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ANALYSIS OF THE WORLD NON-FERROUS METAL INDUSTRY

Abstract:

In this article, we provide the analysis of the world non-ferrous metal industry. In order to do so, we use data from the World Bureau of Metal Statistics (WBMS), the World Bank Commodity Market Outlook (CMO, April 2017) and the global aluminum market overview (UC Rusal, May 2014). We do the aluminum supply-demand analysis. We use statistical methods to highlight dynamics of bauxite production, the trend of non-ferrous metal prices and the share of leading aluminum producing corporations. The results show that in 2016 there is negative aluminum supply-demand balance (approximately 2.2 million tons). In addition, they show that the prices of nickel are more volatile than those of copper and aluminum. The results also show the growing demand for aluminum in the coming years due to increased use of aluminum in the automotive, power and construction industries.

Key words:

aluminum, market, production, consumption, price, transnational corporations

Introduction

The metallurgical industry is a strategic economic development tool for many countries, which are endowed with natural resources in general. The economy of those countries is dependent on the price of raw materials their export. Therefore, to ensure economic safety there is a need to understand the dynamics and trends in the metallurgical industry. Nowadays aluminum occupies the second place after copper in terms of consumption within all metal groups.

Bauxite is the main raw material from which aluminum is obtained. Restricted access to commercially available bauxite resources and depletion of ores are the main obstacle for development of aluminum industry. It should be noted that global aluminum market, as many other markets of raw stocks, is cyclic and depends strongly on fluctuations of global economic situation [1].

Aluminum is utilized in almost every industry from power engineering, mechanical engineering, transportation, consumer goods, to foil and packaging. In order to be widely acquainted on how this industry works we do the supply-demand analysis. The structure of consumption and highlight key players (both states and companies). Finally we conduct a comparative analysis of actual and prognosis white metal prices.

Bauxite production

The largest reserves of bauxite in the world are concentrated in the tropical and subtropical zones of the Earth, so the main production volumes are provided by the countries of South-East Asia, Latina America, Africa and Australia. In general, alumina production is located in these regions, which allows exporting a more complex product with higher added value [6].

The volume of world bauxite production is almost stable with minor decrease of 13.62% in 2014 in comparison with 2013. We observe the same tendency when we look at individual major producing country. There is an exception Guinea, which has registered a significant increase in terms of production. Guinean bauxite production surged by 34.38% in 2016 in comparison with 2015. Therefore, this increase is the result of tax system revision in 2015 and the new governmental strategy to attract more foreign direct investment through its Private Investment Promotion Agency (APIP). Corporate profit tax was reduced from 35% to 30% for mining companies. As a result, the number of mining companies started to explode

Figure1 - Top bauxite producing countries (in thousand metric tons) [4]

