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of the Corporate Food Regime

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Drivers and Implications of Chinese Investments in the Brazilian Agribusiness: Actors, Strategies and Market Dynamics of the Corporate Food Regime

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Abstract

There is already certain accumulation of knowledge about the so-called “Brazil-China soy-meat complex”. China, as an importing pole, undergoes changes in eating habits and class diets towards increased animal protein consumption and restructuring of its livestock production and the meat (mainly pork) and feed industries, driven by rising per capita income, urbanization and affluence of a “new middle class”. And Brazil, as an exporting pole, is experiencing expansion in the planted area, quantity produced and exports of soybeans, driven mainly by the Chinese demand and its effect on the level of prices (the “commodities boom”). However, recent works have shown that this “agribusiness connection” between Brazil and China goes beyond trade relations, as the role of companies and the state in making foreign direct investments (FDI), whether in soy or other agribusiness branches (corn, beef, poultry, sugar, cotton, pulp, tobacco), is increasingly significant. According to Oliveira (2015), Chinese companies have sought to invest in Brazil to gain greater control over the flows and profits of international agricultural trade, in a strategy to undermine the hegemony of the larger North Atlantic transnational agribusiness corporations. And for Wilkinson, Wesz and Lopane (2015), China is no longer willing to depend exclusively on the volatile spot markets controlled by the trading firms to import grain and has pursued “more-than-market” strategies, seeking greater control and decision capacity, motivated by the need to guarantee access to strategic resources for food security. Based on secondary statistical data from Brazilian, Chinese and international sources, fieldwork in the Mato Grosso state (the forefront of the soybean boom in the midwest region), information from the business press and review of the relevant literature, the authors seek to answer two questions in order to update these previous analyzes and contribute to the debate on critical agrarian and agrifood issues in the BRICS. What is the relationship between the Chinese government's food security policy and the involvement at the companies' level (especially state-owned enterprises, but also private ones) in the process of “going out” for the realization of FDIs in agribusiness and agri-food systems of other developing countries? And how do these investments impact on the dynamics of the “Brazil-China soy-meat complex”? In wider theoretical terms, the work sheds light on the way the agrifood systems of China and Brazil are inserted in, affected by, and influence on the restructuring of the international corporate food regime. By conclusion, main trends and perspectives are considered and some critical issues for a research and policy agenda are suggested.

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1. Introduction

China's economic development and international rise as great power represent the most striking fact of capitalism in the era of globalization. By generating impacts on the international division of labor, the global dynamics of capital accumulation, finance, and geopolitics, China represents a force of displacement of the United States as the centre of economic gravitation and political hegemony in the world today.⁴ In Latin America, the Chinese demand and its effect on rising commodity prices has been the main factor behind the paths of economic growth and implementation of social policies by center-left governments in the countries of the continent.⁵ And in Brazil, data and literature indicate that the country experiences a set of contradictory impacts associated with the so-called "China effect".⁶

This article deals with the agrifood relations between Brazil and China. Its aim is to analyze the causes and implications of Chinese investments in Brazilian agribusiness. Several authors have characterized the formation of the "Brazil-China soy-meat agro-industrial complex"⁷ as a driving force of polycentric shifts in international agrifood relations, whose orientation is given initially and primarily from bilateral trade (Peine, 2009; Wilkinson, 2009; Wilkinson, Wesz, 2013; Schneider, 2014; Oliveira, Schneider, 2016; Escher, Schneider, Ye, 2017). However, some recent studies have shown that this "agribusiness connection" between Brazil and China goes beyond trade relations, as the interaction between companies and the state in the realization of foreign direct investments (FDIs) in soy and other agribusiness branches (corn, sugar, meat, poultry, pulp, tobacco) and their related infrastructure is significant and growing.

The analysis of Oliveira (2015) indicates that Chinese companies have sought to invest in Brazil in search of greater control over the flows and profits of international trade, using strategies that aim to weaken the hegemony of the North Atlantic big agribusiness corporations. And the Wilkinson, Wesz, and Lopane (2015) analysis shows that China, motivated by the need to secure resource access for food security of its population, is no longer willing to depend exclusively on volatile spot markets controlled by large global traders to import grains and, therefore, pursues a "more-than-market" strategy seeking greater control over value chains. Chinese companies have made FDIs in assets and resources acquisition to cope with a growing dependence on foreign supply of food and raw materials

⁴ See the books of Harvey (2005) and Arrighi (2007), to cite only two influential interpretations.

⁵ See Armony and Strauss (2012), Sauer et al. (2017), McKay et al. (2017), among others.

⁶ See, for example, Ray and Gallagher (2015), Curado (2015), Jenkins (2015), Branco (2013), Honório and Araújo (2013), Jenkins and Barbosa (2012), Cunha, Lélis and Bichara (2012), Cano (2012), Delgado (2012), Demeulemeester (2012), among others. They highlight three types of effects: 1) direct impacts: growth of bilateral trade flows, in which Brazil exports agricultural commodities and minerals and imports machinery, equipment and electronics, showing a positive trade balance with surpluses in primary products and deficits in manufactures and capital goods; growth in the investment flows and stocks, mostly in mergers and acquisitions, especially in the oil, gas, mining, electric power and agribusiness sectors; 2) indirect impacts: upward trend in the terms of trade between 2005 and 2012, with further fall and normalization at lower levels; chronic exchange rate appreciation due to Brazil's opened and deregulated capital account; and competition in third markets, with losses of market share in manufactured exports to the United States (-12.87%), the European Union (-5.49%) and Latin America (-7.3%); and 3) structural consequences, linked to the risks of "regressive specialization" of the Brazilian economy, with the process of "reprimarization" of the export basket and "premature deindustrialization" in the sectorial composition of production and employment. Brazil-China economic relations in this sense seem to suggest the reproduction of a new core-periphery pattern, as criticized by the ECLAC classics.

⁷ For Weis (2013, p. 8) "the grain-oilseed-livestock industrial complex is the dominant farming system in the temperate world and is spreading to significant parts of the tropics. Their landscapes can be seen as islands of livestock concentrated within seas of monocultures." These islands and seas are disarticulated and rearticulated by innumerable biological, industrial processes and long-distance transport between import poles and export poles, "mediated by a list of technologies, inputs, and large corporations, and marked by the loss of large volumes of useful nutritional material."

through land deals, purchase of production and technological capacity, and construction of transportation, storage and logistics infrastructures.

Methodologically, the paper is supported by results of the authors previous research and a set of new data: secondary statistics from Brazilian, Chinese and international sources, interviews and informal conversations with representatives of transnational corporations, local entrepreneurs and large producers in the state of Mato Grosso (the forefront of the soybean boom in Brazil, in the Midwest region), news from the business press and extensive review of the relevant literature. Based on this information, it is intended to answer two crucial questions to the research problem. What is the relationship between China's government food security policy and the involvement at the companies' level (especially state-owned enterprises, but also private ones) in the process of "going out" for the realization of FDIs in agribusiness and agri-food systems of other developing countries? And how do these investments impact the dynamics of the "Brazil-China soy-meat complex"?

In wider theoretical terms, the work sheds light on the way the agrifood systems of China and Brazil are inserted in, affected by, and influence on the restructuring of the international corporate food regime. The "food regime analysis" has in Friedmann and McMichael's article (1989) its inaugural piece. According to Buttel (2001: 9), the immense vigor and remarkable prestige of the food regimes literature has proved that this is "one of the most durable approaches in agrarian studies since the late 1980s, largely because it is synthetic and nuanced." Initially developed under the influence of World-System Theory and French Regulation Theory, the approach was later reformulated from the political sociology of Gramsci and the economic sociology of Polanyi. This theoretical framework apprehends the existence of a political and economic logic in the dynamics of agriculture and food in the evolution of capitalism.⁸ This logic is expressed through the actions, practices and strategies of certain actors and institutions of the agrifood system and reflected in their conflicts of power and hegemonic disputes on the ordering of relations of production, circulation and consumption at a global scale (Bernstein, 2016; Friedmann, 2016, McMichael, 2016).

The year 1995 seems to mark a new era of the regime, with the establishment of the World Trade Organization (WTO) and the Agreement on Agriculture (AoA), which institutionalizes the liberalization of national markets and restricts the rights of the state to regulate agriculture and food. Under the neoliberal ideology of globalization and the minimal state, there is the increasing financialization of wealth (investment funds, hedge instruments, exchange derivatives, futures markets, etc.), both with financial actors acting in agriculture, food and land markets, and with agrifood companies acting in activities and operations with financial instruments. Large transnational corporations now dominate not only the industries upstream (mainly biotechnology and agrochemical sectors) and downstream (food processing agro-industry) of agriculture, but also the large retail distribution channels (supermarket revolution), so the nickname of "food empires" seems appropriate to them. Moreover, the recent wave of massive FDIs in developing countries directed to the purchase of large tracts of land (global land grabbing) and mergers and acquisitions to concentrate and centralize capital by large agribusiness corporations also plays a decisive part in restructuring the current

⁸ Three food regimes are identified along the economic and political history of capitalism: the "colonial-diasporic" regime (1870-1930), the "mercantile-industrial" regime (1945-1985) and the "corporate-environmental" regime (1995-today). "The 'classical' definition of food regimes includes constellations of class relations, geographical specialization, and interstate power, articulating 'international relations of production and food consumption' to 'periods of capital accumulation'" (Friedmann, 2009: 335). "[Thus, the concrete formation of a regime involves] a specific constellation of governments, corporations, collective organizations, and individuals, which allows capital accumulation based on a shared definition of the purposes of key actors while others are marginalized" (Friedmann, 2005: 229).

food regime (McMichael, 2013; Ploeg, 2010; Clapp, 2014, 2017; Isakson, 2014; Sauer, Borras, 2016; Borras et al. 2016; Borras, Franco, 2012).

The paper is structured in two sections besides this introduction and the conclusions. In the second section it is argued that the causes and motivations of Chinese investments in agribusiness and agrifood systems of developing countries such as Brazil cannot be explained without taking into account the connections between China's economic internationalization and food security policies. And the third section analyzes the evolution, trends and implications of Chinese investments in Brazilian agribusiness, with a careful look at the entry of new actors, their respective strategies and changes in market dynamics, having as an empirical locus the state of Mato Grosso, contrasted to the reality of other regions of Brazil. In the conclusion, beyond a summary of the discussion, it contributes with some critical issues to a research and policy agenda.

2. The agrifood question in China: connections between food security and “going out” policies

Chinese leaders have always attached high priority to the food security of their population, as a fundamental requirement for social stability and political legitimacy of the state. McBeth and McBeth (2010: 276) recall that “the philosopher Mentius (4th century BC) said that nurturing the people is the first principle of government. And that the notion of ‘Mandate of Heaven’ (*Tianming*) expresses the belief that natural disasters (including extreme weather events such as droughts, pests and floods, causing malnutrition and hunger) were products of bad government, justifying withdrawal of support from people to the regime.” The Great Famine, which resulted in the deaths of approximately 30 million people from 1959 to 1961, during the Great Leap Forward, was caused by floods throughout China, plus human errors, such as excessive central quotas and oversized provincial production reports, deforestation and soil erosion, destruction of flood control systems, and other factors (Smil, 2004). But these Mao-era disasters have bequeathed greater attention to food security. And along the Deng-era, through the mandates of Jiang Zemin, Hu Jintao, to the present Xi Jinping, ensuring the production and access of food to the population is a central attribution of government.

