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Iron and steel industry of Russia in the XXI century

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Abstract. The author states that over the past twenty years, the iron and steel industry of Russia has held its position as one of the key industries of the Russian economy. Technological upgrading of production facilities has minimized the backwardness, however the rapid steel production growth in Asia has resulted in loosing business in the global steel market, while getting more dependent on the market situation. This article deals with the main trends, problems and collisions of the steel industry development in the first two decades of this century. The structure of Russian steel export is reviewed. This work is based on statistical and comparative analysis, ratings and forecasts, as well as theoretical postulates of Douglas North about the close relationship of market economy processes with political and social institutions of the country. The purpose of the article is to show that the industry is facing impending stagnation under the economic sanctions, export dependency of the Russian steel industry and worldwide steel overproduction. The following may be taken as the scientific results of the study: systematization, generalization and author's assessment of processes in the Russian steel industry and its development prospects, against the background of global trends in the industry.

Introduction

The steel industry is a key industry for the country. The high level of its export orientation makes it one of the basic sectors of the real economy and an important source of foreign currency in the Russian Federation. The goal of this research is to identify the main trends and collisions in the development of the Russian steel industry, that have occurred over the past two decades. To achieve this goal, the industry development was assessed basing on the analysis of the main steel industry performance indicators, both in Russia and worldwide.

By the beginning of the 21st century, the industry had finally adapted to market conditions. This process was quite painful and took the last decade of the twentieth century. In 2001, Russia was the 4th largest steel producer by the total output. The results of this period were:

A) Privatization and final ownership redistribution both in the industry and in the national economy; decentralization in the industry and getting of full independence in business activities by companies;

B) Corporatization of companies of the industry, establishing of several vertically integrated structures, which unite producers of feedstock and final products, and producing 80 % of the total steel product output [1];

C) Considerable output drop, both due to reduced sales market after the USSR collapse and due to the general output drop for all industries of Russia;

D) improvement (recovery) of financial indicators of companies of the industry after the default in August of 1998.



The steel industry of Russia had the following stable advantages: many local material suppliers and cheap labor.

At the same time there were serious problems in the industry:

1) Inefficient structure of most companies established in the course of privatization. All assets that a company had on its balance sheet were automatically included in its equity capital. As a result, the industry had a large share of non-core assets: there were many social facilities among them. More than 70 % of large companies in the industry were city-forming enterprises [2]. The high social burden of the industry made its products less competitive in the world market.

2) Serious dependency on the external market. Backward export structure: most products were semi-finished i.e. with low added value.

3) Necessity for the introduction of advanced technologies. Only Russian and Ukrainian companies continued to use open hearth furnace. Completion of the transition of the industry to the technological level of industrialized countries [3].

Main trends and collisions in the development of Russian steel industry in the first twenty years of the 21st century

Through 2001 to 2007, companies of the industry were increasing their production output both through technological and arrangement activities. The high monopolization level of the Russian steel industry plus availability of resources invited key market players to acquire foreign assets. Such acquisitions were made in: Ukraine (in particular, Evraz acquired 5 companies in Ukraine in 2007), Czech Republic, Italy, and USA. Not all acquisitions turned out to be smart and many of them were made just before the economic crisis in 2008, when assets were at the peak of their price. Some of the assets were depreciated and some had to be sold cheap. After 2014, the life of Russian companies in Ukraine is complicated, which also motivated them to reduce their assets in that land.

The crisis led to the output drop through 2008 to 2009, and then the slow growth began. The industry minimized its losses due to expanded supply to EU countries, but the level of earlier days was reached not in a day. The output performance of 2007 was beat only in 2018 for cast steel and in 2014 for rolled steel products [4]. The pipe demand was fluctuating and depending on progress of big transport projects in the oil and gas industry. Basically, that situation in the industry could be explained by low domestic demand and dependency on the external market, which had already become unsafe [5]. In fact, the crisis was replaced by stagnation, which was only growing after the economic sanctions against Russia were imposed in 2014.

During the period under review the positions of Russian steel industry was weakened in the global market since the growth of steel production in Asian countries was outstripping: over a period of a little more than a quarter of a century the steel production output was increased by almost 11.5 times in China, by 6 times in India and by more than 2.5 times in South Korea (as shown in Table 1).

Table 1. Steel production output trends (ths. tons) [6, 7].

Countries	1992	2000	2009	2018	Output change through 1992–2018
China	80935	127236	577070	928264	1146.93 %
India	18117	26294	63527	109272	603.15 %
USA	84322	101803	59384	86607	102.71 %
Japan	98132	106444	87534	104319	106.3 %
Russia	67029	59136	60011	72042	107.48 %
South Korea	28055	43107	48572	72464	258.29 %
Germany	39711	43376	32670	42435	106.86 %

Eventually, within the key steel producer group, Russia moved from the 4th place in 1992 to the 6th place in 2018 by absolute output, and its share in the global steel output decreased from 9.3 % to about 4 % as shown in Table 2.

Table 2. Russia's share change in percentage of global steel production output [6, 7].

1992	2000	2009	2018
9.3	6.98	4.85	3.97

Percentage change trends per various technologies of steel production worldwide through 2000-2018 are shown in table 3.

Table 3. Percentage per technologies of steel production in the period 2000/2018 [6, 7].

