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## **PROSPECTS OF UKRAINE ON THE WORLD STEEL MARKET**

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## **ПЕРСПЕКТИВИ УКРАЇНИ НА СВІТОВОМУ РИНКУ СТАЛІ**

*The study aims to assess the state and prospects of the global steel market and the steel market in Ukraine. Exploring influential factors, dissecting market trends, and forecasting challenges and opportunities are the bases of this study. It helps to examine influential factors, investigate market trends, and explore future challenges and opportunities. The article emphasizes the importance of understanding global dynamics before analyzing Ukraine's position in the steel market. A paramount focus is placed on the imperative need to grasp the intricate dynamics of the worldwide landscape before delving into a meticulous assessment of Ukraine's distinct positioning within the steel industry. As the world witnessed a notable surge in steel*

*production the growth narrative for this essential resource unfurled, elevating its influence on economies. The article further discusses factors influencing steel prices, including production costs, profitability, supply and demand dynamics, political events and other factors as well. Part of the study was followed by a detailed description of how International steel exchanges play a significant role in steel trading and price setting. Steel prices have fluctuated in recent years, impacted by the COVID-19 pandemic and changes in demand so it also was crucial to define these trends and predict further data of the steel prices for years ahead. The study overall shows further forecasts that indicate a decline in production and consumption, while exports and imports are expected to increase. A significant part of the study is devoted to examining the role of Ukraine as it's a key global player in the steel industry in terms of production and export. As Ukraine has fulfilled their potential in this market since its independence. However, the ongoing crisis caused by Russia's aggression against Ukraine poses significant challenges for the steel industry in Ukraine, affecting production and operations. This sombre reality highlights the resilience and adaptability required to navigate the complexities of an industry intricately entwined with broader geopolitical dynamics.*

*Метою цього дослідження є оцінка стану та перспектив розвитку світового ринку сталі та ринку сталі в Україні. Оскільки світ став свідком помітного сплеску виробництва сталі, розгорнулася історія зростання цього важливого ресурсу, що посилило його вплив на економіку. В ході праці було проаналізовано впливові фактори, ринкові тенденції та досліджено майбутні виклики та можливості. У статті наголошується на важливості розуміння глобальної динаміки перед коректним аналізом позиції України на ринку сталі. Також в статті обговорюються фактори, що впливають на ціни сталі, включаючи собівартість виробництва, прибутковість, динаміку попиту та пропозиції та політичні події та інші чинники. За частиною дослідження слідував детальний опис того, як міжнародні біржі сталі відіграють значну роль у торгівлі сталлю та встановленні цін на цьому ринку. На прикладі впливу пандемії COVID-19 було проаналізовано зміни у попиті споживачів та як це вплинуло на світовий ринок та окремі регіони. Тому також було вкрай важливо визначити подібні тенденції та спрогнозувати подальші дані щодо цін на сталь на майбутнє. Загалом дослідження показує подальші прогнози, які базуються на детальному огляді даних та закономірностей ринку. А саме ці зміни вказують на зниження виробництва та споживання, тоді як очікується*

*незначне зростання експорту та імпорту в деяких регіонах світу. Значна частина дослідження присвячена дослідженню ролі України як ключового глобального гравця в сталеливарній промисловості з точки зору виробництва та експорту. Оскільки Україна реалізовувала свій потенціал на цьому ринку з часів своєї незалежності, то країна має репутацію як сильного гравця. Проте триваюча криза, спричинена агресією Росії проти України, створює значні проблеми для сталеливарної промисловості в Україні, впливаючи на виробництво та діяльність і як наслідок на споживання та глобальні логістичні шляхи. Ця реальність підкреслює стійкість і здатність до адаптації, необхідні для навігації в складнощах галузі. Тому адресувати подальші виклики та можливості галузі потрібно якомога раніше та базуючись на ефективних стратегіях розвитку.*

