

Defense Economy and National Development: Exploring the Models and Synergies between China and Brazil

*Sabrina Evangelista Medeiros¹, Rita de Cassia Oliveira Feodrippe², &
Laura Martucci Benvenuto³*

Abstract: This paper aims at describing the manner through which both Brazil and China have invested in the defense economy as an instrument for national development. It assumes that investments in the industrial sectors can leverage the full productive chains of the civilian economy, based on the premise that the impact of defense economics is also responsible for spillovers and spin-offs that are not purely economic. In this sense, our hypothesis is that the Chinese and the Brazilian economic models have important synergies as a useful scope for bilateral initiatives engaged in the principle of expanding infrastructure, together with the international ties that make development possible. We have explored official government documents and reviewed the literature that works with the topics, besides mapping the main cooperation programs between both countries. Following the introduction, we analyze the Chinese model first, and the Brazilian model next. We then assess the programs and cooperation initiatives between the countries, which are followed by conclusion points.

Keywords: Brazil. China. Defense economy. National development.

Introduction

The debate surrounding military expenditure has generally showed an antagonism towards other civilian investments, such as in education, public health, and retirement pensions. Why should a country choose to strengthen its defense platform, projecting public policies that might be not visible in attending to society's basic needs? That is a common question that public authorities have to deal with.

There are several ramifications to this discussion, one of which is the political arguments of how safety, security, and defense are interrelated as factors required for a nation's growth. States can cooperate, but have to be prepared in case of war or conflict. National sovereignty is seen as an asset that has to be protected in order for the entire

¹ Sabrina Evangelista Medeiros is Associate Professor in International Relations at the Brazilian Naval War College, Rio de Janeiro, Brazil. Email: sabrinamedeiros@yahoo.com

² Rita de Cassia Oliveira Feodrippe is an M.Sc. candidate in Maritime Studies at the Brazilian Naval War College, Rio de Janeiro, Brazil. Email: ritafeodrippe@gmail.com

³ Laura Martucci Benvenuto is an M.Sc. candidate in Maritime Studies at the Brazilian Naval War College, Rio de Janeiro, Brazil. Email: laura.martucci.benvenuto@gmail.com

governmental structure to work. Even countries which see themselves as naturally defensive should not abdicate having strong armed forces.

On the other hand, there are academic works based on econometric parameters that propose links between the defense economy and the development of a country itself (Hartley, 2007; Joerding, 1986; Ram, 2007). In this context, two realities are considered: first, the one in which military expenditures increase other productive chains and this, as such the defense economy, is a trigger for economic growth. There is also the possibility that economic growth facilitates and actually demands better armies and defense technologies so as to guarantee that the nation is not hindered in its development.

A major issue concerning defense economics is whether the investments can be transferred to civilians as peace dividends, or if they have to be maintained in order to guarantee the status of the actor and act as a deterrent. Considering that the environment in which investors, states, and firms operate in defense is quite sensitive, and is dependent on state finances and subsidies, growth and development may create significant concern in terms of public good. This is a point of relevance, because the dedicated budget for the sector may suffer from significant pressure from public opinion. If, during the 1970s and 1980s, studies tried to figure out how to measure growth from defense spending, from the 1990s, scholars would be dedicated to understanding how the reduction in defense spending after the Cold War would generate space for growth in terms of changing investments.

At the same pace - even though controversial, depending on the economic model used - economists dedicated to the subject agreed on the point that defense investments (as well as civilian) induce growth (Hartley & Sandler, 2007; Joerding, 1986; Ram, 1995). So, even if the investments are guaranteed in terms of peace dividends or periods of defense budget growth, they may generate an impact in the economic performance of a country. Incrementalism is also part of the theoretical approach absorbed here because of its considered effect in small amounts and progressively in time, permitting spillovers to other sectors and technology developments (Mintz & Stevenson, 1995).

