

Working paper

6th International
Conference of the
BRICS Initiative for
Critical Agrarian
Studies



BRICS Initiative for
Critical Agrarian Studies

The Boom and Bust of Iron Ore Extractivism, 2005-2015:
Role of the Brazil-India-China Nexus

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10/2018



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Published by: BRICS Initiative for Critical Agrarian Studies (BICAS)

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Abstract

This paper explores the recent commodity ‘supercycle’ or ‘paradigm’ of 2005-2015 through a regionally situated global study of the iron ore and steel production. Political economic analysis of data gathered through field research in Brazil and India between 2010-2015 offers novel insights that allow exploring whether and how politics at the points of extraction, such as resistance by locals, affect world political processes, such as the price of iron ore and steel. These resources are crucially important for all would-be global rising powers. The study shows how India and Brazil are, together with Australia and China, in a league of their own in the world of iron ore extraction. Iron reserves and production are concentrated in five countries, these four and Russia, which together accounted for 81% of world production in 2012. However, importantly, Indian production did not grow markedly after 2008, when major resistance to its expansion began, and the rise was also not nearly as rapid in Brazil as forecasted. Blockages caused by resistance to major new greenfield mining projects (e.g. Vale’s Apolo project in Minas Gerais in Brazil, NMDCs Rowghat project in Chhattisgarh in India), the closure of existing mines all around India, and disturbance of exporting activities in Brazil partially influenced global iron ore production. In contrast, the absence of such mining politics in Australia and China partly explains why their production continued to boom after 2010. During the 2000s, the world’s steelmaking capacity almost doubled, which also meant that the demand for iron ore and coking coal almost doubled. By 2012 there was a rapid increase in mining investment, but also restrictions on exports (India raised the tax on exports of iron ore lump and fines to 30% at the end of 2011). Generally, steel prices have correlated with iron ore prices, but in 2008 there was a huge dip in steel prices, while iron ore prices rocketed. This suggests that historical relations between iron ore and steel had changed. The study suggests that in 2008 iron (export) became a better business than steel-making. The iron ore boom has meant that mining tycoons have been able to reap “fast, immediate and large profits” through violence geared against locals and the repression of resistance, as the new wealth has been turned into political power via funding the government. This specificity of very high profit margins, providing a lot of capital to the targets of resistance, has meant that in the iron ore boom “[resistance] has been more difficult to organize than in other industries (such as dams) where profits come later.” When the global iron boom hit the Indian political economy, there ensued rampant and illegal mining, rapid expansion to sell as much as possible, and the appearance of new players, such as speculative land grabbers and capitalists who had no prior experience in mining, but were looking for fast money-making possibilities. As a side effect, conflicts spiralled to new levels. In Brazil, the boom led to record high profits for Vale, who controlled most iron ore extraction and exports, the entrance of new players,

speculative capital and destructive projects in new areas, and the building of new infrastructures. Many of these expansions were resisted (but not as notably or deeply as in India), and many checked, some even discontinued by resistance.

Keywords

Brazil, India, Iron Ore Markets, China, Commodity supercycle

1. The Global Iron Ore Boom

I will first analyze the global political economy of iron ore, and the iron ore booms in Brazil and India. Then, I will assess the China-India-Brazil nexus in the iron ore and steel trade. Thirdly, I will assess whether the role of China being the buyer of ore impacted the outcomes of possible resistance to these extractive projects

The global iron ore boom took place between 2008 and 2014. A detailed look at upstream struggles in Brazil and India can shed light on how huge increases in iron prices affected politics on the ground, and how these in turn started to have a global significance as resistance diminished the export of minerals. Graph 1 illustrates how the price of iron ore started to rise in 2004, dramatically taking off in 2009. The bull market was largely a result of China's huge demand which, together with the joint decision on 30 March 2010 (BNDES 2014) by large iron ore producers to let go of the prior scheme, turned the 40-year fixed market, based on a benchmark that kept the price fixed for a year between miners (sellers) and steel-makers (buyers), into spot-pricing.