**Keywords:** world steel market, production, consumption, exports, imports, Ukraine.

**Ключові слова:** світовий ринок сталі, виробництво, споживання, експорт, імпорт, Україна.

**Statement of the problem in general and its connection with important scientific or practical tasks.** Steel is one of the most important materials used in various sectors of the economy, such as construction, automotive, machinery and equipment manufacturing, energy and many others. In the modern world, the demand for steel and other metals is so high due to the presence of numerous factories and enterprises. The global steel market has a significant impact on the world economy, so studying its state, trends and challenges is an important task for understanding global economic processes. The world steel production was increased from 1 736 820 to 1 962 328 of thousand tonnes over the period 2017-2021. It undoubtedly identifies the positive dynamics of growth over last years and underlines its importance in world economy. The World Steel Association predicts a moderate 1-2% increase in steel demand for 2023 [8]. Ukraine is one of a leaders in the world in terms of steel production and export. However, Russia's of aggression and war against Ukraine has caused a huge crisis for the economy and all sectors. Major manufacturing of steel has faced a lot of challenges. This makes its importance to analyze Ukrainian positions on the world steel markets according to new realities.

**Analysis of recent research and publications, which initiated the solution of this problem and on which the author relies, the selection of previously unsolved parts of the general problem, which is the subject of this article.** The problem and further development of the market of metals, and especially steel and its products, attracts the attention of many researchers. Such world-known authors like Giuliiodori D., Wilson J., Muslemani H., Kaesehage K., Coccia M. Among Ukrainian studies, it is worth noting the works of Privarnikova I., Bosak A., Khizhnyak O., Dovgan D. and others dedicated to this matter.

**Formulation of the goals of the article.** The purpose of the study is to understand the state and prospects for the development of the global steel market and the market of steel in Ukraine, identify influential factors, analyse market trends, study market prospects and challenges.

**Presentation of the main research material.** Understanding the factors influencing supply and demand in the global steel market is crucial. Economic development, infrastructure projects, automotive industry, consumer demand, political regulations, and trade dynamics impact steel demand. On the supply side, the availability and cost of raw materials, production capacity, technological advancements, trade policies, environmental regulations, demographic factors, and market competition affect steel supply. Several prominent companies in the global steel market include ArcelorMittal, POSCO Holdings Inc., Nippon Steel Corporation, and Baoshan Iron & Steel Co Ltd [5]. Before analysis of Ukrainian place in the steel market and drawing of perspectives to development, it's essential to understand deeper the world dynamics and overall situation in other countries as well. Following we examine the dynamics of production, consumptions, export and import of the major player in the steel market.

The production of steel plays a vital part within the economy. Steel could be a essential fabric that drives framework advancement and development ventures. It gives the quality, strength, and flexibility fundamental for building structures such as buildings, bridges, and streets. Additionally, steel may be a imperative component within the fabricating and mechanical segments, serving as a crude fabric for different businesses counting car, apparatus, apparatuses, and shipbuilding.

Generally, steel generation is basic for cultivating financial improvement and supporting the working of numerous segments inside an economy.

Based on the data provided in the table 1, several trends can be observed in global crude steel production.

**Table 1. Dynamics of crude steel production volumes in thousand tonnes**

Countries	Years						Basic deviation	
	2017	2018	2019	2020	2021	2022	Absolute	Relative, %
USA	81 600	80 607	87 761	72 732	85 791	80 700	-900	-1,1
China	831 700	929 038	995 419	1064 767	1035 243	1013 000	181300	21,8
India	101 400	109 272	111 351	100 256	118 201	124700	23300	23,0
Japan	104 700	104 319	99 284	83 186	96 336	89 200	-15500	-14,8
South Korea	71 100	72 464	71 412	67 079	70 418	65 900	-5200	-7,3
World	1 736 820	1828 495	1877 228	1882 121	1962 328	1878500	141 680	-8,2

