

Soy, China's Food Security, and the Brazilian Supply

by

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Soy production in Brazil has become a key part of food security policies and has contributed to China's development and social stability since the early 2000s. On the Chinese side, there is a sectoral policy that is part of a broader development strategy, while for Brazil there is a pragmatic response that aims to take advantage of an opportunity that has opened up. The relationship between the two countries, rather than being one of complementarity and reciprocal benefits, is one of asymmetrical interdependence.

A produção de soja no Brasil tornou-se parte fundamental das políticas de segurança alimentar e contribuiu para o desenvolvimento e a estabilidade social da China desde o início dos anos 2000. Do lado chinês, há uma política setorial que faz parte de uma estratégia de desenvolvimento mais ampla, enquanto para o Brasil há uma resposta pragmática que visa aproveitar uma oportunidade que se abriu. A relação entre os dois países, mais do que de complementaridade e benefícios recíprocos, é de interdependência assimétrica.

Keywords: China, Brazil, Soy, Food security, Asymmetrical interdependence

The twenty-first century has brought something new to Latin America: the constant absolute and relative increase in trade and economic relations with China. China's share of the region's exports jumped from just over 1 percent in 1995 to 12 percent in 2019. In the same year, imports from the Asian country accounted for 18 percent of the total. As a result, trade between China and Latin America came to US\$324 billion, with a regional trade deficit of US\$68 billion (UNCTADSTAT, 2020). In contrast to the vast majority of countries in the region, Brazil regularly records a significant trade surplus because of an export basket concentrated on three products: soybeans, iron ore, and oil.

This study focuses on soybeans,¹ which account for about a third of Brazil's exports, with figures that have been increasing since the 2010s. This article seeks to explain the logic behind the trade, showing that China's imports of Brazilian soybeans are part of a national development strategy, in particular related to food security, dating back to the 1990s. Meanwhile, Brazil's soybean

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exports should be seen as a window of opportunity important to a specific agribusiness sector without any articulation with an economic or social development project. Since the late 2000s, the surplus in the Brazilian agricultural trade balance has masked the deficit in manufacturing, but strictly speaking there is no direct relationship between the two. Early deindustrialization² and regressive specialization began in the early 1990s with trade and financial liberalization, and as a consequence industry lost its significance in the structure of production, job creation, and the trade balance, especially in the more capital- and technology-intensive sectors. This process was only partially offset by investment in agribusiness, and this explains the lower level of gross fixed capital formation from then on.³ The reprimarization of the Brazilian export agenda has strengthened certain sectors with little or no concern for the country's industrial capacity. From a political point of view, these sectors are articulated around interests that are conservative when it comes to values and liberal in terms of the economy and easily coexist with regressive reprimarization. At the same time, a political base has been created that has a strong economic interest in maintaining good relations with China and, paradoxically, resists U.S. pressure and the anticommunist rhetoric of certain domestic sectors.

In contrast, China appears to have an articulated strategy. In his analysis of the growing Chinese presence in Latin America, Baiyi (2017: 16) has identified two central objectives of Chinese economic relations: "To elevate the position of Chinese companies in the global value chain and ensure the external supply of raw materials and commodities." It can be added that China has mobilized its companies, especially state-owned companies, to compete for control of the production and distribution chains of the most important raw materials in an effort to guarantee the supply of them. Given its objective limitations, Chinese growth is increasingly dependent on those supplies. Since the time of Deng Xiaoping, Chinese administrations have been developing the country's integration into the global capitalist system, aiming at development with sovereignty. This makes acquisition of technological control, along with the development of endogenous capabilities, a necessity (Schutte and Reis, 2020). The policy of "dual circulation" announced by President Xi Jinping in 2020 should be seen not as a novelty or a break but as a reaffirmation of the nationalist aspiration to develop the country without being dependent on other nations. However, this does not mean that China insists on being fully self-sufficient. In addition to developing endogenous capabilities, the country is striving to "tighten international production chains' dependence on China, forming powerful countermeasures and deterrent capabilities based on artificially cutting off supply to foreigners" (Xi, 2020). In other words, this means establishing relationships of interdependence as a countermeasure to economic sanctions. Food security is a central part of this effort, and here too there is the challenge of optimizing and stabilizing production chains *and supply chains*. "As a large country with a population of 1.4 billion, the focus of the *food* and real economy industries must be on ourselves, and this point must not be abandoned." A long-standing strategy aims to maximize self-sufficiency in part of the food production chain. This requires controlling supply, and the most important crop is soybeans. On the basis of policies aimed both at food production (food security) and at maintaining rural employment (social stability), the Chinese government has been employing a strategy of buying raw soybeans abroad to

control cultivation. This is a policy for freeing up areas for the cultivation of its three basic grains (rice, corn, and wheat) and for the production of fruit and vegetables, activities that are more labor-intensive and require less land than soybeans. With limited availability of land and freshwater per capita, in recent years China has had to improve the food security and sovereignty conditions of its population. At the same time, given its size, Chinese demand generates very large and lasting impacts on supplier countries.

