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GEOECONOMIC RIVALRY IN THE GLOBAL STEEL MARKET

Abstract:

The global steel market was dominated for decades by the so-called steel trinity (USA, China, Japan), but with successive crises in global markets, and due to political factors, it has been dominated by China. The article presents the course of the market takeover using a geoeconomic analysis method developed by the author. It takes into account not only economic data for individual countries, but also the distribution of production and the events and fate of individual industrial companies. It allows diagnosing the causes of changes in a given market and allows evaluating geoeconomic scenarios for the future.

Key words:

geoeconomic analysis, steel market, competitiveness, crises, market takeover

INTRODUCTION

Geopolitics, becoming an increasingly popular tool for analyzing the international situation, relying on hard indicators and measurements by scientific methods that reject doctrines and ideologies, entails the development of its subdisciplines: geostrategy and geoeconomics. In this study, geoeconomics, which has been used for years to assess the wealth of nations and international economic players (Vihma 2018), will serve as the basis for presenting the state of current and past competition in the steel market. Steel alloys of various varieties, types and production technologies are key strategic intermediates for countries in the context of the armaments and electro-mechanical industries, which for many countries is

also often the industry that drives GDP growth (Cunat 2004). Therefore, monitoring of the market situation so crucial is mandatory not only for the largest multinational corporations, whose “to be or not to be” depends on changes in the world economy and ideas for development among competitors (Chan, Yang, Gao 2018). Such monitoring is also of interest to the major powers wishing to pursue interests through the largest possible share of world power (military and economic).

The aforementioned geoeconomics is a subdiscipline of geopolitics. It uses similar tools and methods, but primarily studies market rivalries around the world and in specific regions. Its subject of study is the impact of local conditions on the development and power of countries and multinational corporations of various industries. Geo-economic analysts, however, using not the methods of economics, but geography, have a broader detailed synthetic knowledge, covering the issues studied globally (Axelsson, Håkansson 2016). Without prolonging, the purpose of this paper is to geoeconomically present the most important aspects of the global rivalry between the largest steel producers in recent years. Who has lost and who has gained, and why?

METHOD

This analysis to explain the reasons behind the takeover of the steel market by Chinese producers uses a proprietary research method. A longer time perspective is needed to carry it out, so the period when China began to grow into the world leader in steel production was adopted for the analysis (Hudson, Swanton 2012). According to the method, it was necessary to check how large the production of individual countries and corporations was after each slump in global markets. In the following section, the breakthroughs were detailed. In each of these, the steel production at the time was analyzed, as well as what happened to the major producers in each regional market.

This made it possible to detail the most important reasons for the rise and fall of the production potential of countries and major corporations in the steel market, as in

cases of mergers, dynamic growth and other significant changes, attention was directed to these specific cases. The conclusion brought them all together and determined the answer to the question of what causes caused China and Chinese corporations to take over the steel market.

The method of geo-economic analysis developed for the benefit of this study can be used as a theoretical tool for analyzing other industry global markets as well. However, it is important to use the right quality of data sources. This analysis uses data from the USGS and its international database (USGS 2024). It is also important to present synthetic data geographically on maps. This allows for noticing details and synthesizing different data when applying this author's method of analysis.

The starting point will be the caesura of the peak of the business cycle prior to the financial crisis and the severe shake-up of the international debt-based monetary system (also known as the multi-currency system). This was the period around 1998 to 2008, when many companies collapsed when the banking system was found to be insolvent due to an overly liberal approach to lending, which in turn was driven by the policy of countries and the IMF and World Bank to create money through debt. This system is still in place today, but is now sponsored primarily by taxpayers.