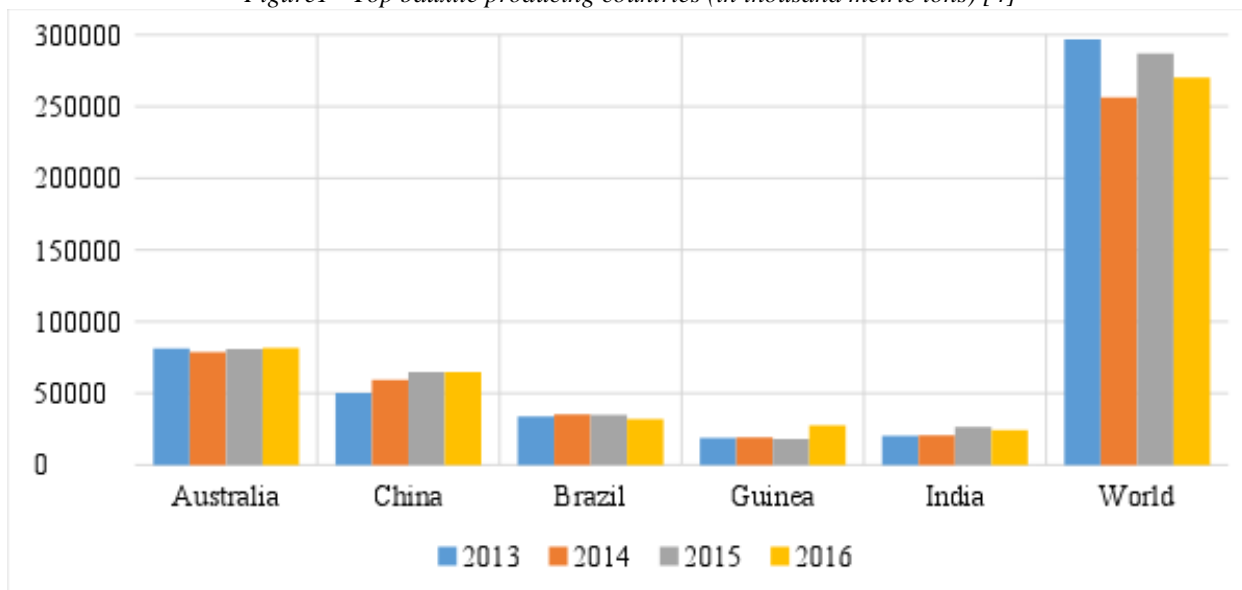
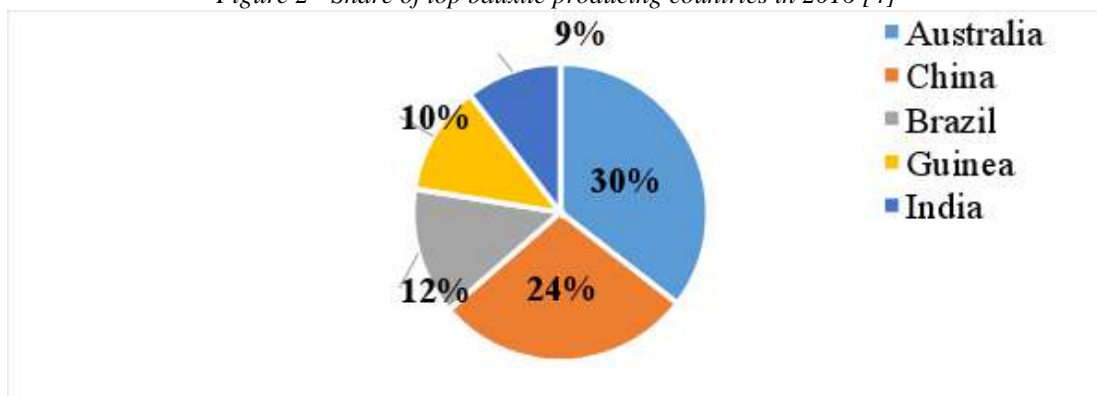


Figure 2 - Share of top bauxite producing countries in 2016 [4]



Aluminum “Supply-Demand” analysis

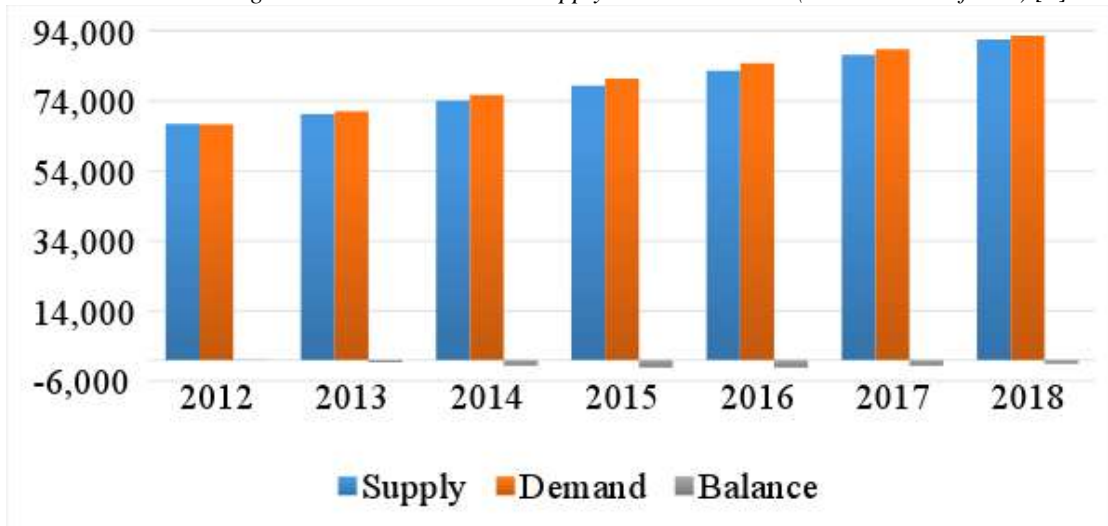
In this section, we are highlighting the balance between aluminum supply and demand in a global picture. Then we are looking at the dynamics of balance at regional level. In the table 1, we see a positive balance only in 2012. After 2012, there is a deficit in aluminum production. On the supply side, China introduced a new law that will also require certain aluminum smelters to cut output by 30 percent in winter 2017 to reduce pollution.

