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## PLACE OF UKRAINE ON THE WORLD STEEL MARKET

**Introduction.** Effective export is one of the key strategic factors of economic development of a country during the globalisation process. The creation of a stable export mechanism is one of the most important tasks on the way of integration of Ukraine into the world economy. This depends on the local enterprises' ability to produce and sell goods that suit the demands of the world market in terms of quality, price and service. Creating and strengthening exporting potential adequate to the demand of the national economy is becoming a key form of stimulating intraregional development of various industries.

Since the steel-casting industry of Ukraine provides over 30% of goods export and over 20% of foreign exchange earnings, it can be considered the export-forming sector of the economy and mostly determines its export potential; thus the problem of improving the export activity of its enterprises is an urgent one.

The goal of this article is to study the current market conditions on the world rolled steel market, defining Ukraine's place in it, and suggesting ways of improving the export activity of the steel-rolling complex. In order to do that, we explore its trade and industrial segmentation; analyse world data and study the geographical structure of world steel trade; follow the price dynamics of the product; outline the characteristics of the steel-casting industry of Ukraine and suggest recommendations on improving the foreign economic activity of smelting businesses on the national level. The object of the research is the process of Ukraine's integration into the world economy through the steel market.

**World Steel Market.** Speaking about the raw iron ore deposits in general, those are located around the world on all main continents and have about 80 billion tonnes of pure iron in total. Ukraine, whose deposits consist of about 30 billion tonnes of iron ore with 9 billion tonnes of pure iron, is currently number one in this category, having almost 18% of world's total (see Fig. 1).

An important index for production purposes is the percentage of pure iron in iron ore, which defines the actual potential of steel production in a given country. Ore is considered rich if it has at least 57% of iron; and for poor ores, the minimum value is 26%. Richest ores

are located in Russia, next in this list come Brazil, Australia and Ukraine.

The largest producer, importer and consumer of raw iron ore is China. In terms of production, it is followed by Australia, Brazil and India (see Fig. 2).

Three largest iron ore companies are the Brazilian Vale and Anglo-Australian Rio Tinto and BHP Billiton, who together are in charge of a quarter of all iron ore mining and over 60% of its sea shipping.

Fig. 3 shows the division of export and import of iron ore in the world.

In Ukraine, in 2010, 72 million tonnes (3% of worldwide total) iron ore was produced. In 2011 and 2012 it was 81 million tonnes. With that, Ukraine is world's sixth iron ore producer, contrasting with it being fourth by the total volume (accounting for pure iron content). Ukraine's production levels are significantly below its initial potential.

Every year the world produces over two billion tonnes of iron ore, from which 61% is turned into steel (while the other 39% into cast iron). Aside from the drop in 2009 due to the world financial crisis, the production of steel has been steadily increasing over the past years by up to 5% per year [2], reaching the all-time high of 1,548 megatonnes of crude steel output in 2012 [3]. During all this time, Asia has been the unchallenged leader in volume of production (Fig. 4).

The countries with the largest volume of steel production have been relatively unchanged over the recent years. China is firmly in the first place, outpacing second-place Japan by six times their production volume, and has the highest rate of increase in this respect (15,7% in 2011; second-place Turkey has 10,5%). See Fig. 5 for the comparison of world's twenty top steel-producing economies.

In line with the increase in the volume of production, the production capacities are increasing as well, as is their level of utilisation, which is a good safeguard against an excessive capacity crisis that occurred on the world steel market in 2009. In 2010, this level increased from 84.4% to 86.5%; and to 88.1% in 2011. The production capacities have grown by 5.5% from 2009 to 2010 and by additional 1.1% the following year [4, p. 3].

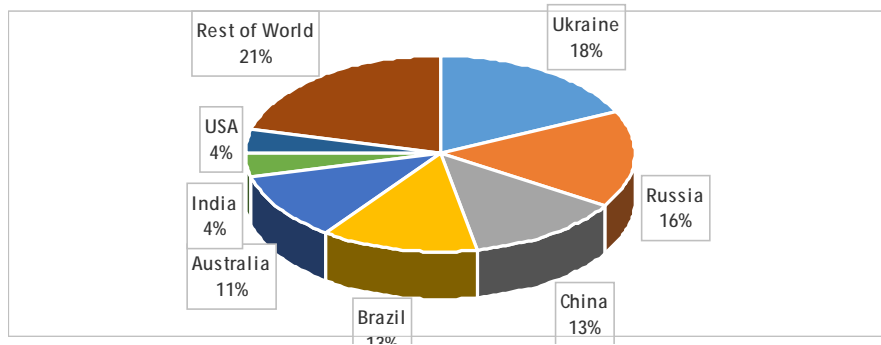


Fig. 1. Iron ore deposits by country [1]

