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THE IMPACT OF THE ECONOMIC AND FINANCIAL CRISIS ON THE EVOLUTIONARY TREND OF WORLD CRUDE STEEL PRODUCTION

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Under the circumstances of intensifying globalization of the world economy we can observe a widespread use of crude steel, context in which crude steel production can be considered an indicator characterizing a country's economic growth. Looking from this perspective, the purpose of this paper is to determine the evolution of world crude steel production and the impact that the economic and financial crisis has had on the evolutionary trend of it. The data used relate to the period 2003 – 2013 and have in view nine regions of development and eleven countries.

Key words: crude steel, evolutionary trend, economic and financial crisis

INTRODUCTION

Globally, the metallurgical industry represents an important activity for the present and future of the global industry, making itself visible for the ability to enhance its contribution to the economic tendency, favored, in particular, by the expansion, over the past decades, of the machine-building industry, as the main beneficiary branch of the metallurgical production [1].

And as the metallurgical processing is considered the essential branch of the industrial economy of a country, as a result of its role as a catalyst of other industrial activities and services, and steel is the material with the widest use in industry, the analysis of the world crude steel production reveals the trend of localization of production capacities in the areas producing ore [2]. However, many developed countries prefer to import steel necessary for consuming industries, while developing states see in this branch of the economy a major consumer of raw materials and labor [3].

In this context, the aim of this paper is to determine, using the data which relate to the period from 2003 to 2013, the evolution of world crude steel production and the eventual influence which global economic and financial crisis in 2008 had on its evolutionary tendency, relative to major geo-economic players. Economic crisis has manifested differently on turnovers of steel industry on domestic and foreign markets [4].

The analysis covers both the nine regions of development, as they have been identified by the World Steel Association, [5] areas that encompass the entire world production, and at the level of the countries occupying the top places in the world rankings during the period considered.

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METHOD AND DATABASE

Methodologically, the paper is based on statistical analysis methods [6,7] and as informatics support in processing and analysis were used Excel.

The study aims at a structural and comparative empirical analysis of the annual crude steel production at both the global level and at the level of the nine regions of development, namely: European Union 27 (EU 27), Other Europe (Other EU), the Commonwealth of Independent States (CIS), North America (NA), South America (SA), Africa, Middle East (ME), Asia and Oceania, regions established in accordance with the classification made by the World Steel Association, [8] but also of the significant aspects of their evolutionary trend for the period 2003 – 2013, in terms of identifying any possible effects of the economic and financial crisis, with the expansion at the level of the first ten producers. The statistical data that underline the study come from the online database and Steel Statistical Yearbooks of the World Steel Association.

ANALYSIS OF GLOBAL AND REGIONAL EVOLUTION OF CRUDE STEEL PRODUCTION

For a detailed knowledge of the evolution of world crude steel production and of the impact of economic and financial crisis has had on it, have been taken into account statistical data on the evolution of the annual global production of crude steel, at a regional level in Table 1.

From the analysis of the data presented above, it is noted that world crude steel production was performed during 2003 – 2007 on an uptrend compared to the stagnation and even slight decline recorded, in the economic and financial crisis, during 2008 – 2009, the increase from the previous year returning in 2010, while in the

Table 1 **World production of crude steel, according to regions / Mt. [8]**

Region	Q/ %	Year										
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
EU 27	Q	192,5	202,5	195,6	207,3	210,2	198,6	139,4	172,8	177,7	168,6	165,6
	%	19,82	19,06	17,04	16,58	15,59	14,79	11,27	12,06	11,56	10,91	10,46
Other EU	Q	21,3	24,0	25,0	28,2	30,6	31,7	29,1	33,7	39,2	40,0	36,6
	%	2,19	2,26	2,18	2,25	2,27	2,36	2,35	2,35	2,55	2,59	2,31
CIS	Q	106,5	113,4	113,2	119,9	124,2	114,4	97,6	108,2	112,7	111,0	108,7
	%	10,97	10,67	9,86	9,59	9,21	8,52	7,89	7,55	7,33	7,18	6,87
NA	Q	126,2	134,0	127,6	131,8	132,6	124,5	82,5	111,6	118,7	121,6	119,3
	%	13,00	12,61	11,12	10,54	9,84	9,27	6,67	7,79	7,72	7,87	7,54
SA	Q	43,0	45,9	45,3	45,3	48,2	47,4	37,8	43,9	48,2	46,3	46,0
	%	4,43	4,32	3,95	3,62	3,57	3,53	3,06	3,06	3,14	3,00	2,91
Africa	Q	16,3	16,7	18,0	18,7	18,7	17,0	15,4	16,6	15,7	15,3	15,7
	%	1,68	1,57	1,57	1,50	1,39	1,27	1,24	1,16	1,02	0,99	0,99
ME	Q	13,4	14,2	15,3	15,4	16,4	16,6	17,8	20,0	23,0	24,7	25,9
	%	1,38	1,34	1,33	1,23	1,22	1,24	1,44	1,40	1,50	1,60	1,64
Asia	Q	443,4	503,5	599,2	675,2	758,4	784,0	811,4	917,8	994,6	1 011,7	1 059,2
	%	45,66	47,39	52,20	53,99	56,26	58,39	65,59	64,06	64,71	65,48	66,93
Oceania	Q	8,4	8,3	8,6	8,7	8,8	8,4	6,0	8,1	7,2	5,8	5,5
	%	0,87	0,78	0,75	0,70	0,65	0,63	0,49	0,57	0,47	0,38	0,35
World	Q	971,0	1 062,5	1 147,8	1 250,5	1 348,1	1 342,6	1 237,0	1 432,7	1 537,0	1 545,0	1 582,5
	%	100	100	100	100	100	100	100	100	100	100	100

