

G. Duginets*¹,
orcid.org/0000-0003-3708-3666,
T. Busarieva¹,
orcid.org/0000-0003-3863-4511,
Iu. Samoilyk^{2,3},
orcid.org/0000-0003-1335-2331,
O. Batrak⁴,
orcid.org/0000-0003-1386-4169,
V. Dengub⁵,
orcid.org/0009-0008-0253-9065

1 – State University of Trade and Economics, Kyiv, Ukraine
2 – Poltava State Agrarian University, Poltava, Ukraine
3 – Caritas Ukraine ICF, Kyiv, Ukraine
4 – Kyiv National University of Technologies and Design,
Kyiv, Ukraine
5 – Odesa National Economic University, Odesa, Ukraine
* Corresponding author e-mail: g.duginets@knute.edu.ua

FOREIGN ECONOMIC ACTIVITIES OF UKRAINIAN FERROUS METALLURGY ENTERPRISES IN THE CONDITIONS OF CRISIS

Purpose. To investigate the directions of the impact of war and the state of global demand for ferrous metals on the stability of the export positions of Ukrainian metal producers in foreign markets. The objectives are: to identify the factors of direct and indirect impact of the war on the foreign economic activity of Ukrainian ferrous metallurgy enterprises; to propose areas for expanding the foreign economic opportunities of Ukrainian metal producers and ways to make their presence in the markets of other countries sustainable.

Methodology. The study used: the content analysis method for evaluating and comparing the data from external sources of information; the analysis and synthesis method – to identify the indirect impact of the war on the export capabilities of steel producers and instability of their positions in foreign markets; the induction and deduction method - to identify the influence of uncertainty as a consequence of the multiplicative action of dynamic negative factors, in particular, in reducing the relevance of medium- and long-term planning.

Findings. The loss of positions by metallurgical enterprises in foreign markets, the acquisition of an unstable nature of the presence of Ukrainian producers in these markets is proven. It is substantiated that the effects of war and the global market contribute to the strengthening of the role of transnational corporations in the export capacity of the Ukrainian metallurgical industry, and the significant differentiation of the effects of war on producers strengthens their intra-industry competition. Therefore, it is proposed to consider challenges not only as a threat, but as an opportunity to gain a competitive advantage in foreign markets. It is indicated that this increases the importance of flexibility of management and production in war conditions.

Originality. It is substantiated that the uncertainty of the impacts of war becomes a factor that limits the relevance of forecasts and long-term planning of export activities, which increases the importance of operational planning and the need to prepare variable scenarios of management actions.

Practical value. The developed proposals will allow expanding the export opportunities of Ukrainian metal producers and ensuring the sustainability of their presence in foreign markets.

Keywords: *foreign economic activity, metallurgical enterprises, the impact of war on export capacity, transnational corporations*

Introduction. Foreign economic activity of metallurgical enterprises of Ukraine today takes place in conditions of powerful external and internal challenges. External challenges include the instability of the global market for metal products, which causes significant fluctuations in demand for it, a high level of competition, protectionist policies in importing countries, a course to reduce the carbon footprint, the use of measures of economic coercion of exporting enterprises to environmentally friendly production, etc.

Internal challenges include an outdated technological base of production, high cost of production, which are exacerbated by the negative impact of macroeconomic, political instability, and the challenges of war. War leads not only to the loss of fixed assets, lack of human resources due to mobilization and forced migration of workers, instability of resource supply, but also to the loss of a significant part of the external market due to disruption of logistics processes and blocking of sea transport routes. The instability of energy supply is another negative factor. An example of this is the suspension of production by ArcelorMittal Kryvyi Rih due to the destruction of the Kakhovka HPP. Only part of the blast furnace production of the enterprise is still operating. The lack of technical water for the technological process forced ArcelorMittal to build a new water supply and a new pumping station for water supply from the Inhulets River. This also leads to an increase in the capital and operating costs of Ukrainian metallurgical enterprises in wartime to neutralize threats and ensure the continuity of the

technological process, which results in an increase in the cost of production and, accordingly, reduces the competitiveness of Ukrainian metallurgical enterprises in the foreign market.

The growth of challenges and threats, the significant dynamics of their change require research into the directions of adaptation to them by Ukrainian metal producers and ways to provide export enterprises of the metallurgical industry.

Literature review. The foreign economic activity of Ukrainian ferrous metallurgy enterprises has received considerable attention from domestic scientists. Even during the war, scientists primarily considered the technological backwardness of the industry [1], unstable demand in the world market and structural imbalances in the global economy [2], the growth of prices for Ukrainian metal products and the emergence of new metal-exporting countries in the world market [3], management problems and inefficiency of the financial and economic mechanism of metallurgical enterprises [4], etc. as the main obstacles to the export of metal products. The influence of these factors is taken into account in the study of foreign economic activity [5, 6] of metallurgical enterprises, but the war forced us to take into account new, more significant threats.

When developing proposals for the formation of a foreign economic strategy for metallurgical enterprises in pre-war times, the uncertainty of external influences was often ignored [4]. For example, when studying the strategy of technological energy intensity of products, assuming coking coal resources and energy supply as stable, the development of the industry was confidently predicted until 2040 [7]. At the same time, a number of scientists identified an increase in the level of un-

certainty under conditions of war and instability of external markets and the impact of this uncertainty on the sustainability of the export activities of Ukrainian metallurgical enterprises [8]. The impact of the war on the activities of the metallurgical industry became so significant that management was faced with the task of how to continue the work of the surviving enterprises [9]. Maintaining production at the level of 15–30 % of capacity was possible with the support of Western partners [9], who provided logistics to their ports and reduced trade barriers for Ukrainian metal products. But the relevance of strategic export forecasts is also limited by the uncertainty of the terms of prolongation of reduced tariff rates, primarily in EU countries [10]. Scientific works detail significant losses of the metallurgical industry during the war [11]. At the same time, without going into detail, scientists point to a “complex of solutions” that not only allowed the export of products to be resumed in the first half of 2022, but also to increase its volumes compared to 2021 by 23.6 % [11]. Since, according to authoritative international sources, the production and export volumes of Ukrainian metal products during this period were significantly reduced [12], this means that some of the metallurgical enterprises took advantage of the reduction or even cessation of production by their Ukrainian competitors and captured part of their foreign market.