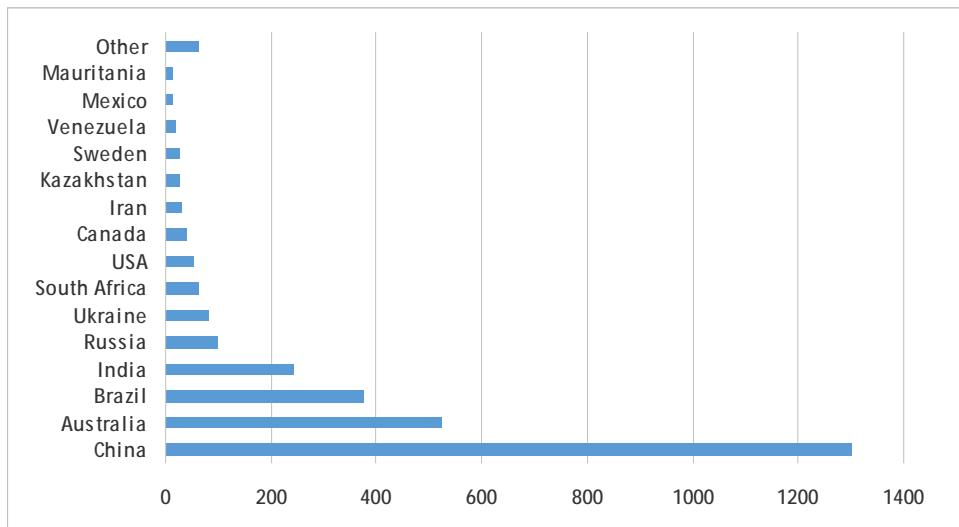


Fig. 2. Iron ore production by country in 2012, millions of tonnes

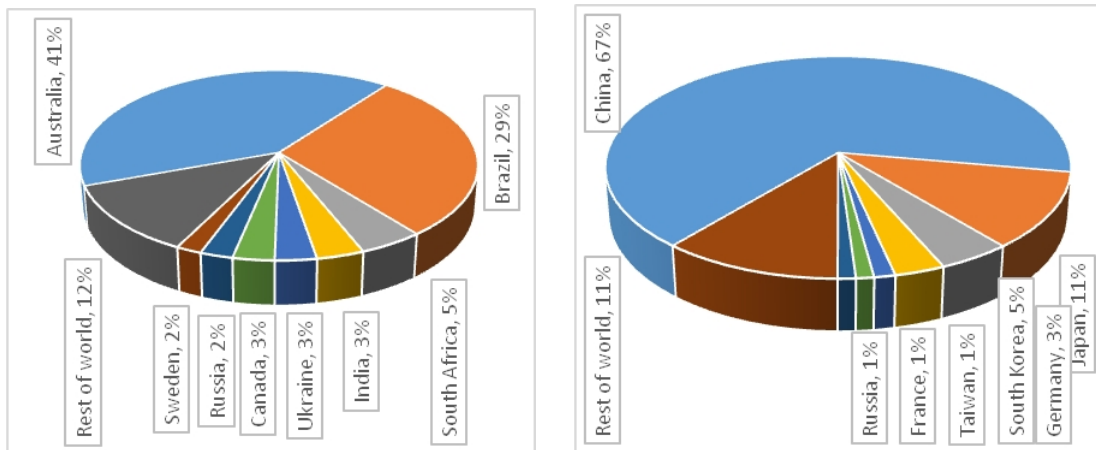


Fig. 3. Iron ore export (left) and import (right) by country, %

It is worth looking in greater detail at some of the key world economies in the steel production. For example, in Germany, according to the German Steel Federation, for the past two decades the production of cast iron has

held at about 30 million tonnes per years and steel at about 45 million tonnes per year. In the United States, during the world crisis 29 steel companies with a total capacity of 67 million tonnes went bankrupt, most large