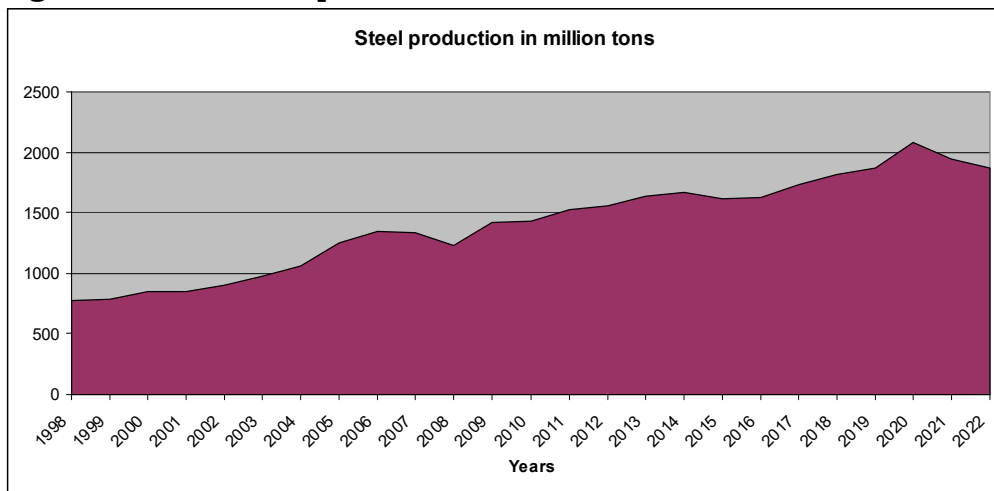
The second period of relative calm was from 2010 to 2018, that is, until the so-called pandemic. Both periods saw dynamic ownership changes in the industry. Most often, larger conglomerates bought out smaller companies unable to cope with debts and falling demand (Razin 2014).

The financial crisis and pandemic were followed by a time of uncertainty and, especially importantly, war preparations due to the bloodiest war in Europe since World War II. The gainers here will certainly be steelmakers, who will win contracts for the defense industry. On the other hand, the period of uncertainty is a time of more restrained purchases in the shipbuilding or automotive industries, which will also affect the steel market. Either way, as in any competition, the winners will be those who are quicker to understand the mechanisms of change and implement appropriate policies in

their countries and companies. This process has already begun after 2021 and is continuing today (Coimbra, Rey 2024).

During the period under review, steel production nearly tripled from 775 million tons in 1998 to 2075 million tons in 2020. In recent years, however, for the reasons described above, production has begun to decline and is now at the level of six years ago, which is a challenge for some producers (Fig. 1).

Fig. 1: Global steel output 1998-2022

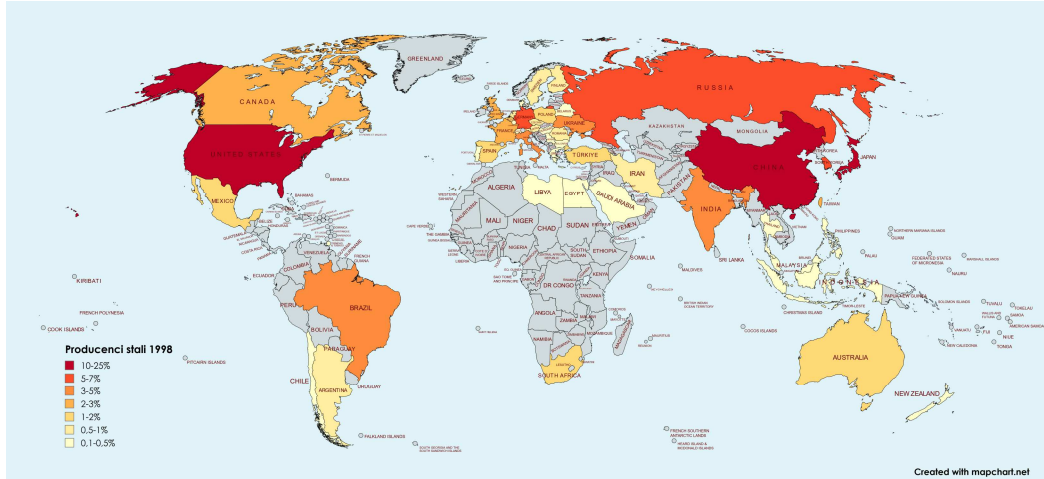


Source: Authors elaboration based on British Geological Survey World Minerals Production Yearbooks (nora.nerc.ac.uk) 2000-2024.