In their study of the problems of maritime transportation of Ukrainian metal products, Borovyk, et al. [13] indicated the loss of the markets of Turkey, Italy, the Netherlands, China, etc. during the maritime blockade by Ukrainian metallurgical enterprises. Researchers note that the EU countries have become the main importer of Ukrainian metal products, but at the same time, they often do not take into account the re-export factor [14].

Considering the directions of strengthening the competitiveness of the country’s metallurgical enterprises in foreign markets, Bugrim, et al. [15] point out the importance of consolidating the metallurgical industry for strengthening the export potential.

Hordieieva-Herasymova, et al. [16] revealed the presence of indirect effects of the war on the export capabilities of metallurgical enterprises. In particular, as noted by Hordieieva-Herasymova, et al. [16], the increase in tariffs of JSC “Ukrzaliznytsia” due to increased risks reduces the level of profitability of metal exports.

Differences in the views of scientists on the significance of factors influencing the foreign economic activity of metallurgical enterprises, changes in metal exports in wartime, the impact of uncertainty on the planning of enterprise activities require detailed research.

The purpose of the article. To investigate the directions of the influence of the war and the state of global demand for ferrous metals on the sustainability of the export positions of Ukrainian metal producers in foreign markets.

The task of the article is to identify factors of the direct and indirect impact of the war on the foreign economic activity of Ukrainian ferrous metallurgy enterprises; to suggest directions for expanding the foreign economic opportunities of Ukrainian metal producers and ways to acquire a sustainable presence in the markets of other countries.

Methods. The study used the method of content analysis to evaluate, compare data from information, statistical and other sources in order to identify the directions of the impact of the war and the state of global demand for ferrous metals on the foreign economic activity of Ukrainian metallurgical enterprises. The method of analysis and synthesis was used to identify the indirect impact of the war on the export capabilities of Ukrainian metal producers, which, in particular, causes the instability of the positions of Ukrainian enterprises in foreign markets. The use of the method of induction and deduction made it possible to identify the significance of uncertainty as a consequence of the multiplicative action of dynamic negative factors, in particular in reducing the relevance of export

activity forecasts and reducing the relevance of medium- and long-term planning and acquiring greater importance of the efficiency of managerial actions in using windows of opportunity in foreign markets.

Results. The competitive advantage of the metallurgical industry before the full-scale war in the global market was that, unlike the metallurgical industries of other countries, it was supplied with national resources – iron and manganese ore, respectively 4.5 and 9 % of world production, coal (1.5 %), etc. This provided the possibility of implementing a full cycle of metallurgical production – from the extraction of raw materials, coke production, sintering to the production of the final product – rolled metal, which reduced the cost of production. At the same time, the Ukrainian metallurgical industry is characterized by a significant level of equipment wear and tear, while the metallurgical industry of developed countries is preparing for the predominant use of hydrogen technology for direct iron reduction and reduction smelting with carbon dioxide capture, in Ukraine the open-hearth method of production is still used.

Before the full-scale war, the competitive advantages of the metallurgical industry also relied on a developed transport infrastructure and favorable geographical location of enterprises. Now these advantages are, to some extent, leveled due to the increase in risks to logistics processes, the increase in the cost of transport services, the loss of access to some natural resources, etc.

In the period preceding the large-scale war, metallurgical enterprises developed the local markets of more than 80 countries, which provided maneuverability in the global market and, accordingly, provided the opportunity to maximize product prices while optimizing transportation costs. Today, these opportunities are also significantly reduced.

In war conditions, the cost of production increases, which, accordingly, reduces the possibilities for exporters of Ukrainian metal to have a flexible pricing policy in foreign markets.

In particular, the number of workers in metallurgical enterprises during 2022–2023 decreased by 41 %. This forces management to look for ways to financially encourage personnel. For example, Metinvest began paying a significant additional bonus to employees of production units. Ferrexpo introduced additional payments to all employees. Interpipe increased salaries by 15 %. This increases the share of labor costs, and, accordingly, the cost of production increases.

Ukrainian metal producers are characterized by significant variability in capacity utilization, which is caused not only by changes in demand on external markets, which results in changes in prices for metal products, but also by the risks of war. These risks have significant differentiation for metallurgical enterprises depending on their geographical location, changes in the directions of missile and bomb strikes on infrastructure and technological facilities, etc.

Thus, the capacities of the Alchevsk Metallurgical Complex, the Yenakiyiv Metallurgical Plant, Donetskstal, and the Khartsyzsk Pipe Plant were lost. During the large-scale war, the Mariupol enterprises of Metinvest, which provided 40 % of Ukrainian steel production, were lost [16]. This accordingly changed the shares of Ukrainian metal product manufacturers in the national export volume.

In the period preceding the large-scale hostilities, the export of metal products mainly took place through the seaports of Ukraine, and in later times, rail transport began to be used more intensively. In particular, Metinvest enterprises: Zaporizhstal, Zaporizhzhia Foundry and Mechanical Plant, etc. promptly changed the directions of supply and already in 2023, the volume of exports to Poland increased by 16 %. This was facilitated by the effective management of Metinvest, which, in particular, allowed significantly reducing downtime at cross-border crossings. At the same time, transport and logistics costs only at the stage of transportation to the western border are twice as high as to seaports due to the geographical lo-

cation of the main production facilities of the metallurgical industry. This increases the prices for Ukrainian metal. The cost of transport services was increased by a significant increase in tariffs. In addition, it is necessary to take into account the costs of transporting Ukrainian products through the EU to European ports, in particular for the purpose of re-export. This led to a 4–6-fold increase in transport and logistics costs. This had not only negative consequences, as it brought the export of ore and coal to the limit of profitability and, accordingly, reduced the problem of their shortage in the metallurgical production of Ukraine.