Our argument is that Brazil and China are partners in this debate considering, in recent years, defense spending and infrastructure investments as an asset for development. Both of them are seen as developing countries, dealing with basic challenges such as social inequality, technological impediments, and high international trade dependence. Both of them wish to become self-sufficient societies, with a good-level of employment and strong national industries. They are also dependent on natural

resources, whose security is unstable and compromising. Brazil's oil industry, its hydropower potential, and its biodiversity are elements which require the attention of the state. The same situation is true with China, a country highly dependent on imports of natural resources which demand an energy supply infrastructure. Growth and defense are, once more, together, connecting development investments and the overall defense planning.

In this paper, we try to outline how the Chinese and the Brazilian governments understand their national development (henceforth, their defense investments and status). We propose an analysis of the official documents and a review of the literature on the topic, observing the impacts of the development policies on the sector and the ties promoted among them. In the following sections, we describe both models in view of the cooperation between China and Brazil and in sectors that might be considered strategic to both perspectives on national development.

The Chinese model

One of the main findings of this study is that the defense economy in China is a mechanism that integrates three main aspects to the country's national development: first, military-civilian relations in both the political realm and the industrial sector; then, a focus on scientific and technological research in the consolidation of an innovation system; and finally, the power projection by weapons development and exports to key strategic partners. Through a literature review and the assessment of official publications, the link between defense and development is revealed as promising and positive.

This section thus tries to establish and explain how the defense industry came to be one of the key determinants of growth in China. It labels the sector as a fundamental driver of both innovation and the formation of productivity around the country. The main argument is that military expenditures demand changes in interrelated civilian industries, such as telecommunications, energy, and infrastructure. As China becomes a great world power, it needs to ensure a continuous flow of raw materials and food. The military not only absorbs that, but in turn stimulates industrial production.

One of the most important authors that writes about the Chinese defense economy, its origins and impacts, is Professor Tai Ming Cheung of the University of California Institute on Global Conflict and Cooperation and School of Global Policy and Strategy. In his book *Fortifying China, The Struggle to Build a Modern Defense Economy* (2008) he explores themes such as the integration between the civilian and defense economies;

the national innovation systems framework; the defense industrial base; the relationship between the defense and national innovation systems; the dual-use economy; techno-nationalism; and development models.

An important concept studied by the author is the political economy of security, which focuses on the nexus between elements such as technological innovation, economic development, and defense modernization. This approach investigates the place occupied by the defense economy within a country's economic, military and technological transformation. One should note that the term "defense economy" used by Cheung is primarily related nowadays to the defense technology and industrial base – although it very much focused on the arms race and deterrence during the Cold War. Therefore, elements of technology and industry are connected in an analysis of how the defense economy contributes to China's national development.

In this sense, the Chinese strategy and model for economic development has long been adjusted to include the defense industry. Both the military and the science and technology sectors are underpinned by a well-planned regulatory system, which allows for an integration between the defense industry and the development of social economy (Xiaoge & Wenbo, 2014). Civil-military integration has been a top priority for Chinese officials since the late 1970s and the defense enterprises, owned by the state, show expansive commercial interests, domestically and abroad. An example of that is the closer relationships developed by civilian manufacturers with government research institutes and universities – the military supply network depends thus on important players such as civilian high-tech firms (Medeiros & Trebat, 2013).

Such a connection was formalized by the Four Modernizations Program, first elaborated by Zhou Enlai in 1963 and concluded by Deng Xiaoping in 1976. National defense has since become an essential part of the opening-up policies that led to market reforms. Furthermore, as Bildirici (2016) states, China's defense sector is an effect of its economic growth, changing dramatically since the late-1990s. Medeiros and Trebat (2013) highlight the significance of the "technological economy" in the reform era of China. According to them, focusing on economic development intensively transformed the military-industrial complex of the country: Chinese leaders have, from the beginning, prioritized national defense in the distribution of supplies and skilled labor.

Two elements are key to understanding the integration between the defense industry and Chinese economic development. The first one is the civilian-military interaction that allows for military technologies to be applied in regular market activities.