Chinese investments in agribusiness and agrifood systems in developing countries need to be understood against this imperative. China's current economic internationalization strategy (“*zou chuqu*” in Mandarin, “going out” in English) was launched in the year 2000, in the 10th Five-Year Plan. Since the introduction of the going out policy, China's IDEs have expanded rapidly from US\$ 2.7 billion in 2002 to US\$ 145.67 billion in 2015, leading the country to move from 26th to 2nd place as the country's largest foreign world investor, in front of Germany and behind only the United States. In 2015, 83.9% of these IDEs were for developing countries (Asia, Latin America and Africa), 14% for developed countries (Western Europe, North America and Oceania) and 2.1% for transition economies (Eastern Europe). Although the most active investors (in the non-financial sector) are still state-owned enterprises (50.4%), the share of non-state enterprises (private, collective, joint ventures, cooperatives, incorporated, limited) expanded from 19% in 2006 to 49.6% in 2015 (MOFCOM, 2016). Companies are encouraged to invest and operate abroad with managerial (bureaucratic simplification), financial (credits, subsidies and tax relief) and political (stable environment and active diplomacy) government support. Although the rationale behind this strategy is manifold⁹, the purpose

⁹ The main reasons are, at the macro level, the orientation towards less reliance on exports, especially after the Asian financial crisis of 1997, the availability of a solid financial base, backed by huge amounts of resources accumulated through domestic savings and mainly monetary reserves, and the demand for commodities and natural resources such as energy, raw materials and food. At the micro level, companies invest abroad to improve the recognition of their brands in international markets, gain direct access to advanced technologies and competences, and ensure control over resources in countries with greater flexibility in labor relations and environmental regulations (before the rise of average wage and the tightening of controls against pollution at the domestic level) (McKay et al., 2017).

of this section is to explain how the different aspects of agrifood issues in contemporary China fuel their IDEs in agribusiness in developing countries.

2.1. Changing eating habits and class-related diets

China is an ancient and historically agricultural civilization, where food is, and always has been, a central identity trait of its culture. However, in spite of their national specificities, regional variations and differences with the West, in the last decades the food practices of the whole country have undergone intense changes, associated to the diffusion of the secular process of “nutritional transition”. This process, experienced by most of the countries on economic development trajectories, drives changes in the eating habits and class diets of the population.

A oversimplified and crude representation is that the old Chinese pattern of food consumption of 8:1:1, or eight parts of grain, one part of meat-fish, and one part of vegetable-fruit [...], has changed rapidly to a standard 4:3:3, four-part grain, three parts meat-fish (and eggs and milk), and three parts vegetable-fruit. The transformation is already well advanced and, if income continues to rise (albeit at a reduced rate compared to the last 30 years), it should be completed during the decade 2015 to 2025. This will bring the Chinese food consumption patterns very much closer to the developed countries (Huang, 2011: 4).

Although it is not appropriate to think of linear patterns of direct causality, it is difficult to dispute that the process of nutritional transition is strongly correlated with the transformations generated by economic growth. China’s per capita income (PPP purchasing power parity) increased from US\$ 302 in 1980 to US\$ 1,227 in 1992, US\$ 3,804 in 2003, US\$ 9,012 in 2010 and US\$ 12,879 in 2014 (IMF, 2015). Its rate of urbanization, from 18% in 1980, exceeded 50% in 2010 (CSY, 2015). The number of people below the poverty line of US\$ 1.25 per day (PPP) decreased from 63.8% of the population in 1992 to 28.4% in 2002 and 11.8% in 2009 (World Bank, 2015). Between 1980 and 2010, per capita household food expenditure (at nominal prices) grew 22 times in rural areas and 15 times in urban areas, and the share of total expenditure decreased from 68% to 41% in rural areas and 57% to 36% in urban areas in the same period (Garnett, Wilkes, 2014: 47).

The McKinsley report, cited by Garnett and Wilkes (2014), indicates trends of food consumption in China according to the different income strata for urban consumers segmented into four categories for 2010. On the basis, the “poor”, with 10% of the population and annual income below US\$ 6,000. At the top, the “rich, with 4% of the population and annual income above US\$ 34,000. And in the middle, two categories. “Mass consumers”, with annual incomes of US\$ 6,000 to US\$ 16,000, who were 80% of the population, but should reduce to 40% by 2020. And the “new mainstream”, with annual income of US\$ 16,000 and US\$ 34,000, is only 6% of the population in 2010 but could reach 50% by 2020. Over the decade, the authors predict that the poor, who consume only the basics, will simply buy the products they already consume, only in greater quantity and more often. Mass consumers, who consume basic and some durable goods, will buy more of the same and diversify a little, as products out of reach today will become more affordable. The rich will continue to access the top of consumption, to buy high quality goods and to seek social distinction. And the new mainstream, the “affluent middle class”, tends to migrate to more expensive and branded products and try out new products, seeking to emulate the habits of the rich.

In this context of rapid transformation of the economy and society, the exercise of these new habits and diets plays an important role as a practice of distinction and a social marker in the definition of consumer class identities,

[...] both symbolically, as a representation of status and success, and materially, as a high-priced food commodity. For example, quoting an agribusiness executive in Shanghai, discussing development prospects for his firm: ‘Meat means wealth. The more money you have, the more meat you will eat.’ [It is symptomatic, therefore] that in China the

consumption of meat will grow throughout the population but will be more pronounced in urban areas and among middle-and upper-middle-class consumers. (Schneider, 2014: 617).

With the economic and social changes resulting from the reform and opening up policy, since the mid-1980s the annual per capita consumption of meat in China has quadrupled, arriving at 61kg of meat per person in 2010. Although a low average when compared to the United States (120 kg) or Australia (118 kg), it is quite reasonable compared to Brazil (73 kg) for example, and it is well above the world average (42 kg). Undoubtedly, this represents a radical change in a country where for less than four decades, and perhaps for a millennium before that, one ate meat a few times a year, only on special occasions (Schneider, 2014). China produces and consumes more than 50% of the world's pork, which represents 39kg per capita, with estimates reaching 50kg by 2025 (Wilkinson, Wesz, Lopane, 2015). It is symptomatic, therefore, that "in Chinese the general word for meat (*rou*) refers to pork, and the Chinese character for home and family, 家 (*jia*), has been created more than 3,500 years, adding the radical root to the pig radical, or more figuratively, by placing a roof over the pig's head." (Schneider, Sharma, 2014: 21).

2.2. Transformations in livestock production and the meat and feed industries

These facts demonstrate that the ongoing changes in eating habits and class diets towards higher levels of animal protein consumption are the main factors that induce transformations in livestock production, restructuring the meat industry and increasing imports of soybeans as raw material for feed manufacturing in China. Until 1985, peasant farmers produced at least 95% of the country's pork. However, in 2009 the number of rural households that produced pigs in China as a whole fell by 50% (with regional variations), giving rise to a new reality through differentiation of producers: backyard producers (1 to 10 pigs/year) accounted for about 27% of national pork production; specialized household producers (50 to 500 pigs/year) by 51%; and large-scale commercial producers (> 500 pigs/year) for 22% of the total. That is, the main trends are specialization, increase of scales and concentration of production, creating barriers to entry, selection and exclusion of small farmers. Nowadays, most operations on a commercial scale are carried out by domestic producers and companies, but it is common for foreign companies to operate mainly in branches of higher technological level (genetics, rations, equipment). The facilities and production methods are characterized as "confined/concentrated animal feeding operations (CAFOs)", predo-minantly located on the east and southeast coast, where the largest slaughterhouses and processing plants are concentrated, although the midwest is also a large producing region, particularly Sichuan province (Schneider, Sharma, 2014).

Despite the common logic and practices of agribusiness from anywhere, owner-ship and operations in the Chinese meat industry are essentially domestic, based on the "dragon head enterprise" (DHE in English) and "company and producer contracts" (*gongsi + nonghu* in Mandarin) model. The DHEs are the leading agribusiness firms, which, supported by heavy government credits and subsidies, coordinate a series of stages in value chains (breeding and reproduction, inputs and feed supply, processing, distribution and sales of meat) through combined strategies of vertical integration and contract farming. According to official statistics (certainly overestimated, but indicative of a notorious fact), through integration systems with direct producers DHEs operate around 70% of livestock production (pigs and chickens), 80% of aquaculture and 60% of the cultivated area. This integration process has advanced greatly after the recurrent Asian flu. In 2011, 8 of the 10 largest pigs slaughtering firms, 9 of the 10 largest processing and packaging firms, 8 of the 10 largest distribution firms, and 6 of the 10 largest pig breeding firms were DHEs. Shanghui, Jinluo and Yurun are the three largest DHEs in the pork sector. Together, in 2011 they made about 70% of the sales of the 10 largest processors and distributors. Shanghui represents an emblematic case of sector consolidation. Originally a state-owned company, in 2006 it was publicly held, in 2009 it obtained investments from Goldman Sachs, and by 2013 it already had capital from six Chinese investment funds. In the same year, Shanghui acquired US\$ 7.1 billion from Smithfield Foods and changed its name to WH Group. Today it is the largest pork processor and distributor in the world (Schneider, Sharma, 2014).

The process of consolidation in the meat industry has been followed directly by restructuring processes in the soy and corn crushing industry for feed manufacturing, which in turn has generated conflicts with Chinese domestic producers and pressures on the traders who supply the raw material. Following China's accession to the WTO in 2001, the state reduced taxes and tariffs, selectively liberalizing soybeans and other oilseeds, primarily for its role in the meat industry.¹⁰ So that today soybean imports from China account for 64% of global trade and 85% of domestic consumption, with three countries accounting for 97% of soy exports to China (Brazil with 45%, USA with 39% and Argentina with 13%). Of the total imported soybean, 85% is crushed for meal (main product) and oil (byproduct) and the remaining 15% for other derivatives (industrial uses) (Oliveira, Schneider, 2016). The feed industry is also controlled by DHEs. In the 12th Five-Year Plan, the goal was to have 50 factories producing 50% of the country's feed by 2015. According to official data, 16 companies were producing 33% of the food consumed in China in 2010. And industry experts estimate that by 2014 the top 10 firms would already be producing 50 percent of the feed. It is no wonder, therefore, that in the list of the world's 100 largest feed companies, classified by volume, 29 are Chinese, out of which 8 are among the top 20 (Sharma, 2014).

All this process has been permeated by conflicts and disputes of interests between Chinese soybean producers, domestic crushing industries, agro-industry workers and the big global traders (YAN, CUI, BUN, 2016). China began to import meal in the mid-1990s, but due to complaints about flattening profit margins and losses in jobs and local value-added, it soon turned to grain imports. China has 29% of the soybean crushing capacity in the world today. By 2000, almost all of this capacity was controlled by domestic firms. However, after the "2004 soybean crisis", when Chinese crushers and refineries gave default on contracts with the US because of the price collapse that year and were forced into bankruptcy, the large western trading companies ABCD (ADM, Bunge, Cargill, Louis Dreyfus) and Asian NOW (Noble, Olam, Wilmar) used this opportunity to take 70% of the control. In 2009, they controlled 80% of crushing and 60% of soybean refining in China. However, motivated by domestic outcry, in 2007 the government launched policies to curb the advance of foreign firms and support the resumption of domestic industry in the sector. As a result, Chinese firms are now controlling 72% of the crushing capacity, although there is a lot of idle capacity and foreign firms account for about 60% of the actual crushing operation (Oliveira, Schneider, 2016; Sharma, 2014). The case of the Chinese COFCO, now one of the largest firms in the branch, going through a process of expansion in the world and in Brazil, will be seen below.

2.3. Complexities of the concept of food security

The effects of these changes on consumption habits and meat production chains are reflected in Chinese nutritional patterns. The first change, of extreme importance, is the reduction of the number of people under the sting of hunger, even if it remains at a moderately high level. The percentage of chronically undernourished people in China decreased from 23.9% in the biennium 1990-1992 to 16.1% in 2000-2002 and to 10.6% in 2012-2014 (FAO, IFAD, WFP, 2014). However, in a book with the provocative title "Who will feed China?", Lester Brown (1995) questioned the country's ability to provide basic food to its population by 2020 without having the resort of buying large quantities of grain in the international agricultural market, generating a global upward pressure on food prices. In his fatalistic prediction, he warned that changing diets, shrinkage of cropland, stagnation of productivity, and environmental constraints would lead to a widening gap between China's food supply and demand, creating a chasm that even the world's major grain exporters would not be able to fill.