*Formed with data from [6]*

During the period under review, China exhibited a remarkable growth rate of 21,8% in crude steel production, solidifying its position as the leading producer globally. The continuous expansion of China's industrial sector, rapid urbanization, and infrastructure development have contributed to this substantial increase. China's dominant role in the global steel market can be attributed to its vast production capabilities and domestic demand. India also witnessed significant growth in crude steel production, with an impressive rate of 23,0%. The country's efforts to support its manufacturing sector, infrastructure projects, and increasing urbanization have fueled the demand for steel. On the other hand, Japan experienced a decline of 14,8% in crude steel production, reflecting challenges faced by its steel industry. Factors such as decreased domestic demand, competition from other Asian economies, and an overall economic slowdown have contributed to this contraction. Similarly, South Korea witnessed a decrease of 7,3% in crude steel production during the reviewed period. Global market fluctuations, intensified competition, and reduced demand from key sectors have impacted South Korea's steel industry. The USA recorded a

modest decline of 1,1% in crude steel production. This marginal decrease can be attributed to factors such as trade policies, market saturation, and fluctuations in the domestic manufacturing sector.

In general, while China and India continue to demonstrate impressive growth, Japan and South Korea face challenges in their steel sectors. The USA maintains a relatively stable performance, while the global steel industry as a whole has experienced overall growth.

The consumption of steel holds extraordinary centrality for the economy. Steel could be a key pointer of financial movement as its request reflects the wellbeing and development of different divisions. It powers the development of buildings, bridges, and transportation systems, driving financial advance and making work openings. Steel consumption moreover drives the fabricating division by serving as a significant crude fabric for businesses like car, apparatus, and machines. In general, the usage of steel serves as a imperative driver of financial development, improvement, and mechanical development. Over the period from 2017 to 2021, China's crude steel consumption growth was the highest at 232,6 million tones. India, on the other hand, showed a decline in consumption, decreasing by 1,3 million tones, which can be attributed to the economic slowdown and the impact of the COVID-19 pandemic. The United States and Japan showed a significant drop in consumption volumes, decreasing by 12,3 million tones and 15,1 million tones. The decrease can be caused by the decline in demand from the sectors such as automotive and construction, as well as the shift towards the use of alternative resources. South Korea, however, showed a positive growth rate in crude steel consumption, increasing by 0,2 million tones over the period. Overall, the world's consumption of crude steel increased slightly by 0,43 million tones over the period, indicating a stable demand for steel despite the challenges [7].

The export of steel plays a crucial role in a country's economy. Steel is a widely traded commodity, and its export contributes to a nation's trade balance and economic growth. Furthermore, steel exports enhance a country's global competitiveness and reputation in the international marketplace. By supplying steel to other countries, a nation can establish itself as a reliable and high-quality provider,

attracting potential trade partners and investors. Increased demand from foreign markets can result in expanded production capacities, job creation, and overall economic development.

China has witnessed a significant increase of 55,5% in steel exports, which can be attributed to various factors such as changes in demand, government policies, or improvements in production efficiency. Similarly, India has experienced a remarkable growth rate of 81% in steel exports, indicating a substantial rise in its export activities. This growth may be influenced by similar factors as China, along with cost-effective production or access to raw materials. Additionally, countries like the USA, Japan, and South Korea have also observed growth in steel exports over the past five years.

The global growth rate for steel exports stands at a strong 49,7%, indicating a growing demand for steel products worldwide driven by economic growth and infrastructure development.

The import of steel holds noteworthy significance for the economy. Steel may be a crucial asset that's not continuously liberally accessible in each nation. Bringing in steel permits a country to meet its residential request, satisfy mechanical necessities, and bolster different divisions of the economy. It makes a difference to bridge the crevice between supply and demand, empowering businesses such as development, fabricating, and framework advancement to proceed their operations easily. It permits companies to source the foremost reasonable steel for their particular needs, upgrading the quality and competitiveness of their items. China has experienced the growth in imports with a percentage increase of 102,72%. This is not surprising given China's position as a global manufacturing hub and its increasing demand for the materials like steel. The imports a percentage has increased up to 35,03% as the US is a major producer of various goods and products, and therefore, it relies less on imports of them. Japan and India have faced moderate growth in imports with percentage increases ranging from 17,34% to 18,59%. This indicates their steady growth in the import sector. South Korea has decreased in imports to 10,99%. In the main, the overall world tendency of import has experienced a percentage growth of 44,03% in the last 5 years from 2017 to 2021.

