistkykh pidpryyemstv hirnycho-metalurhiynoho kompleksu Donbasu [Reserves of technical re-equipment of energy-intensive enterprises of the mining and metallurgical complex of Donbass]. *Ekonomika Ukrayiny – Ukraine economy*, 2, 84-88 [in Ukrainian].
9. World Steel Association. *worldsteel.org*. Retrived from <https://www.worldsteel.org/steel-by-topic/statistics/global-map.html> [in Ukrainian].