The opening of seaports contributed to the growth of Ukrainian metal exports. At the same time, military risks of sea transportation due to mine danger, missile and bomb attacks on ships even under the flag of other countries led to a significant increase in protection and indemnity (P&I) insurance premiums, since all territorial waters of Ukraine are classified as dangerous by the Lloyd's Association of Underwriters. This resulted in an increase in transportation costs. With a significant increase in transportation costs, the level of profitability for some types of products approached the minimum value and the export potential of manufacturers of these products became more dependent on price fluctuations in foreign markets. This puts some enterprises on the verge of bankruptcy. This provides additional incentives for increasing the depth of metal processing, since with an increase in the market value of the final product, the share of transport services in the product price will decrease.

War conditions often require a reduction in production volumes, which is often a difficult technological task for metallurgical enterprises. In particular, reducing production requires the suspension of some technological facilities but requires keeping them, for example, metallurgical furnaces, in a hot state, which increases the level of non-production costs and leads to an increase in the cost of production.

Also, as a result of hostilities in traditional locations for the procurement of ferrous scrap, the volumes of procurement in 2022 decreased by 75.9 % year-on-year. The trends of reducing procurement have persisted in the following period of time, which creates a problem of scrap shortage and reduces the possibilities of expanding the production of metal products in the event of the need to increase the volume of its exports. The shortage of ferrous scrap for metallurgical production is also contributed to by the formation of shadow schemes for the re-export of this raw material through EU countries, for which a preferential export duty has been introduced, which is 60 times lower than in countries that are end consumers of this raw material. This affects not only the volumes but also the sustainability of production (for example, in 2023 the Interpipe Steel enterprise stopped work due to a shortage of scrap metal), but also the sustainability of export supplies of Ukrainian metal products.

In wartime, the possibilities of providing the metallurgical industry with coke have also significantly decreased. Ukraine has natural reserves of mainly heavy coking coal and therefore needs to import other brands of coke. In 2023, Ukrainian metallurgical enterprises managed to import coke of these brands by rail in the amount of only 330 thousand tons, which is insufficient for sustainable production. This also affected the significant reduction in production volumes in 2022–2023 of pig iron, steel, and ferroalloys over the entire study period since 2012, as evidenced by the data in Fig. 1 [17].

A certain recovery in production volumes year-on-year in 2023 (Fig. 1) is less typical, according to Ukrmetallurgprom [18], for products of deeper processing, in particular, rolled products (Fig. 2).

One of the features of foreign economic activity in wartime is not only the significant dynamism in changing risks in magnitude, direction, and the multiplicative effect of the entire complex of existing threats. War also causes a significant level of uncertainty of impacts on all areas of activity of metallurgical enterprises, including foreign economic activity. The uncertainty of foreign economic activity of metallurgical enter-

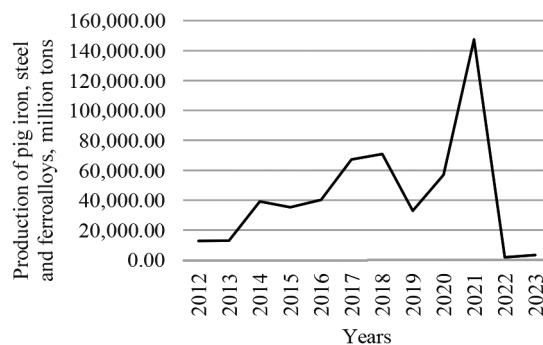


Fig. 1. Production of pig iron, steel and ferroalloys in Ukraine, million tons

prises is exacerbated by the fact that the situation in the world market is currently also volatile. Thus, in mid-2022, the significant level of problems in the metallurgical industry as a result of hostilities, was compounded by the problems of the global metal products market, they were associated with a decrease in demand due to a decrease in economic activity in importing countries, for example, EU countries. As a result, if before the large-scale war Ukraine exported 70–80 % of produced metal products, now, according to [19], the share of exports is about 50 %. At the same time, the volatility of the world market contributes to the opening of windows of opportunity for Ukrainian exports. But these opportunities in modern conditions do not ensure the sustainable nature of foreign economic activity for Ukrainian metal producers.

For example, in November 2023, demand for metal products in China increased, which led to an increase in world prices for it [12]. Therefore, prices for products of Ukrainian manufacturers increased during the following period, which contributed to an increase in their export volumes (Fig. 2).

At the same time, a significant part of Ukrainian steel exports (~90 % according to the results of 2023) is not a deep processing product, but steel billet, which limits export opportunities. For example, in 2023, Ukrainian manufacturers exported ~75 % less long-rolled products than in 2021 [19].

There are also significant changes in export directions. Thus, in previous periods the export destinations were the countries of Africa (36.6 % in 2021), the Middle East (20.6 %) and South America (15.4 %), then the war led to the loss of these markets for Ukrainian exporters. In particular, the main export destinations of semi-finished products from Ukraine in 2023 were Bulgaria (36.7 % of the export volume) and Poland (23 %), although according to the results of 2021, the main importers of Ukrainian semi-finished products were Italy (30.9 %), Turkey (12.8 %) and the Dominican Republic (8 %) [19]. To a large extent, the change in importers was caused not only by the blocking of the main routes for transporting Ukrainian metal products

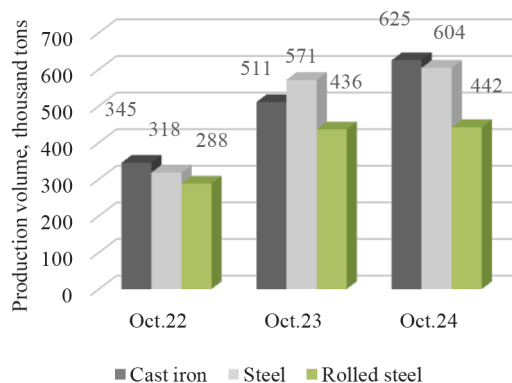


Fig. 2. Dynamics of metal production during martial law, thousand tons

in 2022, but also by changes in customs tariffs for certain export destinations, primarily to EU countries, the increase in logistics costs with the predominant use of rail transport, etc.