immediate aftermath (2011 – 2013) its value reaching record levels.

Comparing the information presented for the years of start and end of the period studied, it appears that in 2013, globally, crude steel production increased to 611,5 million tonnes (Mt) compared to 2003, representing an increase by 62,98 %.

The results obtained show that inclusively world crude steel production was influenced by the crisis, but in different proportions, except for Asia and the Middle East. In these areas, the economic and financial crisis at the end of 2007 has not an impact on crude steel production; on the contrary there is an increase in this production.

But in order to have an enlightening picture on the evolution of global production of crude steel between the beginning and the end of the analysed period and also to highlight its dynamics on development regions throughout the period under study, using data from Table 1, Figure 1 shows the geographical distribution of production in 2003 and in 2013.

It is noted that, both at the beginning of the analysed period (2003) and at its end (2013), crude steel production was achieved predominantly by Asia, this being in 2003, 45,66 % of the world production, whereas in 2013 it rose to 66,93 %, while European Union 27, North America and the Common wealth of Independent States stand at a long distance.

Also in 2013, compared to 2003 in all analysed regions crude steel production decreased except Asia, whose growth was fulminant (46,58 %) and the Middle East who performed at the end of the period analyzed, 1,64 % of the total production, compared to 1,38 % in 2003.

At the same time, there is a significant decrease in the share of production held in the European Union 27 in world production of crude steel, from 19,82 % in 2003 to 10,46 % in 2013, the reduction being of 47,23 %, and at the level of the Common wealth of Independ-

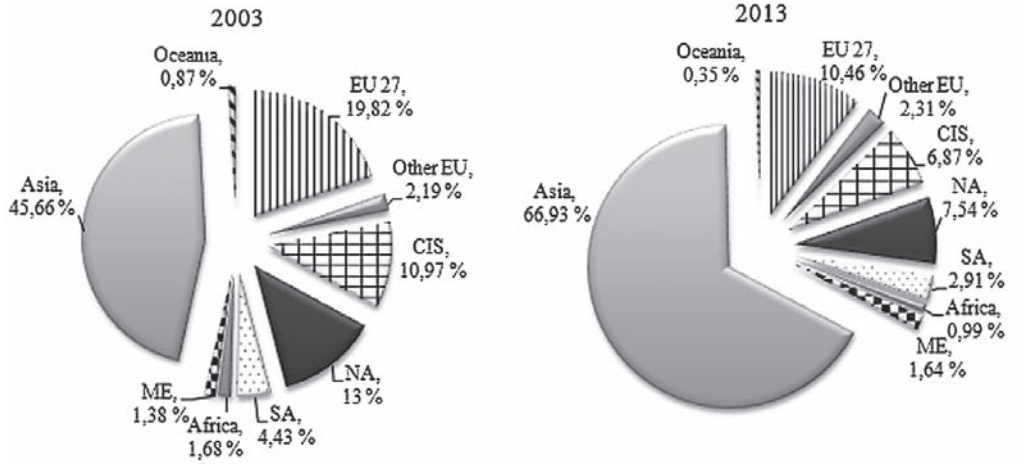

Figure 1 Geographical Distribution of Crude Steel Production in 2003 vs. 2013 [8]

ent States from 10,97 % to 6,87 %, with 37,37 % and in the region of North America from 13 % to 7,54 %, the decrease being of 42 %.

On the same downward trend enrolled the crude steel production effected in the regions: South America (from 4,43 % to 2,91 %, with a reduction of 34,31 %) and Africa (from 1,68 % to 0,99 %, with a decrease of 41,07 %).

By analyzing the evolution of the dynamics of crude steel production according to geographic areas, it can be seen that, in general, it follows the trend of global production, with the exception of Asia and the Middle East, areas which in 2008 – 2009, recorded an increase of steel production compared to the previous years. Although the European Union 27 ranks second among producers of crude steel in the world, both at the beginning and the end of the analysed period, the study shows that, in the year 2013 among the top ten producers is included a single country in this region, namely Germany.