Country	Oxygen-blown converter	Electric furnace	Open hearth furnace	Other processes
China	62.6/88.4	15.9/11.6	1.4/-	19.8/-
India	49.8/45.2	40.9/54.8	9.3/-	-/-
USA	53/32	47/68	-/-	-/-
Japan	71.2/75	28.8/25	-/-	-/-
Russia	58.1/66.9	14.6/30.8	27.4/2.8	-/-
South Korea	57.2/66.6	42.8/33.4	-/-	-/-
EU	60.2/58.5	39.8/41.5	-/-	-/-

The industry sustained critical technological changes in the period under review. Buying and using advanced equipment mostly made by European manufacturers became a philosophy [8]. The Russian steel industry became less backward relating to the steel industry leaders with reference to the manner of production compared by its technological form. The progress was slowed down by the economic crisis of 2008: plans were frustrated for the development of thin casting systems and construction of dozens of mini-mills, and just about ten production facility enterprises were actually launched. The share of open-hearth production in the total volume of Russian steel output was minimized by an order and its final closure is planned to be carried out in 2020. Among the main steel producers only Russia and Ukraine remained.

Adding to inefficient structures of companies, the technological lag gave labor productivity indicators lower than in the PRS. In 2010, 1 employee in Russia produced only 11.8 % of the steel output performance in PRC i. e. it was 8.5 times lower [9].

The Russian export structure was slowly changing. It was determined mainly by demand in foreign markets, and to a lesser extent by our technological capabilities. The bulk of exported steel was in the form of feedstock (iron ore, pellets and scrap) and low-availability products (pig iron, iron and non-alloy steel semi-products), which together made up about 80 % of the total metal export in physical terms. The share of their products (hardware, pipes, and products of reprocessing) was not more than 20 % of the export at the end of the first decade of the 21st century [10, 11].

The industry has preserved its existing structure with prevailing large integrated plants having high capacity and high output of products with low added value, that was a consequence of development focused mainly on the world market. This trend of development met the state line of industrial policy i. e. keeping people in one-company towns employed to avoid social problems in such towns. In return, owners of vertical groups of companies could expect for priority access to the governmental financial support. The support included an extended list of imported production equipment not subject to VAT and preferential loans for big investment projects.

Lack of steady growth in domestic steel consumption resulted in greater export orientation of the industry. Export was a priority for the industry as only export could support mass steel production through all this time.

However, export growth was critically limited in the second decade of the 21st century. The following problems can be highlighted:

a) Protectionism in PRC, restricting their markets for foreign exporters; for Russia it means that the industry will have to focus on cast steel and rolled products with low added value, despite the stepwise upgrade of production technologies;

b) Sanctions of the industrial countries against Russian economy after 2014 that slowed down its development, reduced the domestic demand for steel and put additional obstacles in the way of Russian steel producers in the foreign markets;

c) Both rapid domestic production growth and steel overproduction in Asia, like worldwide. Steel product prices drop.

d) Environmental problems: Europe's transition to stricter environmental standards for the steel industry will also affect the Russian steel industry. Today, the European Union (with its New Green Deal) is considering a carbon tax on imports (border adjustment carbon tax) to support its environment-friendly production. That assumes that a special tax will be charged for steel imported to the European Union (produced using the conventional carbon-intensive technology). For European steel producers, it is about 25 Euro per one ton of carbon dioxide, which encourages them to switch to clean technologies. Russian enterprises will have to update production according to EU standards (including EU equipment to be bought) or incur additional expenses for that tax [12].

Automotive sheet and pipes of various diameters added to the product range are among positive development aspects of the industry in the second decade of the 21st century. Russia was a number 2 exporter of pipes and pipe production capacity increased and exceeded the domestic demand by much. However, the output growth due to these positions was short-lived. The automotive industry was hit hard by the ruble devaluation in 2014 and polymer pipes became a real alternative in the housing and public utility sector, so Gazprom had to abandon a number of its projects. The domestic demand could not consume the entire industry's output, although it showed some growth in 2017–2018. Competition also has increased in the world market of steel. The results of 9 months of 2019 show that exports has decreased by 11 % for flat products and by 15.6 % for long products compared to the same period of the previous year, and the structure of Russian steel export remained unchanged over the past years and had a high share of semi-products [13].

Apart from external factors that had a negative effect on the industry development, it is necessary to point out internal reasons that are not less, but even more important. This is the absence of institutional changes and related economic reforms in this country, and 'persistently ineffective solutions' chosen by the establishment [14].

Summary

The Russia's economic growth in the first decade of the 21st century was stimulated by high energy prices. However, this growth was not associated with institutional changes and was not accompanied by economic and political reforms. As a result, the steel industry growth as well as the entire Russian economy was short-lived. After the global economic crisis in 2008, many European countries and the United States introduced protective actions against steel producers from other countries. Steel production in Asia grew at a faster pace. The steel demand in the world during 2014–2018 was unstable: growing was followed by falling. With recessed Chinese economy growth, all these factors contributed to the steel overproduction growth in the world and led to a drop in the prices, which made life of Russian steel producers even more complicated. Steady performance of the industry may be associated with an increase of in metal consumption in the domestic market, but under the existing economic sanctions and the absence of institutional changes, this seems unlikely.

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