This was an epic change according to financial analysts, as such changes in the pricing systems of the world's top commodities are rare.¹ Events intensified in the 2008 world economic crisis, when Chinese steel plants decided not to pay the agreed prices, but buy on lower terms afforded by the crisis. This move resulted in a backlash, as in 2010 Vale and BHB Billiton wrote short-term contracts with Japanese steel mills for higher than agreed prices, thus scrapping the old system from the supply side. Chinese officials became very worried about this change in affairs-in effect it showed that production consolidation by the big multinationals could control the market even more effectively than the world's largest governments. Meanwhile, the change to spot pricing aggravated socio-environmental damage at points of production, as many now saw their chance to embark on the bull market-or to find buyers, particularly those in China, who would be happy even with low-quality ore if they could get it under the spot price. This they most probably did, if the illegal exports from India are any evidence.²

¹ <http://moneymorning.com/2010/03/30/iron-ore-2/> (accessed 13 August 2015).

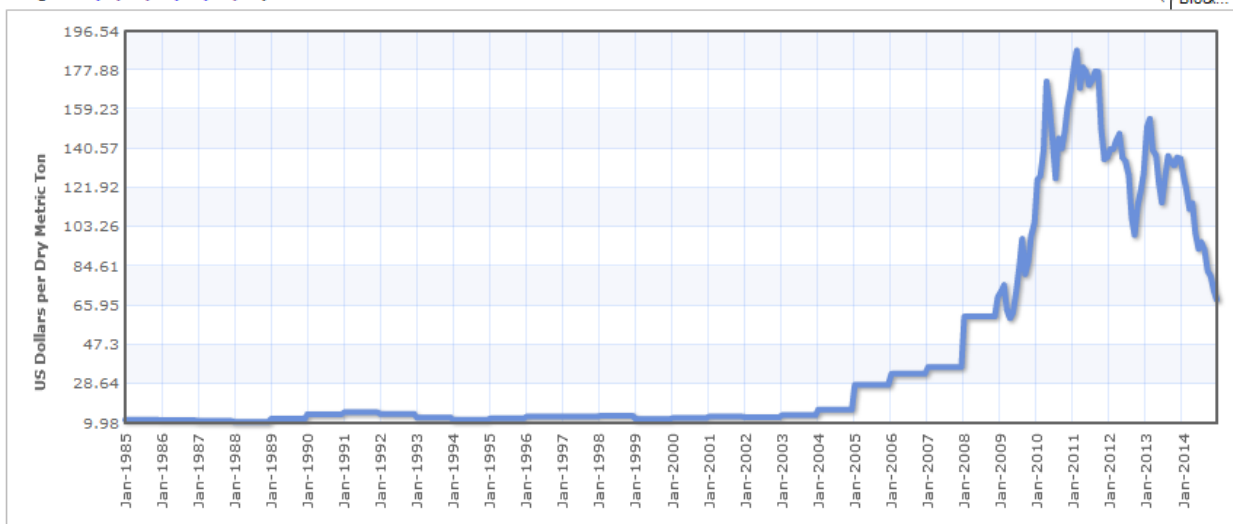
² The Australian producers, BHB, Rio Tinto and an aggressively expanding newcomer, Fortescue, in particular, managed to reap huge windfall gains, as they paid about USD 11 to ship a ton to China, while Brazilian producers paid about USD 25 a ton. The comparatively greater iron extraction boom in

In Graph 1 it is interesting that the price of iron ore has not gone down as much after the 2011 peak as could have been expected, but has remained high. The 2012 shutdowns of mines in India contributed to the renewed price increase in 2013, these closures being widely noted in business news and sending alarms across the world of investors; analysts are very sensitive to any conflict news, rightly considering conflicts as increasing the risk to investment. A firm's financial performance weakens with the increasing perception of risk caused by direct stakeholder activism (Vasi and King 2012).

Iron Ore Monthly Price - US Dollars per Dry Metric Ton

Range 6m 1y 5y 10y 15y 20y 25y 30y

Jan 1985 - Dec 2014: 57.310 (4) Block...