¹⁰ The uses of soy have also changed. Food products derived from soybeans remain common ingredients in diets and cooking, and are basically non-genetically modified, domestic production (NGMO). But the Chinese now consume soybeans more and more as cooking oil and mainly as industrial pork or chicken, and in this case most of it is imported GMOs.

Xu, Zhang and Li (2014) discuss this controversy and explain that the Chinese government, using official statistics, states that China's grain production has declined from 512 to 431 million tons (Mt) between 1998 and 2003, but since 2004 the country has achieved "ten years of consecutive growth" in grain production, reaching 602 Mt in 2013, almost 40% above the level of 2003. However, they support the thesis that government figures are overestimated, and through alternative calculations say that since 2008 there is a discrepancy between the official statistics and the best estimates that reach 22% in 2012, inferring that this year the production would be 100 million Mt below the government's calculation. And they question that in the short term the increasing imports of soy and maize for feed accentuate the difficulty of domestic production reaching demand and that in the long run China's cereal supply may be further hampered by restrictions of land and water resources, as well as the environmental degradation that is still very high.

McBeth and McBeth (2010), in turn, affirm that environmental and food security problems are recognized by the elite, that citizens include them in assessing government performance and that so far China has managed to feed its huge population. So this is not an immediate concern, but one that will already be in the medium term. Thus, if it is not addressed soon, the social and political stability of the country will be a danger. The point to note is that China's "agrifood question" is definitely more complex than a simple quantitative question.

Accordingly, Zhou (2010) shows that China has maintained grain reserves well above its annual consumption, the diversification in the supply of other products (meat, milk, eggs, fruits, vegetables) is remarkable, and the improvement in food availability and accessibility is significant. And infers that the average energy intake of the Chinese population reaches the required, the protein intake is adequate, but in rural areas is still low and needs to be improved, and the fat intake reaches the required, but in urban areas and richer rural areas has become excessive. In fact, nutritional imbalances are beginning to emerge, such as a significant increase in overweight and obesity rates and the emergence of chronic non-communicable diseases, the growth in the level of food and waste, and the proliferation of food and health scandals and anxieties about food quality¹¹, in addition to the aforementioned problems of overexploitation of natural resources and environmental damage. There is also a lack of effectiveness of the mechanisms to address the factors that undermine social stability, such as the persistence of poverty and the increase of social and regional inequalities, as well as the lack of transparency with the management of public reserves of grains.

All of this suggests that there is a contradiction between government narratives and official speeches on food security and the policy practices effectively implemented in China. At its core is a subtle conceptual question, but of crucial importance. The term "food security" (*shipin fangyu anquan*), as used in the West as defined by the FAO, has only recently begun to appear in official Chinese academic writings and reports, primarily in documents that explain UN policies or target foreign audiences. The term "food safety" (*shipin anquan*), however, is used in state regulation, in the media coverage and in public debate in the wake of recent food scandals. But the term actually used and practiced in the field of food policy is "grain security", or "cereal self-sufficiency" (*liangshi anquan*) (Christiansen, 2009; Zhou, 2010).

This means adhering to a level of at least 95% of domestic grain production, being rice, wheat and corn the three cereals considered as "strategic crops" that make up the staple food basket for population's direct consumption. The list of strategic crops has already been longer, but as seen

¹¹ The major recent food safety scandal was the case of melamine tainted infant milk powder in 2008, which resulted in the deaths of 6 children and more than 30,000 patients with kidney stones. The so-called avian flu has also reverberated around the world, as between 2003 and 2013 China reported cases every year except 2011. Another was the illegal additives waste in pork from Shanghai/Smithfield, the "lean meat powder" (drugs banned in China since 2002 but allowed in the USA). And the American fast-food company KFC, whose suppliers were found feeding their chickens with more than 18 antibiotics, drugs and hormones, among others (Schneider, Sharma, 2014).

earlier, since China's entry into the WTO in 2001, soy-beans and other oilseeds have been excluded from the basic cereal basket and liberal-ized, so today the country is dependent on international trade for supply its demand. The government officially still keeps maize as a strategic crop. But since it is also an important input in feed manufacturing and its domestic production is based on non-GM seeds at higher costs than in countries like the United States, Brazil and Argentina, many have stated that corn must become the "second soybean" and that with the consolidation of the meats and feeds industries completed, China must increasingly depend on the international market to ensure the supply of maize in the face of its growing demand (Sharma, 2014).

The critical point is that this terminological confusion or ambiguity obfuscates the crucial shift in the diets of Chinese population, with the growth in meat consumption and decline in grain consumption. Among pessimistic and optimistic estimates, China has 121 to 137 million hectares of arable land, 2.818 billion cubic meters per year of freshwater flows and a population of nearly 1.4 billion people. Hence the logics of the food security official slogan: the "Challenge 21/9", meaning 21% of the population, 9% of arable land and 7% of freshwater in the world (McBETH, McBETH, 2010). So when the government rejoices at its success with buzzwords like "China feeds 21% of the world's population with 9% of agricultural land, making a major contribution to food security" and "We'll feed ourselves!" in response to "Who will feed China?", it is only saying that it reaches the level of 95% of grain self-sufficiency. But it hides that China depends on imports to 4/5 of the soybean and more and more of the corn that it consumes to supply the feed industry, which, in turn, goes to produce the meat, which already represents 3/10 of the average diet of the Chinese consumer (Huang, 2011).

In China, there are criticisms of the selfishness and hypocrisy of Westerners who already eat a lot of meat and do not want the Chinese to do the same, claiming that this poses a "threat to sustainability". However, in recent years even the government has been showing awareness of the problem, both for environmental (CO2 emissions), social (inequality of consumption between classes) and health (increased obesity and associated diseases) reasons, and the necessity of a policy to reduce the growth of meat consumption in the country.¹² Even so, people want and desire to eat more meat, which seems like progress against a past of scarcity; and the government is also aware that securing the "modernization of diets" is important for its own legitimacy and public confidence. In the coming years, therefore, the country will face the challenge of continuing to provide more and better quality food for the part of the population that still lacks it, while at the same time addressing the effects of food excesses and imbalances of another part of the population – being the problem of "meatification of diets" at the heart of this double challenge (Garnett, Wilkes, 2014; Schneider, 2014).

2.4. Going out to secure control over natural resources

Ultimately, the increased consumption of meat, changes in livestock production and restructuring in the meat and feed industries encapsulate all the contradictions of the Chinese agrifood question, whether they are sufficiency, health and safety, or social, environmental and health problems. This is why, in addition to imports, China is going out with its companies and investing in agribusiness in order to ensure control over natural resources for the production and supply of food and agricultural raw materials. More than anything, even though it is already pushing for containment measures, China wants to ensure the continuation of the "meatification of diets". So Schneider (2014) refers to Chinese IDEs in agribusiness as "meat grabs" rather than "food security land grabs" as pretty usual in the literature. However, in the most recent period the trend is less the purchase of land and more and more the acquisition of companies with specific assets important to control different links of value chains. Thus, only for didactic and analytical purposes, without intending to propose a rigid periodization of

¹² The Guardian (<https://www.theguardian.com/world/2016/jun/20/chinas-meat-consumption-climate-change>) informed that, animated by health and environmental activists, in 2016 the government introduced a plan with new dietary guidelines aimed at reducing the growth of meat consumption by 50% by 2030, which in turn could reduce GGE by 1 billion tonnes and reduce obesity and diabetes.

ruptures in the historical process, it is possible to observe the evolution of internationalization of the Chinese companies that carry out IDEs in agribusiness through three phases.

The first phase, which began in the first half of the 2000s and runs through 2008, is marked by the emergence of China as a global player in the commodities market. Although it is also a major producer of commodities (coal and oil, aluminum and steel, wheat, rice, corn and soybeans, etc.), its domestic production did not keep up with its demand (COATES, LUU, 2012). During this period, China's dependence on imports of food, energy, and agricultural and mineral raw materials became clear. Its demand, along with other factors, will be one of the key forces behind the unprecedented escalation in the commodity price level. "The construction of an international base of suppliers of these commodities is possibly the most visible face of the internationalization of Chinese firms and the broad initiative of the Chinese government in international relations" (Medeiros, 2011: 209).

One could argue that this phase has gone by 2012, when Chinese growth begins to slow down (from an average of 10% to about 6.5% per year) and the commodity price boom comes to an end, returning to "normal" levels, despite the continuing strong demand. But what is to emphasize is that although the going out policy had already existed since 2001, it is from the onset of the crisis of 2008 that the second phase begins, when the FDIs of Chinese companies in the agribusiness sector intensifies, particularly in land deals in Southeast Asia, Africa and Latin America countries, including Brazil. At that time there was extensive media attention from NGOs and academic scholars discussing whether China is not becoming itself a neocolonial power, as one of the main players in the wave of global land grabs triggered by the crisis. However, careful evidence based studies have shown so far is that despite the fears that "China is taking over the world", Chinese land investments are much smaller than those from other countries, such as the Gulf states, or even from Europe or the United States. In any case, it is true that even though there is a diversity of actors (central state, provincial, private, wealthy individuals and investment funds), Chinese investments in land can be characterized as a kind of "developmental outsourcing", in which the state plays a crucial role in planning, intervention and regulation of the whole process (HOFMAN, HO, 2012).

Finally, in the third phase, which runs from 2012 to the present day, there seems to be a change in the strategy – perhaps for the criticisms linked to the "China as land grabber" discourse – in which the orientation of Chinese FDIs shifts from land purchases for direct cultivation and towards the acquisition of companies' assets in the agribusiness sector with the primary objective of controlling stages and processes upstream and downstream of the value chains of certain commodities in key regions, and even for the construction of infrastructures of logistics, transport and storage. The analysis of FDIs in Brazil will be further advanced. For now, just remember some Chinese companies with high profile processes of expansion. The previously commented Shanghai, which in 2013 acquired the American Smithfield and became the largest pork company in the world. State-owned ChemChina, which in 2017 acquired Switzerland's Syngenta and today controls 8% of the seed market and 20% of the global pesticide market.¹³ And the state-owned COFCO (China National Cereals, Oils and Foodstuffs Corporation), the largest soy producer and crusher, oil refiner, processed food manufacturer and agricultural trading company in China, which in 2014 acquired the Dutch company Nidera (US\$1.2 billion) and Singapore-listed and Hong Kong-based Noble (US\$1.5 billion), both with large-scale operations in Brazil and other Southern Cone countries, entering the same ABCD ranking, which are now no longer "Big Four", but the "Big Five". It is already spoken of the ABCCD, being the second C refers to COFCO.

Of course Chinese companies (state or private) are aware of the profitability and business opportunities within the market. However, they all follow strategic guidelines defined by the state. In

¹³ In fact, ChemChina's acquisition of Syngenta is part of a process of corporate consolidation for the entire inputs sector, with the confirmation of Bayer's acquisition of Monsanto (which will control 29% of the seed market and 26% of the pesticide market) and the merger between Dow and Dupont (which will control 25% of the seed market and 16% of the pesticide market) (CLAPP, 2017).

short, the going out policy supports domestic agribusiness companies to invest in land and agricultural resources, set up processing operations, build logistical capacities, cooperate with and acquire foreign firms to expand the global reach of China's private or state-owned enterprises, to the point of seriously threatening the power of leading transnational corporations of the North Atlantic agrifood sector.

