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INVESTIGATION OF THE CONJUNCTURE ON THE MARKET OF THE GLOBAL METAL PRODUCTS MARKET<http://orcid.org/0000-0001-6014-9999>

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Larysa Kapranova, Investigation of the conjuncture on the market of the global metal products market

The article displays scientific and methodical character. It represents an attempt to define fluctuations of the conjuncture fluctuations on the international market of metal production. It is found that market fluctuations that occur on the international market of metal production are caused by several factors –such as globalization, shifts of the world leaders in manufacturing and export of metal production, process improvement, the necessity to manufacture high-tech steel grades, globalization of markets and production factors etc. It is also found that transformational process have now become an important factor of development of the worldwide business links. HHI for the world market of metal production was calculated. The international metal production market proved to be quite concentrated as its HHI has remained to be >1800 for nearly a decade. HHI dynamics for 2007 – 2016 is presented. The current tendency of manufacturing metal production appears to be negative. In the years of 2007-2016 the world output of metal production dropped. The reasons of that are the following: the world's economic crisis, growth of the goods; manufactured of substitutes. which are to replace the goods previously manufactured of metal; drop in construction volume; general overproduction in this branch of industry. It was determined that under conditions of the world's economic crisis it was necessary to develop a concept for development of the native iron and steel industry that could predict: reduction of dependence on export, due to development of metal consuming industries of branch in Ukraine (shipbuilding, aviation engineering, machine building); ensuring manufacturing of high tech steel grades that are of higher demand on the market, application of technologies, capable of diminishing dependence on expensive energy carrier; technical modernization of the branch with objective of diminishing negative environmental consequences.

Капранова Л.Г. Кон'юнктурні дослідження світового ринку металопродукції

Стаття має науково-методичний характер. В статті зроблено спробу визначити коливання економічної кон'юнктури на міжнародному ринку металопродукції. Встановлено, що кон'юнктурні зміни, що відбуваються на міжнародному ринку металопродукції зумовлені багатьма факторами – такими як глобалізація, зміна світових лідерів у виробництві та експорті металопродукції, технологічний прогрес, необхідність виробництва високотехнологічних марок сталі, глобалізація ринків факторів виробництва та ін. Встановлено, що трансформаційні процеси на сучасному етапі перетворились на важливий фактор розвитку світогосподарських зв'язків. Розраховано ННІ для міжнародного ринку металопродукції. Виявлено, що міжнародний ринок металопродукції є доволі концентрованим, бо на протязі майже 10 років ННІ >1800. Наведено динаміку ННІ за 2007 – 2016 рр. Виявлено, що тенденція виробництва металопродукції має негативні тенденції. Тобто за період з 2007 – 2016 роки в світі виробляється все менше металопродукції. Такий стан пояснюється наступними чинниками: світова економічна криза; збільшення виробництва товарів субститутів, які замінюють товари що раніше вироблялись з металу; зменшення обсягів будівництва; виробництво товарів з металопродукції привело до перевиробництва і цій галузі. Визначено, що в умовах світової економічної кризи необхідно розробити концепцію розвитку вітчизняної металургійної галузі, яка має передбачати: зниження експортозалежності через розвиток в Україні металоспоживаючих галузей (корабле-, авіа-, машинобудування, будівельна промисловість); забезпечення випуску високоякісних марок сталі, які і в умовах кризи мають попит на ринку; використання технологій, які дозволяють зменшити залежність від дорогих енергоносіїв; технічне переобладнання галузі з метою зниження негативних екологічних наслідків.