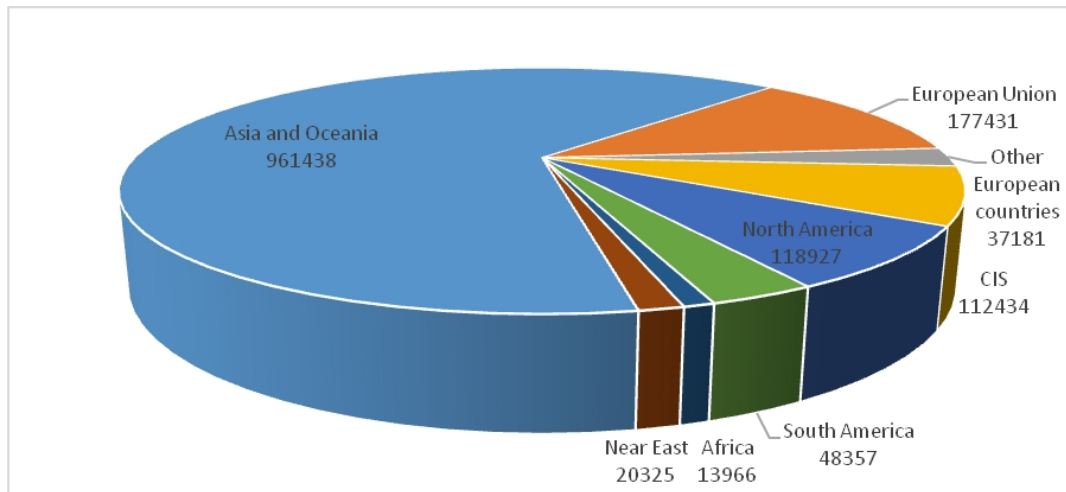


Fig. 4. Steel production segmentation in 2011, thousands of tonnes [2]

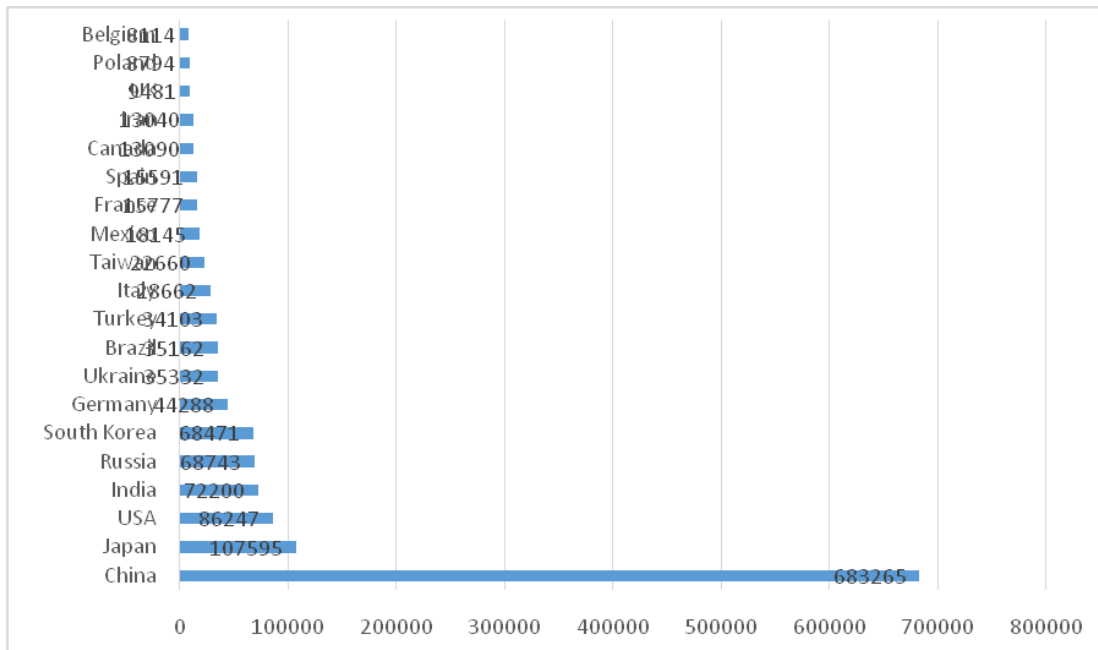


Fig. 5. Main steel producers in 2011, thousands of tonnes [2]

integrated firms. Consequently, the volume of steel production has fallen by 47% in 2009 compared to the previous year. Currently it is on the rise again, but still has not reached the pre-crisis levels [5].