Description: China import Iron Ore Fines 62% FE spot (CFR Tianjin port), US Dollars per Dry Metric Ton

Unit: US Dollars per Dry Metric Ton

India and Brazil are, together with Australia and China, in a league of their own in the world of iron ore extraction, as Table 1 and Graph 2 illustrate. Iron reserves and production are concentrated in five countries, these four and Russia, which together accounted for 81% of world production in 2012 (BNDES 2014, 208). Indian production did not grow markedly after 2008, when major resistance to its expansion began. In a later chapter I show how blockages caused by resistance to major new greenfield mining projects (e.g. Vale's Apolo project in Minas Gerais, NMDC's Rowghat project in Chhattisgarh), the closure of existing mines all around India, and disturbance of exporting activities in Brazil partially

Australia should be studied in more detail with regards to its impacts and particularly in order to explain how the absence of resistance was partly responsible for such a rise in production.

influenced global iron ore production. The absence of such mining politics in Australia and China partly explains why their production continued to boom after 2010.

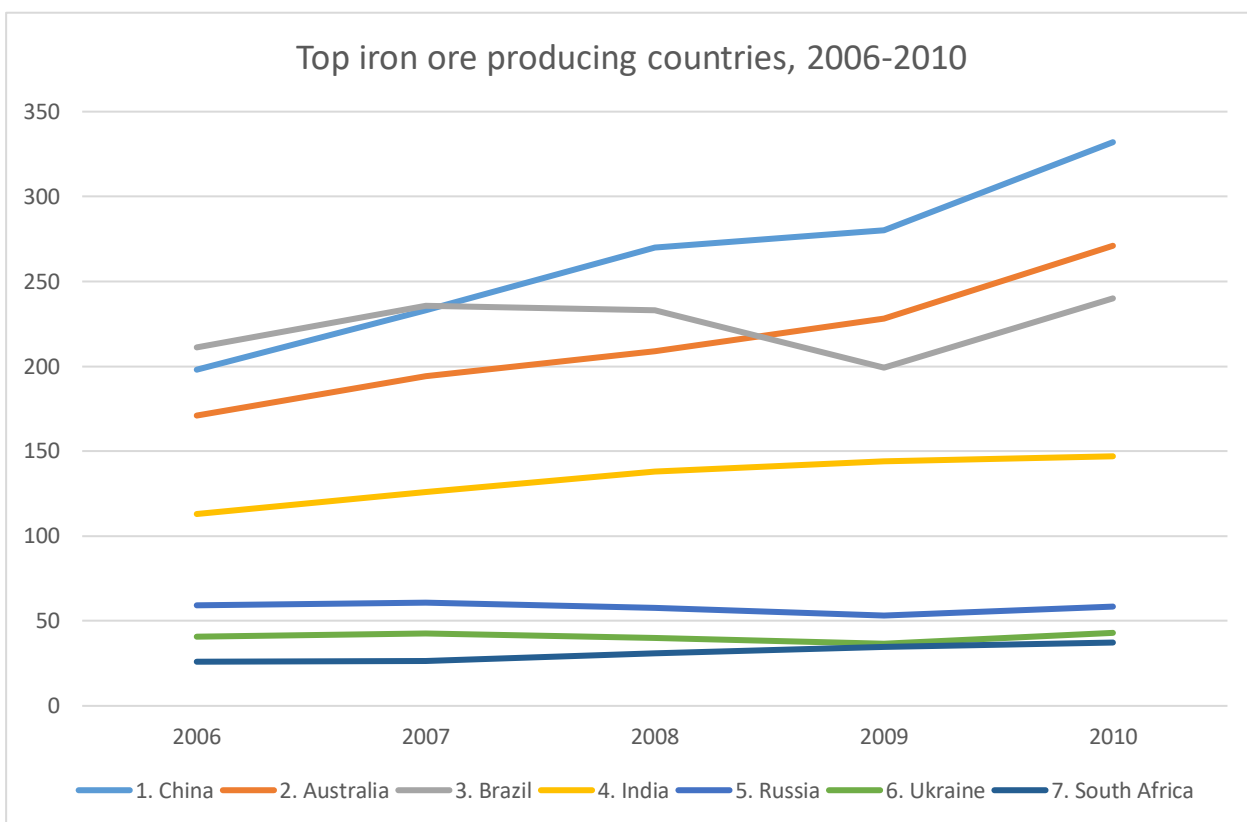
Table 1: World's top iron ore producing countries, measured by metal content (thousand metric tons), 2006-2010