Капранова Л.Г. Конъюнктурные исследования мирового рынка металлопродукции

Статья носит научно-методический характер. В статье сделана попытка определить колебания экономической конъюнктуры на международном рынке металлопродукции. Установлено, что конъюнктурные изменения, происходящие на международном рынке металлопродукции обусловленные многими факторами - такими как глобализация, изменение мировых лидеров в производстве и экспорте

металлопродукции, технологический прогресс, необходимость производства высокотехнологичных марок стали, глобализация рынков факторов производства и др. Установлено, что трансформационные процессы на современном этапе превратились в важный фактор развития мирохозяйственных связей. Рассчитано ННИ для международного рынка металлопродукции. Выявлено, что международный рынок металлопродукции является довольно концентрированным, так как на протяжении почти 10 лет ННИ > 1800. Приведена динамика ННИ за 2007 - 2016 гг. Выявлено, что тенденция производства металлопродукции имеет негативные тенденции. То есть за период с 2007 - 2016 годы в мире производится все меньше металлопродукции. Такое положение объясняется следующими факторами: мировой экономической кризис; увеличение производства товаров-субститутов, заменяющих товары ранее производившиеся из металла; уменьшение объемов строительства; производство товаров с металлопродукции привело к перепроизводству в этой области. Определено, что в условиях мирового экономического кризиса необходимо разработать концепцию развития отечественной металлургической отрасли, которая должна предусматривать: снижение экспортозависимости через развитие в Украине металлопотребляющих отраслей (корабле-, авиа-, машиностроения, строительной промышленности); обеспечение выпуска высококачественных марок стали, которые и в условиях кризиса пользуются спросом на рынке; использование технологий, которые позволяют уменьшить зависимость от дорогих энергоносителей; техническое перевооружение отрасли с целью снижения негативных экологических последствий.

Setting up the problem. Market fluctuations, that occur on the international market of metal production are caused by several factors, such as : globalization changes of the world leaders in manufacturing and export of metal production, process improvement, the necessity to produce high tech steel grades, globalization of markets and manufacturing factors et al. Market fluctuations of the world market of metal production have influence upon development of domestic iron and steel industry, it causing the necessity to implement transformational transitions both in the structure of national economy in general and according to the present –day requirements.

Revelation of crisis phenomena is a typical trait of nowadays stage of development of the world economy, making it necessary to take the latter into account for defining the directions of development of the national economy in general and particularly iron and steel industry, as it is the most export-oriented segment of the national economic complex of Ukraine.

A substantial contribution into the research of the problem of market changes on international markets under conditions of the cyclical character of economic development was made by such domestic and foreign scholars like: I. Baguirova, A. Pigou, S.Brew, G.Bashnyanin, A. Galchinkiy, V. Vernadskiy, B. Gubskiy, A.Kyreyev, S.Youriy, Y. Kozak, M.Kondratyev, D.Lukyanenko, C. McConnell, Y.Makogon, V.Omelchenko, S.Mochernyi, Y.Saveliev, N.Pytets, V.Savchuk, P.Samuelsan, V. Tarasevich, M Tugan-Baranovskiy, A.Filipenko, S.Fisher,R.Friesch, E Hansen, T.Tsygankova et al

The objective of the article is to conduct market investigations of the market of metal production.

The results of the investigation. According to the opinion of S.I. Douguina market situation in a wide sense of this term means a complex of conditions that exist on the market for a particular time span. Thus, the notion itself contains a complex of inter-related conditions, that determine transition from one state to another. Market situation possesses several typical traits. **Market situation** –is a particular state (situation) on a particular market within certain time, geographic and other limits, that are formed under the influence of the constitutive factors.

Depending upon the market level it is assumed do discern between: a) general business conjuncture-i.e. the tendencies that happen in industry of a particular country or the entire world's industry; b)- country's conjuncture; c)the conjuncture of separate segments of the market and branch conjuncture; d) =the conjuncture of the market of separate goods and services-the current changes and fluctuations in the domain of manufacturing and sales of separate particular goods and services.

The market situation (conjuncture) is formed under the influence of certain factors, that are known as conjuncture forming. They comprise natural and climate factors, macro-economic, micro-economic, political, social , scientific and engineering factors. The most important

qualitative and quantitative indices are demand and proposition. The general indices of international trade are export, import and foreign trade turnover. If export dominates in foreign trade turnover we may talk of export-oriented economy, if vice versa-of import-dependant economy. Both variants of development of the national economy are far from being efficient. In case of export-oriented economy a positive factor is in the fact that hard currency comes to the country in substantial amount, negative moment is the influence of external factors, the first and foremost being the world's economic crisis. At import-dependent economy the internal output reduces, the country receives less hard currency, in leading to devaluation of the national currency in the long run.