Export deliveries of products of deeper metal processing – metal products in 2024 decreased by 8.1 %, while their imports increased by 47.2 % in the same period. A comparison of the growth of export and import volumes in 2024 shows an increase of 14.3 and 15.2 % for long-rolled products, respectively, and 40.7 and 80.2 % for flat-rolled products. There is a different trend in the growth of export and import volumes for semi-finished products – by 45 and 1.5 % [19]. This indicates an inappropriate structure of production and export due to the effects of the war.

The management of the main producers of metal products is taking certain steps to solve the problem. In particular, Zaporizhstal has started producing hot-rolled products to compensate for the lost capacity of PJSC Mariupol Metallurgical Plant. This will also provide an opportunity to increase the export volumes of these products.

The opening of sea ports has allowed Ukrainian exporters to begin resuming the supply of metal products to local markets, in particular, the Middle East.

The unpredictability of external influences makes it extremely difficult for Ukrainian metallurgical companies to plan their activities strategically. Even leading analysts from Western countries [20] point to significant uncertainty in the metal products market due not only to declining demand, inflation, but also to geopolitical factors, as evidenced by one of the lowest average growth rates of world steel production [20] since 1950 (Table 1).

Contrary to the conclusions of some scientific works on the realistic long-term forecasting of foreign economic activity in wartime [21], this reduces the relevance of export volume forecasts for Ukrainian management even to EU countries, since they depend on the uncertainty of the possibility of prolonging the preferential customs regime with the EU after 2025. This is also affected by the uncertainty of steel consumption in EU countries and the significant variation in its consumption by European importing countries in the conditions of a slight increase in the overall global level of consumption of steel and steel products (Table 2) [21].

Table 1

Average growth rates of world steel production, % per annum

Years	Average Growth Rates, % per annum	Years	Average Growth Rates, % per annum	Years	Average Growth Rates, % per annum
1950–1955	7.4	1975–1980	2.2	2000–2005	6.2
1955–1960	5.1	1980–1985	0.1	2005–2010	4.6
1960–1965	5.6	1985–1990	1.4	2010–2015	2.5
1965–1970	5.5	1990–1995	-0.5	2015–2020	3.0
1970–1975	1.6	1995–2000	2.5	2020–2023	0.4

Table 2

Dynamics of steel and steel product consumption, million tons

Countries	Years					2023 to 2019, %
	2019	2020	2021	2022	2023	
World	1,880	1,885	1,963	1,890	1,892	100.6
European Union (27)	147.8	130.9	154.1	142.6	127.6	86.3
Other Europe	43.1	44.3	51.2	48.4	53.4	123.9

The uncertainty of external influences increases the importance of operational planning and the need to prepare variable scenarios of management actions of Ukrainian exporters of ferrous metals.

This, in the context of restrictions on imports of products with a carbon footprint, also significantly increases competition in the EU market, in particular from non-EU European countries, so the increase in their consumption (Table 2) is a certain compensatory effect for Ukrainian exporters of restrictions on steel exports to the EU. The level of competition in the EU market is also evidenced by changes in the volumes of supplies by the main exporting countries (Fig. 3) [22]. The data presented in Fig. 3 also indicate the level of loss of this market for the Ukrainian metallurgical industry for the period 2002–2023.

If for other countries, compensators for dynamic changes in the global market are national markets where domestic producers have certain advantages due to reduced transport costs, regulatory measures, etc., an example of which is European countries that are not members of the EU (Table 2), then for Ukraine, as a result of the war, these opportunities have been reduced by more than a quarter [23, 24].

The significance of the difference in the ratios of exports and domestic consumption of pig iron by Ukraine and other exporting countries is given in Table 3 [21].

This also affects the cost of Ukrainian metal products due to the suspension of production capacities from time to time but the need for costs to maintain them in working condition.

With a decrease in pig iron production and significant fluctuations in export volumes in 2024, a trend of a decrease in pig iron exports relative to the indicators of 2023 was also revealed (Fig. 4) [19].

In the first half of 2024, according to the State Customs Service [19], 598.9 thousand tons of pig iron were exported,

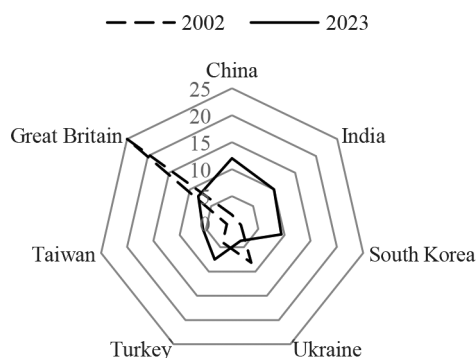


Fig. 3. Changes in EU countries' imports of metal products by supply direction (% of total volume)

Table 3

Volume of production, exports, imports and domestic consumption of pig iron, million tons

Countries	Production		2023 to 2022, %	Exports 2023	Imports 2023	Ratio of export volumes to domestic consumption (2023), %
	2022	2023				
Ukraine	6.4	6.0	93.8	1.2	0.0	4.8
Turkey	9.1	8.7	95.6	0.1	1.4	10.0
United Kingdom	4.8	4.5	93.8	0.0	0.0	4.5
Other Europe	15.8	15.0	94.9	0.1	1.4	16.3
Kazakhstan	2.9	2.7	93.1	0.0	0.0	2.7
Ukraine	6.4	6.0	93.8	1.2	0.0	4.8