On the demand side, China’s transition to a consumption-led economy, along with industrial reform and environmental concerns, is expected to slow growth in metals demand. China’s efforts to boost its commodity-intensive infrastructure and construction sectors have been a key driver of metal demand.

Table 1 – Global aluminum supply-demand balance (in thousands of tons) [3]

	2012	2013	2014	2015	2016	2017	2018
Supply	67 406	70 260	74 032	78 286	82 590	87 148	91 471
Demand	67 268	70 960	75 658	80 383	84 755	88 683	92 538
Balance	138	-700	-1 626	-2 097	-2 165	-1 535	-1 067

Figure 3 - Global aluminum supply-demand balance (in thousands of tons) [3]

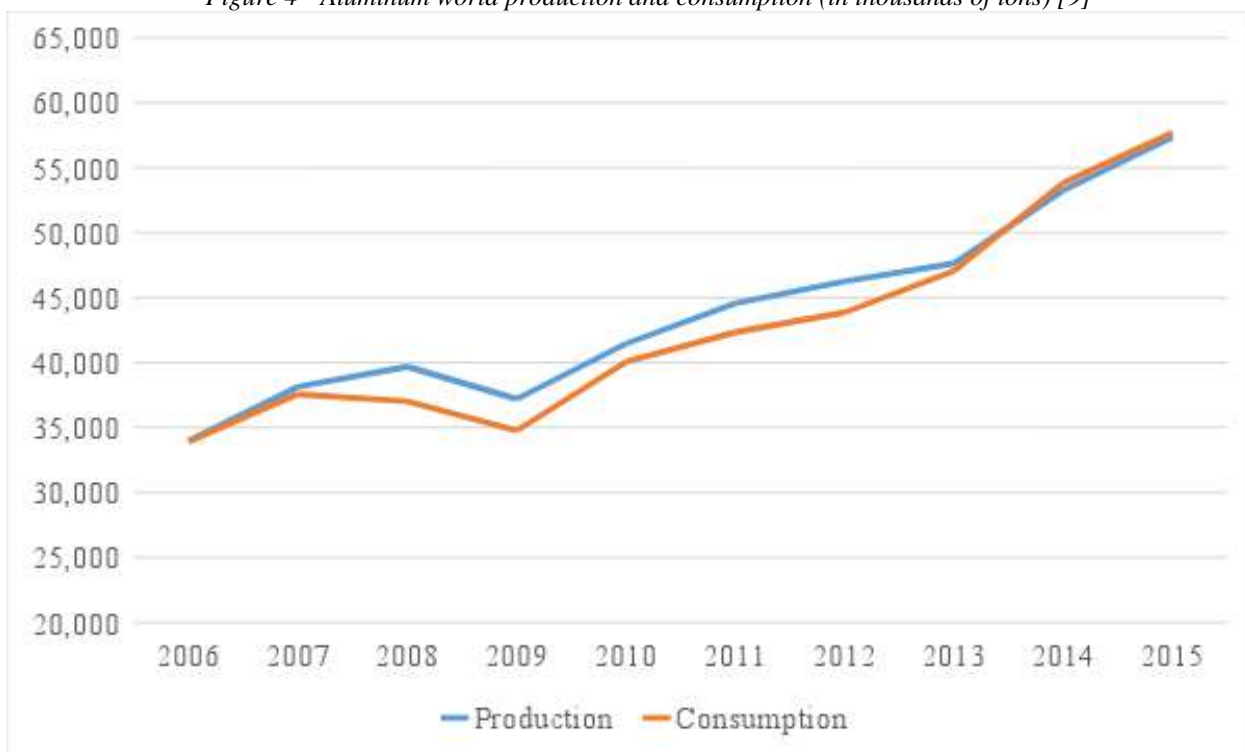


Aluminum Production

In 2009 after the 2008 financial crisis, the global aluminum industry started to grow in both side production and consumption. Between 2009 and 2013, we observe an overproduction of aluminum. On the contrary, from 2014 to now there is almost an equilibrium between production and consumption (see Fig. 3)

In the non-ferrous metals market, as well as in the ferrous metals market, the main issue in 2015 was the excessive supply, while the dynamics of demand were sluggish. Since January 2015, there has been a steady trend towards a decrease in world prices for non-ferrous metals, which is due to the slowdown in the development of the world economy, primarily China, as well as the strengthening of the dollar and a decline in oil prices [2].

Figure 4 - Aluminum world production and consumption (in thousands of tons) [9]