Three approaches to this relationship can be identified. The first is as a “win-win,” with significant potential for progress, especially in negotiating more options for other agricultural products such as meat. This view is widely promoted by the agribusiness sector, its political representatives, and supporters of economic liberalism, since it reflects the competitive advantages of each. The second recognizes regressive specialization as a problem but denies its being the result of a structural relationship of dependency. The problem, in fact, is said to be on the other side in that Brazil has not done its homework. Interestingly, this view is shared by sectors of neo-Keynesian thought that are demanding industrial policies and by more liberal sectors that have not yet given up on industry and point to the cost of doing business in Brazil, particularly its tax structure and state bureaucracy, as a cause of its incapacity to escape its position as a peripheral country. Finally, the third view, that of Bernal-Meza (2018: 85) and Cano (2012: 841–842), is that exporting agricultural products and minerals while importing manufactured goods is a reproduction of the center-periphery relationship. For the structuralists of the past century and supporters of dependency theory, the dependent economic structure that generated underdevelopment and turned Brazil into a peripheral nation was linked to the asymmetrical power relations that condemned the country to being a supplier of food and raw materials (Furtado, 2007 [1969]). Dependency relations between peripheral and central countries involve a political-military subordination that guarantees the dependency of the productive system (Mello, 1997). Souza (2021) also emphasizes political domination in discussing the trajectory of Brazil's dependency.

The case to be analyzed here involves the role of soybeans in China's food security strategy and its reflection in Brazil, along with the United States and its main suppliers. Our work begins with the hypothesis that a combination of the second and third approaches is expressed in an asymmetrical interdependence that ends up deepening regressive specialization. The text is divided into four sections, the first of which is this introduction. The second section provides a perspective on Brazil and the debate on the meaning of the Sino-Brazilian relations around the soybean complex. The third section explains that the soybean trade has been part of a Chinese food security strategy since the late 1970s. The fourth section presents our conclusions.

THE GROWTH OF THE SOYBEAN SUPPLY IN BRAZIL

In the early 1970s, it was the Japanese government that invested in Brazil to open a new soybean frontier. This was done through the Japanese-Brazilian Cooperation Program for the Development of the Cerrado. Japanese cooperation was involved in guaranteeing the supply of seeds, storage, transport

(ports, roads, railways) and crushing capacity (Pereira, 1995). By the second half of the 1990s, China had become the main buyer of Brazilian soybeans, overtaking Japan, and in 2019 it imported more than 60 million tons of Brazilian soybeans, a number that only continued to grow. Meanwhile, Japan maintained its demand, which hovered around half a million tons. Europe has become consolidated over the years as the second-largest importer, with 7.7 million tons (Brasil, 2021). In 2019 soybean exports to China alone accounted for 9 percent of Brazil's total global exports. Together with oil and iron ore, soybeans were responsible for a significant trade surplus with China, valued at US\$27.4 billion that year. According to the Companhia Nacional de Abastecimento (National Supply Company—CONAB) (2021), in the 2019–2020 harvest Brazil produced 124.8 million tons of soybeans, of which 82.97 million tons were exported, with 60.6 million tons going to China. In other words, of a total of 36.94 million hectares planted in soybeans, 17.93 million hectares were planted to meet Chinese demand alone. The soybean complex generates foreign exchange for the country and income for producers. Income generated from soybeans has been growing much faster than the gross domestic product (GDP) and agribusiness as a whole.

World demand for soybeans went from 175.89 million tons in 2001 to 360 million tons in 2020, reflecting a curve that is most certainly on the rise (AMIS, 2021). China was responsible for about half of the increase in demand. In times of falling international prices (2008–2009 and 2012), the devaluation of the Brazilian currency (the real) helped to offset the losses. The constant increase in Brazilian producer income in the period, despite price fluctuations, was the result of an increase in productivity. According to the CONAB (2021), average productivity increased by 13.26 percent between 2011 and 2021. In the same period, the cultivated area expanded from 25.04 million to 38.5 million hectares.

As a result, the interests linked to this sector gained importance both within and outside the Brazilian government. Soybean exports to China have given a prominent role to the interests related to this flow in national agribusiness. Aprosoja Brasil (Brazilian Association of Soybean Producers) is closely connected to the prorural legislative bloc represented by the Frente Parlamentar da Agropecuária (Parliamentary Agricultural Front—FPA), which represents some 48 percent of the representatives and senators of the National Congress (Gershon, Meireles, and Barbosa, 2020). An example of this was its coming together in 2014, during the Dilma Rousseff administration, to overturn the proposal for new taxation on the soybean production chain (Gottens, 2014). The central role of the Ministry of Agriculture, Livestock, and Supply in Brazil's relations with China, particularly in the Jair Bolsonaro administration, is also worth noting.