3. Chinese investments in Brazilian agribusiness: evolution and trends, perspectives from Mato Grosso

In the previous section we analyzed the reasons explaining the process of “going out” of the Chinese companies to realize FDIs in agribusiness and the agrifood sector of developing countries. In this section, in counterpart, we will study the “arriving in” (Armony, Strauss, 2012) of these companies in Brazil. In other words, the aim is to analyze the implications of Chinese FDIs in Brazilian agribusiness, characterizing the actors, strategies and impacts of their entry in the market dynamics. Empirically, the main focus is on the evolution and trends of these investments in Mato Grosso, Brazil's largest soybean and maize producing state, located in the midwest region of the country, where large-scale capitalist or corporate model predominates and where the largest transnational agribusiness companies are based. Nonetheless, it will not lose sight of the dynamics of other important Brazilian regions that are also major producers, such as the south, origin of soy production in the country, where there is a relative predominance of small and medium-scale family-based agriculture, and in MAPITIBA, a new locus of agribusiness expansion with large-scale production in Brazil.

As already mentioned, beyond trade relations, evident in the constitution of Brazil and China respectively as export and import poles of the “soy-meat complex”, agri-business FDIs are assuming an increasingly decisive role in the polycentric restructuring of international agrifood relations. So, table 1 show all Chinese FDIs in Brazilian agribusiness to date and serves as a reference for the analysis performed in the next items.¹⁴

¹⁴ The CEBC (2016, 2017) currently represents the best source for qualitative study of Chinese FDIs in Brazil, since, unlike data of the Central Bank of Brazil, it presents information disaggregated by sector and companies. In addition, it monitors the investment announcements published in the media and then confirms them with both the companies of origin and destination.

Tabela 1. Chinese investments in Brazilian agribusiness.

Year	Origin	Destination	Stage	State	Value (US\$)	Objective	Modality	Ownership	Nature
2011	China National Agriculture Development Group Corporation (CNADC)	Goias Government	Announced	GO	7 bi	Participation in projects to expand grain cultivation and the construction of the North-South railway line in Goias. An area of 2.4 million hectares for the production of soybeans and its export to China.	Greenfield	Central SOE	Resource Seeking
2011	Chongqing Grain Group (COGG)	N/A	Announced	BA	300 m	Purchase of 100 thousand ha to soybean production; installation of a crushing plant; investment stopped due government restrictions to land purchases by foreigners	Greenfield	SOE	Resource Seeking
2011	Anhui Longping High-Tech Seeds	N/A	N/A	N/A	N/A	Provide genetics of rice seeds to the local partner, who multiplies and markets them by paying royalties; or create a joint venture, with terms to be discussed in the future	Strategic Partnership	Private	Competence/Market Seeking
2011	COFCO Ltd	Companhia Nacional de Açúcar e Alcool (CNAA)	Announced	GO, MG	N/A	Purchase of two plants of CNAA	F&A	Central SOE	Resource Seeking
2011	Grupo Pallas International (GPI)	Bahia Government	Announced	BA	N/A	Land purchase for soybean and bioenergy production to export to the Chinese market.	Greenfield	Private	Resource Seeking
2012	Universal Timber	N/A	Announced	AC	20 m	Forest management project in the municipalities of Madureira and Feijó	Greenfield	Private	Resource Seeking
2013	BBCA	N/A	Confirmed	MS	320 m	Construction of a processing unit with capacity for 1,200,000 tons of grain in Maracajú	Greenfield	Central SOE	Resource Seeking
2014	Tide Group	Prentas Quimica	Confirmed	PR	N/A	Restore the productive capacity of Prentas and invest in research and development of agrochemicals	F&A (partial)	Private	Competence/Resource Seeking
2014	China Tobacco International do Brasil (CTIB)	China Brasil Tabacos Exportadora (CBT)	Confirmed	RS	20 m	Tobacco production and construction of factories, warehouses and offices in Santa Cruz do Sul and Venâncio Aires	Joint Venture	SOE	Resource Seeking
2014	ChemChina	Adama Brasil	Confirmed	PR, RS	N/A	29 generic pesticides under development, assets and personnel	Acquisition	SOE	Competence Seeking
2014	COFCO Ltd	Nidera Agri	Confirmed	RS, PR, MT, SC, SP, MG, GO, BA, DF	1.2 bi	Origination, processing and trading of soy and corn, distribution of inputs, infrastructures and services of storage, transportation and logistics	F&A	Central SOE	Competence/Resource Seeking
2014	COFCO Ltd	Noble	Confirmed	BA, MT, MG, SP, PR	1.5 bi	Origination, processing and trading of soy and corn, distribution of inputs, infrastructures and services of storage, transportation and logistics	F&A	Central SOE	Competence/Resource Seeking
2016	Hunan Dakang Pasture Farming Co/Panaxin	Fraxil	Confirmed	MT, AP, TO, PA	200 m	Origination, processing and trading of soy and corn, distribution of inputs, infrastructures and services of storage, transportation and logistics	F&A (partial)	Private	Competence/Resource Seeking
2017	DKBA/Pengxin Dow	Selagriicola Sementes do Brasil	Confirmed	PR, SC, SP	N/A	Origination, processing and trading of soy and corn, distribution of inputs, infrastructures and services of storage, transportation and logistics	Acquisition (Partial)	Private	Competence/Resource Seeking
2017	CITIC Ltd.	Sementes do Brasil	Confirmed	N/A	1.1 bi	Research centers, seed processing plants and corn geopolism bank, licenses for the use of Morgan and Dow Seeds brands	Acquisition (Partial)	Private/State backed	Competence Seeking

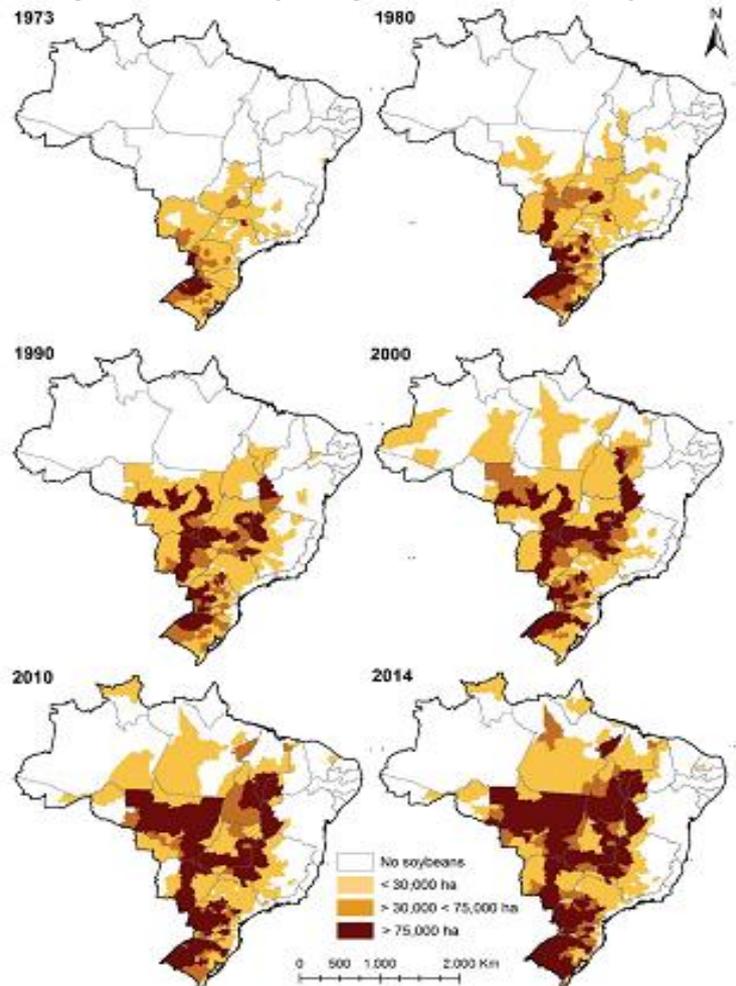
Source: the authors, based on data by CEBC (2016, 2017).

3.1. The expansion of soybean agribusiness: commodities boom and land markets

Between the mid-1960s and 1980s, during the military dictatorship, Brazil experimented with the “modernization of agriculture”. This process has completely altered the sector’s dynamics in the country’s accumulation of capital and economic development, transforming the technical basis of agriculture, raising its productivity and integrating it to the upstream input industry, downstream processing agroindustry and the financial system. All this was made possible by state policies such as credit, technical assistance, rural extension, research and development, colonization of agricultural frontier and land tenure, and infrastructure construction. From the mid-1980s and early 1990s this process went into crisis. However, following the 1999 exchange crisis, the FHC government promoted an “agribusiness re-launch” policy to maintain the balance of payments’ current account. And by the mid-2000s, under PT governments, a new pattern of capital accumulation was established based on the commodity boom and the valorization of land prices, upon the alliance between large land ownership and internationalized agri-business complexes and secured by the state’s macroeconomic policy (Delgado, 2012).

In the meantime, the expansion of planted area, quantity produced, productivity and exports of soybeans in Brazil explodes, a phenomenon directly linked to the increased Chinese demand and the consequent rise in prices, which characterizes the Brazilian counterpart in the formation of the “Brazil-China soy-meat complex”. Figure 1, below, expresses in a vivid way the evolution and spatial configuration of this process.

Figura 1. Expansion of the soybean planted area in Brazil by micro-regions.



Source: Flexor, Leite (2017: 410). Elaborated by V. J. Wesz Jr. with data of IBGE.

Soybean production in Brazil expanded at an average annual growth rate of 6.7% between 2000/01 and 2015/16, with grain volume jumping from 38.4 to 95.4 Mt in the period. The planted area grew at a rate of 6.2% per annum, going from 14 to 33.2 million hectares. And productivity grew at an average annual rate of 0.7% per year (CONAB, 2017).¹⁵ Certainly a set of production technologies (transgenic seeds, no-till, use of agrochemicals, etc.) contributed to these results. However, there is no doubt that the incorporation of more land to soybean production was a decisive factor, since the growth rate of planted area was much higher than the productivity growth rate. The progressive geographical expansion reflects this point. Soybean production currently covers 53% of Brazil's total grain area and its cultivation has been concentrated in the midwest and southern regions, where the five largest producing states are located: Mato Grosso, Paraná, Rio Grande do Sul, Goiás and Mato Grosso. However, throughout the more recent period, there has been a great and notable advance in the cultivation of soybeans towards the north and northeast, in a region that has been called MAPITOBA, an acronym for the border area that encompasses parts of the states of Maranhão, Piauí, Tocantins and

¹⁵In Brazil, as in other countries of “modernized agriculture” in the southern hemisphere, there are at least two harvests of grains per year, one being soy and other corn. Often a third is still made, usually wheat in the south and cotton in the other regions. Thus, in the same period from 2000/2001 to 2015/2016, maize production grew at a rate of 4.5% per year, from 35.2 to 66.5 Mt, with the area planted growing at 1.5% from 13.2 to 15.9 million hectares, with a productivity growth rate of 2.6% per year (CONAB, 2017).

Bahia. The importance and significance of this phenomenon when observed in monetary terms is even more evident. The gross value of soybean production in Brazil grew at an annual rate of 7.7% between 1996 and 2012, increasing the share of soybean VBP from 9.4% to 25.73% in total national agricultural GDP (Hirakuri, Lazzarotto, 2014), which subsequently drops to 20% in 2014/ 2015, due to the end of the commodity price boom (CNA, 2015).

Even with the important demand for processed soy in the domestic market¹⁶, 52.6% of soybeans produced in Brazil were destined for export in the form of grains. Soybean exports grew at a rate of 8.8% per year between the biennia of 2000/2001 and 2013/2014, from 15.5 to 44.5 Mt. With 41% of all soy offered in the global market, Brazil is now the world's largest exporter of soybeans, followed by the USA with 39.3% and Argentina with 7.3%. The value of its exports reached US\$ 30.961 billion in 2013, equivalent to 31% of the value of agribusiness exports and 12.8% of the country's total exports, accounting for 37% of the Brazilian trade balance (Hirakuri, Lazzarotto, 2014). China is its biggest market. In 2003, 54% of Brazil's soybean grain exports still went to Europe and only 30% to China. However, in 2013 the percentage of Europe fell to 12%, while China received astonishing 75% of Brazil's soybeans, being more than 95% in the form of grains (Oliveira, Schneider, 2016). Indeed, as the notion of "Brazil-China soy-meat complex" indicates, there is a mutual dependence between the supply and demand of soybeans from both countries, but with a better balance for China, which has more diversified sources of supply than Brazil of demand (Wilkinson, Wesz, 2013).