The second one relates to the innovation system created by China in the past 30 years, which evolved around scientific research for indigenous production. In recent years, China's efforts to promote technological upgrading is much related to military scientific research, which has assumed a central role in integrating licensed foreign technology with indigenous innovation – specifically focusing on microelectronics (Medeiros & Trebat, 2013).

Following the United States' experience, Beijing has pursued the integration of the development of the social economy and the construction of national defense, improving the regulations system which encouraged private companies to build an effective technology transfer process (Xiaoge & Wenbo, 2014). This has been accompanied by major results in the modernization of the People's Liberation Army, turning the country's military force a case of successful remodeling.

Cheung (1988) identifies that there is a close link between the military and economic development, so that the military is at the heart of China's economy. This is due to the great allocation of resources demanded by the sector, especially in terms of industrial and technological assets. The author shows an interest in the political economy of security and focuses on the nexus between economic development, technological innovation, and defense modernization in China, which concerns the place of the defense economy in the country's economic, technological, and military transformation. For him, the dual-use economy acts as a bridge between the defense economy and the broader civilian economy. The establishment of a civil-military dual-use economy has been the continuous effort of the government since the 1990s.

The integration of the defense economy scope into the broader civilian economy is a necessary premise to forming a dual-use technological and industrial base (Cheung, 2008). The author argues that the establishment of a vibrant dual-use economy provides a valuable opportunity for the defense economy to gain access to advanced technologies, knowledge, techniques, and practices. Today's leaders face the same conundrum of how to pursue prosperity while ensuring the country's military might. Forging a mutually beneficial relationship between the competing interests of wealth and power is crucial for ensuring sustainable long-term growth and security (Cheung, 2008).

Cheung (2008) tells us that indigenization has become a crucial component of Chinese thinking on the relationship between technology, national security, and economic prosperity, which is sometimes referred to as techno-nationalism. China's latest investments over the last three decades have resulted in a defense economy that, today, is

decidedly dual-use in nature (Cheung, 2008). At the heart of his book is the relationships among technology, innovation, national security, and the country's development trajectory. The author presents the concept of the national innovation system as a useful approach that views technological development and innovation as a constantly evolving process.

Therefore, in the last thirty years, the separation between military investments and civilian research and development (R&D) have become a useless approach. China has a clear idea of its need for national security in order to maintain economic growth and society's levels of improvement - as can be seen in Barbosa (2017). It became almost impossible to separate the achievements of high-technology groups (companies, universities, or R&D institutes) and the benefic effects anticipated by the armed forces.

In order to complement the ideas previously outlined, it is necessary to analyze what the official documents show. From the main Chinese White Papers published by the State Council, some general ideas may be highlighted as strategic directives that guide the Communist Party's political choices on how to drive the economy. The official document on the country's Peaceful Development (2011b) establishes that China sees the development of science and technology as an essential factor for guiding economic and social development. Industrialization must seek to build innovation centers all around Chinese territory. Based on the high-technology scope of the military sector, the defense economy pushes the country's modernization in important industries such as aviation, spacecraft, and telecommunications. In return, robust armed forces are necessary to uphold China's national security, making it feasible for the Chinese nation to pursue its peaceful development and rejuvenation.

China's White Paper on the country's Military Strategy (2015) states that the growth of national interests generates a vulnerability in its national security situation. A strong military is seen as key to making the country both safe and strong, allowing it to deal with old and new threats without jeopardizing fundamental Chinese assets. The "civil-military integration"⁴ is treated as a concept under the principle of combining military efforts with civilian purposes. It goes beyond asserting that stronger policy support is required for China to establish uniform military and civilian standards for

⁴ This concept is treated as a combined expression by the Chinese government and incorporates a set of actions and interpretations that creates a unique environment for joint programs between civilian industries and the military sectors.

infrastructure, key technological areas, and other major industries, which shows the compatibility and complementary aspects of these elements.