Development of the world economy is nowadays accompanied with strengthening of transformational processes, that become an important factor of business links, that influence the process of the world economic and political development.

According to the data, provided by World Steel Association, the main manufacturers of steel in 2008 were: 1 – China (500.5 mln mt); 2 – Japan (118.7 mln mt); 3 – the USA (91.4 mln mt); 4 – Russia (68.5 mln mt); 5 – India (55.2 mln mt); 6 – Germany (45.8 mln mt); 7 – Україна (37.1 mln mt).

The situation for Ukraine has turned for worse, since the year of 2012. So from the seventh place that Ukraine occupied in 2008 the country went down, making room for such countries like South Korea, Brazil and Turkey, finding itself on the tenth place in the rating of the biggest countries, manufacturing metal production, according to the data provided by Word Steel Association.

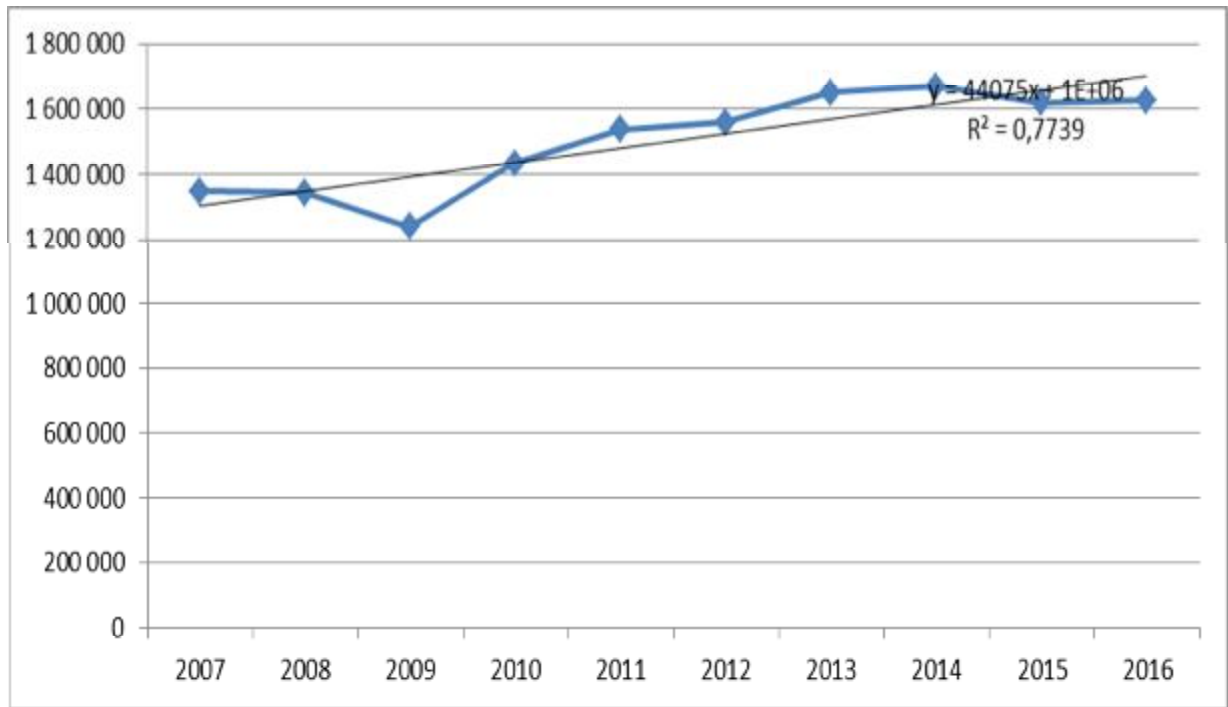
Table 1

Dynamics of manufacturing of steel production in the world in 2007 – 2016 in thousand of metric tons.