BEFORE THE FINANCIAL CRISIS OF 2008-2009

After a period of transition triggered by the collapse of the USSR, the geo-economic situation stabilized, and the decline in production in the former Eastern Bloc countries began to be compensated by state-sanctioned Chinese production. Also, African, Latin American and Asian countries, hitherto not considered highly industrialized, began to play a more serious role in the world economy, in which, as in any system, there can be no vacuum (Herfindahl 1997) (Fig. 2).

Fig. 2: Steel producers in 1998



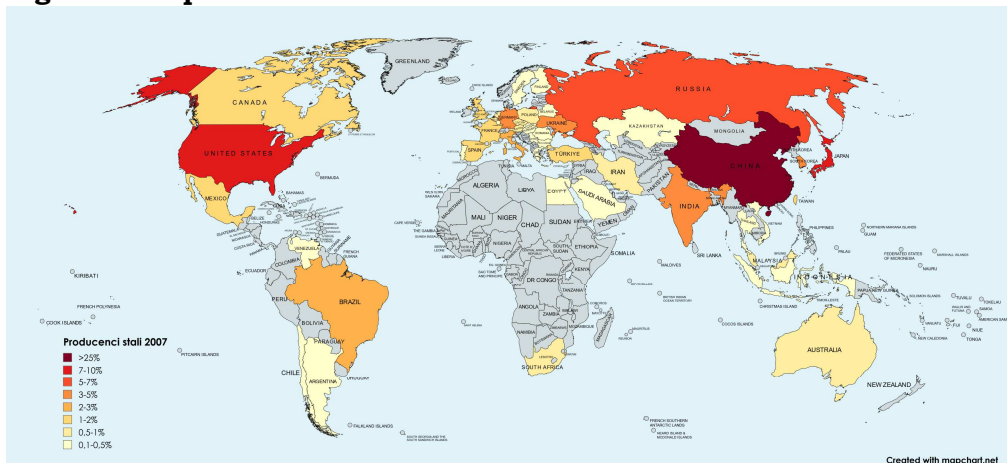
Source: own compilation based on BGS & USGS data.

Almost half of the steel produced in 1998 was produced by steel mills in China, the US and Japan. This was the so-called big steel trinity. In Europe, Germany remained the most important producer, in Africa - South Africa, and in South America - Brazil. In China, already producing the most, there were more than a dozen state-owned combines, among the largest of which were Baoshan, Shoudu, Anshan, Wuhan and Shanghai Iron & Steel Co. It was entirely indigenous capital (Wu 2000). Similarly in the United States, but the three largest corporations in the industry, i.e. US Steel, Nucor and Bethlehem, were private companies (D'Costa 1999; Gallet 1997). Japanese corporations with the largest sales at the time were primarily Nippon Steel, followed by Sumitomo, NKK, Kawasaki and the already much smaller Kobe Steel. These also have the status of private companies (Nair, Kotha 2001). In Germany, two corporations dominated: Thyssen Stahl and Krupp AG (Bender et al. 2008). In Russia, there were a great number of combines, but the Uralsk Magnitogorsk combine was already gaining a clear advantage. Together with others, such as Severstal, they were state-owned (Doroshenko 2001). Korea's most important producer, 35% state-owned, was Chebol Pohang (Lieberman, Kang 2008). In Brazil, India and Ukraine, the steel sector was highly fragmented, so despite their significant share of world production, these countries were not home to any multinational corporation. The situation

was different in Italy, where almost all steel production was in the Riva Group's steel mills (Worrell et al. 1997). In summary, the largest corporations in the steel market were US Steel, Baoshan, Pohang, Nucor, Bethlehem, Shoudu, Nippon Steel and Thyssen - each with an annual production of more than 25 million tons of crude steel. This was the period after the Asian crisis and the time when post-Soviet economies were recovering from industrial restructuring. Who took advantage of the period of prosperity can be seen by looking at the figures for 2007, just before the great financial crisis.