Setting steel prices involves considering economic, political, and technical factors. Prices can be determined based on production costs and profitability, allowing the market to determine competitiveness. Alternatively, collective agreements, exchanges, and auctions play a role in price setting. Supply and demand significantly impact steel prices. For instance, Indian steel demand increased by 23%, while Europe and the US experienced decreases of 5% and 9% respectively. Political events, such as EU tariffs on steel imports, can also affect prices. Stock exchanges and auctions serve as infrastructure entities for steel trading. International steel exchanges like the London Metal Exchange, the Chicago Mercantile Exchange, and the Shanghai Metal Exchange facilitate futures and options trading. Steel prices have fluctuated in recent years, reaching a peak in 2021 at over \$1,000 USD/MT before declining due to the COVID-19 pandemic and changes in demand. The pandemic led to a 13% drop in global steel prices according to the World Steel Association (fig. 1).



**Fig. 1. Dynamic of steel price 2015-2023, USD/MT**  
*Source: formed with data from [7]*

The recovery of the global economy and increased construction activity may also be contributing to the rise in steel prices. Overall, the steel market is subject to

fluctuations due to various factors, and it is important for industry stakeholders to monitor and respond to these changes to remain competitive in the market. The increase in steel prices may be due to several factors, such as increased demand from China, supply chain disruptions, and rising raw material costs. However, from the beginning of 2022, steel prices began to rise again against the background of the recovery of the global economy and increased demand for this material. So, the understanding the factors influencing steel prices is essential for stakeholders in the steel market.

Based on the average growth rate in the following table we can assume that production and consumption will decline slightly in the next year. Fortunately, export and import of the steel will increase 15% and 9%. All these predictions could be true and turn into reality. However, Russia's war of aggression against Ukraine has caused a huge crisis for our economy and all sectors. Major manufacturing of steel have faced a lot of challenges. According to the Organisation for Economic Co-operation and Development, «ArcelorMittal Kryvyi Rih fully stopped operations in March 2022 due to Russia's full-scale invasion, fortunately small part of it restarted in April 2022. Metinvest Group has been badly impacted by Russia's aggression. According to its report from the second quarter of 2022, its Azovstal plant and its Ilyich plant could not produce crude steel at all in the period. Kamet Steel could produce only 0,45 mmt, a drop of 26% from the first quarter of 2022. As a result, the total production of the company dropped sharply by 77% to 0,45 mmt during the same period. Zaporizhstal produced 1 mmt in the first seven months of 2022, down by 56,3% year-on-year. According to the company, this decline was associated with a shortage of raw materials and logistical problems caused by the war [4].

Table 2 provides a forecast of Ukraine's position on the world steel market, focusing on key indicators such as production, consumption, export, and import. The forecast indicates a challenging period for Ukraine's steel industry in the short term, with significant declines expected in production, consumption, and export. However, there are indications of recovery in the long term, with a gradual increase in production and stabilization of import levels. These forecasts highlight the potential

volatility and uncertainties in the global steel market and the need for effective strategies to address market challenges and leverage growth opportunities.

**Table 2. Forecast of Ukraine's position on the world steel market in thousand tonnes**

Indicator	Chain growth rate					Average growth rate	Expected data for 2022	Expected data for 2023	Expected data for 2024
	2018	2019	2020	2021	2022				
Production	-0,94	-0,95	-3,85	2,50	- 69	-14,448	15162	13039	11214
Consumption	8,33	-13,8	-10,7	16,00	- 65	-13,045	4,4	3,8	3,3
Export	14,65	-12	-11,9	70,83	-65	-0,716	11323378	11323378	10512624
Import	20,49	-8,35	-17	41,40	-35	0,306	1478856	1483381	1487920