	Країна	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1	China	489 712	512 339	577 070	638 743	701 968	731 040	822 000	822 306	803 825	807609
2	Japan	120 203	118 739	87 534	109 599	107 601	107 232	110 595	110 666	105 134	104775
3	India	53 468	57 791	63 527	68 976	73 471	77 264	81 299	87 292	89 026	95477
4	United States	98 101	91 895	59 384	80 495	86 398	88 695	86 878	88 174	78 845	78475
5	Russia	72 387	68 510	60 011	66 942	68 852	70 209	69 008	71 461	70 898	70453
6	South Korea	51 517	53 625	48 572	58 914	68 519	69 073	66 061	71 543	69 670	68576
7	Germany	48 550	45 833	32 670	43 830	44 284	42 661	42 645	42 943	42 676	42080
8	Brazil	33 782	33 716	26 506	32 948	35 220	34 524	34 163	33 897	33 256	31275
9	Turkey	25 754	26 806	25 304	29 143	34 107	35 885	34 654	34 035	31 517	33163
10	Ukraine	42 830	37 279	29 855	33 432	35 332	32 975	32 771	27 170	22 968	24218
	World aggregate production	1348108	1343429	1238755	1433433	1538003	1560131	1650354	1669450	1620001	1627004

* Word Steel Association <https://www.worldsteel.org>

According to the data of Steel Association shown in Table 1 a conclusion may be arrived at, that there is a positive tendency for manufacturing metal production in the world. So, aggregate metal production in 2016 was increased by 278896 th. mt, as compared to 2007. Figure 1 shows graphically a positive tendency of manufacturing metal production and a linear trend, typical of the case.



* Compiled acc. to the data, provided by Word Steel Association <https://www.worldsteel.org>

Fig. 1 The dynamics of manufacturing of metal production in 2007-2016 in th. mt.

Figure 1 shows that there is a positive trend for manufacturing of metal production in 2007 – 2016. Evaluation of annual world output of metal according to the Table 1 is shown graphically in Figure 2. But is it a truthful tendency?