The narrative of Brazilian interests and their relationship to the soybean complex coincides with that of the Chinese authorities and analysts, emphasizing the understanding that this is a positive-sum relationship for both sides of the business. In the strategic document on the Brazil-China relationship released at the end of 2020 by the Brazil-China Business Council, agricultural trade is given “centrality in terms of strategic commitments” (Rosito, 2020: 89). Along the same lines, the editors of a reference book on Brazilian agribusiness

perspectives use the words “interconnected” and “mutual dependence” (Jank, Guo, and Miranda, 2020: 2). In his preface to that book, Shenggen (2020: 31) of the Chinese Agricultural University mentions the existence of “strong mutual agricultural complementarity.” In the same volume, however, Chen and Tian (2020: 315) admit that

at present, the agricultural cooperation between the two countries is more confined to importing Brazilian primary agricultural products and investments in Brazil by Chinese-funded enterprises. Yet, this form of cooperation is not conducive to comprehensive and in-depth development of agricultural cooperation between the two sides, nor can it promote the realization of industrial harmony between them. Most of Brazil’s agro-food exports to China are land-intensive products, based on unprocessed raw materials.

However, these writers also identify possibilities for expanding and diversifying exports, albeit always limited to agribusiness.

Faced with the deepening of Brazilian deindustrialization reflected by the decline in the proportion of the GDP represented by manufacturing and in the export agenda and, since 2016, the abandonment of industrial policies to alleviate or reverse this trend, any discussion of “diversification” of the Brazil-China export agenda was increasingly limited to the inclusion or increase of other commodities in the commercial relationship, including pulp and paper, cotton, chicken, orange juice, and coffee.

Aside from the opportunity for specialization in the raw materials sector, there is an asymmetry when it comes to earnings. With the export of raw soybeans, Brazil is losing not only the margins gained by processing it into bran or oil but also, in theory, its meat exports. In the end, soybeans are used in China to guarantee the maximum production of meat, though that production is less efficient than that of Brazil. The margin for meat exports from Brazil to China is closely related to its ability to react quickly to supply shocks, something that became apparent with the advent of swine flu in China, when pork exports increased from 48,914 tons in 2018 to 250,581 in 2019. Despite Brazil’s not posing obstacles to the import of Chinese manufactures, China abandoned a tariff system that determined the operating margin for Brazilian exports. Furthermore, Chinese investment in the various links of the soybean chain also ends up limiting and conditioning the opportunities available to Brazilian companies. Demand for supplies or trading is an example. If soybeans were really central to the Brazilian economy, one wonders why there has not been a concerted effort over the years to set up companies that could compete with international companies on a global scale.⁴ Brazilian agribusiness seems to be complacent about being limited to the production of oilseeds.

In an issue dedicated to agribusiness of *China Today* (2020), several analysts repeatedly mentioned “partnership between giants,” “complementarity,” and a “win-win game.” Marcos Jank (CEO of the Asia-Brazil Agro Alliance) characterized the China-Brazil relationship as “an inevitable yet unplanned marriage.” This statement deserves to be questioned; China has clearly organized its soybean supply lines in order to maintain the growth of its agri-food sector. At the same time, China’s exports to Brazil are rather diversified and composed almost exclusively of industrialized products, with the top 10 in 2019 being

drilling or exploration platforms;⁵ telephone components (including printed circuits); parts for transmitters and receivers; electric motors, generators, and transformers; heterocyclic compounds; semiconductor devices, integrated circuits, and electronic microassemblies; artificial or synthetic textiles; parts for vehicles, automobiles, and tractors; and other spare parts (Abracomex, 2020).

FOOD SECURITY AND THE ROLE OF SOYBEANS FROM THE CHINESE PERSPECTIVE

Internal economic and political structure is a key factor in China's strategy for incorporation into the international system (Nolke, 2015) but not as part of a struggle for hegemony or global domination. China does not seem to be investing in a new world order. The key to understanding its actions is national sovereignty and development. The needs for stability and internal growth determine the parameters for expansion.

Food security has gained a higher priority in the world as arable areas decrease and climatic conditions adverse to food production increase. Despite having a large amount of land suitable for farming, China has a per capita agricultural area smaller than most countries because of the sheer numbers of its population. With a population of 1.43 billion (United Nations, 2019), in the past two decades China has become the world's largest food consumer by volume and in 2016, according to the United Nations (FAO/STAT, 2019), its largest producer. In order to meet this growing demand, China has been increasing its food imports every year, and this trend is expected to continue. At the same time, there has been an even more noteworthy increase in its domestic production. In 2018, 564 million people were living in rural areas in China (NBSC, 2018). In a country with such a large population, agricultural production will always be a concern. Still, with about 20 percent of the planet's population and only 8 percent of the world's arable land (around 122 million hectares) and 5 percent of its drinking water, the country has managed to produce 95 percent of the food consumed by its population (Huang and Yang, 2017).