This idea is enhanced by the National Defense White Paper of 2010 (2011a), which defines that economic development and national defense building are taken into consideration simultaneously by the state. It highlights the development achieved in information infrastructure as an example of successful civilian-military integration: a national defense optical fiber communications network was used as a primary element for the formation of a new generation information transmission network, assisting the communication sector performance. The document also stresses that Chinese defense has been integrated with social and economic development, in a way that priority has been given to major infrastructure projects required by national defense. Industries, technologies, and products have been optimized, which becomes clear in the seventh section called “Science, Technology and Industry for National Defense”.

The development model of defense-related industries has been transformed from one that used to focus on military demands and supply chains as a segregated activity, to one that understands economic efforts as complex, synergic, and interrelated. In this sense, enterprises and institutions are now well regulated and encourage the use of civilian industrial capabilities and social capital, in order to conduct research into the production of weaponry and equipment. The goal is to strengthen basic and applied research in defense-related science and technology, so that innovations can be facilitated and incorporated into the industrial complex. Fields such as aeronautics and space, electronic information, special and high technologies, and energy and nuclear power have strategic significance and receive financial stimulus from the government to develop key projects and capabilities. The principle of coordinating the development of national defense and the economy is in line with the decisions of China to appropriating defense expenditure in accordance with the country’s strategic needs.

The last government publication examined is the one which outlines the Diversified Employment of China's Armed Forces (2013), presenting the view that Chinese armed forces support key infrastructure projects, elevating advantages in hydroelectric, transportation, engineering, and cartographic units. This also applies to the support of national and local infrastructure construction, which relates to the national economy and people’s livelihood in areas such as transportation, water conservancy, energy, and communications.

It is, therefore, possible to understand that the government's initiatives have been traced as drivers for the modernization of the Chinese defense economy. Levesque and Stokes (2016) identified a trend in which advances in the defense sector support economic development through the means of civil-military integration. The residual benefits of integrating R&D in the military and civilian fields has been a strategy of every Chinese leader from Mao Zedong to Xi Jinping.

The Brazilian model

Brazilian development policies are marked by what was called "*desenvolvimentismos*" – the old and new development waves, characterized by policies held mainly during the 1930s and 1950s/1960s. In this sense, national development has been the focus for a considerable period in which the challenge was to occupy the territory with a great level of autonomy and by proposing defense and security as a plan for national unity. Indeed, national development planning during the last 15 years in Brazil had the same approach of spreading development throughout the national territory and guaranteeing space for integration and cooperation.

In order to understand the recent Brazilian defense policy, it is necessary to observe two aspects that have relevance in this analysis: the defense industry sector, which was already ranked fifth internationality among exporters in the early 1980s; and the development debate as part of the actual Brazilian economic framework. According to a report published in 2015 by Senator Ricardo Ferraço from the Senate Committee on Foreign Relations and National Defense, the Defense National Policy (*Política de Defesa Nacional*) - originally from 1996, revised in 2005 - gave rise to the National Defense Strategy and the National Defense White Paper, the first documents to establish a general compromise in between defense and development. Despite the political and economic crisis that affected Brazil in 2017, the latest versions of the documents, the National Defense Policy (renamed the *Política Nacional de Defesa*), the National Defense Strategy (*Estratégia Nacional de Defesa*) and the White Paper on National Defense (*Livro Branco de Defesa Nacional*) gave ample room for the development of the defense sector through the expansion of its capacities, as well as to promote Brazilian productive and technological autonomy, in order to broaden Brazil's international insertion and ensure the greater involvement of Brazilian society in these matters.