Source:

http://www.indexmundi.com/en/commodities/minerals/iron_ore/iron_ore_t16.html

Country	2006	2007	2008	2009	2010
1. China	198	233	270	280	332
2. Australia	171	194	209	228	271
3. Brazil	211.2	235.5	233	199.2	240
4. India	113	126	138	144	147
5. Russia	59.1	60.8	57.8	53.2	58.5
6. Ukraine	40.7	42.8	40	36,6	43
7. South Africa	26	26.5	30.8	34.8	37.3

Graph 2: Top iron ore producing countries, measured by metal content
(thousand metric tons), 2006-2010



Iron ore is the most important commodity used in steel-making, and the increased iron extraction has gone to new steel mills, mostly in China. During the 2000s, the world's steelmaking capacity almost doubled, which also meant that the demand for iron ore and coking coal almost doubled. According to the 72nd Steel Committee Meeting of the OECD in 2012, this "surge in demand was unexpected" and consequently the "supply side response lagged"; by 2012 there was a rapid increase in mining investment, but also restrictions on exports (India raised the tax on exports of iron ore lump and fines to 30% at the end of 2011), which suggest that "market factors and restrictive policies can cause significant supply disturbances for steelmakers in the short term."³ Of course, some steel mills and countries face a more difficult situation than others, India being among them. I will show how this is true and how this new setting of more chaotic markets is enfolded by a cascading effect of politics at the points of production.

Graph 3 tracks the price of steel since 2008. Generally, steel prices have correlated with iron ore prices, but in 2008 there was a huge dip in steel prices,

³ <https://www.oecd.org/sti/ind/50494260.pdf> (accessed 2 July 2015).

while iron ore prices rocketed. This suggests that historical relations between iron ore and steel had changed.