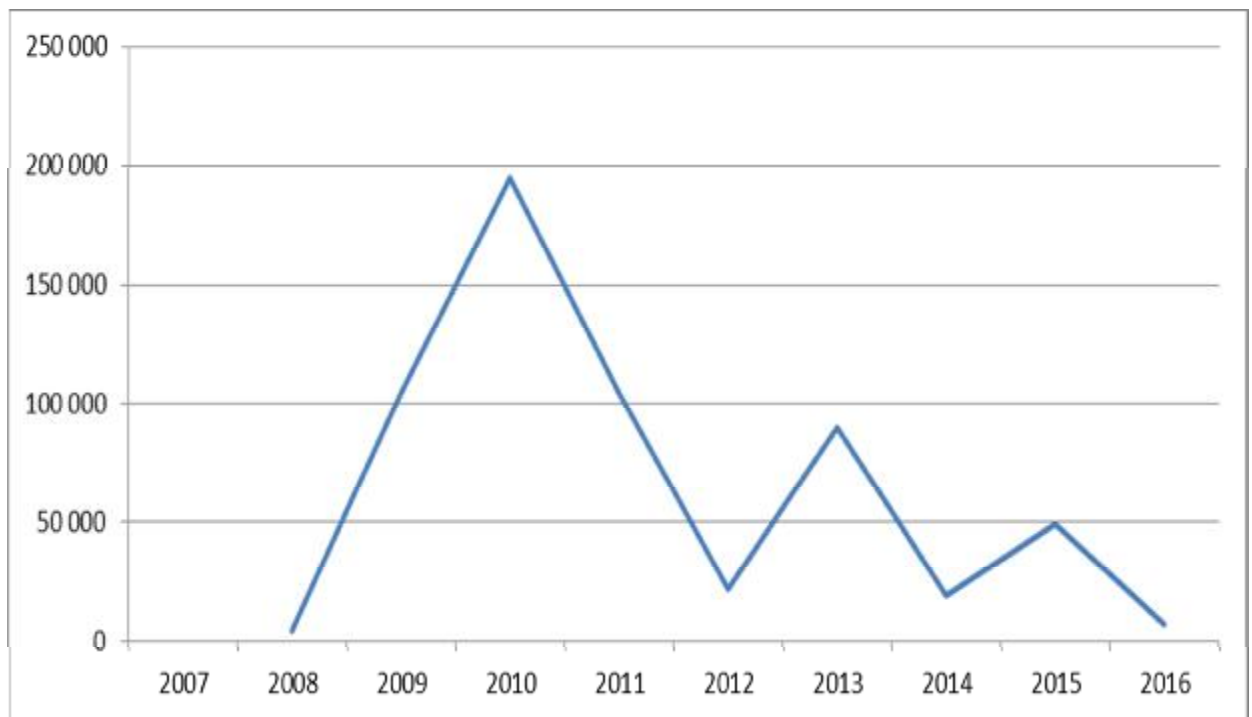


Figure 2 The dynamics of annual world metal output in 2007 – 2016, in thousand of metric tons.

* Compiled acc. to the data, provided by Word Steel Association <https://www.worldsteel.org>

As can be seen in Fig.2. there are some negative tendencies as well. So in 2007-2016 less metal is manufactured in the world. It can be explained by the following factors:

- The world's economic crisis;
- Increase in production of goods, made of substitutes, that are to replace goods, previously manufactured ;
- Reduction of the volume of construction ;
- Manufacturing of metal goods led to overproduction in that branch.

Among general transformation tendencies on the metal production market the following may be singled out:

- 1) General growth of manufacturing of metal products;
- 2) Transition of production sites closer to the seashore;
- 3) Changes in the countries, that are leaders of ferrous metals manufacturing ;
- 4) Transformation of production to developing countries ;
- 5) Reorientation towards application of new smelting technologies;
- 6) Reorientation towards creation of mini- and midi-plants and increase in the number of metal processing works;
- 7) Growth in demand of special (structural) steel grades;
- 8) Consolidation of iron and steel enterprises due to globalization and transnationalization of the world's industry;
- 9) Implementation of innovative manufacturing technologies of ferrous metal production ;
- 10) Growth of requirements for environmental safety of production.

During the entire period development of the international metal production a staunch trend for concentration of its growth has been observed, though its leaders are changed.

For analyzing the structure of the international market the methods of evaluation the level of its concentration are often applied. The market is analyzed within its boundaries, which can be subdivided into goods limits, time and geographical limits. Such approach is efficient for each particular case. Different methods and indices are used for investigation of concentration of international markets [1, p. 320]

The method of evaluation of concentration ratio (CR) found most often application, though this index has a substantial drawback- it does not take into account the market segment, covered by import and thus an overstated index may be obtained [1, p. 320], next index, used in EEC countries is Lind's ratio.

Lind's ratio, just like concentration ratio is calculated only for several biggest companies and so it does not take into account the entire market situation [1, p. 321].

That is why in 1982 in the USA the official statistics abandoned completely application of concentration ratio in favour of Herfindal-Hirshman Index (*HHI*) [1, p. 321], which is evaluated according to the following formula:

$$HHI = \sum_{i=1}^n p_i^2, \quad (2.5)$$

where p_i – is a share i -of the country, %.