Historically, in China, the notion of food security has been closely linked to social stability and political legitimacy. In the words of Shenggen (2020: 32), former director general of the International Food Policy Research Institute, "Food security for the Chinese people is related to a deep sense of crisis in collective memory, an inexorable pursuit under the constraint of natural endowments, and is the cornerstone of political stability and economic prosperity." In the 1970s there was a clear perception that Chinese economic development would require addressing agrarian issues, given the major problems related to food security that Deng encountered at the end of the decade (Arrighi, 2009). Chinese agriculture has, in fact, undergone a major transformation. China has become the world's largest grain producer, with the harvest increasing from 249 million tons in 1978 to 342.56 million tons in 1984. In the following decades, this trend continued; in 2017 production reached 608 million tons (FAO/STAT, 2019). This sharp increase in production (and earnings) in a short period was the driving force behind the rural-urban migration that fueled a cycle of capital accumulation by that class, which ended up positively influencing other

sectors. Thus the organization of agricultural production was important in China's enviable economic growth in the past three decades (Mezzetti, 2000).

In the 1990s, the government prioritized the intensive use of technologies, along with increasing irrigation, intensive use of fertilizers, and increasing energy generation and consumption capacity in rural areas (Jabbour, 2010). These efforts made it possible for the country to avoid dependency despite its ongoing urbanization. This was accompanied by income growth, which led to increased food consumption. In line with positive income elasticity in terms of certain foods and the scarcity of areas where progress was an option, China has focused on expanding production of foods such as corn, wheat, and rice while deliberately reducing soybean production. The production of agricultural products other than soybeans doubled in size from 1990 to 2018, demonstrating the rapid response of the Chinese agricultural sector to the growing demand during the period. While soybean production remained relatively stable, with a marginal increase from 13.5 million tons in 1995 to 15.9 million tons in 2018, total agricultural production increased in the same period from 696.5 million tons to 1.212 billion tons (FAO/STAT, 2019; OECD/FAO, 2019).

In other words, China decided at an early stage to consider soybeans an industrial input, outside the goals of food self-sufficiency. There is a clear difference between the policies for soybeans and those for wheat, corn, and rice. Between 1995 and 2015, wheat production increased from 102.21 million tons to 130.19 million tons while imports dropped from 10.11 million tons to 4.5 million tons. In the same period, corn saw an increase in production from 111.99 million tons to 224.58 million tons, with imports staying flat at 4.65 million tons. Similarly, rice production increased from 126.88 million tons to 142.63 million tons while imports stood at 4.86 million tons. Soybean production fell from 13.50 million tons to 10.69 million tons, while imports exploded from 0.795 million tons to 83.23 million tons (FAO/STAT, 2019; OECD/FAO, 2019). Sugar reflected a different pattern, with domestic production increasing in the 1990s and stagnation and an increase in imports in the 2000s. Population growth, combined with rising incomes, led to an increased demand for food and other products, including soybeans, that were used to feed the growing numbers of poultry, swine, and cattle for slaughter. This created a spike in international prices, according to the Food and Agriculture Organization (FAO, 2013a). In 1995, China imported 0.7 million tons of soybeans, and since then this number has not stopped growing, reaching 132 million tons in 2018 (OECD/FAO, 2019). The question for China with regard to soybeans was therefore whether it was possible to find production on the international market to meet its growing needs. This explains a sudden increase in soy imports, mainly from the United States, Brazil, and Argentina.

In addition to the increase in income and urbanization, another phenomenon had an impact on the growth in demand and consequent imports of soybeans. Economic growth provoked a series of structural changes in the consumption of agricultural products. According to the FAO (2013b), direct consumption of grains, for example, has been falling in China, while demand for meat and oils, dairy products, and sugar has increased (Huang and Gale, 2007). These changes are noticeable when placed in relation to the growth in the GDP per capita, in a movement directly linked to urbanization.

Since 1990, the urban population has grown every year, but according to the National Bureau of Statistics of China (NBSC, 2018) the rural population in 2017, although now smaller than the urban population, was still large, 576.6 million. The premise of the Thirteenth Five-Year Plan (2016–2020) was continuation of the migration of a significant part of the population from rural areas to cities. This policy was seen by the Chinese government as one of the key points for sustaining the country's growth.

In a study of the Chinese economy, Huang and Gale (2007) observed that per capita consumption of traditional staple foods such as grains tends to decline or remain stagnant with rising incomes while demand for animal products does not. This means that the demand for soybeans is also growing because it is used to feed animals in the livestock industry. For the Li and Fung Research Center (2005), food consumption in China is moving toward reflecting the European standard. The consumption of beef per capita increased by 535 percent between 1990 and 2018 compared with a per capita increase of 103.72 percent for pork. In absolute numbers, there was growth from 0.73 million tons in 1990 to 5.67 million tons in 2018. Although the consumption of beef is still much less than that of pork, in 2018 China already consumed the equivalent of 10 percent of the world's consumption of beef measured in carcasses (Cicarne, 2021).

Thanks to the efforts made to increase productivity, the Chinese agricultural sector itself is the main supplier of food to its population. This fact has provided economic and political stability at a relatively low cost during the period of high economic growth. Chinese agricultural production has increased in order to sustain a good part of the demand generated by the increase in its population's income. At the same time, the government faced the great challenge of balancing increased production and modernization with the need to guarantee work in the countryside. The Chinese government's policies aimed at domestic production of staple cereals and other labor-intensive products had a social element, along with considerations relating to efficient use of scarce land and water resources (Xu, 2017).