GRAPH 3: PRICE OF STEEL, 2008-2014

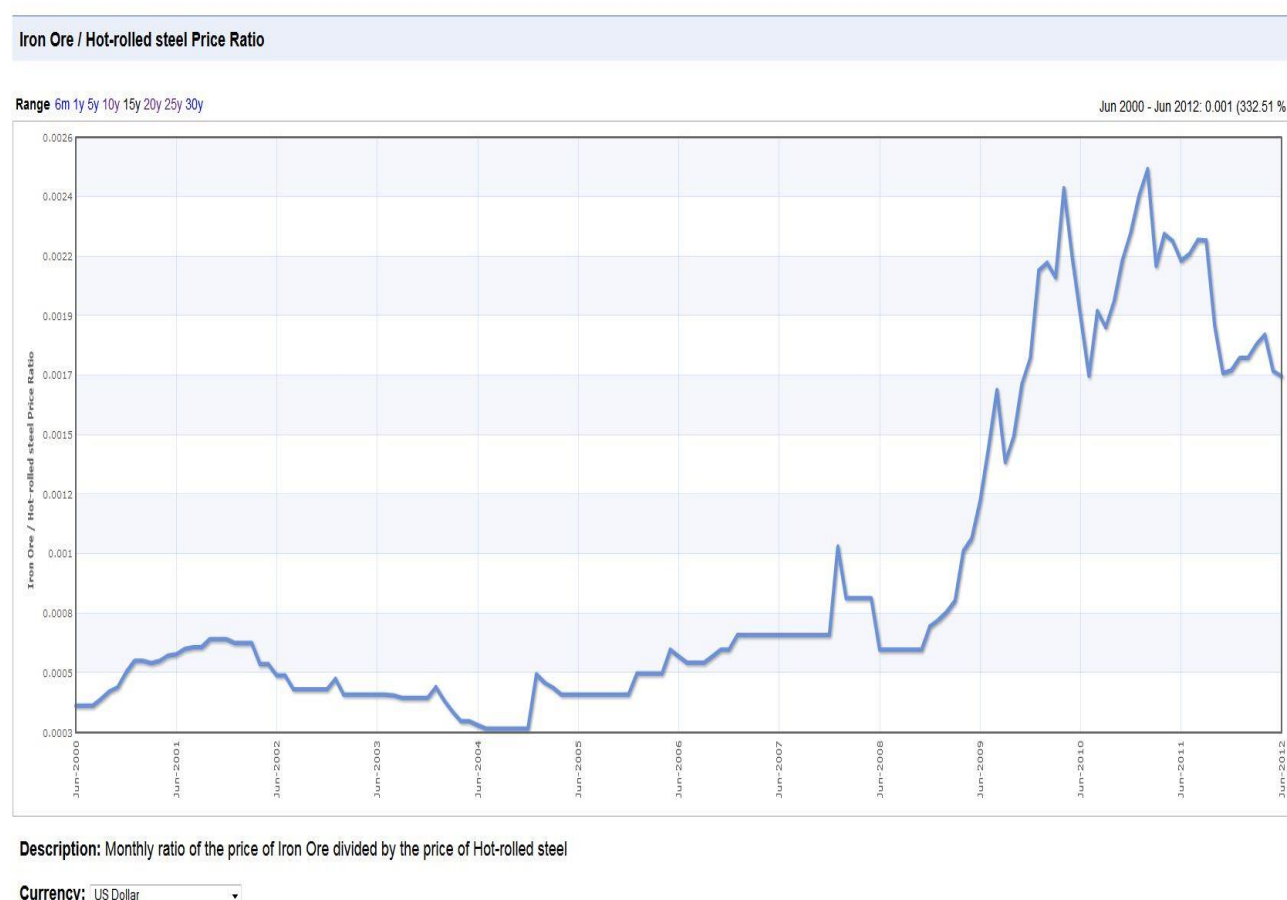
Historical price graph for Steel



A comparison of Graphs 1 and 3 suggests that in 2008 iron (export) became a better business than steel-making. This notion is supported by my interviews: Arun Agarwal, a doctor-cum-concerned citizen argued, for example, that it made no sense to make steel, when the profit margins in iron ore extraction rose to over 80% in many parts of India. Chenoy and Chenoy (2010, 120), also referring to Agarwal (who has filed writ petitions in courts against the state of India for mismanaging the citizens' mineral wealth), write that the rise in iron-ore mining profits per ton went from 50 rupees in 2000 to 5,000 in 2010. In Brazil, Vale made a USD 17.5 billion profit in 2011 (this being 76.1% of the Brazilian mining sector's net profits), meaning USD 220,069 per employee, a profit margin of 36.6% and a return on assets of 16.6%, based on Vale (2012). Meanwhile, globally, the cost of iron ore and coking coal as a percent of the price of global hot-rolled steel increased to about 60% by the end of 2011 from the pre-2007 level of about 10-30%, and iron ore cost percentage rose from 5-10% in 2005 to

30-40% in 2011.⁴ Graph 4 illustrates that the iron ore to hot-rolled steel price ratio increased by 332.5% between 2000 and 2012, showing how iron ore became much more profitable, and thus a more important business.

Graph 4: The price of iron ore divided by the price of hot-rolled steel, 2000-2012



Concomitantly, the costs of producing iron ore have not increased apace-in fact they were de facto lowered during the boom, as illegal miners not paying royalties, taxes and other required payments to the state, workers and impacted people made up over half of total production in India. In Indian iron ore extraction, according to coordinators from the Development Initiative (an MMP

⁴ <https://www.oecd.org/sti/ind/50494260.pdf> (accessed 2 July 2015).