Aluminum consumption

Per capita aluminum consumption differ from one country / region to another. The higher per capita income the higher the per capita aluminum consumption is (see Table 2). In our sample, India has the lowest per capita alumi-

num consumption as it is classified as an agricultural producing country. In the group of middle income countries, China is the leader with 22.9 kg of per capita aluminum consumption.

According to the World Bank Commodity Outlook of April 2017, China’s share of world metal consumption surpassed 50 percent in 2015. It necessary follows that China is one of the key player in the world aluminum industry, which has an ability to directly affect the industry outcomes.

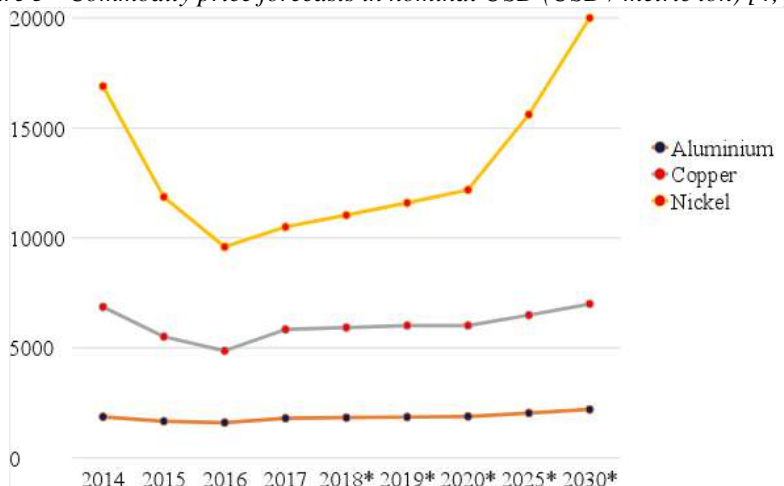
Table 2 - Comparative strategic analysis of aluminum consumptions by countries and regions [1, 5]

Indicators	Agricultural producing countries	Countries with high rates of urbanization and industrialization	Countries with developed economy, developed service sector and hi-tech
Average per capita consumption, kg	India: 2,6 kg	Middle East: 6,7 kg China: 22,9 kg Brazil: 8,6 kg Russia: 8,4 kg	South Korea: 46,7 kg Germany: 29,9 kg USA: 18,1 kg Japan: 16 kg
Increase in per capita consumption (2015 to 2011), in %	India: + 75 %	Middle East: + 69 % China: + 56 % Brazil: + 60 % Russia: + 26 %	South Korea: + 57 % Germany: + 1 % USA: + 21 % Japan: + 6 %
GDP per capita, thousand USD	Less than 10 thousand USD	From 10 thousand to 30 thousand USD	From 30 thousand to 60 thousand USD