In 2000 China had 295.4 million workers employed in the production of major food products. In 2014 there were 224.1 million workers, 71 million fewer, but there was an increase of more than 50 percent in production (NBSC, 2018; Xu, 2017). While these data reinforce the idea of capitalization and professionalization of Chinese agriculture during the period, they also reflect the state's effort to keep a significant portion of the population in the countryside. There was a deliberate choice by the Chinese government when it came to soy imports in order to guarantee near-self-sufficiency in other items, making a more rational use of land and water and prioritizing the maintenance of opportunities for employment and income in rural China (Figure 1). As a result, in 2018 China produced only 14 percent of the soy it consumed.

Analyzing the numbers on production, import, and soy harvest areas in China for 2000–2017, we can estimate the area needed to produce imported soybeans (Table 1). Considering its average productivity, producing the amount of soy it imported in 2018 would require at least 40 million more hectares of land than it has, around 33 percent of its arable area, and some 171 trillion liters of additional water.⁶ This is a frightening scenario for China. It was on the basis

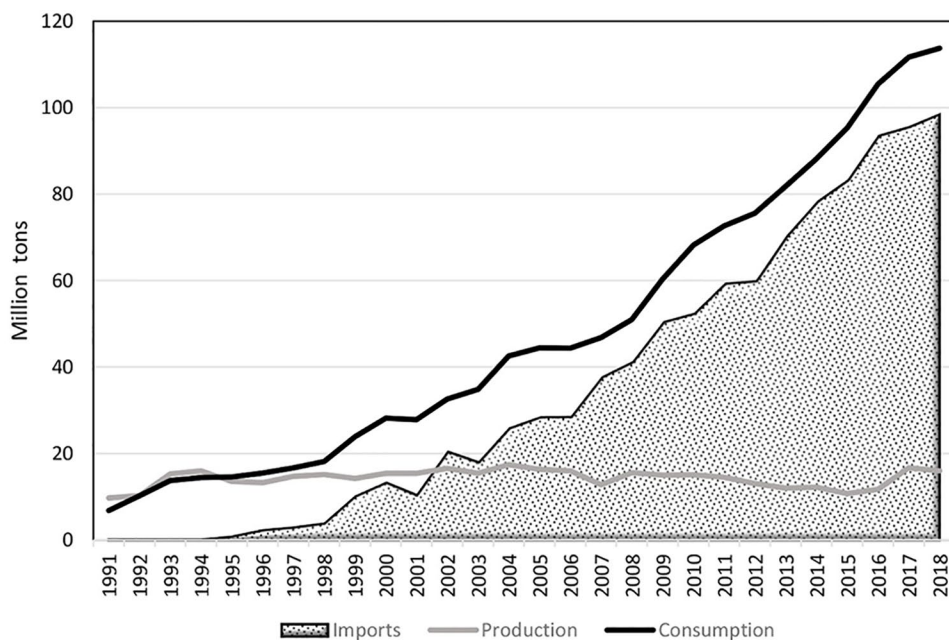


Figure 1. Soybean consumption, production, and import (in millions of tons) in China, 1991–2018 (data from OECD/FAO, 2019).

of this analysis that China decided to consider soybeans outside its food self-sufficiency goals. The challenge that this posed was to guarantee access to this supply using the international markets. The country could not leave this up to the operation of supply and demand, nor could it depend on a market structure dominated by Western transnational companies.

Soy production is highly concentrated globally. The three main sources of China's soy imports are the United States, Brazil, and, to a lesser extent, Argentina. The influence of this trade item on the U.S. economy is much less than it is for the Southern Cone countries, where soybean exports are the main pillar of their exports. The smaller number of suppliers limits China's room for maneuver. However, in the absence of conflict these producers complement each other, given that they are located in the Northern and Southern Hemispheres and can increase supply in the event of weather issues or trade disagreements. In recent years the Brazilian share of China's soybean imports has been growing (from 48.6 percent in 2015 to 65.1 percent in 2019), while the U.S. share has been heavily impacted by the trade war, falling from 35.6 percent in 2015 and 35.2 percent in 2017 to 18.5 percent in 2018 and 19.9 percent in 2019 (ITC, 2020). It was this increase in soybean exports that took China's share of total Brazilian agro-exports from 24.1 percent in 2015 to 38.5 percent in 2020 (Brasil, 2021b). In 2020, agro-exports accounted for around 50 percent of total Brazilian exports to China. For China, this represented 20 percent of its total imports of agricultural products.