The soybean boom and the expansion of agricultural frontier that it drives are the main forces behind the so-called "society and economy of agribusiness", formed from the migration of the southern settlers in their "march" to the midwest (Herédia, Palmeira, Leite, 2010).¹⁷ Some authors have questioned the narrative that links soybean exclusively to large-scale capitalist farms, pointing out the existence of a variety of "family farming styles" that also grows soybeans (Vennet, Schneider, Dessen, 2014). Although this should not be overlooked, the concentration of production is, nevertheless, the dominant trend. Data from the 2006 Agricultural Census, although not updated, serve to illustrate. Of the 1,346,649 agricultural establishments that produced soybeans that year, 6,080 units from 1000 to 2500 and more ha produced 49.92% of the total; 5,674 units from 500 to less than 1000 ha produced 14.06%; 24,787 units from 100 to less than 500 ha produced 20.13%; 22,783 units from 50 to less than 100 ha produced 5.26%; and the remaining 1,287,325 with less than 50 ha produced only 10.63% (Escher, 2016).

Another consequence of the soybean boom and other agricultural commodities is the appreciation of land prices and the concentration of land ownership, in the context of "global land grabbing" (Wilkinson, Reydon, Di Sabbato, 2013; Borrás, Franco, 2012; Borrás et al., 2012, 2016; Sauer, Borrás, 2016).¹⁸ The rise of food prices in 2008 led to increased demand for land in exporting countries, such

¹⁶ Brazil has 16% of the global soybeans crushing capacity, Argentina also 16%, the USA 19% and China 29%. In 2013, 47.4% of the soybean produced in Brazil was destined to the domestic market for meal, oil and biodiesel, with 52% of the meal and 23% of the oil being exported, while biodiesel was all for domestic consumption (CONAB, 2017). Three factors explain this strong domestic demand: the massive replacement of animal fat and butter by vegetable oil and margarine in food habits; the National Program for the Production and Use of Biodiesel (PNPB), which requires a mix of 7% in fuel composition and should reach 10% in 2020; and the use of meal for chickens, pigs and cattle feed in CAFO systems (Wesz, 2016).

¹⁷ Although important, the paper will not discuss the negative consequences of agribusiness expansion on health, environment and livelihoods of rural populations. See the following references on this theme: Oliveira and Hecht (2016), Garrett and Rausch (2016), Carneiro (2015), Fearnside and Figueiredo (2015).

¹⁸ Long before the international land grabbing debate, there were debates in Brazil about "*grilagem de terras*" (illegal appropriation, either by Brazilians or eventually foreigners) and "foreignization of land". The Gini index for land in Brazil is 0.856 and there are 34,371 rural properties (0.7% of the total) covering 4.3 million hectares (0.79% of the total) owned by foreigners (Wilkinson, Reydon, Di

as Brazil, inducing a rise in the level of prices of land assets, which averaged R\$ 4.756 per ha in 2010 to R\$ 10,083 in 2015, an average increase of 112% at the national level. In fact, the increase was greater in the midwest region (254%), where the state of Mato Grosso is, followed by the north (252%) and the northeast (206.6%), where most of MAPITOBA's areas are located, and then the south (205%) and the southeast (194%), areas of older occupation. This stimulated new forms of appropriation of rents from these assets, changing the productive and patrimonial functions of agricultural activities: first for productive purposes and then for speculative purposes, increasingly oriented by the dominant logic of financial capital, which is evident in the strong correlation between the price of the hectare of land and the price of soybeans (0.923) and the BOVESPA index (0.886) (Flexor, Leite, 2017).

It is within this context that one must understand the entry of Chinese and other countries FDIs to purchase of land in Brazil in the recent period. Some exaggerated assessments have reported that the Chinese have acquired exorbitant 7 million hectares (Acioly, Pinto, Cintra, 2010), but more empirical sound studies (Oliveira, 2015; Wilkinson, Wesz, Lopane, 2015; which too CEBC (2016) data as a starting point, identified only a few projects with reliable information.

In 2007, Pacific Century Group's, based in Hong Kong, acquired 27,397 hectares in a minority stake with Argentina's CalyxAgro. And private firm Zhejiang Fudi Agriculture Co., in partnership with Beidahuang /Heilongjiang State Farm Co., acquired about 600 ha in Rio Grande do Sul and 16,000 ha in Tocantins between 2007 and 2008. But faced with operational difficulties, they ended up selling most the assets to Univer-so Verde, a subsidiary of provincial state-owned Chongqing Grain Group (CGG), in 2011. In the same year, CGG tried to buy 200,000 ha in western Bahia to produce soybeans, but the Brazilian government imposed legal restrictions on the acquisition of land by foreigners that had existed since the previous year, and the firm ended up buying a smaller area (52,000 ha), announcing the construction of a crushing of soybeans and also of a fertilizer factory in Barreiras (BA), as well as rail transport and storage infrastructures, hitherto not carried out due to environmental, administrative and social problems (occupation of the MST).

The privately held Sanhe Hopeful Grain and Oil Co. and state-owned CNADG (China National Agriculture Development Group) announced the purchase of a large 2.4 million ha and the construction of railway and storage infrastructure in Goiás, totaling US\$ 7.5 billion over 10 years. However, what actually happened was only the 20% stake in the construction of a port terminal in Santa Catarina, which is now stopped for lack of environmental license. And the Pallas International group announced an interest to the Bahia government in buying 250,000 ha for the production of soybeans for export, also without confirmation.

In contrast, investors from Europe and the USA, as well as from countries such as Argentina and Japan, have entered with considerable force to purchase large tracts of land for direct production of large-scale soybean cultivation for exportation. Agricultural business groups from these countries, such as Cresud/Brasilagro, Adecoagro, SLC Agrícola, El Tejar, TIAA-CREF, Multigrain/Xingu Agro and V-Agro, have acquired more than 750,000 hectares of land in Brazil since 2008.

According to Oliveira (2015), although Chinese FDIs in land purchase are smaller than those of other countries, they received disproportionate negative attention in the media, alarmist critiques of intellectuals of various ideological colors, resistance from social movements and opposition from the ruralist block, whose members actually want to opportunistically position themselves as necessary partners for the realization of these investments. In our own field work in Mato Grosso, several

Sabbato, 2013). This suggests that the scandalous land concentration in Brazil is probably due much more to the action of Brazilians than to foreigners. Even so, the Land Matrix website reports that from 2000 up to now there were 61 ads for land purchases by foreigners in Brazil, the main ones being the United States (12), Canada (10), Argentina (10), Japan (8), the Netherlands (5), China (5) and the United Kingdom (4).

interviewees alluded to the fact that the Chinese pressure to buy land must be restored if the measures to liberalize the purchase of land by foreigners are advanced in parliament, which goes to the same direction and reinforces the reasonability of Oliveira's (2015) hypothesis. However, for the moment this type of investment is stopped and what progress is of another nature.

3.2. ABCD, COFCO and other new entrants: restructuring the grain market

The dynamics of the agricultural commodities trading market has undergone changes in recent years, with corporate concentration, competitive intensification and the vertical, horizontal and financial integration of value chains defining the process trends (Clapp, 2015). Historically dominated by the four major companies known as ABCD, which buy and sell grain and other commodities and undertake various activities, from finance to production, processing, transportation and distribution, the branch is being restructured with the entry of new firms, mainly Asian (China, Japan, Singapore, Russia). In 2014, the ABCD accounted for 46% of the grains exported by Brazil, compared to 36% by the Asian firms. But in 2015 there was a sudden reversal when Asian traders, including China's COFCO, shipped 45% of the grain exported by Brazil, while the ABCD companies had 37% (Bonato, 2016). From this angle, a look at the market dynamics in Mato Grosso may be revealing of the meaning of these changes.

The origins of the restructuring of the trading branch and Brazil's specialization in the export of soya *in natura* date back to 1996, with the Kandir Law, which exempted the Tax on the Circulation of Commodities (ICMS) in the export of raw materials and kept the burden on manufactures, increasing the competitiveness of the former and lowering of the second. As a result, the profit margins of the crushing industry declined and global traders came in strongly, increasing their control over crushing operations to the detriment of Brazilian firms. Between 1995 and 1997, at the height of privatization and opening up to foreign capital, ABCD's share went from 22% to 43%, mainly through mergers and acquisitions. Since then, these companies have implemented verticalization strategies for the whole chain, with production and sale of inputs, financing, insurance and technical assistance services, grain purchase, processing, warehousing, transportation and trading; to make major investments in logistics and infrastructure, through the construction and expansion of port terminals, waterways and roads, connecting the producing regions to the international market; and to establish partnerships with seed and pesticide companies, for example between Cargill and Monsanto, Bunge and Du Pont, ADM and Syngenta, Dreyfus and Dow. In 2010, the ABCD controlled 65% of the fertilizer market, 80% of the financing to soybean producers, 50% of the crushing and refining capacity and 85% of the grain trading (buying from producers, cooperatives, resellers and smaller companies). They also started to establish horizontalization strategies, working in the energy sector, either through the production of soybean biodiesel (in this case, buying from family farmers to obtain the "Social Seal", so the government grants them tax exemptions) or ethanol from sugar cane and corn (Wesz, 2016).

In addition to ABCDs, in mid-2000 the Brazilian company Amaggi experienced an expansion that guaranteed it the fifth position among the largest soybean and corn trading companies in Brazil. The Amaggi Group was founded in Paraná in 1977 by André Maggi. His son Blairo Maggi was governor of Mato Grosso, senator by the same state and, with the impeachment of Dilma Rousseff, became minister of agriculture of the Temer government, since September of 2016. The group is composed of four main divisions (trading, production, energy, and logistics). The foreign trade business accounted for 80% of revenues in 2013. Outside Brazil, the company has facilities in Argentina, Paraguay, Switzerland, the Netherlands and Norway. In general, the firm operates through strategies similar to transnational traders (Oliveira, 2016).

Recent years have been marked by deeper structural changes in the dynamics of the grain (soybean and corn) market, especially with the entry of Asian companies, with COFCO the main one, generating a remarkable effect of a competitive agricultural trading. According to information provided by Reuters (2017), although in 2016 COFCO presented a debt of Y\$ 51.88 billion (US\$ 7.6 billion) and is having financial problems with Nidera, the company is in the process of integrating the operations of Nidera and Noble Agri under his command and has already become the second largest

trading company in Argentina, behind Cargill, and the fourth largest in Brazil, ahead of Dreyfus.¹⁹ It is worth remembering that COFCO had already entered the sugar industry, acquiring two CNAA plants in 2011 and with the total integration of Noble Agri in 2016, now it has four units in São Paulo, being today the sixth in the branch ranking in Brazil. In the process of integrating Noble and Nidera operations, COFCO changed its management, bringing the general director and commercial manager of two ABCDs.

COFCO's strategy, according to interviewees, is to control upstream and down-stream of the soy and maize value chain. For this, it has two operational arms: one in seeds, technological development and distribution of inputs; and the other in origina-tion, crushing and foreign trade. In the seed business, in addition to Nidera's products, it works in partnership with Dow (whose corn division was acquired by CITIC²⁰) and Syngenta (acquired by ChemChina, as previously seen). And in the trading business, it operates in the open market in China, where the COFCO factory (the company with the largest storage and crushing capacity in the country) must go to buy. The soybean oil and soybean meal produced by the company in Brazil goes to the Asian and European markets, while the grains go exclusively into China. Consolidated the integration of Nidera and Noble, COFCO already dominates 11% of the grain market in Brazil, but intends to reach 22% in the next five years. Despite the ambitious goal, according to the interviewee, "Chinese money will not be lacking for this expansion." Indeed, in an agreement with China Investment Corporation (CIC), the Chinese sovereign fund, COFCO created COFCO International Holding, which controls 80.1% of the capital, while CIC controls 19.9%, providing a formidable international financial platform.