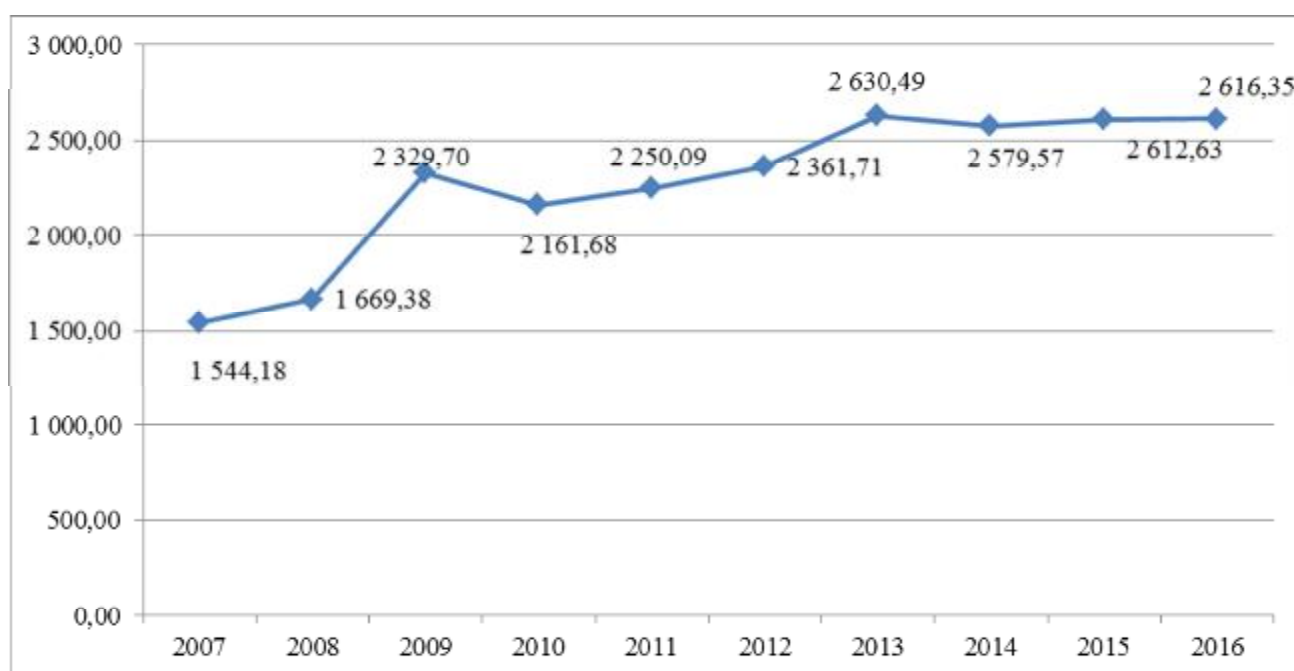
According to the Table 1, in which the dynamics of metal production export in the leading manufacturing countries and the entire world is represented we'll calculate *HHI*.

Таблиця 2.

Evaluation of Herfindal-Hirshman Index for the countries, that are the world leaders in metal manufacturing in 2007 -2016.

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
China	36,33	38,14	46,58	44,56	45,64	46,86	49,81	49,26	49,62	49,64
Japan	8,92	8,84	7,07	7,65	7,00	6,87	6,70	6,63	6,49	6,44
India	3,97	4,30	5,13	4,81	4,78	4,95	4,93	5,23	5,50	5,87
United States	7,28	6,84	4,79	5,62	5,62	5,69	5,26	5,28	4,87	4,82
Russia	5,37	5,10	4,84	4,67	4,48	4,50	4,18	4,28	4,38	4,33
South Korea	3,82	3,99	3,92	4,11	4,46	4,43	4,00	4,29	4,30	4,21
Germany	3,60	3,41	2,64	3,06	2,88	2,73	2,58	2,57	2,63	2,59
Brazil	2,51	2,51	2,14	2,30	2,29	2,21	2,07	2,03	2,05	1,92
Turkey	1,91	2,00	2,04	2,03	2,22	2,30	2,10	2,04	1,95	2,04
Ukraine	3,18	2,77	2,41	2,33	2,30	2,11	1,99	1,63	1,42	1,49
HHI	1544,18	1669,38	2329,70	2161,68	2250,09	2361,71	2630,49	2579,57	2612,63	2616,35

Figure 3 represents the dynamics of HHI in 2007 – 2016.



HHI increases with growth of concentration and vice versa. The following *HHI* standards are used in the USA:

- 1) $HHI < 1000$ – the market has low concentration;
- 2) $1001 < HHI < 1800$ – medium concentration level ;
- 3) $HHI > 1800$ –highly concentrated market [1, p. 321].

Since 2007 until 2016 gradual concentration of the world market of metal production was observed, it being a negative factor, as it was due to appearance of new manufacturing countries on the market, the quantity of goods, that are substitutes of metal goods and also, due to the crisis phenomena throughout the world. Judging by our evaluations, represented in Table 3 and Figure 3 we may arrive at a conclusion that the international market of metal production is highly concentrated , its $HHI_{p03} > 1800$ (see Table 2.).