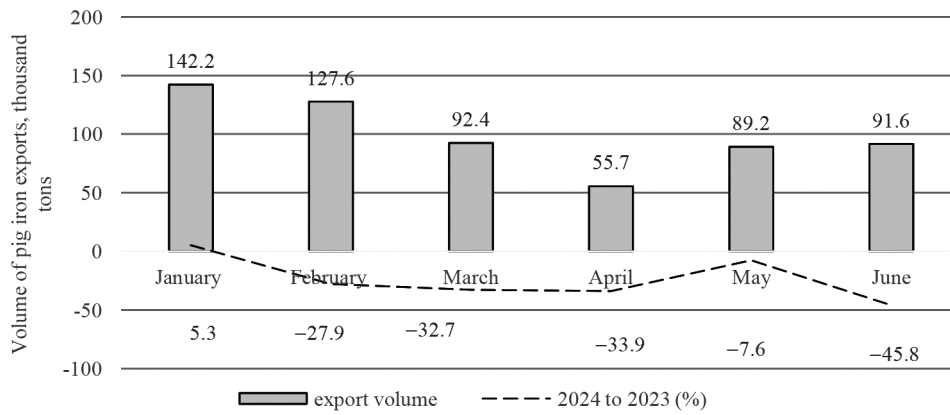


Fig. 4. Export of pig iron in 2024, thousand tons

Table 4

Continuously Cast Steel Production Volumes 2021–2023

Countries	Million tons			2023 to 2021, %	% Crude steel output			2023 to 2021, %
	2021	2022	2023		2021	2022	2023	
European Union (27)	148.6	132.6	122.9	82.7	97.3	97.2	97.3	100.0
Other Europe	52.2	45.8	43.5	83.3	99.9	100.4	99.	99.1
Turkey	40.4	35.1	33.7	83.4	100.0	100.0	100.0	100.0
Ukraine	14.1	4.7	3.7	26.2	66.2	75.2	59.2	89.4
Other CIS ^e	9.0	8.2	8.1	90.0	99.3	99.4	99.2	99.9

which is 25.1 % less than the indicator of the corresponding period of 2023. Revenue from pig iron exports amounted to 226 million USD, which is 26.9 % less than in 2023.

According to the average data of 2023, the geographical structure of Ukrainian exports of ferrous metals was as follows: EU countries – 87.01 %, in particular, due to the abolition of import duties and quotas by the European Commission; European countries that are not part of the EU – 6.7 %; other countries – 4.19 % [19].

The above-mentioned uncertainties of the war, the volatility of the world metal products market reduce the possibilities of strategic planning of export activities and increase the need for a dynamic response to external challenges, operational management of the adjustment of goals and activity plans. In particular, the detailing of plans should not be harsh but variable depending on the change in the significance of impacts and vectors of their action. It also becomes important to consider challenges not only as a threat, but, with the differentiation of impacts by manufacturers, as an opportunity to gain a competitive advantage. This increases the importance of the flexibility of both management and production to external changes.

The increase in the flexibility of metallurgical enterprises to the challenges of war is hindered not only by the fact that they represent a complex conglomerate of new and outdated technologies, but also by the fact that as a result of the war, Ukraine loses even the positions in technological ratings that it had in previous periods. This is evidenced, in particular, by a comparison of data on the dynamics of continuous cast steel production volumes and the share of these volumes in total steel production (Table 4) [21].

Therefore, despite certain improvements in the indicators of gross exports of ferrous metals in 2024 compared to 2023 – as it can be seen from Fig. 5, constructed according to data from the State Customs Service of Ukraine [19], the results of foreign economic activity of enterprises in the metallurgical industry could be better if the level of metal processing changes.

The variance of the relative indicators of ferrous metal product exports (Fig. 6) by month to ferrous metal export volumes in both 2023 and 2024 is high, respectively, 37.5; 36.9.

Also, for ferrous metal exports and products from them in 2024, a break in the 2023 trend of reducing export volumes from month to month is characteristic – the 2024 trend has become upward.

At the same time, a negative trend has been identified – a reduction in the relative indicators of ferrous metal product exports by month to ferrous metal export volumes. Thus, while

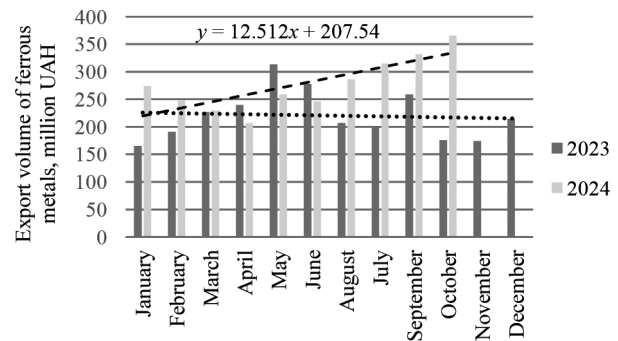


Fig. 5. Ferrous metal exports, UAH million

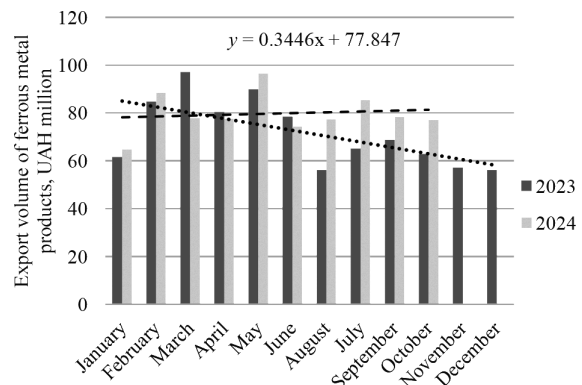


Fig. 6. Export of ferrous metal products, UAH million

maintaining the nature of the change for ferrous metal products (Fig. 6), the trend line for 2024 has much less dynamics – its gradient is almost 37 times smaller than the gradient of the trend line for ferrous metal exports in 2024.

This also affects the dynamics of ferrous metal exports; in particular, it causes instability in the volume of Ukrainian metal products exports to the USA (Table 5) [25] since the share of deep processing products, in particular carbon and alloy steel pipes, in the total volume of exports is insignificant.

Technological lag leads not only to the loss of competitive positions of the Ukrainian metallurgical industry in foreign markets. The export potential of an enterprise with outdated technologies, for example, open-hearth, becomes more dependent on fluctuations in prices for metal products in foreign markets and a slight change in prices can put such an enterprise on the verge of bankruptcy.

Therefore, it is necessary: to increase the share of converter, electric arc, powder technologies in the production structure; to increase the share of continuous steel casting, which ensures a reduction in metal losses in the production of finished products by up to 20 % and a decrease in their cost; to introduce auxiliary innovative, digital technologies both in the production of metal products and in the preparation of raw materials.

But the introduction of innovative technologies requires highly qualified personnel, which will result in an increase in labor costs (today the average share of these costs in the cost of Ukrainian products is ~8 %) and an increase in capital and operating costs, which limits the possibilities of a flexible pricing policy and, accordingly, reduces the level of competitiveness of the Ukrainian metallurgical industry in foreign markets.