Speaking of Japan, it is important to note its special geographic situation, specifically, the island location and the almost complete lack of energy sources and raw iron ore. Despite that, due to the traditionally high level of technological provision of all levels of metallurgy and constant orientation towards industrial development and maintaining national interests, it currently holds the second place in world steel production. Japanese steel industry,

same as most of the Japanese economy, is characterised by deflation process.

India often faces the problem of attracting foreign investment; it receives only about 2% of the world amount of direct foreign investment into developing countries. There are also problems with actual implementation of the investment projects, often due to impossibility of purchasing land for construction, as locals often protest selling Indian lands to foreigners, as they perceive it. Due to this, many “greenfield” projects of building new plants from scratch, such as 2007 projects announced by Arcelor Mittal and Posco, have failed. Instead, a safer bet now

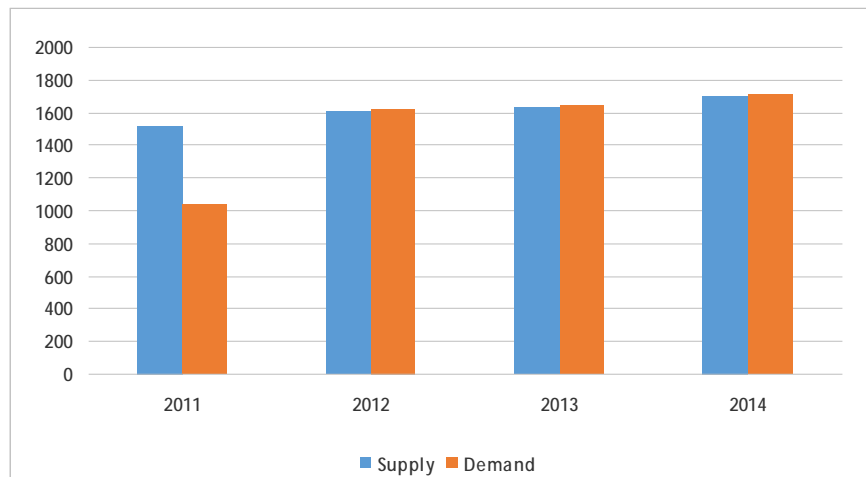


Fig. 6. Actual and projected world supply and demand, millions of tonnes

are the “brownfield” projects, which essentially mean either upgrading and improving current steel factories, or rebuilding and repurposing older establishments. For instance, the largest Indian steel producer, Steel Authority of India Limited, has been using this strategy for some time, getting permits to use closed and unused plants and factories for their needs [6]. A huge advantage and significant potential for Indian steel industry lies with its vast iron ore resources, relatively cheap electric energy, cheap and reasonably qualified workforce and often easy access to sea ports.

In Latin America, Brazil is the leader in many indicators, including steel production, where it comprises about 70% of the region. Like India, it faces somewhat similar difficulties, especially in attracting foreign investment [4, p. 3]. South Korea is another important player in the steel production, but it is specific in that its territory has rather poor iron ore deposits. Most of raw ore for the production is bought from South African countries. Korea also is doing geological surveys and developing deposits in Australia, Vietnam, Mongolia and Ethiopia [7].

In Russia, steel production takes about 10% of its industry and consists of over 1,500 firms, 70% of which are urban development enterprises. The total production volume is about 70 million tonnes, over 80% of which comes from seven large companies [8, p. 55]. Russia has the largest confirmed iron ore deposits, mostly in the European part of the country. The single largest deposit is the Kursk Magnet Anomaly.

China with its 45% share of the world steel market is worth a mention, too. In this country, over 60% of metallurgy are held by the state. Its inclusion in the WTO pushed the government to great spending on development of industry and infrastructure, which served as a base for China's intensive economic development. One of the

main reasons of China's joining the WTO was its desire to increase the influence of APEC countries on the world economy [4, pp. 38 – 39]. Increase in own production has gradually forced China to begin importing raw ore. Having significant deposits of their own, China are currently the largest importer of iron ore in the world.

**The Geography of World Steel Trade and Price Analysis.** First of all, it is important to note that trade of primary forms of steel is insignificant; in 2010 it was just over one million tonnes. Main buyers of such steel are Jordan (19%), Dominican Republic (13%), Denmark (9%), and Macedonia (7%) [8, p. 26]. The main segment of trade are iron and non-alloy steel.