China's strategy to guarantee soybean supply for its food production involves not only guaranteeing commercial contracts but also increasing control over the various links in the production and distribution chains. Brazilian

TABLE 1
Soybean Production in China and Its Consequences, 2000–2020

<i>Year</i>	<i>Production (millions of tons)</i>	<i>Imports (millions of tons)</i>	<i>Area Used (millions of hectares)</i>	<i>Area Needed to Replace Imports with Local Production (millions of hectares)</i>	<i>Soybeans Processed to Make Soy Bran in China (millions of tons)</i>
2000	15.41	13.24	9.30	7.99	21.93
2005	16.35	28.31	9.59	16.60	36.27
2010	15.08	52.34	8.51	29.55	59.12
2015	10.68	83.23	5.4	42.10	84.66
2017	16.66	95.50	8.11	46.48	100.47
2018	15.96	88.04	8.41	46.39	89.24
2019	18.10	8.51	9.35	45.72	94.32
2020	19.6	100.32	9.88	50.56	94.59

Source: Data from OECD/FAO (2021) and NBSC (2018).

farmers, in contrast, produce soybeans but do not necessarily control the main links in the chain, which are dominated by major international players. Upstream there is the production of seeds, fertilizers, pesticides, and financing, and downstream there is milling, transport, distribution, and marketing. According to information collected by the Conselho Empresarial Brasil-China (Rosito, 2020: 99), only 30 percent of the final gain goes to the direct producer.

Alongside the traditional traders ADM, Bunge, and Cargill, from the United States, and LDC/Dreyfus (ABCD), from France,⁷ now we also have the China National Cereals, Oils, and Foodstuffs Corporation (COFCO). The latter tries to challenge the century-old hegemony of the big four, known as the ABCD. This was the logic behind international acquisitions such as the purchase of Nidera, based in the Netherlands, and the basic agriculture businesses of the Hong Kong-based Noble Group. These acquisitions are not recorded as investments for Brazil, but they have a major impact on the positioning of the Chinese company, which started its activities controlling 11 percent of the Brazilian market only to expand from there (ECLAC, 2019: 163). The ABCD companies will continue to be important players, but they have lost the centrality they once had, largely because of the COFCO's consolidation. The Chinese also conquered leadership positions in the other Mercosur countries (Argentina, Paraguay, and Uruguay).

Other examples are the acquisitions of China's Hunan Dakang International Food and Agriculture (a subsidiary of the Shanghai Pengxin Group): in 2016 the company bought 57 percent of Fiagril, a Brazilian grain trader and processor (US\$200 million). The following year, it acquired 54 percent of Belagrícola, one of the largest distributors of agricultural raw materials and grain traders in Brazil, for US\$253 million (Cariello, 2019: 24). Following the same logic, China Merchants Port acquired 90 percent of the container terminal in Paranaguá and COFCO's investments in the river ports in Barcarena and Miritituba, in Pará, to transport soybeans from Mato Grosso (Escher and Wilkinson, 2019). COFCO even put together its own fleet of trucks to transport soybeans in Brazil. Also worth mentioning is the construction of the new port in São Luís do Maranhão

(the only one in Brazil with the capacity to receive large ships) by the Chinese construction company CCCC. Many of the infrastructure investments are financed by Chinese state-owned banks, in particular, EximBank and the China Development Bank.

Upstream, in 2017 the CITIC Agricultural Industry Fund Management Company acquired Dow Agro Sciencias Sementes & Biotecnologia Brasil Ltda. Syngenta AG was established in 2000 through the merger of the agrichemical businesses of Novartis and AstraZeneca and acquired by the China National Chemical Corporation (ChemChina) in 2017 for US\$43 billion. Here Brazil entered the equation in the acquisition of a Swiss company by a Chinese state-owned company because it is the company's second-largest market for pesticides and seeds. Syngenta controls 19 percent of the global pesticide market and 20 percent of the Brazilian pesticide market (ECLAC, 2019).

Another key factor here was a large crushing capacity built in China itself and the country's application of differentiated tariffs to defend itself: 3 percent for grain, 5 percent for bran, and 9 percent for oil (Miranda, Jank, and Soendergaard, 2020: 338). Added to this, in Brazil, the Kandir Law, through which Brazil facilitated the export of raw materials at the expense of its processing capacity, had a major impact.⁸ This resulted in China's going so far as to determine a regressive specialization within its own soybean complex, importing only unprocessed grain. With all this, China is no longer merely a consumer of soy production in the Americas but has positioned itself to be one of the organizers and controllers of the product's production and distribution chains (Escher, Wilkinson, and Pereira, 2018).

An issue that must be considered is the extent to which China wants to remain dependent on the supply of Brazilian and U.S. soy. While neither the Trump administration's policy of pressure on China nor the Bolsonaro administration's rhetoric resulted in any supply problems, speculation about the medium-to-long term emerged. Several observers, including Gazzoni and Dall'Agonol (2018), have analyzed the potential of the African continent. In theory, the southern African region has edaphoclimatic conditions that are very similar to those of the soybean-growing areas in South America. Other countries identified with the potential to expand production are Canada, Russia, and Ukraine. These are merely possible future scenarios, since these countries have no potential to become large producers in the short term, given that soy production, whether in Brazil, the United States, or Argentina, depends on the development of local technologies, large-scale infrastructure, and major investment in machinery and equipment to increase productivity.