The entry of COFCO has generated impacts on the market and concerned react-ions among representatives of other firms. Since 2014, there has been a redistribution of market share among traders, mainly due to the entry of COFCO, but also of other companies, as will be seen below. The share of ADM, for example, went from 15% to 12% between 2014 and 2017, as reported in an interview. Bunge's interviewee did not want to report the share of the company, but said that all ABCD lost with the entry of COFCO and other firms, although they maintained basically the same volume.

The perception of market operators is that COFCO is more willing to operate with lower profit margins on the price paid to suppliers. This tends to throw the average margin of all the firms down. According to an interviewee, they are especially aggressi-ve when they want to close a load, paying a higher price than others: "Their calculation is different." The reaction of the operator on this is not to cover the offer and withdraw from negotiation: "Let them kill the hunger of grain." The COFCO's interviewee, on the other hand, considers that the company is not more aggressive than the others: "The calculation of margin formation is the same, based on the market. We just burn margin to ensure 'take-pay'. We raise prices when you need to close the load, which others also do." But he acknowledges that "without a doubt the imperative of food security is fun-damental." And he emphasizes that "the tendency of the company is first to consolidate its competitiveness in a market environment. Once that is guaranteed, then the goal is really food security." The controversy seems

¹⁹ During fieldwork in Mato Grosso, when we contacted Nidera to make an appointment the telephone operator was already on behalf of COFCO and the director who received us informed that if we arrived the following week we would already find the COFCO sign in place of Nidera's one.

²⁰ In order to meet the requirements of the Brazilian authorities to effect the merger between Dow and Du Pont, it was necessary for the former to divest part of its corn seed business in Brazil, which was acquired by the Chinese CITIC Agri Fund for US\$1.1 billion. The deal totals US\$ 287 million in assets, including seed production units, research centers, germplasm bank, the Morgan brand and a temporary use license of Dow Seeds brand. Still in the agrochemical industry, it is worth remembering that in 2014 the Chinese private company Tide Group, which operates in China, the Americas and Europe, acquired Prentiss Qui-mica, which has the capacity to supply 35 million liters (ML) of herbicide, 15 ML of insecticides and 15 ML of fungicides per year, has 24 approved registrations and 35 registrations awaiting approval.

well explained in the speech of another interviewee. According to him, “COFCO’s differential is that it is within China, where, in addition to having factories with enormous crushing capacity, it still knows the market and, as a state-owned company, has direct access to the government and its sovereign wealth funds. This is noticeable in the prices paid by COFCO, which are higher, especially when they want to close cargo. They work longer throughout the year, fill more ships and close more volume. It’s the scale effect.”

In addition to COFCO, Hunan Dakang Pasture and Farming Co., an agricultural subsidiary of Shanghai Pengxin Group Corp., is another Chinese company that entered the Brazilian grain market, albeit with smaller investments. Pengxin is a private conglomerate with more than 40 wholly or partially owned subsidiaries worldwide and a diversified business portfolio including real estate, urban infrastructure construction and high technology investments. In 2016, it announced interest in acquiring a US\$ 3 billion stake in Banco Indusval & Partners SA in Brazil. Its founder, Jiang Zhaobai, is number 501 among the world’s richest according Hurun magazine, with a fortune of US\$3.7 billion (China Daily, 2017).

Hunan Dakang acquired two companies in the agribusiness sector in Brazil. Fia-gril Ltda., headquartered in Mato Grosso, is responsible for the resale of inputs (seeds, pesticides, fertilizers), technical assistance, grain origination and trading. Following a process of expansion and diversification of the portfolio, with the creation of Fiagrill Participações, which includes FS (biodiesel and corn protein factory), part of Cianport (transportation and logistics, with barges and port terminals) and Serra Bonita (seeds), the company faced problems of indebtedness and cash flow, having to sell part of the assets. In 2012 Amerra Capital Management acquired 25% of the company and in 2016 Hunan Dakang acquired 57%, remaining 18% still in the hands of the original partners. The share acquired by the Chinese concerns only Fiagrill Ltda., with 35 units in Mato Grosso, Amapá and Tocantins. The operation follows the same, but now there is a whole system of governance with council, compliance, guidance by results and reports, and a director placed by Hunan Dakang, which is present on the Chinese stock exchange. And in 2017, Dakang also acquired 54% of Belagrícola, based in Paraná, which generated R\$2.8 billion in 2016, also acting as reseller of inputs, originator and cerealist, with 38 grain receiving units and 55 input stores in Paraná, Santa Catarina and São Paulo. The two companies have origins in family businesses, operate throughout the grain chain and have headquarters in the two main soybean and corn producing states (Mato Grosso and Paraná), revealing the strategy to control the entire value chain from origination to exportation. “It’s the easiest way to be close to all sides of production without properly owning all assets”, said the director of Belagrícola. DKBA, the Brazilian arm of Pengxin, recently opened an office in São Paulo. “This office will be shared by Fiagrill and Belagrícola, and also represents the interests of the group”, he added (Valor, 2017).

However, Chinese companies are not the only ones to enter and destabilize the market dynamics. There are several new entrants who, according to the field work, until recently bought soybean and corn only in the port (FOB) and now are buying in the “available” (spot market) or even doing origination directly with the producers (verticalization). According to a list provided by the commercial manager of one of the ABCD companies, in 2017 there were 31 companies operating in the trading business in Mato Grosso, particularly in the northern part of the state, along (the road) BR 163.²¹

²¹The list informs the following agricultural trading firms, sorted according to the country of origin of its ownership: from the United States, ADM, Bunge, Cargill and CHS; France, Louis Dreyfus; Brasil, Amaggi, BTG (ECTP), CGG (Cantagalo), Caramuru, CVale, Ceara, ABJ, Cutrale, Petrópolis, AFG, Sipal, ABC, Algar and Soy Brasil; Chile, Graneles; Switzerland, Glencore; Austria, JAF; China, Nidera (COFCO), Noble (COFCO) and Fiagrill (Dakang); Japan, Naturalle (Itochu), Multigrain (Mitsui) e Gavilon (Marubeni); South Korea, Selecta (CJ); Russia, Sodrujestvo; and Singapura, Olam.

Among the Brazilian companies, it is worth mentioning ECTP (Engelhart Commodities Trading Partners), set up by Ricardo Lehman from agricultural businesses with papers from the bank BTG Pactual, which started to operate in the real market in 2013, with a share of 5% of the grains of Mato Grosso. Lehman was Noble's chairman, but when the Chinese acquired it, he took employees to the new firm, which already had a select customer portfolio formed by large producers and companies, and know-how in the Chinese market, where goes 85% of its exports. The firm has no warehouse, transportation and factory assets, which makes its fixed costs lower and allows it to pay slightly higher prices to its customers and to cover the prices of others when they need to fill a ship. And among the Asians, the Russian trading company Sodrujestvo, which operates in twelve countries, stands out. Under the name Aliança Agrícola do Cerrado, it has invested around R\$ 3 billion in Brazil, operating mainly in Minas Gerais and Goiás, and now expands its business to land purchases, direct production, storage and logistics in Mato Grosso, Tocantins and Maranhão. Its owner is the billionaire Alexander Lutsenko, who in the 1990s left the Russian army to create the firm and, using his close relationship with Vladimir Putin, expanded his business around the world and consolidated his position in Brazil, which is now the largest operation of Sodrujestvo outside Eastern Europe and Central Asia (Relatório Reservado, 2016).

However, even more important are the general trading companies (*sōgō shōsha*) of Japan that operate in Mato Grosso. Mitsui, which bought the Swiss Multigrain, in 2014 accounted for 60% of the soybeans exported from Brazil to Japan, although the company's largest market is China, in addition to controlling 200,000 hectares of land alone and a further 390,000 hectares in partnership with SLC Agrícola. Itochu, which acquired 50% of Naturalle in 2014 and intends to buy the remainder in order to expand its capacity for origination and export of soybean and products for human consumption, in addition to considering investing in infrastructure and logistics. Sumitomo, which has acquired 65% of input distributor Agro Amazônia, is injecting resources into origination and negotiating with COFCO to finance current costs in the same activity. And Maru-beni, which in 2013 acquired the North American Gaviolon, through a process of expansion made the company's net revenue in Brazil jump from R\$ 257 million in 2014 to R\$1.7 billion in 2015, enlarging its operations in origination and doubling its port capacity. According to Hall's (2015) interpretation, Japanese trader's primary objective is to guarantee the stable supply of grain to Japan, whose food security depends on imports at 40%. But to be competitive in the global market is necessary to manage huge volumes, which only the Japanese market is not able to absorb. Therefore, the strategy is also to serve the Asian market, especially China. By 2014, 25% of Chinese soybeans imports were supplied by the Japanese. The aggressive expansion of COFCO and other Chinese trading companies, with Brazil as the central locus of FDIs, can also be seen to some extent as a response to the strong presence of Japanese traders in their grain supply.

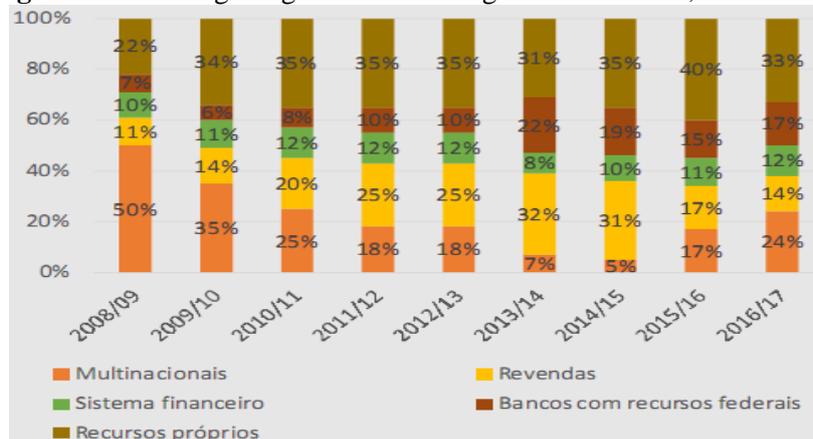
3.3. Strategies of vertical integration: origination, financing and barter

Considering the data analyzed above, it is worth emphasizing that the different actors interviewed during the fieldwork reiterated the perception that the entry of the Chinese and other firms into the grain market (soybean and corn) in Mato Grosso generated structural changes. They perceive that the increase in competition is negative for companies operating in the origination and trading branches, but positive for direct producers and companies operating in the transportation, logistics and warehousing branches. In this sense, this item examines the impact of this fierce competition on the relationship between traders and resellers with the farmers themselves, particularly through the intensification of vertical integration strategies, including the "origination" activity and the new patterns of financing via the "barter" practice.