At the end of 2011, world supply of steel was 1,515 million tonnes while demand was 1,036 million tonnes. Actual and projected supply and demand data can be seen in Fig. 6. Most trading is done in the USA (21%), South Africa (14%), Bulgaria (11%) [8, p. 27]. Most consumption of steel production is observed in Asia, where, of course, is the world's single largest consumer China. Also high level of steel consumption, as well as high rate of increase in it, are present in Japan, India and South Korea.

The price dynamics for steel reflected overall trends, falling lower than 350 US\$/tonne in early 2009. Since then, steel price has been increasing up to the maximum of 595 US\$/tonne in April 2010, but fell within a few months to 400 US\$/tonne reflecting the threat of defaults and budget problems in several European countries. After that, there has been a steady growth again, up to a maximum of 812 US\$/tonne in February 2012. Currently, as of February 2013, the composite world steel price is at 736 US\$/tonne [9].

The total volume of world rolled steel trade has decreased by 36% to 269 million tonnes in 2009, which caused a worldwide crisis. The price tendencies on various rolled goods have been following the general

pattern of ferrous metals prices, albeit with some lag. In 2011, consumption of rolled steel goods increased, mostly due to activity of distribution companies in Europe and USA that were replenishing their stocks depleted during the depression of the previous couple of years, caused by the financial crisis, the crisis of building industry in Europe, etc. In the Near East, however, the demand for those goods was still low, mostly due to political instability in a number of countries, including Tunisia, Egypt, Algeria, Jordan and Libya. These, and other, countries sustained direct losses to their industrial complex because of military and guerrilla warfare; and it repelled many potential foreign investments. Although many industrial companies keep their production programs running, they tend to keep their stocks low and rarely place large orders.

Metallurgical industry of Egypt, one of the largest rolled steel consumers of Near East, is currently on the verge of collapse because of political instability. Local companies find it almost impossible to export their production and are thus unable to fulfil their promises to their partners. CIS countries, being main importers to the region, are stopping their shipments, afraid of losses [10].

On the other hand, Turkey is now offering some of the highest prices for the rolled steel produce, even despite a small price drop compared to 2011. Also import prices are increasing in China (mostly due to high demand in the car industry) USA, Japan and India. In Europe, imports of rolled steel have been falling due to an increase in price from both local and Russian producers. This instigated a noticeable move towards Ukrainian exporters who keep price at previous lower levels.

In general, currently the number and relative position of countries importing and exporting rolled steel remains unchanged. China is the leading importer, followed by Germany, South Korea and Italy, all of whom (except China) significantly reduced imports during 2011. As for export, the largest exporter of rolled steel is currently Japan (10%), followed by USA (9%), Russia (6%) and Ukraine (5%) [8, p. 54].

**Metallurgical Industry of Ukraine.** Mining and metallurgical complex of Ukraine is the second largest among the CIS countries for the production of ferrous metals. In 2010, it produced 37% of CIS's iron, 34% of steel and 27% of rolled steel goods [11, p. 14]. In recent years up to 80% of goods produced by Ukrainian steel companies has been exported: semi-finished goods, finished rolled goods including flat hot-rolled and cold-rolled coils and sheets, rails, rebar and wire rod, rolled sections and products for further redistribution – steel pipes, wire products, coated steel, etc. That the country has a number of major steel plants allows it to occupy a significant position among global steel producers. At the

end of 2011, Ukraine ranked 8th in the world in steel production.

Steel production has always been a leading industry of Ukraine. Volumes of production provide more than 20% of GDP. In the export structure, steel and its products have always occupied an important place. With the rising price of steel and steel products in the world market in 2011, due to increase in volume of sales to the EU steel brought over 32% of all foreign exchange income in the country.

Increased activity in international markets allowed Ukrainian steel companies to significantly increase their exports in 2010 – 2011 by 6,1%, up to 21.9 million tonnes. The increase in exports of steel products was for several reasons, one of which was the growth of the supply of long rolled products (rails) in the regions of the Caucasus and Central Asia, where there is an increased demand for these products. At the same time, there has been a significant decrease in exports of long products to Russia. In the flat production sector, however, there is currently an increase in activity on the markets that are key consumers of Ukrainian produce. This led to an increase in prices. In its turn, there is expected an increase in demand from Russia due to their preparations for the football World Cup in 2018. It is expected that steel consumption will increase by 1 – 2%, or 3 – 5 million tonnes. At the same time, trade limitations on supplying this region with Ukrainian produce can become a problem. It is worth noting that 75% of all metal produce exported to the CIS from Ukraine is for Russia. In addition, Qatar, which hosts the 2022 World Cup, is another possible market for our metallurgy. Its government are planning to renovate three existing stadiums and build nine new ones. They are also planning an underground train line with the length of 320 km.