*Formed with data from [1, 5]*

Based on the next table 3, it is clear that Ukraine's exchange adjust for steel has expanded by 54,88%, showing higher steel trades compared to imports. The outside exchange turnover has too developed by 49,03%, highlighting the noteworthy part of the steel industry in Ukraine's by and large remote exchange. In any case, the particular share of steel trades in add up to household trades has marginally diminished by 0,07%, suggesting a minor decay within the industry's commitment to Ukraine's by and large sends out. Essentially, the particular share of steel imports in add up to residential imports has diminished by 8,43% in Ukraine's residential showcase. The coefficient of of relative export specialization has diminished by 28,02%, showing a decay in Ukraine's steel exports' competitiveness compared to other nations. This emphasizes the require for the industry to upgrade its competitive edge. On the other hand, the coefficient of intra-industry specialization has expanded by 3,93%, suggesting that Ukraine's steel imports are getting to be more responsive to outside request. By and large, the information illustrates development in Ukraine's steel remote exchange turnover and a positive exchange adjust, but emphasizes the significance of expanding the competitiveness of steel sends out [2].

**Table 3. Analysis of foreign trade volumes of steel in Ukraine**

Indicator	Years					Basic deviation	
	2017	2018	2019	2020	2021	Absolute	Relative, %
Balance of the trade balance	7533115	8570345	7483437	6650952	11667442	4134327	54,88
Foreign trade turnover	9801575	11303629	9988543	8730014	14607136	4805561	49,03
Specific share of exports in the steel total domestic exports	20,0%	21,0%	17,5%	15,6%	19,9%	-0,0001	-0,07
Specific share of imports in the steel total domestic imports	2,29%	2,39%	2,06%	1,93%	2,10%	-0,0019	-8,43
Coefficient of RES	1,23	1,32	1,27	1,12	0,89	-0,345	-28,02
Coefficient of IIS	76,86	75,82	74,92	76,18	79,87	3,019	3,93

*Formed with data from [1, 5]*

The following table 4 reveals that there has been a significant increase in the index of average export prices, which has risen by 23,25% during the 5 years period. The index of average import prices has also increased by 19,77%. The fair trade terms, however, have remained relatively stable, with an increase of only 2,92%. These findings suggest that there is a growing demand for steel exports from Ukraine, which has led to an increase in export prices. On the other hand, the increase in import prices could be attributed to the factors like fluctuations in supply and demand, trade policies, and additional costs. The fair trade terms indicate that Ukraine's steel industry is operating under relatively stable market conditions.

**Table 4. Analysis of the net terms of trade of steel in Ukraine**

Indicator	Years					Basic deviation	
	2017	2018	2019	2020	2021	Absolute	Relative, %
index of average export prices	140,2	116,3	88,7	91,6	172,8	32,6	23,25%
index of average import prices	121,9	115,2	94,2	94	146	24,1	19,77%
fair trade terms	1,15	1,009	0,942	0,974	1,184	0,034	2,92%

\*Made by the author based on the data [1, 5]

**Conclusions and prospects for further research.** In this study, we evaluated the dynamics of steel production, consumption, exports, and imports on a worldwide scale, as well as the variables affecting the steel market. Demand for steel is quite strong, with China being the main manufacturer and exporter. While emerging nations use more steel, Europe and North America use less of it. The development of technology, governmental regulations, and shifting customer preferences will determine the direction of the steel business. While it's anticipated that China and India will continue to rule, other nations' market shares could change. In order to remain competitive and meet consumer demands, producers must make investments in innovative technology. For the sector to succeed, innovation and sustainable practices are essential.