The aforementioned crisis led to the bankruptcy of a number of corporations, especially those struggling with high production costs in their home countries, the effects of the Kyoto Protocol, signed by various countries since the late 1990s, which imposed CO₂ reductions and internal environmental and fiscal policies of countries. Many steel mills have closed or production has been relocated, but as late as 2007, few symptoms heralded a halt to the rapid growth of production, which had reached 1.3 billion tons, almost double the level of 10 years earlier. China in particular took advantage of this period to expand its production capacity (Pauliuk, Wang, Muller 2013) (Fig. 3).

Fig. 3: Steel producers in 2007



Source: own compilation based on BGS & USGS data.

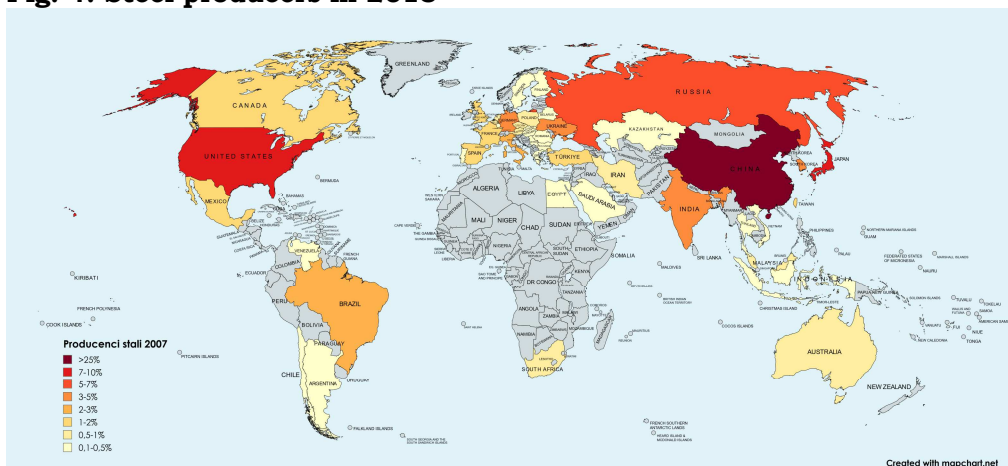
China had taken over 1/3 of the global steel market by 2007. Japan and the U.S. lost ground, but retained their

positions in the so-called big steel trinity. In Europe, Russia and Ukraine caught up and surpassed German producers, while South Africa remained the leader in Africa and South America - Brazil. In China, state-owned companies Baosteel (f. Baoshan) and Anshan maintained the largest production, while the Shagang combine became the third competitor. In addition, a number of other combines, including many new ones, maintained significant production there at the time (Song, Liu 2012). In Japan, a number of smaller steel mills merged, and as a result, the JFE Steel group was in first place in 2007, in that country, followed closely by Nippon Steel and Sumitomo (Oda et al. 2012). In the US, US Steel and Nucor maintained their dominant position, but it was already apparent that international producer ArcelorMittal, which was the third steelmaker in the US at the time, was entering the market. Russian production grew steadily under the oligarch-state system. The dominant position in the Russian market was maintained by the Magnitogorsk combine (MKK) and Severstal (Kopfle, Hunter 2008). In India, the steel industry was still highly fragmented, but the Tata group had risen to the first position there. In South Korea, Pohang was still the largest steel corporation, but Hyundai was growing in importance. In Germany, there was a merger of steel mills during this period and the formation of the Thyssen-Krupp corporation, but in second place was already ArcelorMittal. This corporation also began to invest in Ukraine, and there it gained a dominant position in the market by buying up the krzyworski combine and several minor ones. In other countries, production, despite growth, most often failed to keep up with the rest. The largest multinational corporation during this period became ArcelorMittal, thanks to the buyout of many steel mills in trouble in various countries. Far behind it were the Japanese companies JFE Steel and Nippon Steel, followed in turn by China's Baosteel, Korea's Pohang, US Steel and Nucor, and then Thyssen-Krupp, the Magnitogorsk combine and China's Anshan and Shagang. Each was responsible for producing at least 15 million tons of steel in 2007 (Mukherjee, Roy 2010).