The Brazilian National Defense White Paper introduced the *Plano de Articulação e Equipamento de Defesa*, the general plan for the integration of the armed forces in terms

of logistics, procurement, and interoperability. Even though it was developed before the Ministry of Defense was put into operation, the defense catalog for logistics turned out to be one of the most important demands of the objectives associated with making the defense sector more effective, efficient, and sustainable over the following decades. The insertion of Brazilian companies and products in the North Atlantic Treaty Organization (NATO) catalog system is one of the recent changes in the protocols that organize not only the Ministry's procurement processes, but the whole industry's contributions. This impacts the total value chain, standardizing the defense sector. The Brazilian Defense Catalog (*Catálogo de Empresas de Interesse da Defesa*) had close to 4000 national companies in the NATO catalog system, 420 economic activities which are directly considered of interest to the defense sector, and more than sixty-six thousand products were introduced in the same system.

Another main aspect of the Defense White Paper is the strategic plans associated with the main investments that are programmed to be of a huge number of investments. De Souza and Oliveira (2017) organized a scheme identified the following projects: the Navy nuclear program; the nuclear submarine construction; the Blue Amazon Monitoring System (*Sistema de Gerenciamento da Amazônia Azul*); the recovery of the operational capacity of the Army (*Programa de Recuperação da Capacidade Operacional da Força Terrestre*); cyber defense; the Territorial Border Monitoring System (*Sistema de Monitoramento de Fronteiras Terrestres*); the Integrated Protection System of the Strategic Structures (*Sistema Integrado de Proteção de Estruturas Estratégicas Terrestres*); the anti-air defense system; the missile and rockets systems (ASTROS 2020); the modernization of the AM-X and F-5; the operational capacitation of the Brazilian Air Force; and finally, airspace and defense robustness (cargo plane KC-390). For the authors, the “technological imperative” is the element that makes Brazilian projects around defense, opening space for a different perspective on the core structures which uphold the Brazilian development plan.

This is part of a general policy that benefits from a possible view of the future due to the continuity of the present conjecture or due to innovation processes that would lead Brazil to new positions in the international arena. In this sense, *Brasil 3 tempos* was a document that gathered propositions on Brazil's future from a long-term planning perspective, as part of the directive of a state policy to be consolidated beyond the current political arena in the subsequent years of 2007, 2015, and 2022. Assuming a pragmatic view of the needs for institutional governance enhancement in Brazil, in both private and

public institutions, the project brought together specialists from statistics and applied economics, and federal institutes as well as from universities, to face the problem of Brazilian development in an effort to achieve the simplification and acceleration of the planned processes.

The main understanding behind this view, as is shown in the document, is that there is what is called a “natural scenario” that has to be modified while suffering interference from actors. The interpretation of the conjecture as formed by the actors’ behavior is similar to that from the international relations theoretical framework from which Brazil has been acting in terms of foreign policy. The model used was based on the European Union prospective model, where there is a need for thinking and debating, but also modelling the future.

As some of the outputs, the Lula government’s productive development plan (*Política de Desenvolvimento Produtivo*, 2008) and Dilma’s “plan on a greater Brazil” (*Plano Brasil Maior*, 2011) were part of the consensus on the inclusion of defense matters into a broader view of state policies on growth (Pacheco & Pedone, 2017). It is worth noting that Brazil’s main understanding of the defense sector could reach companies from the defense industrial base, but also other industries associated with primary and secondary raw materials, as well as those from infrastructure.

In terms of the Brazilian international reputation, Rafael Villa (2017) calls for a “hybrid behavior” of the Brazilian foreign policy in defense and security matters. This may happen for two main reasons: first, Brazil can be viewed as a regional leader or it is absorbed by internationalization intentions; second, its military modernization process addresses intentions other than that of maintaining a peaceful regional status, much more “interpreted like a typical balance of power practice”. On the other hand, Burges (2013) argued that Brazil is a possible bridge between small powers or sub-regional actors from the South and those from the North, as it occupies the place of a non-contesting actor in the international system, trying to open windows of opportunity to a broader participation.