Expanding the export range of the metallurgical industry to include high-tech metal products, where the cost of raw materials and labor costs in the cost of a ton of the final product plays a smaller role, will result in the intensification of production and the acquisition of new opportunities in the global market. Today, competitive positions in the metallurgical industry are held by companies where technological innovations are supplemented by international experience in forming an effective organizational structure, in particular on the basis of vertical integration – involving companies at different stages of the technological cycle. Currently, the high level of consolidation is shown by the Metinvest Group, the Industrial Union of Donbass, ArcelorMittal and Interpipe. One of the common definitions of the competitiveness of the industry in foreign markets is the growth (maintenance) of its share in the volume of global exports in accordance with the country's overall rating in world trade [26]. Since the impact of war risks on the

activities of Ukrainian metallurgical enterprises in war conditions is greater than the risks of foreign markets, intra-industry competition for foreign contracts is significantly intensified. Therefore, the competitiveness of the metallurgical industry in war conditions should be considered as a differentiated ability of enterprises to secure advantages both through joint actions within the industry and through actions outside it. This requires an operational response of the enterprise to changes in the structure of industry exports, a relevant and timely assessment of the trend of changes in industry production and maintaining the export capacity of its own production using all possible tools: digitalization, innovation, investment attractiveness, effective management policy, etc. This increases the role of its highly efficient enterprises in maintaining the competitiveness of the industry and their acquisition of all possible directions for entering foreign markets.

Such areas include the formation of transnational corporations (TNCs) through the acquisition of foreign assets by Ukrainian companies, especially in the markets of countries where access may be limited by the adoption of relevant decisions by the institutional structures of these countries, or the acquisition of metallurgical enterprises in Ukraine by foreign corporations. An example of this is ArcelorMittal Kryvyi Rih, one of the largest producers of metal products in the world with an extensive external distribution network. But the conditions of war create additional problems even for Ukrainian TNCs. Thus, before the start of the large-scale war, ArcelorMittal Kryvyi Rih provided a significant part (30 %) of its coal needs through supplies from ArcelorMittal Temirtau (Kazakhstan). Today, this supply through the territory of the aggressor country has been interrupted, which leads to an increase in material costs and, accordingly, affects the export capabilities of ArcelorMittal. This requires the search for new forms and directions of resource provision.

The path of establishing stable partnership relations with consumers in foreign markets looks promising. For example, the formation of stable sales networks in other countries, which will provide prospects for cooperation with consumers even at the stage of their development of metal-containing products, will expand the possibilities of direct supplies of Ukrainian metal to foreign automobile, machine-building enterprises, etc. This will also ensure the ability of relevant planning of foreign economic activity by Ukrainian metallurgical enterprises. But this makes the primary task of the metallurgical industry a radical departure from the export of raw materials or even semi-finished products to external supplies of high-tech metal products.

Of particular attention in the foreign economic activity of the Ukrainian metallurgical industry is the restoration of its traditional regional sales markets in the countries of Asia, the Middle East and Africa. The problem is that, as a result of the closure of the Black Sea transport routes, importing countries changed suppliers, and some of them – India, Brazil, Turkey – began to stimulate their own production. In such conditions, the task of national institutional policy is not to save individual manufacturers of metal products, but, first of all, to ensure the conditions for the effective functioning of the metallurgical industry.

Customs and tariff policy needs to be improved by analyzing the situation in foreign markets and taking into account the prospects for the development of mutually beneficial cooperation with importing countries of Ukrainian metal products, and prompt adjustment of quantitative and restrictive regulatory measures.

The problem of supplying ore, coal, and energy resources to metallurgical enterprises also needs to be resolved. The shortage of ore is caused not only by interruptions in logistics routes, but also by significant fluctuations in its price on the world market (by 1.5 times during 2022–2023).

The uncertainty and instability of resource supply exacerbates the uncertainty of the export prospects of Ukrainian metal products. This also indicates the advantage of integrating production along the technological chain, which allows

Table 5

Dynamics of Ukrainian metal products exports to the USA in 2024, tons

Months	Total export volume	Export volume of carbon and alloy steel pipes	Share of pipes in total export volume, %
January	2,369.00	130.46	5.51
February	13,912.50	0.00	0.00
March	25,696.70	15,100.30	58.76
April	249.40	8.87	3.56
May	20,317.60	6,725.78	33.10
June	10,895.90	10,519.15	96.54
August	606.20	0.00	0.00
July	8,515.80	8,028.45	94.28
September	10,019.30	9,410.26	93.92
October	15,580.50	0.00	0.00
November	8,236.80	0.00	0.00

optimizing the export range and reducing dependence on related industries, in particular, ore suppliers.

In the face of significant risks in order to maintain their own competitiveness, metallurgical companies are now directing their efforts to reduce non-production costs in order to reduce the cost of production. Unfortunately, these reductions also include innovative projects, projects for technological renewal of production and its direction towards increasing deep redistribution, which, in the long term, will lead to a decrease in the competitiveness of Ukrainian metallurgical enterprises. This is a clear example of the indirect effect of the challenges of the war on Ukrainian exporters of metal products.

A decrease in the level of competitiveness also reduces the possibilities of attracting investments in production, and leads to an increase in the cost of attracting external financial resources, which are extremely necessary for export activities.

The widespread implementation of a flexible price policy by Ukrainian metal producers in foreign markets is sometimes accompanied by anti-dumping investigations. Therefore, it is advisable to consider the introduction of anti-dumping supervision.

A positive practice in developed countries, which exporters of Ukrainian metal products should adopt, is the creation of their own localized network of service metallurgical centers (SMCs) in other countries aimed at trading in small batches of metal and even at retail trade. These centers accumulate small batches of the assortment and deliver metal products to local consumers, and upon request carry out additional processing of metal products from cutting to coating. This not only provides an opportunity to receive additional income, contributes to an increase in export volumes, but also ensures a stable export position in local markets. The emergence in recent periods of time in Ukraine of intermediary firms that cooperate with Ukrainian metallurgical enterprises, providing them with export services, in our opinion, does not fully correspond to the practice of SMCs, since the activities of intermediary firms are clearly involved in the shadow economy.