member and NGO from Bhubaneswar offering advocacy for locals in mining areas), there were “very low production costs, almost none”; it was “almost all profit.” The cost of extracting an iron ore ton in Odisha was, according to a trade union leader of a steel plant, “no more than 700 rupees”; the traders took care of transport costs. The figures my informant gave for the costs, including bribes, ranged from a high of 1,500 rupees down to 400 rupees. These figures differ dramatically from the calculation done by Accenture with BNDES researchers (in BNDES 2014, 217), where they assume that companies would make all the required payments. In their calculation, in 2012 India presented mine costs of about USD 60/t, and Brazil about USD 40/t, the latter being the lowest in the world. The bulk of assumed costs in India consisted of royalties. China differed dramatically from the rest of the world, with its high USD 150/t production cost, estimated by Accenture to grow by 2021 to about USD 250/t. The last part of the analysis in BNDES (2014) suggests a major discrepancy in that China can no longer produce cheap domestic iron ore, while most other iron possessors can. Furthermore, figures indicating that Brazil and India have some of the lowest costs in the world seem to be correct, though they underestimate how cheap the costs actually are: Indian costs have likely been the cheapest in the world for some years based on my data.

An Odishan journalist argued that the iron ore boom has meant that mining tycoons have been able to reap “fast, immediate and large profits” through violence geared against locals and the repression of resistance, as the new wealth has been turned into political power via funding the government. This specificity of very high profit margins, providing a lot of capital to the targets of resistance, has meant that in the iron ore boom “[resistance] has been more difficult to organize than in other industries (such as dams) where profits come later,” as claimed by Arun Agrawal. Indeed, in this regard, the iron boom has been an exception even in comparison to other minerals: in gold, for example, production costs are so high that a gold boom would not create such large profit margins or possibilities for fast cash, as Agrawal added.

When the global iron boom hit the Indian political economy, there ensued rampant and illegal mining, rapid expansion to sell as much as possible, and the appearance of new players, such as speculative land grabbers and capitalists who had no prior experience in mining, but were looking for fast money-making possibilities. For example, in Karnataka’s Bellary area, a group of well-connected businessmen-politicians formed an illegal extraction ring around the Reddy brothers, who quickly became millionaires. As a side effect, conflicts spiralled to new levels. Agrawal (see Chenoy and Chenoy 2010, 121) even argued that the

popularity of the Maoists in the 2000s can be explained by the rise in iron-ore mining profits and thus inequality, as locals were not offered shares in profits. Royalties remained at a ridiculous 15 rupees on average per ton. For Chenoy and Chenoy (ibid.), this “contractor-politician-mining-transportation nexus and the huge profits being made from mining is part of local knowledge and frustration” and “the Maoists are able to take advantage of this exploitation and failure of government institutions.”

In Brazil, the boom led to record high profits for Vale, who controlled most iron ore extraction and exports, the entrance of new players, speculative capital and destructive projects in new areas, and the building of new infrastructures. Many of these expansions were resisted (but not as notably or deeply as in India), and many checked, some even discontinued by resistance. Meanwhile, the government increased minimum wages and distributed social welfare and credit access, along lines typical of responses by Latin America’s progressive governments to extraction (Kröger 2012; Gudynas 2012; 2015; Veltmeyer and Petras 2014; Deonandan and Dougherty 2017); these policies of “new extractivism” worked as a counter-measure to larger mobilization attempts based on local socio-environmental grievances.

When juxtaposing Graphs 1 and 3-or looking at Graph 4--it can also be seen that after the iron ore boom, between 2008-2013, when iron was the better business, steel has regained ground, with rising steel prices since 2013. Graph 5 below shows in greater detail the iron ore price in 2005-2014, the period on which I focus.