While Villa (2017) pointed out the dichotomy associated with this view on the defense burden and development versus integration through peaceful means, Burges (2013) provoked readers by indicating that the Brazilian discourse on solidarity is part of a project of being the bridge, instead of just acting inside the region. Malamud (2011) had before stated that the “mis-match between the global performance and regional performance” had put Brazil in a growing divergence dilemma. In the author’s view, although this foreign policy behavior had led to Brazil facing problems in terms of real

leadership in the region, at the same time, some of the regional and global motivations had proved to be the way to a progressive recognition in the international scene. In Malamud's perspective, also, Brazil's intentions on military and economic apparatuses were insufficient to foster those projects' hold in both regional and international scopes.

So, insufficiency seems to be measured by the difference between the levels of development required for the growing of the national economic status, and also the robustness of the national economy so as to promote integration, internationalization, and technical cooperation. So as to boost foreign policy programs, economic development requires the capacity of sharing and provoking change overseas. In spite of the volatile economic status of Brazil, which deals permanently with political and economic variations, there is the belief that natural resources and geographical potentialities would require more emphasis on planning, defending, and projecting Brazilian interests over and above those past achievements.

The key movements to overtaking this status were concentrated on technological improvements and innovative thinking between the government and the industries that took place, surprising as it may seem, under both liberalization and national incentives (Faé, Goulart & Zilio Abdala, 2016). Liberalization is marked by competitiveness under market rules and in terms of internationalization and the maintenance of the international labor division; the focus on national incentives is because of the social policies undertaken, but also, it is relevant for the fiscal and financial incentives towards national industry to work together with the government in such tight relations that maintained the unveiled unethical and corrupt relations between the private and public actors.

The movement around institutional reforming inside the Ministry of Defense was proposed by Dagnino (2009) to be neither a rational, nor an incremental, process. He observes that the management of the changes in course was in some way controlled by a technical framework, but also from incremental political change. Dagnino (2008b) maintains that the visibility that defense investments may have in terms of development is because of some important findings in the spin-off processes that induce civilian developments derived from defense investments, especially after war. Although his view on defense investments is based on the recognition of possible spin-offs, he reinforces the fact that the progress associated with those investments must be thought about from a perspective that correlates the needs and fragilities of a democratic state with those incentives.

Through ties of technological improvement and innovation, in recent years liberalization took place as part of a national economic development plan, at the same time as the whole economy was suffering from high debt and very low growth rates. As an example, the integration of energy security and defense planning was progressively rising and was in parallel with the opening investments around the recently discovered oil reserves in the deep seas pre-salt region in the Brazilian Economic Exclusive Zone's waters. The recent legislation (*Lei 4567/16*) that permits foreign investors to exploit the pre-salt oil reserves is under the same policy developments that opened space for foreign investors in the Brazilian defense industries and companies (debates about whether it should or not are not considered here). Recognizing the limits for Brazilian investors and the opportunities for the sector, with high levels of investments, leads Brazil to achieve other steps in the international system, although it reveals in some way the insufficiency of the national market and, as a consequence, the country's lost national autonomy.

Brazilian progress in the defense industry sector could not be made without this combination of international-liberalism and development economics, benefiting from both foreign investment and the national enhancement of local investors and entrepreneurs. This dichotomy was in some way surpassed with the practice of a formula that would gather incentives from enhancing the Brazilian presence and power to the scope of social development that was in place in at least the last 12 years. At this point, we should mark that the failure of the liberal policies, decades before, however, marked the presence of new industrial relations with a recovering class of national businessman (Diniz & Bresser-Pereira, 2013).

Subsequently, the economic crisis affecting the most developed states presented emerging markets as an alternative for new investments and the repositioning of the flow of investments. There comes a transition process in which development would be the output, but also the model from the investment's perspective (Diniz & Bresser-Pereira, 2013). A mechanism to achieve progress through provoking development and opening new sources of investments, as opposed to the pre-existing arrangements and frameworks, would be considered the way of dealing with less than ideal economic conditions.