Metal prices forecasts

During the period from 2012 to 2015, prices of aluminum fell to the level of production cost, and even lower because of the significant impact of the financial markets and excessive metal stock in warehouses accumulated in previous years. Metals prices surged by 10 percent in the first quarter of 2017. Prices were driven higher by strong demand - particularly in China’s property, infrastructure, and manufacturing sectors - as well as various supply constraints.

Figure 5 - Commodity price forecasts in nominal USD (USD / metric ton) [4, p. 21]

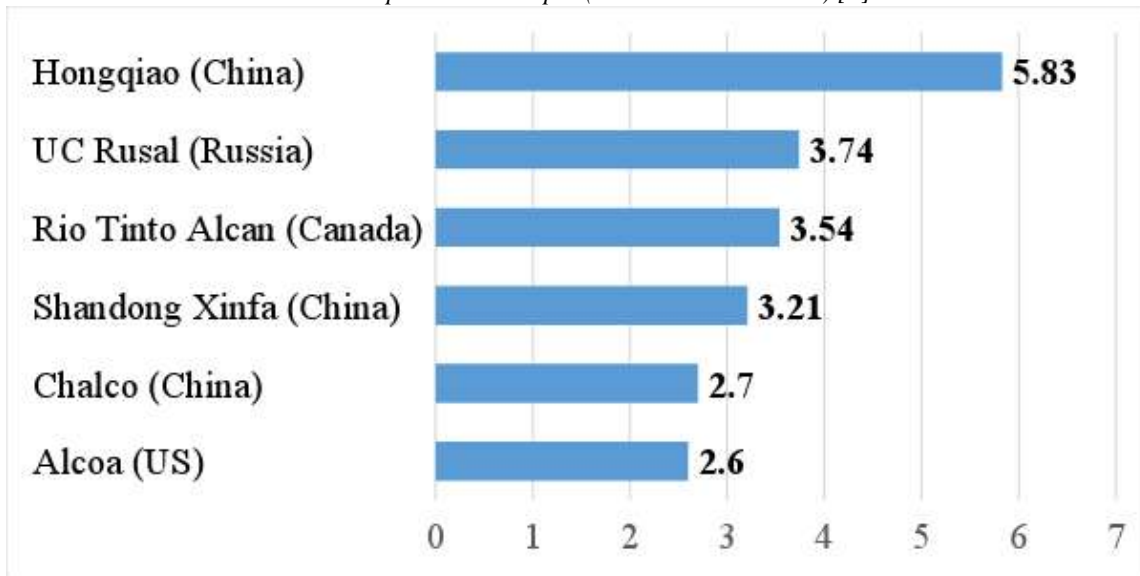


Aluminum producing companies

The aluminum industry is one of the industries where Russia is occupying a leading position. It follows that the Russian metallurgical conjuncture can partially influence the world aluminum market. Three out of the six leading primary aluminum production corporations are Chinese.

This shows that not only China consumes the biggest part of world aluminum but also produces the biggest. Many aluminum-producing companies suffered when the prices fell in 2014 and reached the level of production costs. So to survive some of those were obliged to take some strategic decisions about cost reduction and reengineering business processes. For instance, UC Rusal started to close non-profitable factories and optimized production processes in large numbers of its plants.