STEEL MARKET AFTER THE FINANCIAL CRISIS

Then a lot changed after the financial crisis of 2008-2009. Production at that time returned to the levels before these key events, but a lot of minor steel mills closed. After the crisis, demand grew, but some countries and some corporations strengthened in competition for markets, while others lost ground and fell out of supply chains. One look at how the market changed during one of the years of relative calm, although it was not a surge. For example, in 2018, when global steel production reached 1.8 billion tons, roughly the amount of steel produced in the world now, after a period of so-called CoViD-19 pandemic (Fig. 4).

Fig. 4: Steel producers in 2018



Source: own compilation based on BGS & USGS data.

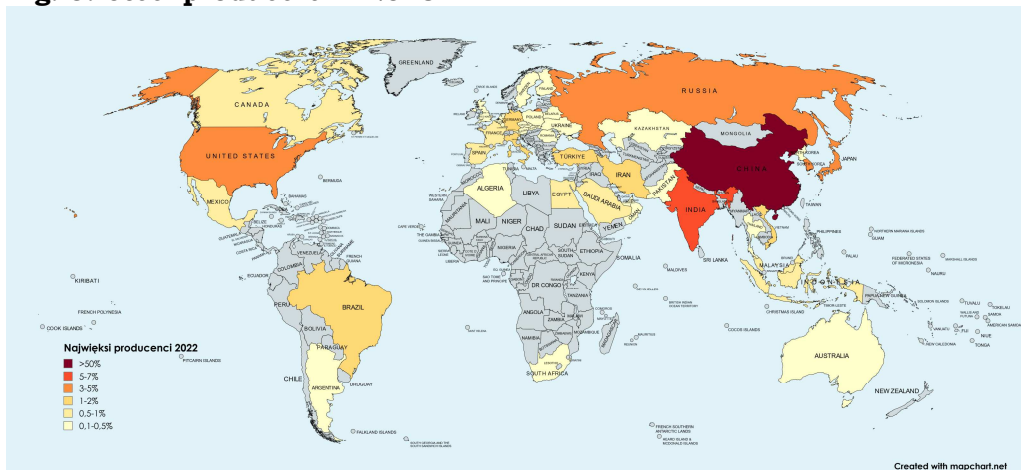
The post-crisis period has been used by China to dominate the global steel market, producing more than half of the world's steel. Importantly, still despite the pandemic and the war in Eastern Europe, which reduced production overall, China continues to produce at the same centrally-planned level, further eliminating weaker competition and increasing geoeconomic market share. Nevertheless, production and its utilization are two different things, and it should be kept in mind that in centrally planned economies like China's, much of the production may be wasted or not used according to logical resource management principles. There was also a

commissification of capital during this period. Baowu (f. Baosteel with attached mergers of smaller combinations), and the Shougang, Hebei, Shagang, Anshan, Shandong, Ma'anshan, Tianjin Bohai, Beijing Jianglong and Benxi steel groups and conglomerates became the largest steel-producing companies in China. In 2018, China's main competitors, Japan and the US, weakened, so the big steel trinity has finally ceased. The second place was taken by India. The takeover of bankrupt smaller mills by the state-owned Steel Authority of India took place there. The importance of Tata Steel has also declined (Vogele et al. 2020). In Japan, Nippon Steel and Sumitomo merged, so JFE fell to second place, and these two corporations produced 90% of Japan's steel. In the U.S., U.S. Steel experienced a crisis and fell to fifth place, with Nucor remaining the largest player. In Russia, on the other hand, obsolete steel mills remained fragmented and none of the combines prevailed without developing production more. South Korea remained among the important shareholders in the steel market, with production growth owed to POSCO (f. Pohang) and Hyundai, which began to catch up with its largest domestic competitor. In other countries, ArcelorMittal maintained an important position and was thus the largest corporation in the steel market before the so-called pandemic. China's largest producer, Baowu, was second, while it was followed by two more Chinese producers still on the list: Shougang and Hebei (otherwise known as Hesteel). The fourth largest corporation was Nippon Steel-Sumitomo, followed by more Chinese conglomerates: Shagang and Anshan (a.k.a. Ansteel). Behind them, Korea's POSCO and Japan's JFE showed significant production, followed by China's Shandong. The aforementioned companies produced at least 30 million tons of crude steel in 2018 (Sun et al. 2020).