The effect of “the Chinese factor” led to the Chinese metal produce market closing for Ukraine. While in 2004 Ukraine exported over 2.1 million tonnes of metal to China, in 2008 it was only 10 thousand tonnes, and since 2009 China completely stopped importing Ukrainian steel.

One of the few markets that remain (mostly) stable consumers of Ukrainian metal during and after the crisis are the countries of the Near East, to which goes 18.5% of total export, making it the second, after the EU, market in this respect. That market is also expanding fast and is currently on the rise, allowing new perspective for cooperation with Ukraine in the area of metallurgy. It is expected that the recovery processes in Lebanon, Iraq, Gaza Strip and the building boom in Algeria will increase imports of Ukrainian produce, specifically, long rolled products for construction purposes.

The largest companies of the Arabian Iron and Steel Union (AISU, thirteen countries that together hold over

90% of steel production in Arabic countries) are concentrated in Egypt, which is where a significant part of Ukrainian export has been heading. This is caused by high rate of development of Egypt's economy (up to 6% per year), which, naturally, helped increase the demand for metal produce on local markets. Recently, however, due to political and social instability caused by the revolution, as we already mentioned before, trade has diminished as Egyptian companies switched to their own stocks instead of buying new produce. Export of Ukrainian rolled metal goods there fell by 15.8%. It also reduced in Tunisia (16.1%), Syria (31%), Morocco (34.9%), Mauritania (41.4%), Algeria (48.3%) and Bahrain (90.1%). At the same time, Ukraine's export in other Arabic countries has increased, most notably Iraq (7.4 times) and Qatar (10.7 times), as well as Saudi Arabia (34.2%) and Jordan (22.3 %) [12].

In general, Ukraine has been expanding its cooperation with Arab countries in recent years. In 2011 alloyed steel export increased by 89.1%, and cold-roll flat-rolled products by 14.5%, although some reduction in exports of other types of produce has also taken place. There is a number of reasons behind this expansion, specifically: [13, p. 67]

- Fast economic development of the AISU countries;
- The markets in the AISU countries are both capacious and unsaturated; thus there are enough market niches still not occupied by other world steel producers;
- Domestic market of the Arab countries is not fully provided with steel produce, especially production of high-added products, enabling Ukrainian steel producers to increase exports to the region.
- Increase in implementation of infrastructure projects in AISU countries increases their demand for steel products.
- Consolidation processes with foreign companies in the steel industry are strengthening, offering the prospect of Ukrainian-Arab vertically integrated companies.

In connection with the prospects of the Arabic market for our metal producers, the cooperation between the AISU and the Ukrainian Association of Ferrous Metallurgy.

One other prospective route of cooperation between Ukraine and the AISU is attracting Arab investors to modernise the companies of our mining complex using Arab investment funds. For Ukraine this means influx of much-needed financial resources for modernising and developing this sector of economy; for the AISU this means participation in the internationalisation processes and protection of domestic economies from excessive money supply that would cause inflation and overheating of the economy.

**State Conception of Development of Ukrainian Steel Complex.** Increasing competition on the world

markets requires timely reaction to technical, economic and informational changes that are taking place, by making decisions and implementing solutions on both corporate and government levels. For successful functioning, Ukrainian steel firms must account for world tendencies in metallurgy development, such as [14]:

- Increase in competition during steady fall in the rate of increase of metal consumption;
- Increase in requirements to metal production quality.
- Prioritised development of steel-making technologies in order to create flexible and highly effective technological complexes and modules.

Main gap in Ukraine's steel industry is the equipment that is commonly used. It is often borderline decrepit, and very outdated. Additionally, raw material is often of low quality and is not supplied reliably. Consumption on domestic markets is rather low, Ukrainian financial system is ineffective and energy sources are not readily available. In recent years, China started encroaching on traditionally Ukrainian markets by increasing their production and reducing prices. By doing so, Chinese companies will be able to completely push Ukraine out of Asian markets.