Figure 6 - The world's leading primary aluminum producing companies in 2016, based on production output (in million metric tons) [7]

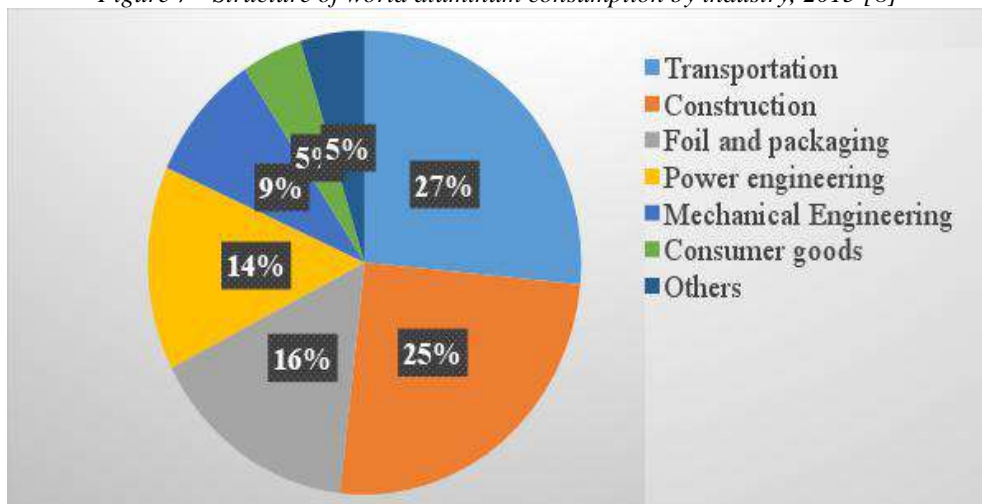


Structure of world aluminum consumption by industry

As said in the beginning, the aluminum consumption is widespread in our contemporary life. The automobile production growth and the increasing aluminum content in car are one of the drivers of world aluminum industry. So, the construction industry's share in aluminum consumption is the highest and reached 26% in 2015. The technological development will lead to an increase in aluminum consumption in the construction industry.

Population growth and urbanization, Aluminum/Copper (Al/Cu) substitution in power engineering, per capita income increasing and consumer behavior development are those factors, which are enabling the growth of aluminum consumption.

Figure 7 - Structure of world aluminum consumption by industry, 2015 [8]



Conclusion

In the light of what precedes, we can say that aluminum is the second metal consumed in the world after copper. The aluminum industry plays a key strategic tool in the economy of many natural resources exporting countries. We have seen that aluminum price does not solely depend on its supply-demand dynamics. It also depends on the global financial markets state, the oil prices and the development state of the world economy. This metal demand is expected to grow in the following years due to different factors. Among those factors, we can cite the world population & urbanization growth, the increasing aluminum content in cars and the possibility to substitute copper by aluminum in the power-engineering sector. It is also necessary to outline that Chinese corporations are leading the world aluminum production.

Nevertheless, there are UC Rusal, Rio Tinto and Alcoa, which are actively competing with Chinese ones. These companies have many foreign subsidiaries in counties, which are endowed with natural resources like bauxite. This way they can auto-supply themselves in raw material for the aluminum production. As aluminum supply-demand is balanced and prices are not volatile, investors are more likely motivated to invest more in the non-ferrous metal industry.

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Appendix 1 - Total Aluminum Balance model (thousands of tons) [3]

	2012	2013	2014	2015	2016	2017	2018
North America	133	85	-464	-481	-671	-747	-651
Central & South America	737	754	643	436	427	524	524
Europe	-2 444	-2 806	-3 215	-3 456	-3 630	-3 785	-3 873
CIS & Russia	3 146	2 834	2 493	2 619	2 745	2 878	3 190
China	-2 410	-2 979	-2 945	-3 450	-3 385	-2 900	-2 650
India	-772	-617	-539	-280	-81	-7	-143
Japan, S.Korea, SE Asia	-5 013	-4 982	-5 041	-5 043	-5 183	-5 326	-5 406
Middle East and other Asia	3 215	3 457	4 085	4 433	4 437	4 592	4 763
Africa	1 135	1 279	1 240	1 157	1 148	1 192	1 156
Australia	2 086	1 990	1 816	1 649	1 688	1 694	1 673
Other	326	285	300	320	340	350	350
TOTAL	139	-700	-1627	-2096	-2165	-1535	-1067