COVID-19, WAR IN UKRAINE AND CHINESE STEEL HEGEMONY

As mentioned, another event in the world that shook the steel market was the so-called pandemic (Saltykova 2021) and

Fig. 5: Steel producers in 2018



Source: own compilation based on BGS & USGS data.

the outbreak of a full-scale Russian-Ukrainian war. The increase in armaments production could not happen by leaps and bounds, so to this day we are still seeing the effects not only of the so-called pandemic, but also of a general increase in labor costs (resulting from demographic factors in industrialized countries), environmental costs, and the substitution of steel for other resources while using new technologies (Song 2023). This does not mean that the steel industry will begin a permanent recession, as was the case with lead metallurgy. However, policies unfavorable to industrialization in many liberal-democratic countries have led to the takeover of many markets by ecologically unconcerned China (Vu, Haraguchi, Amann 2021; Ba, Coleman 2021). The latest data (as of the end of 2022) show that, as a result of the economic processes the Chinese government has predicted, the country already has a nearly 55% share of steel production (Figure 5). That's growth very fast considering that it's been four years (Song 2023). Growth was recorded, although not as spectacular, by Indian corporations. Overall, however, the hierarchy remained the same at the top. In terms of growth, it is also worth highlighting the dynamic development of metallurgy in Vietnam and Indonesia. The largest declines are in the free market economies: Japan, the US, South Korea, Germany. Russia and Turkey also recorded significant

declines. Ukraine lost 2/3 of its production capacity in the war. Also, many EU countries, including Poland, succumbed to the negative effects of the so-called pandemic and the subsequent destabilization of the European market by the war. One can also observe the development of metallurgy in the Middle East, where Iran and Turkey have been joined in developing the industry by Saudi Arabia and Egypt. The latter has also taken a leadership position in Africa's metallurgy (Matykowski, Tobolska 2021).

CONCLUSIONS

The geoeconomic rivalry has now entered a stage of returning to stability, and this may be helped by an increase in procurement by the arms industry (Wilczyński 2013). The examples described show that merging companies from one country avoided bankruptcies, and that selling out to foreign capital did not always end well for a country. This can be seen in the deceleration of the multinational corporation ArcelorMittal, which has lost most recently, including its leading position in the steel market, and as part of the necessary savings extinguished furnaces, not excluding Polish steel mills.

Competition for markets between states and their capital represented by corporations, for this is the paradigm used by geo-economics, will now be decided in the coming period. Until the next crisis or war, a gradual restoration of the amount of steel produced globally will certainly be observed. Some countries and corporations will take advantage of this, building their geo-economic power will help develop societies and wealth, not just measured by GDP.

One can see, above all, from China how the development of primary industry has led to socio-economic development, despite the communist regime in that country. However, the way the economy is controlled through central planning, as the USSR has already found out, is ineffective and a repeat of history can be predicted. What will happen, and when, as China descends into chaos? Or could it be the EU will break up sooner and that will cause another crisis? Others predict World

War III as the inevitable end of the current business cycle in a few years. Still others, that the US dollar financial bubble will eventually burst and the currency will lose its value completely, leading to a crisis like the world has never seen before. Either way, whoever would like to play prophet in order to convince people of their reasoning should turn to geopolitics, or in the case of economic discourse, geoeconomics.

History likes to repeat itself, and the basic processes outlined in the above analysis, although perfunctory, to a skilled mind can subject different ideas to winning the geo-economic game, whether on a global scale or in one's own national backyard. Therefore, one should be encouraged to study geoeconomics and geopolitics more broadly, for the rivalry is most often hidden. It is very rarely seen on the fields of modern battles. Everyone takes part in it, whether they wish to or not.

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