"Origination" is an active organization of the market by operators (mainly traders and resellers) to ensure the grains supply by directing production, financing the inputs, and providing technical assistance by locking the price of the product before the harvest. It can be understood as a response to "market failures", but often becomes a way of building a growing market which depends on the product availability (Wilkinson, Pereira, 2014). In a way, this is the specific form that companies have

been able to find to carry out vertical integration strategies within the limits imposed by the grain market, which are much larger than in the cases of tobacco or poultry and pig industries, usually taken as typical examples of vertical integration in agriculture. Until around 2014, the ABCD group dominated about 80% of the soybean origination in Mato Grosso; it currently dominates about 50%. ADM, for example, used to originate 50%, buying the rest on the available market. Today, it can originate only 30%, depending on the available market to buy another 70%. The price difference between available and originated is around 10%. Lower control and the tightening price level are the main reasons for the reduction of the profit margin, as commented on previous item. A major cause of ABCD's loss of origination capacity is the Asian firms gain of origination capacity, such as Multigrain/Mitsui, Gavilon/Marubeni, Sodrujestvo, Olam (in partner-ship with ADM), but, especially COFCO, which currently originates around 70% of its traded volume, and "advances strongly". Glencore also "came out strong". Cargill "disappeared", Dreyfus "declined, but follows strong", and Bunge "declined, but still dominates". There is also another motivation to reduce the participation of the global traders in origination, associated with gain of financial capacity of the more capitalized producers who have their own storage infrastructures, managing to escape the trader's dependence and are able to sell their produce directly to the available market.

Figure 2. Financing of agricultural costing in Mato Grosso, 2008-2016.



Source: IMEA (2017).

Behind this process, there's actually a changing of patterns in financing of agri-cultural costing in Brazil, particularly in regions where large-scale capitalist production predominates, as Mato Grosso and MAPITOBA, being less intense in the south, where there is still great number of family farmers' small- and medium-scale producers which in the aggregate, however, represents a considerable volume of total production (Vennet, Schneider, Dessein, 2015; Bazotti, 2016; Wesz, 2013). Leite and Wesz (2014) observe that from 1996 to 2012 the volume of resources applied by the National Rural Credit System (SNCR) increased from R\$23 billion to R\$114.7 billion, as the National Pro-gram for Strengthening Family Agriculture (PRONAF) accounts for 15% of this value. The south and southeast regions concentrate more than 70% of the value, and around 20% goes to the mid-west. The SNCR resources applied in Mato Grosso increased from R\$1.9 billion in 1999 to R\$8.8 billion in 2012, with soybean funding absorbing R\$ 2 billion, equivalent to 20% of total soybean costing in Brazil. However, according to data from IMEA (2017), only the tillage costing in Mato Grosso in the 2016/2017 harvest was of R\$17.37 billion, to finance an area of 9.36 million hectares at R\$ 1,854.14/ha. As can be seen from the data in figure 2, despite the importance of the public credit provided by SNCR at lower interest rates than the market, agricultural financing in Mato Grosso is now predominantly private (83%), with highlight to the huge percentage of funding from own resources. Even so, the role of the global traders and input resellers is particularly decisive, standing at around 40% in recent years.

Both traders and resellers use to finance producers through the so-called "barter" operations. According to Pereira (2016), barter, which began to be practiced in Brazil in the mid-1990s, is

basically a triangular operation between the producer, the input reseller and the originator. A trader advances the resources so that the producer acquires in the market the necessary inputs for planting the harvest, or, conversely, some inputs are offered, which is a rule when the one who advances the inputs is a resale, being that in the post-harvest the producer pays back in product, without using money. A hedge agreement is signed, with a guarantor and Rural Producer's Certificate (CPR) registered at a notary's office for business up to US\$ 250,000 and land mortgage as guarantee for businesses above US\$250,000, where the value of the inputs, which can reach 80% of the harvest, will be "locked" in price and quantity, with the interests embedded. For example, in areas with productivity of 53 sacks/ha, 43 sacks are guaranteed to the originator. The composition of production costs, according to a producer who grows 35,000 hectares in Sinop, is on average 40% fertilizers, 23% chemical, 7% seeds and 30% operational. After harvest, the producer delivers the product to the firm, which takes its share and stores the remainder, providing a service to the producer, if the producer does not have his own warehouse. If the producer sell the remaining product to the same trader the cost of selection, drying and storage is not charged, but if he wants to sell to the other, he will have to bear this cost, which in most cases makes the operation expensive and impractical, generating dependence of the producer on the originator and hindering its direct access to the available market. If the price at the time of harvest is higher than at the beginning of the harvest and producer breaks the contract, selling to a third party and a higher price and paying in cash and not in product to the originator, in the next harvest he will hardly have a with the same firm, which in addition can attribute a bad reputation on him.

Most traders operate simultaneously as input suppliers and grain purchasers, establishing a married operation that allows the margin at both sides of the value chain to be appropriated, as well as a way to increase their market share. Some resellers do barter through CPR contracts with producers and sales contracts with traders. This when the very firm is not a trader, such as Fiagril, for example, what may have contributed to aggravate its liquidity problems, leading her to the capital market. Traders often operate with financial resources raised in the international market at lower interest rates, which is not always so easy for resellers. According to unofficial information, in the next three years COFCO must make available approximately R\$100 million per crop, Dreyfus R\$70 million and ADM R\$100 million. In the case of COFCO, its funding source is the Chinese banking system. There, they take it at an interest rate of 2% per year and in Brazil are remunerated at a rate of 10% per year. This indicates that a good part of the profitability of the firms that carry out barter operations in Brazil comes from arbitrage with interest rates, following a logic of financialisation of agriculture (Balestro, Lourenço, 2014), which gives them advantage in origination, input sales and volume formation, but raises speculative risk. It is symptomatic that, as we have been informed, the value in papers that roll in the market is at least four times greater than the real product.

3.4. FDIs beyond agribusiness: storage, transport and logistics infrastructures

It is common opinion among scholars, experts and representatives of Brazilian agribusiness that despite the positive indicators in terms of production, productivity, organization of the chain, market access and importance in the trade balance, the sector has hindrances that limit its competitiveness. The main "bottlenecks" cited are those associated with "Brazil Cost". Without ignoring that these narratives are biased and try make invisible and minimize the social, distributive, environment and health problems related to agribusiness, anyone visiting Mato Grosso will recognize that the actors have a certain reason in their own point of view. Bulk storage capacity is lower than grain production, mainly within producer establishments, making it difficult for the farmers to take advantage of better market opportunities. And the costs of agricultural freight are very high given the lack of adequate transport and logistics infrastructures in the different modalities. In this sense, there are expectations that Chinese investments can help fill these bottlenecks, both on the Brazilian part, who want to reduce their costs and improve their profitability, and on the Chinese part, who want to cheapen their imports.

In the 2013/2014 harvest, Brazilian grain production was 188.7 Mt, while the static bulk storage capacity was 123.3 Mt, which represents 64.8% of the total production. In addition, the storage

capacity within rural properties is only 15% of the grains stored in Brazil, well below the 35% that represent the average in developed countries. This weakness hampers strategies for scheduling sales according to the movements of demand and prices at times of harvest in other countries, by restricting the formation of stocks for future sales, forcing the producer to have to deliver his product to the trader, assuming “short freight” costs, or direct shipping to the port, assuming the “long freight” costs, as well as congesting roads and ports with trucks (Hirakuri, Lazzarotto, 2014). In recent years, public policies and private storage initiatives have significantly increased storage capacity at the farmer’s establishments. It is in this movement that has gained momentum the already commented “available” market, in which the producer can get between 10% and 20% above the price of Chicago stock exchange (CBOT price) paid by the traders. With this in mind, CONAB has projected investments for the construction of bulk silos, which, however, are still insufficient (Pereira, 2016).

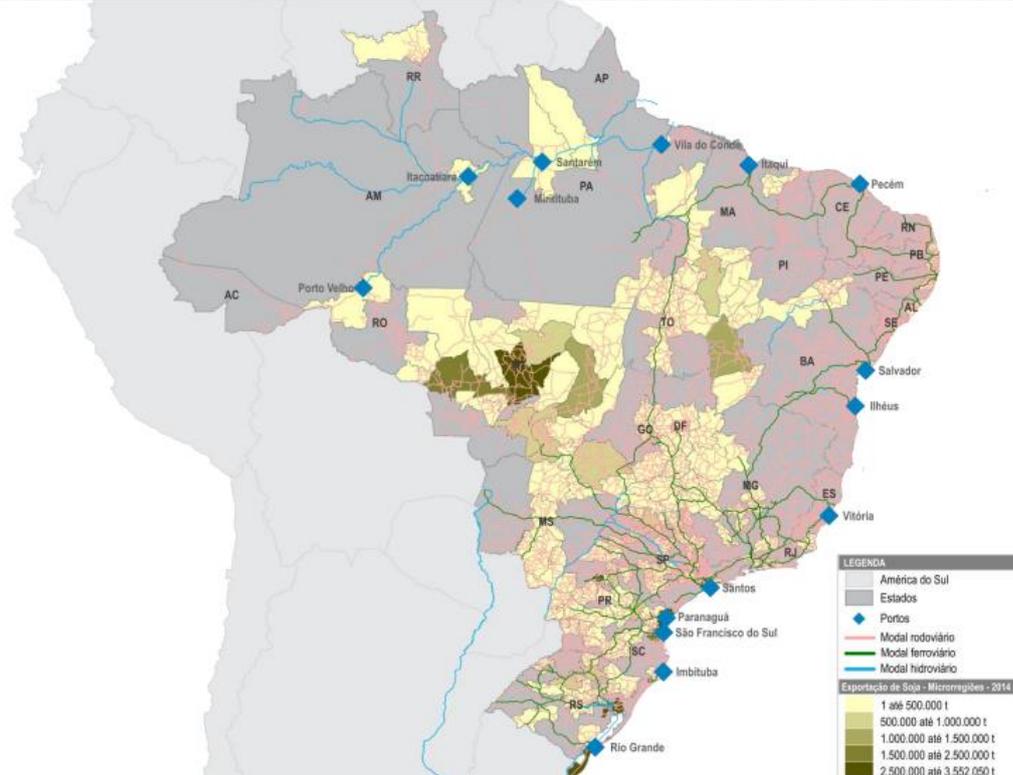
Global traders have traditionally controlled storage structures in the scope of their verticalization strategies. But now COFCO challenges this space by announcing acquisitions of warehouses in Mato Grosso beyond those that Noble and Nidera already had. One unit, located in the municipality of Itanhanga, has capacity for 72 thousand tons, and another one, in the municipality of Novo Mundo, for 60 thousand tons. In addition to these already operating warehouse acquisitions, COFCO has still purchased land and is finishing construction of a new warehouse in the municipality of Marcelândia (MT), with a capacity of 70,000 tons, which is expected to start operating later this year.

In an interview, IMEA technicians reported that Mato Grosso has a static storage capacity of about 30 Mt, equivalent to one harvest year. In their view, there are doubts whether the return on investment from the producer is actually economically feasible. But they think that, given the current conditions of transport infrastructure, building storage capacity is certainly something more feasible and realistic than relying on the services of América Latina Logística (ALL).²² In Mato Grosso, the railroad has almost the same cost as the highway, being only 5% cheaper, due to the monopoly control exercised by the company ALL, which practices very high margins, calculated over the road costs and not on their own real costs. This is where the importance of investments in different modalities of transport and logistics (asphalting of roads, construction of waterways and port terminals, and construction of new rail networks).

Figure 3 shows the logistic infrastructure map for soybean exports in Brazil in 2014. The microregions located in the north of Mato Grosso, along the BR 163, are the ones that export the most, but are very distant from ports and poorly served by railroads. Brazil exports 60% of its soybean by highway, 30% by rail and 10% by waterway. The cost per tonne paid by the producer to export grain in Argentina and the US is US\$20, while in Brazil it is US\$92. The use of the waterway mode in cargo transportation, hypothetically, would represent a 44% costs reduction compared to rail and 84% to road. The outflow of domestic production continues to be concentrated in southern and southeastern ports, around 80% of the volume, but should be directed more and more towards those in the north and northeast, which still outflow only 20% (Pereira, 2016). In the case of the midwest region, Santos (SP) ships 48% of the volume, Vitória (ES) 14%, Paranaguá (PR) 10%, and 28% go through other ports. But official estimates are that by 2018 grain movement through the “Arco Norte” should quadruple, going from 5Mt to 20Mt. This implies that 50% of central grain exports will be shipped through the port of Santarém (PA) and 11 % by Vila do Conde/Barcarena (PA), leaving 35% for Santos and 3% for Paranaguá (SEABRA, 2016). According to interviews, the cost is 35% lower for northern than for southern ports. In Mato Grosso, the rule today is that the production of Sorriso up goes through the Arco Norte (Miritituba and Barcarena) and the one of Lucas do Rio Verde down through the south (Santos and Paranaguá).