To retain its place in the world's top eight steel producers, Ukraine needs to take urgent action and lower prices in order to maintain a competitive edge. For that, a complex analysis of cost prices has to be done in order to find roads to lower prices. Innovative changes in technology and production and constant increase in quality and assortment of production are also required. By analysing world steel product markets and defining demand patterns producers are able to determine the qualities that give competitors' products advantage over Ukrainian exports.

There is a number of ways of developing export activities of steel companies [15]:

- Increasing the capacities of companies located near seacoast. Such companies have easier access to imported raw materials and energy sources, as well as cheaper option of delivering export goods. Such convenient location is always a good booster to steel mills and primary production plants, as evidence by a strong tendency towards locating such enterprises at sea and lake coasts in the United States and seacoasts in Western Europe. Heavy development of ferrous metallurgy in Japan and South Korea has also strongly influenced by developing higher production capacities in regions close to large industrial ports [16].

- Development of new markets and expansion of existing ones, attracting new consumers of steel production by, as already mentioned, increasing its quality, proper certification, active marketing, creating shared international trading firms.

- Outsourcing steel production to developing countries using transnational corporations, which can give significant financial advantage. This is one of the key reasons why countries like Brazil, Mexico, Argentina, South Korea, Taiwan and Turkey are among the leaders in cast iron production [16].

- Creating small and medium sized plants, as there is a clear tendency for decrease in demand for large volumes of homogeneous metal mostly due to technological advances.

- Building vertical inter-sectorial complexes incorporating both domestic and foreign firms using private and state capital with orientation towards highly technological production.

To increase sales effectiveness it might be a good move to go from centralised sales management to custom manufacturing, integrating the production cycle with end consumer. This means changing the production process making “addressed consumption” on the market a higher priority than industrial product output.

Ukrainian industrial development strategy for the period until 2017 notes that in order to create the basis for moving on towards post-industrial economics the rate of production development in the steel complex will be slowly decreasing compared with the sped-up development of high-tech production. Priority has to be given to technological improvement and technical retooling of the main steelmaking processes using resource-saving and ecologically clean technologies, specifically: [17]

- Modernisation of enriching sinter productions and higher quality of raw materials preparation;

- Improvement of secondary treatment plants and continuous steel dispensing machines.

- Using new kinds of energy carriers in blast furnaces.

It is important to create fitting conditions for speeding up the process of diversification of production and optimisation of its structure by increasing output volumes for new production types. There is also a strong need, especially from ecological point of view, for improving schemes for development of natural mineral reserves.

Thus, in order to solve the export problems on the state level, it is important to determine main directions of development of steel industry, implement corrections to the industrial innovation policies, create effective state export strategies and export promotion programmes.

**Conclusions.** World financial crisis of 2008 influenced main tendencies on the world steel markets, causing noticeable fall in steel production in almost all countries. Only Asian and some Near East countries showed growth in that respect. Starting from the end of 2009, however, there has been positive dynamic in steel

production and growth in volumes of sales. Turkey, South Korea and Italy showed largest growths in terms of steel production.

Ukraine, along with other top steel producing countries, kept its positions, though it was also hit hard by the crisis that caused significant reduction of production. Although Ukraine is holding steadily in its eighth place by production, its higher production costs (10 – 15% higher than in Russia and 24 – 27% higher than in China) creates obvious difficulties on the competitive market. Along with that, competitive pressure is constantly growing and the problem of outdated production equipment is becoming more and more noticeable.

Thus, it is apparent that managing production costs and optimal financial management are key questions in managing foreign economic activity of a steel company. Currently there are often separate money flows in domestic and foreign currency in most companies, which is creating additional difficulties.

Following areas of solutions to problems of export activities of Ukrainian metallurgical enterprises were identified:

- Reducing product prices;
- Organising the development of new markets and expanding existing ones;
- Improving the organisation of export management;
- Non-centralised structure of sales management;
- Transition to custom production.

The analysis of the state of the steel complex suggests that the rate of production will gradually slow down compared to the rapid development of high-tech industries. Therefore, Ukraine needs to implement modern production technologies in order to export high-quality end product. This, however, requires significant financial inputs. Thus financing of the whole steelmaking industry is currently one of the key problems.