With regard to Ukraine, it is a significant producer and exporter of steel, known for its high-quality goods and affordable manufacturing prices. Turning our attention to Ukraine, it plays a significant role as a major steel producer and exporter, renowned for its high-quality products and competitive manufacturing costs. However, the domestic consumption of steel in Ukraine is relatively lower compared to its exports. The industry faces challenges, including operational issues and intense competition. Nevertheless, there is immense potential for growth and expansion in the global market. Ukraine must address these challenges by focusing on operational improvements, embracing innovation, implementing sustainable practices, and strategically selecting export markets to maximize its potential. By capitalizing on its inherent strengths, enhancing competitiveness, and fostering a culture of innovation and sustainability, Ukraine can position itself as a dominant player in the global steel industry. This will not only elevate its standing in the international steel market but also pave the way for improved economic prospects. The findings of this research highlight the importance of leveraging advantages, embracing innovation, and prioritizing sustainability to propel Ukraine's success in the steel industry.

## Література

1. Державна служба статистики України. URL: <https://ukrstat.gov.ua/> (дата звернення: 12.07.2023).
2. Янів, Л. М., Приварникова, І. Ю. Розвиток світового ринку сталі та перспективні закордонні ринки для підприємств чорної металургії України, *Науковий вісник Херсонського державного університету. Сер.: Економічні науки*, 2016. 21 (2), С. 130-133.
3. Global Steel Market Outlook. CUMIC Steel. URL: <https://www.cumic.com/2023-global-steel-outlook-report.html> (дата звернення: 12.07.2023).
4. GMK Center. «Запоріжсталь» протягом 2022 року працювала на 50% потужності через логістичні обмеження. URL: <https://gmk.center/ua/news/zaporizhstal-protyagom-2022-roku-pracjuvala-na-50-potuzhnosti-cherez-logistichni-obmezhennya/> (дата звернення: 12.07.2023).
5. Teampacesetter. The Economics of Steel: 4 Factors That Affect Steel Demand, URL: <https://teampacesetter.com/blog/the-economics-of-steel-4-factors-that-affect-the-industry/> (дата звернення: 12.07.2023).
6. Trade Map. Trade statistics for international business development. URL: <https://www.trademap.org/> (дата звернення: 12.07.2023).
7. Trading Economics. Steel Data, URL: <https://tradingeconomics.com/commodity/steel> (дата звернення: 12.07.2023).
8. World Steel Association. URL: <https://worldsteel.org/media-centre/press-releases/2022/december-2021-crude-steel-production-and-2021-global-totals/> (дата звернення: 12.07.2023).

## References

1. State Statistics Service of Ukraine (2023), “Foreign economic activity”, available at: <https://ukrstat.gov.ua/> (Accessed 12 July 2023).
2. Ianiv, L. M. and Pryvarnykova, I. Yu. (2016), “Development of the global steel market and promising foreign markets for Ukrainian ferrous metallurgy

enterprises”. *Naukovyi visnyk Khersonskoho derzhavnoho universytetu. Ser.: Ekonomichni nauky*, vol. 21 (2), pp. 130-133.

3. Global Steel Market Outlook (2023), “CUMIC Steel”, available at: <https://www.cumic.com/2023-global-steel-outlook-report.html> (Accessed 12 July 2023).

4. GMK Center (2022), “Zaporizhstal” operated at 50% capacity during 2022 due to logistical constraints”, available at: <https://gmk.center/ua/news/zaporizhstal-protyagom-2022-roku-pracjuvala-na-50-potuzhnosti-cherez-logistichni-obmezhennya/> (Accessed 12 July 2023).

5. Teampacesetter (2023) “The Economics of Steel: 4 Factors That Affect Steel Demand”, available at: <https://teampacesetter.com/blog/the-economics-of-steel-4-factors-that-affect-the-industry/> (Accessed 12 July 2023).

6. Trade Map (2023) “Trade statistics for international business development”, available at: <https://www.trademap.org/> (Accessed 12 July 2023).

7. Trading Economics (2023), “Steel Data”, available at: <https://tradingeconomics.com/commodity/steel> (Accessed 12 July 2023).

8. World Steel Association (2021), “December 2021 crude steel production and 2021 global crude steel production totals”, available at: <https://worldsteel.org/media-centre/press-releases/2022/december-2021-crude-steel-production-and-2021-global-totals/> (Accessed 12 July 2023).

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