Table 3.

Dynamics of output and consumption of metal products in thousand metric tons

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Світове виробництво	1348108	1343429	1238755	1433433	1538003	1560131	1650354	1669450	1620001	1627004
Світове споживання	1330937	1336598	1233734	1409997	1523028	1552549	1658980	1667523	1615941	1633717
+/-	17171	6831	5021	23436	14975	7582	-8626	1927	4060	-6713

According to our evaluation data, pictured in Table 3 we may calculate that overproduction of metal in 2007 - 2016 was equal to 65,664 th. mt. .

For iron and steel industry of Ukraine its export orientation and raw materials export components seem to be a major risk factor. For Ukraine defining of the necessity of enabling production facilities for medium-term perspective is strategically important, as all contracts, concluded by domestic manufacturers are long-term ones, it leading to economic losses or the necessity to refuse further execution of contract obligations, and thus leading to reduction in competitive strength of this branch of industry on international markets.

The main factors for integration of Ukraine into the international metal market are the presence of the following factors, that exist due to historic or geographic prerequisites of its development: deposits of iron ore, presence of water resources, refractories, dolomites, coke and power-generating coal, cheap and qualified labour force, technological innovations, close distance to the sea-ports and presence of the exit to the Mediterranean sea, development of power engineering industry and high profit rate in the branch.

The prospects of successful integration of the native iron and steel industry into the international market of metal production under the conditions of the world economic crisis are, first of all, linked with application of opportunities of vertical integration: 1) integration of sales channels by means of acquisition of metal-trading firms abroad; 2) integration through acquisition of metal-treating enterprises (metal rolling and other enterprises with further metal treatment); 3) integration of facilities that manufacture cast ingots, 4) integration through participation in stock market sales at specialized commodity exchanges, i.e. at the new types of international markets; 5) integration of raw materials divisions, with less expenditure. Application of the possibilities of horizontal integration could be performed, first of all, by widening the geographic structure of export, it enabling to reduce dependence upon short-term fluctuations in demand.

Thus, the main integration direction of iron and steel industry of Ukraine into the international market has to be innovative and integration development of the industry on the basis of relationship between state and manufacturers, that will take into account interests of both sides, and will be aimed at interests of the final consumer, it promoting quick overcoming of crisis phenomena and ensuring stable economic growth of the country, further integration and expansion of private capital and free competition.

Conclusions The performed investigation led to solution of the task of research of the situation of the world market of metal production, particularly:

It was found that nowadays transformational processes had become an important factor of development of international business links. .

General tendencies of conjuncture on the international market of metal production were revealed: production growth of metal products in the whole world, transition of production facilities closer to the seashore, changes in the countries, that are the world leaders in ferrous metals manufacturing, transition of production to developing countries, application of up-to-date methods of smelting, the tendency of constructing mini-and midi-plants, growth in demand in special (structural) steel grades, increase in metal working facilities, consolidation of iron and

steel enterprises, due to globalization and trans-nationalization of the world industry, implementation of innovative technological processes of manufacturing ferrous metals and increase in requirements for environmental safety of production.

Under the conditions of the world economic crisis it is necessary to develop a concept for development of national iron and steel industry, which has to envisage: diminishing of export dependence, by developing metal working enterprises (shipbuilding, aviation, machine building and construction industries), producing high quality steel grades, that are in great demand even in crisis, application of technologies that will allow diminishing dependence on expensive energy carriers, technical modernization of the entire industry with the objective of reducing negative environmental consequences.

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Keywords: conjuncture, international market, the economic crisis, market transformation; steel market, the metal industry.

Ключові слова: кон'юнктура, міжнародний ринок; економічна криза; трансформація ринку; ринок металопродукції; металургійна галузь.

Ключевые слова: конъюнктура, международный рынок; экономический кризис; трансформация рынка; рынок металлопродукции; металлургическая отрасль.

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