ANALYSIS OF THE IMPACT OF THE FINANCIAL AND ECONOMIC CRISIS ON THE EVOLUTIONARY TREND OF CRUDE STEEL PRODUCTION

Starting from the consideration that in the countries belonging to the two geographic regions (Asia and Middle East) the financial and economic crisis has not influenced the evolution of crude steel production and the analysis provides useful information on the evolution of the geographical distribution of this production, the research conducted aims also to analyze the distribution of crude steel production in the key countries in the regions already addressed and the proportion in which the crisis affected the production in these countries compared to the area they belong to and the evolution recorded in the whole world. In order to have a relevant image on the dynamics of global production of crude steel for the first ten producers in the world, ranking which was achieved for 2013, using data from Table 2.

The analysis of the data presented in Table 2 shows that, inclusively at the level of the countries under study, the evolution of the production of crude steel follows the trend of production related to the region where they fall, being distinguished particularly the increasing trend of China's production, which throughout the period analyzed was ranked 1 and at the end of the period, received 49,23 % of the world production of crude steel, as compared to only 22,89 % in 2003. If Japan maintains its second position throughout the period under study, and the United States third position, with the exception of 2009, when it ranks five, it appears that after a period of relative growth with the installation of the financial crisis in 2008, the value of production fell in 2013, its level being below the value recorded in 2003.

It can also be noted the spectacular evolution recorded by India, which in 2003 ranked eighth worldwide, and in 2013 was ranked fourth, surpassing countries with tradition in this area, such as Russia, South Korea, Germany and Ukraine.

RESULTS, CONCLUSIONS AND FUTURE DEVELOPMENTS

From the comparative analysis of the results of the study conducted on the evolutionary trend of global, regional and national production of crude steel during the period 2003 – 2013 result the following conclusions:

- World crude steel production has registered an upward trend except in 2008 and 2009, when, during the financial crisis, production decreased compared to the previous year, but it rebounded in 2010 – 2013, although in the last year of the analysed period the increase is insignificant compared to the previous period (only 8 Mt);
- In the nine regions analysed, generally, the trend of crude steel production follows the trend of world evolution, except Asia and the Middle East whose production, inclusively in 2008 – 2009, is part of an upward trend;
- Although the European Union 27 occupies, as a region under study, the second position among the producers of crude steel in the world, both at the beginning and the end of the period, however, among

Table 2 **Crude Steel Production, according to main producers / Mt. [9]**

Country	Year										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
China	222,3	272,8	355,8	421,0	489,7	512,3	577,1	638,7	702,0	716,5	779,0
Japan	110,5	112,7	112,5	116,2	120,2	118,7	87,5	109,6	107,6	107,2	110,6
United States	93,7	99,7	94,9	98,6	98,1	91,4	58,2	80,5	86,4	88,7	87,0
India	31,8	32,6	45,8	49,5	53,5	57,8	63,5	69,0	73,5	77,6	81,2
Russia	61,5	65,6	66,1	70,8	72,4	68,5	60,0	66,9	68,9	70,4	69,4
South Korea	46,3	47,5	47,8	48,5	51,5	53,6	48,6	58,9	68,5	69,1	66,0
Germany	44,8	46,4	44,5	47,2	48,6	45,8	32,7	43,8	44,3	42,7	42,6
Turkey	18,3	20,5	21,0	23,3	25,8	26,8	25,3	29,1	34,1	35,9	34,7
Brazil	31,1	32,9	31,6	30,9	33,8	33,7	26,5	32,9	35,2	34,5	34,2
Ukraine	36,9	38,7	38,6	40,9	42,8	37,3	29,9	33,4	35,3	33,0	32,8
Italy	27,1	28,6	29,4	31,6	31,6	30,6	19,8	25,8	28,7	27,3	24,1
Total	724,3	798,0	888,0	978,5	1 068,0	1 076,5	1 029,1	1 188,6	1 284,5	1 302,9	1 361,6

the top ten producers in 2013 is included only one country, namely Germany, which achieved only 2,69 % of world production, while in 2003 are included two countries, Germany and Italy, both gaining 7,40 % of the total production;

- Throughout the period under study the evolution of production obtained from China and India was placed on an upward trend compared to the other countries analysed, which change as a rule their position in the global hierarchy, except for Japan, ranking 2nd and the United States ranking 3rd, economies which register a decline, especially after 2008, their decline being offset by increases in Asia and the Middle East.

In order to better capture the role and place of production of crude steel obtained by each country to their overall development, the study will be continued by taking into account the level of production of crude steel per number of inhabitants of each country, [10] a more relevant indicator if we take into account the fact that the countries have different sizes and economic forces, an analysis that will lead to enlightening conclusions on the contribution that each crude steel producing country has to the development of the world economy.

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Note: The responsible translator for English language is C. Dicu Targu Jiu, Romania