In the long-term strategic direction of development of the steel industry of Ukraine there should be systemic restructuring of the industry with a focus on the situation on both domestic and international markets. The building of metallurgical complex and infrastructural objects capable of increasing export potential of the industry must continue. Prospects of development of Ukrainian metallurgy are closely associated with increased competitiveness by reducing energy and materials consumption and labour costs, introducing of scientific and technical progress. The interest of steel mills in Ukraine in the implementation of all this hard work must be stimulated with appropriate income taxes, comprehensive support from the government aimed at development of production, implementation of advances in scientific and technical process, use of innovations.

### References

1. **United States Geological Survey**, available at: <http://usgs.gov/>
2. **World Steel Association**, available at: <http://worldsteel.org/>
3. “**World crude steel output increases by 1.2% in 2012**” Press release by the World Steel Association.
4. **Козлов А. В.** Мировое производство и глобальный рынок стали / А. В. Козлов // Производство проката. 2011. – № 11. – С. 33 – 45.
5. **American Iron and Steel Institute**, available at: <http://steel.org/>
6. **Steel Government of India**, available at: <http://steel.nic.in/>
7. **Metal market news**, “Metaltorg” trade system, available at: <http://metaltorg.ru/>
8. **Рынок черных металлов 2011: сталь и прокат** // Металлургические исследования, 2011. – Режим доступа : <http://metalresearch.ru/>
9. **World Steel Prices rate aggregator**, available at: <http://www.worldsteelprices.com/>
10. **2011 flat roll market analysis**, available at: <http://metalindex.ru/>
11. **Обзор чёрной металлургии Украины** // Инфо Майн, 2011. – 127 с.
12. **Ukrainian Association of Steelmakers**, available at: <http://uas.su/>
13. **Ермакова О.** Развитие украинского экспорта металлопродукции в страны Арабского союза чугуна и стали / О. Ермакова, В. Осипова // Экономика Украины. – 2009. – № 12. – С. 62 – 68.
14. **Чентуков Ю.** Интеграция Украины в мировое пространство на примере металлургической отрасли Донецкого региона / Ю. Чентуков // Экономист. – 2005. – № 6. – С. 60 – 63.
15. **Буркинский Б.** Инновационный уровень производства и конкурентоспособность чёрной металлургии Украины / Б. Буркинский, С. Савчук // Экономика Украины. – 2007. – № 4. – С. 4 – 15.
16. **Шутаева Е.** Реализация экспортного потенциала металлургического комплекса Украины в контексте развития мирового рынка металлов / Е. Шутаева // Экономика и управление. – 2011. – № 24. – С. 246 – 257.
17. **Якубовский Н.** Концептуальные основы стратегии развития промышленности Украины на период до 2017 г. / Н. Якубовский // Экономика Украины. – 2007. – № 11. С. 4 – 21.

**Костенко І. В., Висоцький А. Є., Попович Г. С.**  
**Позиціонування України на світовому ринку сталі**  
 Це дослідження присвячене опису світової та

української продукції, що відноситься до ринку сталі. У дослідженні розглядаються основні характеристики ринків сталі та прокату такі, як оцінка об'єму виробництва, споживання і прогноз розвитку. Робота містить характеристику ринку прокату в умовах світової фінансової кризи, а також основні дані подій у світовій сталій промисловості.

*Ключові слова:* сталь, прокат, залізна руда, виробничі потужності, експортер, імпортер, сировинна база.

**Костенко І. В., Высоцкий А. Е., Попович А. С.**  
**Позиционирование Украина на мировом рынке стали**

Настоящее исследование посвящено описанию мировой и украинской продукции, относящейся к рынку стали. В исследовании рассматриваются основные характеристики рынков стали и проката, включая оценку объема производства, потребления и прогноз развития. Данная работа содержит характеристику рынка проката в условиях мирового финансового кризиса, а также основные данные по событиям в мировой стальной отрасли.

*Ключевые слова:* сталь, прокат, железная руда, производственные мощности, экспортер, импортер, сырьевая база.

**Kostenok I. V., Vysotskyi A. Ye., Popovich G. S.**  
**Place of Ukraine on the World Steel Market**

This study covers the description of the world and Ukrainian products related to the steel market. The study examines the main characteristics of steel and rolled metal markets, including the production volume, consumption and development forecast. The paper contains a description of rolled metal market during the global financial crisis, as well as basic information about developments in the global steel industry.

*Key words:* steel, rolled metal, iron ore, production capacity, exporter, importer, raw materials base.

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