Encouraging soy cultivation in new regions such as Kazakhstan, Russia, and African countries is also unlikely to have an impact in the short or medium term, although these efforts do shed light on the concern of the Chinese authorities about the country's excessive dependence on a supply from very few countries. For example, in October 2020, the Chinese government announced that it would begin importing soy from Tanzania (Nyabiage, 2020). The volume announced was merely 120 tons. Undoubtedly, an opportunity does open up here for countries that produce soy for export such as Ethiopia, South Africa, Nigeria, and Zambia. However, none of this represents an alternative in the short-to-medium term to the short-term import volumes from the Southern

Cone and the United States. In the medium-to-long term, however, this may change.⁹ Considering the data presented above, the demand for soy should continue to increase in the coming years. Considering the strategic importance of soy imports to China, there must be an ongoing concern with reducing the weakness created by this dependency. In addition to further strengthening its relationship with the Southern Cone countries, it might choose to encourage and finance cultivation of the crop in other countries.

FINAL CONSIDERATIONS

This article has shown that the significant imports of Brazilian soybeans by China are a response to a long-standing successful national development strategy that has food security as one of its pillars. The government sought to use its land in the best possible way, domestically producing close to 100 percent of its basic grains, as well as labor-intensive crops such as vegetables and fruits, along with pigs, chickens, dairy products, and eggs. To feed the animals, it used mainly domestically produced corn and imported soybeans, a product that requires a large amount of land and water and minimal labor. At an early stage China decided to consider soybeans an industrial input, something that lies outside of the goals of food self-sufficiency.

In order to make this policy viable, China had to face the challenge of guaranteeing a foreign-based supply of soy, something that is very much concentrated in the United States and the Mercosur countries, particularly Brazil. This explains the Chinese concern not to leave the relationship at the mercy of international markets and to act on the various links of the soy complex, which includes materials, financing, trade, distribution, and processing. As a result, the soybeans imported by China from Brazil are almost entirely raw grain, which it processes into bran to feed animals and oil for human consumption, generating employment and income in the processing industry. This relationship fits with the ideas presented by Xi Jinping (2020) regarding dual circulation, in which an internal logic of production and consumption is connected to a guaranteed supply of the external inputs necessary for the functioning of internal circulation.

Meanwhile, Brazilian exports are not part of any specific national development project; rather, they represent the use of a window of opportunity by a specific agribusiness sector with little backward or forward linkage in the production complex. It is evident that over the past two decades large-scale imports of Brazilian soybeans have been very important to China and have become the heart of the relationship between China and Brazil. This relationship is one of asymmetrical interdependence that ends up deepening the regressive specialization that was already under way. Brazil is vulnerable to fluctuations in price and demand on the world market, in particular in China, given that it does not have a strategy for using income to increase its industrial-technological capacity. This vulnerability is reflected in the ideas put forth by Prebisch (2000), and it is one of the main reasons that Brazil risks being caught in a dependency trap.

The narrative of "complementarity" mystifies the fact that for Brazil the earnings coincide with specific economic groups. Trade surpluses with China

help Brazil's external accounts, but they are not part of a development process with increased levels of investment and productivity. And while soy production involves research and development, it is an enclave technology that does not encourage establishing an endogenous industrial-technological capacity that would reduce the gap between Brazil and the developed countries. At the same time, early deindustrialization and regressive specialization should not be considered a result of the economic and/or political relationship with China. The asymmetric relationship was established because the Brazilian economic and political structure was weakened by the debt crisis in the 1980s. Structural adjustments and neoliberal reforms had led to a setback in the effort to overcome the country's peripheral situation with regard to global capitalism. This led to China's finding, in both senses of the word, fertile ground for meeting its objective of guaranteeing the supply of raw materials necessary for its development. Examining the relationship between the pattern of trade with China and early deindustrialization, Salama (2012: 232) points out that trade relations were not accompanied by an adequate exchange rate policy or by appropriate industrial policies, and this, in our opinion, has to do with the structure of political and economic power in Brazil and the absence of a bourgeoisie concerned with any actual national project or a political articulation with the capacity for imposition (Berringer, 2015)—a result of a peripheral role in global capitalism that long predates the nation's relationship with China. After Dilma was overthrown in 2016, there was a radical abandonment of any strategizing aimed at recovering endogenous industrial-technological capacity—establishing the hegemony of a coalition among agribusiness, the financial sector, and an ultraliberal ideology aimed at eliminating the capacity for state intervention in the economy (Carneiro, 2019).

In other words, it can hardly be argued that the absence of this Chinese demand would have created opportunities for Brazil to overcome its peripheral condition. The growth of economic relations between Brazil and China, at least in the period under consideration, has not been accompanied by the political or military relations involving domestic interference typical of the experience of peripheral countries.¹⁰ At the same time, these relationships reinforce those sectors, in this case agribusiness, that have no greater interest and are opposed to attempts to recover the capacity of the Brazilian state in order to articulate a national development project. As Vadell (2013: 51) has said, the concentration of Chinese trade, investment, and financing consolidated the pattern of regressive specialization, while Chinese manufacturing exports to South America further weakened Brazilian industry, generating a relationship of asymmetric interdependence.