Ukraine's export capabilities are significantly limited by its structural imperfections, a small share of high-grade metal products in exports, and a significant cost of production, which makes some production (for example, open-hearth furnaces) unprofitable due to low world prices.

Conclusions. The metallurgical industry has lost part of its local foreign markets and a significant share of the markets of those countries where Ukrainian metal products continue to be exported.

The insufficient stability of the competitive positions of even the most powerful and effective Ukrainian metal producers in foreign markets has been proven. At the same time, the high level of flexibility of their management to dynamic challenges has been confirmed. It has been proven that although the large-scale war is the main reason for the reduction in the production and export capacity of enterprises in the metallurgical industry of Ukraine, changes in demand on the global ferrous metals market also complicate the foreign economic activity of enterprises. This is confirmed today by one of the lowest indicators of the average growth rates of world steel production since 1950.

It has been proven that the dynamism of change and the multiplicative effect of the entire complex of existing threats of war leads not only to direct negative consequences for Ukrainian enterprises. This also causes a significant level of uncertainty of impacts on all areas of activity of metallurgical enterprises, in particular on the foreign economic direction and requires new qualities from metal producers – flexibility to dynamic challenges and efficiency in using market opportunities.

The uncertainty of foreign economic activity of metallurgical enterprises is exacerbated by the fact that the situation in the world market is also volatile. As a result, if before the large-scale war Ukraine exported 70–80 % of produced metal products, now the share of exports is 50 %.

Multidirectional changes in the world market contribute to the opening of windows of opportunities for Ukrainian ex-

ports. At the same time, these opportunities in modern conditions do not ensure the sustainability of Ukrainian exports of metal products. The uncertainty of external influences also reduces the relevance of forecasts and, accordingly, limits the possibilities of medium- and long-term planning of foreign economic activity of metallurgical enterprises. This increases the importance of operational planning and the need to prepare variable scenarios of management actions. It is indicated that the importance of the effects of war and the global market contribute to the strengthening of the role of transnational corporations in the export capacity of the Ukrainian metallurgical industry, and the significant differentiation of the effects of war on Ukrainian producers leads to increased intra-industry competition. Therefore, it is proposed to consider challenges not only as a threat, but, with the differentiation of effects, as an opportunity to gain competitive advantages. This also increases the importance of the flexibility of both management and production to external changes.

Directions for expanding the foreign economic opportunities of Ukrainian metal producers and ways to acquire a sustainable nature of their presence in the markets of other countries are proposed.

References.

1. Hrybinenko, O., & Shahoian, S. (2020). Development of the export potential of Ukraine in the context of innovations of the international mining and metallurgical companies. *Economy and Region*, 1(76), 38–51. [https://doi.org/10.26906/EiR.2020.1\(76\).1916](https://doi.org/10.26906/EiR.2020.1(76).1916).
2. Nikiforova, V. (2018). World steel industry: current challenges and development trends (analytical overview). *Industrial Economics*, 1(81), 86–114. <https://doi.org/10.15407/econindustry2018.01.086>.
3. Mushnykova, S. A. (2019). Current state and prospects for the development of metallurgical enterprises of Ukraine. *Bulletin of Transport and Industry Economics*, 68, 273–279. <https://doi.org/10.18664/338.47:338.45.v0i68.189030>.
4. Levchuk, K., & Romanyuk, R. (2018). Strategy of economic governance of metallurgical enterprise via innovative approaches. *Publishing House "Baltija Publishing"*, 2(16), 302–325. https://doi.org/10.30525/978-9934-571-28-2_16.
5. Zos-Kior, M., Kuksa, I., Samoilyk, Iu., & Storoška, M. (2017). Methodology for assessing globalisation development of countries. *Economic Annals-XXI*, 168(11–12), 4–8. <https://doi.org/10.21003/ea.V168-01>.
6. Guginets, A., Shvydanenko, O., Busarieva, T., Balanovska, T., & Gogulya, O. (2023). Specific modern features of the transformation of the knowledge component of TNC. *Financial and Credit Activity Problems of Theory and Practice*, 2(49), 384–397. <https://doi.org/10.55643/fcapter.2.49.2023.4017>.
7. Kuts, G. O., & Teslenko, O. I. (2021). Forecast assessment of the full technological energy intensity of Ukrainian ferrous metallurgy products according to production schemes until 2040. *System Research in Energy*, 2(65), 44–52. <https://doi.org/10.15407/pge2021.02.044>.
8. Sepeta, V. V. (2019). Analysis of modern condition and development tendencies of the metallurgical industry of Ukraine in the conditions of instability. *Economic Bulletin of the SHEI of the Ukrainian State Technical University*, 2(10), 88–94. <https://doi.org/10.32434/2415-3974-2019-10-2-88-94>.
9. Smolinska, N., & Ravok, S. (2023). Analysis of the state of the metallurgical industry of Ukraine in the conditions of war. *Bulletin of Khmelnytskyi National University*, 2, 235–240. <https://doi.org/10.31891/2307-5740-2023-316-2-38>.
10. Dvulit, P., & Andrusiak, K. A. (2023). Challenges of the metallurgical industry of Ukraine in the current conditions. *Management and entrepreneurship in Ukraine: stages of formation and development problems*, 1(9), 265–272.
11. Liahovska, O. (2023). Features of the largest enterprises of the metallurgical industry of Ukraine during the war. *Economy and society*, 47. <https://doi.org/10.32782/2524-0072/2023-47-86>.
12. Dnipropetrovsk Investment Agency (2024). *Steel production in Ukraine increased by 20 % in 2023*. Retrieved from <https://dia.dp.gov.ua/spozhivannya-stali-v-ukra%D1%97ni-zroslo-na-20-u-2023-roci>.
13. Borovyk, S. S., Kravchenko, O. A., & Steba, A. A. (2023). Problems and prospects of the development of the export freight flow of ferro-alloys from Ukraine by marine transport. *Scientific notes of the*

Tavriya National University named after V. I. Vernadskiy Series: Technical Sciences, 4(73/6), 215-219. <https://doi.org/10.32782/2663-5941/2023.6/31>.