Graph 5: Iron ore prices, 2005-2014

Iron Ore Monthly Price - US Dollars per Dry Metric Ton

Range 6m 1y 5y 10y 15y 20y 25y 30y

Jan 2005 - Dec 2014: 40.690 (144.75 %)



Description: China import Iron Ore Fines 62% FE spot (CFR Tianjin port), US Dollars per Dry Metric Ton

Unit: US Dollars per Dry Metric Ton

The first major impact on iron ore flows was in 2010, when Goa, India's largest export state, was forced by the Centre Government to impose a moratorium on mining, which meant that no more new mines were opened and the rising trend of mining volumes was reversed. The moratorium was instigated by the Centre State Minister of Forests and Environment, Jairam Ramesh, after pressure by activists who notified him of the illegalities in place. The highest prices were experienced after this moratorium. Another rise in prices, towards the end of 2012, came when mines were shut down in Goa, in September 2012, by the BJB Chief Minister of Goa, following the order of the Shah Commission. This move was followed by the Centre revoking all environmental licenses for mines 5 days after the Chief Minister's announcement. In December 2012, in the third major decision regarding Goa mines, the Central Empowerment Committee of the Supreme Court handed down a stop order to mines, which meant that the mines closed in September could not easily be opened again; the petition for this had been made in September 2012 by the Goa Foundation, an NGO.

This last order was no longer big market news, which might explain why iron ore prices were not impacted much by the decision, if we are to assume that the Goa decisions would play a global role. They might very well have, given that India was the world's 4th largest exporter, and the rest of India more or less followed what happened in Goa and Karnataka. Investors saw these initial moves as

signs of a major change in the political setting, and worried that there was an increased risk of iron ore becoming unavailable (given the mine closings) not only from India, but also from other potential “resource nationalist” states.⁵ However, by this time Goa had fallen from its position in the 1990s as one of the leading global exporters to a small player in the late 2000s, so it is difficult to say whether these mining curtailments would have drastically shaken global prices. After 2014, the new capacity that investment created during the boom started to be instrumental in the form of some new large mines, which suppressed global prices.

1. Exploring China’s role in global iron ore extraction

Recent advances in movement outcome literature have emphasized that third parties must be studied in order to understand outcomes (Luders 2010). Foreign powers, particularly global hegemonies or rising powers, have been the most important third party in local conflicts crucial to global capitalism’s expansion (particularly via extractivism) for at least for the last five centuries (Arrighi 1994; Wallerstein 1974; Moore 2015), and most likely even much longer.⁶ China, as a rising giant and the greatest new buyer of resources, has played perhaps the most important third-party role in resource conflicts since 2005, and given the political and economic contexts, we might expect that the situation of resistance against iron exports is harder in Brazil than in India. The Brazilian and Indian governments have very different diplomatic and trade relations with China, particularly in terms of mineral policy. The Brazilian government’s policy is to sell as much as it can to China, to balance the negative trade account resulting from the importation of cheap consumer goods for the new middle classes of Brazil, without considering the strategic importance of iron ore or not caring about this

⁵ Reflecting a major global political change in resource extraction regimes, in 2012 resource nationalism became the top risk for executives in the Ernst & Young (2013) business risk radar for mining and metals, (c.f., in 2008 it had been ranked 8th for the next 5-year period).

⁶ Foreign powers and the world system may have been the key forces of change (also in global mining) for 5,000 years: Frank and Gills (1993) argue that capital imperialism has been present since the Bronze Age, wealthy families and state power being the oscillating key driving forces of this capitalist expansion. There is still a need to study the past 5,000 years of mining politics, including possible resistance, from this World System perspective.

due to its massive reserves and a wish to promote a multi-polar world order. The Indian government, on the contrary, woke up to the reality that its limited reserves of strategic iron ore were being fast depleted by illegal miners exporting to a historic and key rival, China, with whom they have had border clashes.

If a country depletes its own reserves, and there is a war, iron ore is likely to immediately become a very strategic mineral whose (non-)trade can be used as a weapon. China is currently fast depleting its own reserves, which are of very low quality in global comparison (especially in contrast to India and Brazil), and India is estimated to surpass China in production volume by 2017. India currently has at least twice the amount of reserves of China when considering the average iron content (author's analysis based on the data in BNDES 2014). It is no wonder that China has been willing to pay a high price for iron ore in the past years in order to amass a safe reserve: the absence of access to this mineral, even theoretically, is a serious obstacle to a would-be world power.