If autonomy was not conquered without considering the macroeconomic factors that are straightforwardly imposed by international markets and the governing paradigms, new forms of states' relationship could arise from those findings – the BRICS (Brazil-Russia-India-China-South Africa) as an alternative will be addressed later. As opposed to the order in place, those new arrangements consolidated new forms and strategies to

survive – even under the established economic crisis. Therefore, arrangements were, as it was said before, overlapping, and they could not meet the needs due to economic limitations. One measure that could be cited as a domestic rearrangement that could be seen inside this transition would be the enhancement of inter-agencies' ties and projects. Next, the existence of para-diplomatic programs (including the federalists, but also those from sources other than the Ministry of Foreign Relations), had guaranteed the maintenance of thematic or residual projects on technical cooperation that would finally represent a scope of dealing with lower investments and take advantage of the structures already in place.

That is why and how the defense development model arose together with development. Not only through the trust in spin-offs and spill-over effects on the civilian side, but from the perspective that new sources of indirect foreign policy could share bigger values and have an expressive impact on the national economy. Noticing that established frameworks on specific matters could guarantee future developments on South-South cooperation, the state bureaucracy has contributed to this wave, supporting the various initiatives all around state's institutions.

The partnerships and joint projects

In the 1980s, Latin America was marked by an economic crisis and, in this context, the Sino-Brazilian relationship became more dense. Although there was an imprecise context, Brazil and China observed this as a possibility to act jointly in overcoming these barriers. The convergence of interests regarding the multilateral sphere was a stimulus, but also raised the possibility of establishing a strategic agenda to face the traditional system. Through that agenda, it was possible to increase the relationship and intensify academic and political knowledge about each other. Between the years of 1980 and 1990, China passed through a political orientation called “pragmatic”, in which it was characterized by its non-alignment with the great powers and the beginning of a multilateral dialogue, which progressively gained importance in the country's politics, and this orientation would guide its interests in Latin America.

Under changes since the 2000s, the geopolitical and global financial system has changed, and the rise of China - as well the emergence of countries like Brazil, India, and Russia - shifted the global economy centered in the United States. These changes are important for the understanding of the flexible multiple faceted inter-state relations that have emerged. According to Cintra (2013), the Chinese interests in Latin America are

growing, especially in 2000s, based on four main motivations: the first one would be the search for primary products that are plentiful in the region; secondly, the region offers a market to export Chinese products; third, to isolate Taiwan from the recognition of its independence; and fourth, to ensure “strategic partners” to increase China’s influence in the region (Cintra, 2013: 30-31).

China’s interest in Brazil is related to the movement of the Chinese foreign policy that focused on new market opportunities, so as to increase the quality and quantity of its exports. On the other side, Brazil anticipated an opportunity to use this relationship as a mechanism for reducing its dependence on North-South relations. Brazil is also considered a good partner in terms of information sharing, producing, and acquiring advanced technologies (Becard, 2013). Taking Becard (2013) into consideration, Brazil is seen as an important player in South America and China is seen as the central pivot in Asia, which may provide an alternative to Brazil’s intentions of cooperation within the traditional world trade framework.

Brazil is privileged with agricultural areas, energy resources, and opportunities in an important range of economic sectors. Because of that, it is interesting for China to invest in infrastructure as a way to achieve more assertiveness in trade, as well as it is important for Brazil to guarantee its domestic development. Brazil is capable of attracting good commercial relations with other countries based on the diversification of its market - 80% of the region’s companies are Brazilian and they have an important role in development and the environment. In this regard, the Sino-Brazilian relationship has achieved an important position in the international arena, such as in cooperation in economic areas.

Considering the motives exemplified above, the table below contains some bilateral agreements that were promulgated between Brazil and China, focused on the defense and strategic sectors. These agreements can be seen as markers of the beginning of the Sino-Brazilian relationship.