14. Osipova, L. (2022). Dynamics of Ukraine's export in the conditions of a full-scale war: problems and possible ways of their elimination in the context of European integration. *Bulletin of Khmelnytskyi National University*, 6(2), 50-54. [https://doi.org/10.31891/2307-5740-2022-312-6\(2\)-9](https://doi.org/10.31891/2307-5740-2022-312-6(2)-9).

15. Bugrim, O. Yu., & Kolesnik, E. O. (2020). Analysis of competitiveness of enterprises in the scale of the metallurgical industry of Ukraine. *Economic Bulletin of the SHEI of the Ukrainian State Technical University*, 1(11), 120-127. <https://doi.org/10.32434/2415-3974-2020-11-1-120-127>.

16. Hordieieva-Herasymova, L., & Krainiak, A. (2022). Functioning of enterprises in the metallurgical industry of Ukraine: current challenges and activity trends. *Economy and society*, 44. <https://doi.org/10.32782/2524-0072/2022-44-40>.

17. State Statistics Service of Ukraine (2024). *Value of output, value added of enterprises by types of economic activity with a breakdown by turnover in 2017–2023*. Retrieved from <https://www.ukrstat.gov.ua>.

18. Ukrmetallurgprom (2024). *Results of the metallurgical industry of Ukraine for 11 months of 2024*. Retrieved from <https://www.ukrmetprom.org/rezultati-diyalnosti-metallurgynoi-49>.

19. Ministry of Digital Transformation of Ukraine (2024). *Dashboard on exports and imports of Ukrainian goods*. Retrieved from https://business.dija.gov.ua/analytics/dashboard/dashbord_shchodo_eksportu_ta_importu_tovariv.

20. Euroferr (2024). *Economic and steel market outlook 2024–2025*. Retrieved from <https://www.eurofer.eu/publications/economic-market-outlook/economic-and-steel-market-outlook-2024-2025-first-quarter>.

21. World Steel Association AISBL (2024). *World-steel-in-figures*. Retrieved from <https://worldsteel.org/data/world-steel-in-figures-2024>.

22. Eurostat (2024). *Main EU trade partners for iron and steel*. Retrieved from [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Main_EU_trade_partners_for_iron_and_steel_\(SITC_67\).png](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Main_EU_trade_partners_for_iron_and_steel_(SITC_67).png).

23. Buhaichuk, V., Kryvulskyi, Y., & Hliuza, K. (2023). Formation of the strategy for the development of the enterprise in the conditions of war. *Economy and society*, 56. <https://doi.org/10.32782/2524-0072/2023-56-81>.

24. Saliy, Y., & Saliy, O. (2023). Changes in the foreign economic activities of Ukraine in the conditions of war. *Journal of Strategic Economic Research*, 3(14), 58-71. <https://doi.org/10.30857/2786-5398.2023.3.6>.

25. International Trade Administration (2024). *U.S. Steel Import Monitor*. Retrieved from <https://www.trade.gov/data-visualization/us-steel-import-monitor>.

26. Kotenko, S., Ilchenko, S., Kasianova, V., Diakov, V., Mashkantseva, S., & Nitsenko, V. (2022). Determination of the Expected Value of Losses Caused by the Cargo Transportation Insurance Risks by Water Transport. *Inventions*, 7(3), 81. <https://doi.org/10.3390/inventions7030081>.

Зовнішньоекономічна діяльність підприємств чорної металургії України в умовах кризи

Г. В. Дугінець^{*1}, Т. Г. Бусарева¹, Ю. С. Самоїлик^{2,3},
О. В. Батрак⁴, В. В. Деньгуб⁵

1 – Державний торговельно-економічний університет, м. Київ, Україна

2 – Полтавський державний аграрний університет, м. Полтава, Україна

3 – Міжнародний Благодійний Фонд «Карітас України», м. Київ, Україна

4 – Київський національний університет технологій та дизайну, м. Київ, Україна

5 – Одеський національний економічний університет, м. Одеса, Україна

* Автор-кореспондент e-mail: g.duginets@knu.edu.ua

Мета. Дослідити напрями впливів війни та стану глобального попиту чорних металів на сталість експортних позицій українських металовиробників на зовнішніх ринках. Завдання роботи: виявити фактори прямого й непрямого впливу війни на зовнішньоекономічну діяльність підприємств чорної металургії України; запропонувати напрями розширення зовнішньоекономічних можливостей українських металовиробників і шляхи набування сталого характеру присутності на ринках інших країн.

Методика. У дослідженні використані: метод контент-аналізу для оцінювання та співставлення даних зовнішніх джерел інформації; метод аналізу й синтезу – для виявлення непрямого впливу війни на експортні можливості металовиробників і несталості їх позицій на зовнішніх ринках; метод індукції та дедукції – для виявлення впливу невизначеності як наслідку мультиплікативної дії динамічних негативних факторів, зокрема у зменшенні релевантності середньо- й довгострокового планування.

Результати. Доведена втрата металургійними підприємствами позицій на зовнішніх ринках, набування несталого характеру присутності виробників України на цих ринках. Обґрунтовано, що впливи війни та глобального ринку сприяють посиленню ролі транснаціональних корпорацій в експортній спроможності української металургійної галузі, а значна диференціація впливів війни на виробників посилює їх внутрішньогалузеву конкуренцію. Тому запропоновано розглядати виклики не лише як загрозу, але й як можливість набути конкурентну перевагу на зовнішніх ринках. Доведено, що це збільшує значимість гнучкості менеджменту й виробництва в умовах війни.

Наукова новизна. Обґрунтовано, що невизначеність впливів війни стає фактором, який обмежує релевантність прогнозів і довгострокового планування експортної діяльності, що збільшує значимість оперативного планування та необхідність підготовки варіабельних сценаріїв управлінських дій.

Практична значимість. Розроблені пропозиції дозволять розширити експортні можливості українських металовиробників і забезпечити сталий характер їх присутності на зовнішніх ринках.

Ключові слова: зовнішньоекономічна діяльність, металургійні підприємства, впливи війни на експортоспроможність, транснаціональні корпорації

The manuscript was submitted 13.08.24.