China was responsible for the 42% increase in the international trade of iron ore between 2007 and 2012; it imported 362 mt while the global increase was less (343 mt), as imports decreased in Japan, Europe and some other regions (based on author's calculation on data in BNDES 2014). Over 90% of Chinese investment in Latin America goes to mineral extraction (Arce 2014, 126). China is Brazil's largest commercial partner, and iron exports represented 35% of all of Brazil's exports to China in 2013. Of the iron exported by Brazil, 56.4% went to China in 2009, while Germany, in second position, got less than 5% (Moreno 2015, 45). This marks a sharp shift in iron ore destination, as well as in where the appropriated capital accumulates. In the 1960s-1990s, it was Japan who benefitted the most from new global iron ore investments; according to Ciccantell and Patten (2017, 57) between its opening in 1983 and 1994, the Carajás mine "provided billions of dollars of subsidies for Japanese economic development via the steel industry," an unequal exchange in which China has now taken the prior position of Japan.⁷ China's rise to global power status would not be possible

⁷ However, Japan was able to get iron ore much more cheaply than China through its Brazil-connection; while the huge excess capacity created by the Carajás mine "drove down global iron ore prices from US \$46.31/ton in 1983 to US \$25.16 by 1994", my analysis of the global iron ore boom prices of 2007-2014 demonstrates that China had to pay a much heavier price for its ore, meaning that it has accumulated relatively far less capital from this unequal exchange than Japan before it. Nevertheless, China did

without the cheap iron extracted from Brazil, India and Australia, and such rise is directly dependent, at least partially, on global iron ore politics. The highest growth rates of China's economy coincide with the cheaper price of iron ore, and the decline of its growth rate with the higher price years suggests that the serious curbing of iron ore flows from India and Brazil (in the form of barring several projects) by their resistance, with its concomitant influence in increasing ore price, has influenced the pace of creating new global powers.

In 2013 Brazil exported 173 mt of iron to China, in other words more than the whole national production of India. In a decade, Brazil's exports to China increased 4.5-fold.⁸ This situates China as a crucial boom driver and a key third party to the resistance targeting Brazilian iron ore producers. The scale of exports, production and relative importance of iron ore in Brazil to China and to Brazilian exporters makes the targeting of iron ore production a much more difficult task in Brazil than in India. There are very few accessible global alternatives for China to achieve such massive iron ore imports besides Brazil. India, for example, is no longer a contender, since the country has banned increases in the export of minerals to China or elsewhere, retaining them for local steel plants. This signifies that resistance in India rarely has to face such a powerful third party as that posed by a national government-China trade nexus. In this sense, the courts' decisions to halt iron ore operations in Goa, which mostly exported its production to China, was in line with Indian government policy to curb exports of key minerals, particularly to China. But wanting to counter China's rise, the Indian government has created MOUs with other global powers. For example, it is vehemently supporting the South Korean-Western capital-based POSCO project in Odisha-in which it has nevertheless failed. This is mostly due to very strong local resistance, whose struggle has been eased as there have been other third parties, including national capitalists, which are also against POSCO. This suggests that any study of extractivism has to consider the role of international trade and diplomacy. Yet, international relations cannot explain the major regional variations across countries.

2. Resistance, Investment Outcomes, and the role of China

manage to secure cheap iron ore by its particular Goa-connection and other trade relations at least until 2010, so profits were made and fortunes turned in spite of the price boom.

⁸ http://usa.chinadaily.com.cn/world/2014-01/27/content_17259987.htm (Accessed 10 July 2015)

Section to be possibly added later on.

References

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Markus Kröger is an Academy Research Fellow and an Associate Professor in Development Studies at the Faculty of Social Sciences, and a member of the Helsinki Institute of Sustainability Science, University of Helsinki. His research has focused on the political economy of development and natural resource extraction especially in Latin America, India and the Arctic. He is the author of *Contentious Agency and Natural Resource Politics*, and a host of articles on forest policy, global forestry, Brazilian political economy, Latin American environmental politics, mining, and social movement outcomes. He is currently studying the political economies of deforestation and the conflicts related to industrial forestry.