Our analysis of the soy complex shows a strong asymmetry. Brazil's soybean trade to China is organized and works according to a logic that corresponds to goals and policies established by China in terms of its national development strategy. On the one hand, we identify a clear policy with medium-to-long-term planning that operates on two levels. The first concerns domestic demand and production, which are geared toward autonomous growth. The other has to do with the external circulation needed to guarantee the supply of the inputs necessary for the sustainable functioning of internal circulation and with the lowest possible supply risk to implement what is called an "internal demand

expansion strategy." To do this, the country even makes use of state-owned companies (Xi, 2020: 3). In this medium-to-long-term strategy, Brazil is identified as a guarantor of the soy supply. This generates income for producers and other Brazilian companies involved in the soy complex but does not correspond to any industrial-technological development strategy.

Speaking broadly of "complementarity," with each country pursuing its competitive advantage, would Brazil have been confined, on the one hand, to specialization in the agribusiness sector and, on the other hand, to China as an industrial power? From our analysis, the answer is no. If it were, it would have considerable exports of meat and chicken, and it does not because China has a policy of defending its internal circulation despite Brazil's having a comparative advantage. Furthermore, the proportion of Brazil's total exports represented by bran and oil, which fell from 7.41 percent in 2000 to 0.46 percent in 2018, indicates an asymmetry in the trade relationship between the two countries caused by political planning on the part of the Chinese state to which Brazil has adapted.

In short, the Brazilian soy trade to China is organized and works according to a logic that corresponds to goals and policies that China has established, and this despite the fact that certain Brazilian sectors with strong political connections are able to take advantage of this logic to increase their income. These sectors have an economic and political interest in deepening this relationship, thereby reinforcing a logic of regressive specialization in Brazil with a dependency that increasingly distances the country from the feasibility of returning to an industrial-technological plan in which the soy complex was subordinate.

NOTES

1. Soybeans are an agricultural commodity used as raw material to feed livestock for human consumption.

2. "Early deindustrialization" is the reduction of the proportion of manufacturing in domestic production and total employment without the country's having reached a high level of per capita income (Severian, 2020; Salama, 2012).

3. However, there was a slight recovery in production, employment, and manufacturing exports between 2004 and 2007, a reflection of public policies aimed at reversing this trend. The gross value added of industry as a whole increased from 14.5 percent in 2002 to 16.6 percent in 2007 (Severian, 2020: 151). These policies coexisted with an expansion of agribusiness.

4. A select group of multinationals that dominates international trade in soybeans and thus ends up controlling a significant part of the global value chain.

5. It was precisely the main imported product that was the target of an industrial policy that was launched at the end of the first decade of the 2000s, which ended up being abandoned when President Dilma Rousseff's administration fell in May 2016.

6. According to Mekonnen and Hoekstra (2011), 1,800 liters of water are consumed to produce 1 kilogram of soybeans.

7. These are century-old companies: Archer Daniels Midland (ADM) was founded in 1902, Bunge in 1818, Cargill in 1885, and Louis Dreyfus in 1865. They control a large part of the production and processing chains in exporting countries and as importers are present on all continents involved in the soy value chain. In 2016, this group controlled more than 70 percent of the world market of the agricultural sector (Chemnitz, 2017: 26). However, since the second decade of the twenty-first century, these companies have been losing ground, mainly to Asian companies.

8. Complementary Law 87/1996 (the Kandir Law) generated a tax exemption for the circulation of goods and services on exports of raw materials and maintained a tax burden on industrialized

products. On the one hand this allowed for greater competitiveness in exports of Brazilian agricultural commodities, while on the other hand it significantly reduced the viability of agro-industrialized production destined for the foreign market.

9. To assess the time needed for a given region with available land to begin production and become consolidated as a significant soy producer, we must begin with the fact that the productive process requires materials like machines, agricultural equipment, fertilizers, pesticides, genetic improvement of plants adapted for the specific region, technical knowledge for managing production from planting to harvesting, and a network of financial services, road infrastructure, storage, and transportation for getting the harvest out for export. On the basis of soybean production experience in Brazil (Gazzoni and Dall'Agonol, 2018), specifically in the Midwest region, it is believed that around 25 years would be a reasonable time frame for regions, in particular Southern Africa, Russia, or Ukraine, to become major soybean producers if they chose to do so. Another way to overcome China's dependence on soy imports would be to find substitutes for soy, particularly in meat production, which is also not on the short-term horizon.

10. A recent example often cited by former President Luiz Inácio Lula da Silva concerns the case of the offshore oil reserves that were discovered in 2007. The PT administrations tried to use the export of these resources to leverage an endogenous technological industrial capacity with the new exploration framework sanctioned in 2010, but this policy met with strong opposition from the U.S. government and from its Exxon and Chevron oligopolies in particular. In contrast, there is no record of any attempt by China in this regard. China's interest was to position itself to guarantee the supply of oil, in this case as part of a supplier diversification policy (Schutte, 2016).

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