²² It is true that the opinion of IMEA technicians is based on technical feasibility studies. But the opinion of most large and medium-sized producers, cooperatives and representative organizations, also based on studies, is that despite the 13% annual interest rate and 10-year return on investment, owning a warehouse is strategic and should be a trend among the most capitalized producers.

Figure 3. Logistics infrastructure to Brazil's soybean exports by micro-regions, 2014.



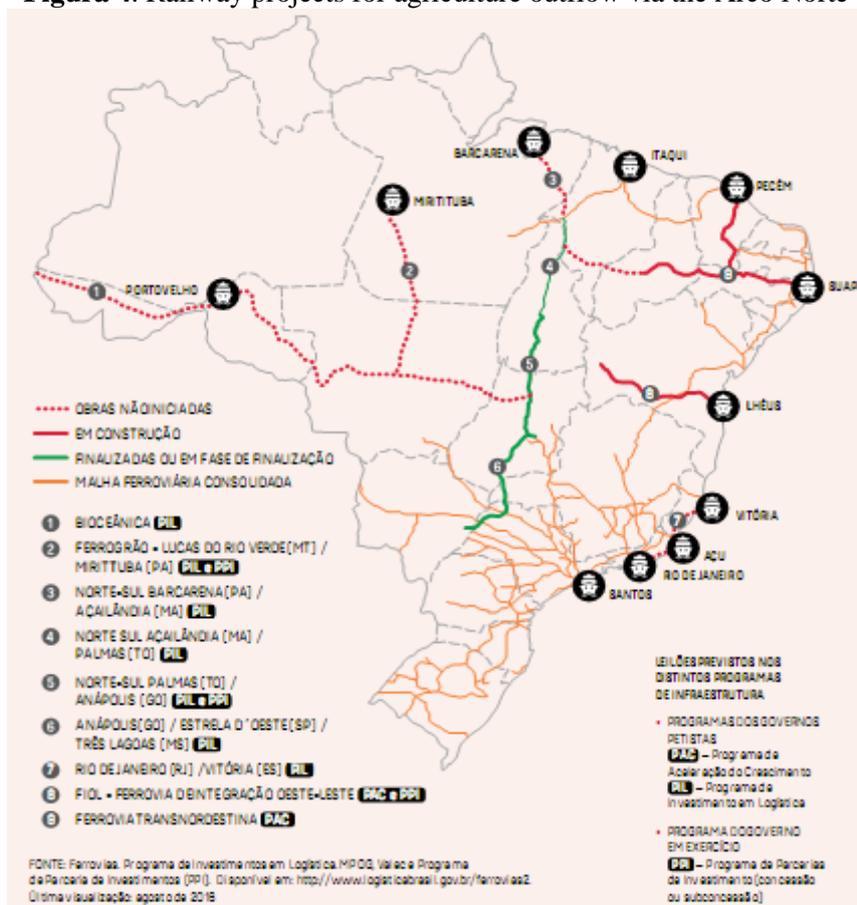
Source: Seabra (2016: 5).

Undoubtedly, investment projects aimed at converting the Arco Norte around the Tapajós River into an extensive multimodal logistic corridor for agricultural and mine-ral exports are advancing. Some works were already being planned through the Growth Acceleration Program (PAC) and the Logistics Investment Program (PIL) in the Dilma governments. And now, under the Temer government, the Investment Partnerships Program (PPI) consolidates a logic of privatizations and concessions for transnational capital through FDIs. Although a detailed analysis of these investments is outside the scope of work, it is worth noting the main ones. Among the most important storm port facilities are Bunge-Amaggi, Cargill, Hidrovias do Brasil, Bertolini, Caramuru and Cianport in Mirirituba/Itaituba (PA) and Cianport, Bertolini, Odebrecht, Dreyfus and Amaggi in Santarém (PA). Among the most important maritime port facilities are Amaggi in Itacoatiara (AM), Tegrán (Novagri, Glencore, CGG, Amaggi, Dreyfus and CHS) in Itaqui (MA), Cargill in Santarém (PA), Hidrovias do Brasil, ADM, Tefron (Bunge-Amaggi) in Vila do Conde/Barcarena (PA), Caramuru and Cianport in Santana/Macapá (AP) (Pereira, 2016; Aguiar, 2017). In relation to Chinese companies, Fiagril/ Hunan Dakang operates with Cianport (in which Fiagril Participações has part) and COFCO operates with Hidrovias do Brasil (2.5 Mt through the north and 1.5 Mt through the south) Cianport sees COFCO as a potential customer.

However, where there is the greatest expectation regarding the role of Chinese investments is really in major railroad construction projects. Figure 4 shows the map of the Brazilian rail network, with emphasis on the new projects in Arco Norte (North-South, Ferrogrão and Bioceânica), all of which are of interest to Chinese investors. According to a report published by Agência Senado (2017), China Eryuan Engineering Group released a study (which cost US\$ 50 million) in which the technical feasibility of Bioceânica and others was announced. The study projected that 37% of the grain cargo in Mato Grosso could be transported by the Bioceânica to the Pacific, 51% by the southern ports and 12% by the northern ports through the Ferrogrão and North-South railroads. The PIL and PPI foresee concessions for the construction and operation of 1140 km of railroads between Lucas do Rio Verde and Itaituba, budgeted at R\$ 9.9 billion. Ferrogrão is basically a project of the ABCD and Amaggi

traders, in order to integrate a multimodal logistic corridor of grain outflow from Mato Grosso by Tapajós. Construction of the FIOLE (East-West Integration Railroad) and the North-South Rail-road stretch between Açailândia (MA) and Barcarena (PA) are also on the Chinese radar. Bioceânica, whose Brazilian stretch is estimated at R\$ 40 billion, has an extension of 3,5 thousand km, from Rio de Janeiro goes to the municipality of Campinorte (GO), passes through Lucas do Rio Verde (MT) and Porto Velho (RO), and arrives until the border of Acre with Peru. And there is still the need to build the last stretch of the Transnordestina Railway, currently under the concession of CSN (Aguiar, 2017).

Figura 4. Railway projects for agriculture outflow via the Arco Norte



Source: Aguiar (2017: 69).

In 2014, China Railway Construction Corporation signed an agreement with Ca-margo Corrêa to evaluate the formation of consortia for the construction of railways. In 2016, signed investment agreements with the governments of Mato Grosso and Pará. And in 2016 China Communications Construction Company (CCCC) announced the opening of a Brazilian office, the purchase of 80% of Concremat contractor and the construction of the São Luis port (MA) and its own terminal there, as well as the intention to participate in several auctions, including Ferrogrão and North-South. According to Aguiar (2017), the agreements between the Chinese and Brazilian governments, between Brazilian states and Chinese companies, and between Chinese and Brazilian companies, should be understood as derivations of the Chinese investment project under the One Belt, One Road initiative, which has its most dynamic axis in the Eurasian Continent and the Asian Pacific, promising to completely redesign the global geopolitics.

4. Conclusions

This paper sought to shed light on the relationship between China's government food security policy and the involvement of its (state and private) companies in the "going out" process to make FDIs in

agribusiness and the agrifood system of other developing countries and the implications of these investments on the dynamics of “Brazil-China soybean-meat complex”. By doing this, the work contributes to fill two theoretical gaps in food regimes, raised by Goodmann and Wilkinson (2015). First, the approach would focus exclusively on agriculture as a source of food, failing to address its role as a source of raw materials. As it was seen, before being food, the Brazilian soybean is precisely a raw material to the manufacturing of feed for the Chinese pigs raised in CAFO systems. Second, the approach would have a homogenizing view, overly focused on the North/West, with relative neglect of the national and regional dynamics of the South/East countries. Again, the formation of the Brazil-China soy-meat complex is emblematic of a polycentric shift that operates a restructuring in the third food regime driven by the interests of agribusiness corporations, food industry and national states in a South/East line, challenging the power of their North Atlantic counterparts.

Thus, it is important to note that the direction of Chinese investment abroad has priorities that stem from strategic choices: to ensure the supply of relatively scarce commodities such as energy, raw materials and food and, at the same time, markets for technology-intensive Chinese industries whose allows for added value. It's not hard to identify this clear geopolitical orientation, according to which regions with abundant natural resources, such as Brazil, receive priority investments in agrifood and energy sectors, in contrast to high-income countries whose trade flow favors more technology-intensive sectors. Thus, although Brazil is located far from the original Eurasian route of the One Belt One Road (OBOR) initiative, it is possible to think of China's investment strategies in Brazil within the global geopolitical dynamics of the project, as the country fulfills a role in the articulation of global value chains of strategic interest.

In this sense, and particularly in the case of soybeans, the FDI's of Chinese companies have sought, through mergers and acquisitions and still little through green-field investments, to control the flow of agricultural commodities. This dynamics has been accompanied by a fierce dispute with the large agribusiness corporations that dominated this market. From the point of view of the Brazilian producers, the competition generated by the entry of Chinese companies, especially in the trading branch, has favored them. Another potential benefit for agribusiness producers is the expectation of investment in infrastructure for product marketing (warehousing, transportation, logistics) at a time when the expansion of production could not do without this modernized operating base and that the domestic crisis situation has not provided the necessary resources to the realization of these large investments.

It turns out that China's interest is for Brazil to export grains *in natura*, whose value addition would occur within its territory. However, for the producing states of the midwest and other regions, a local value addition would be the preferred alternative, including for fiscal reasons. In this way, there is a clear conflict of interests that only a deliberate policy favoring value addition in Brazilian territory could level. It is clear that China is investing in the Brazilian soybean chain not only for competitive advantages, but also to achieve levels of control over the value chain that ensure food security in a strategic component of the new class diets of Chinese population. Its entry, as well as that of other actors, increase competition and weaken the ABCD group's oligopolistic control. This favors farmers' price negotiation and allows some to move forward along the chain. Nevertheless, Chinese investments reinforce the export only of soybeans, which hampers the generation of income in the producing regions and contradicts eventual policies in Brazil for the development of integrated chains of grains, meats and processed products. While China has a clear vision of its priorities, Brazil is currently undermined economically and politically, which makes it difficult to consolidate strategies for the mutual benefit of this set of food chains so central to the consumption patterns that now are increasingly widespread in emerging countries.

Of course, strategic planning is a key aspect of the Chinese economic model and its companies' internationalization policy through FDI's, where public and private actors are rooted in a set of rules and incentives, guarantees and obligations. In other words, China knows what it wants when it's “going out”. However, Brazil little understands the causes and implications of the “arriving in” in its

territory. A plan or vision of future is lacking, on the Brazilian side, which can, in a perspective of cooperation and alliance between emerging countries, direct Chinese investments towards most convergent paths with priority interests (such as infrastructure bottlenecks) for a “national project”. Brazilian agribusiness has undeniable competitive advantages at a global scale. Despite the concentration and specialization in some commodities, its value chains have high technological content, a result of investments that date back to the middle of the last century. The problem is that all of this incorporated knowledge is being transferred, at no cost, to a partner with whom strategic alliances could be built for “mutual benefit”. For this, however, is lacking a long-term vision seeking to build some consensus among the actors and institutions involved in the agro-industrial chains about their role in the general dynamics of the Brazilian economy. And, principally, a more transformational agenda with a rural development strategy capable of integrating broader issues such as income and wealth generation, social and productive diversity, social and distributive justice, food and nutritional security and environmental sustainability.

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