Table 1 – Agreements on defense sector

Name	Date of promulgation
Protocol of Cooperation in the Area of Industrial Technology	March 9 1990
Agreement on Scientific and Technological Cooperation	August 24 1992
Agreement between the Government of the Federative Republic of Brazil and the Government of the People's Republic of China on technical security related to the joint development of Earth Resources Satellite	July 29 1998
Agreement on cooperation in peaceful applications of space science and technology between the Government of Brazil and the Government of the People's Republic of China	July 30 1998
Agreement for the Cooperation in the Peaceful Uses of Nuclear Energy	January 14 1998

Source: <http://www.cebc.org.br/pt-br/dados-e-estatisticas/acordos-bilaterais>.

According to Cunha (2016), Ambassador Roberto Abdenur increased steps to strengthen the Brazil-China bilateral relationship. Visits were gradually established and, in 1982, an agreement on the subject of science and technology was mutually signed. Then, President José Sarney negotiated other agreements in the areas of industrial technology, energy, and pharmaceuticals in 1988, but the most important result of the negotiations was the China-Brazil Earth Resources Satellite (CBERS) project in the area of satellites (Cunha, 2016: 73). The signing of the protocol that later embodied the project itself represented an important area that both countries were intending to develop, involving high value-added technology.

The success of this program meant that Brazil and China were seeking independence in relation to the “developed countries” in the matter of technology transfer, representing a new structure of South-South cooperation. The project CBERS established a novel model of cooperation that, on the Brazilian side, contributed to technological modernization, and for China, served as instrument to develop the country’s productive forces, such as defense, energy, and infrastructure.

The cooperation in the scientific and technological sectors is one of the field’s most developed at different levels between Brazil and China; it is extremely important for Brazil to improve its knowledge on the theme through China, as it continues to be a technological tool which impacts other areas like agriculture, human resources, and the

environment. The “China-Brazil Climate Change and Energy Innovative Technologies Center” was created as an academic and technological cooperation instrument between Tsinghua University in China and the Federal University of Rio de Janeiro in Brazil (*Universidade Federal do Rio de Janeiro*), to study climate change and energy sources and applicability.

There is also the “Binational Brazil-China Center of Nanotechnology”, a bilateral cooperation project between the Brazilian Ministry of Science, Technology and Innovation and the Chinese Sciences Academy (Becard, 2013). The Chinese Academy of Agricultural Sciences has an international department of cooperation and one of its partners is *Empresa Brasileira de Pesquisa Agropecuária*. The different levels of sector cooperation have been increasing over the last few decades, and areas such as biotechnology, data processing, the development of new materials, joint action to eradicate HIV/AIDS, and pharmaceutical remedies etc. are expanding (Oliveira, 2010).

In 1993, the “Strategic Partnership” between Brazil and China was formalized. In terms of foreign policy, this increase of degree was announced unilaterally by President Jiang Zemin, and it represented the political consolidation of the mutual strengthening. In 2012, this partnership was increased to a level of “Global Strategic Partnership” and new intergovernmental dialogues were established. The creation of the *COSBAN* (*Comissão Sino-Brasileira de Alto Nível de Concertação e Cooperação*) in 2010 was “aimed at promoting the highest strategic level, development policies at economic, commercial, financial, scientific and technological academic and cultural levels” (Pires, Paulino, Cunha, 2015: 151) and the Global Strategic Dialogue contributed to the advancing of these interests.

There is also the *Plano Decenal de Cooperação* (Ten-Year Cooperation Plan) 2012-2012 and the *Plano de Ação Conjunta* (Joint Action Plan) 2015-2021, that provides strategic goals to guide the bilateral relationship objectives. The Brazil-China Business Council promotes dialogue between the most important companies in both countries. The similarity of the foreign policy agendas between Brazil and China facilitates the development of joint policies and the establishment of this high-level dialogue indicates the advancing of cooperation that has expanded over forty years of relations.

The table below is the resume of plans and initiatives between Brazil and China that were exemplified in the article.

Table 2 – Resume of Plans and Initiatives of Cooperation

Plans and Initiatives	Year
China-Brazil Earth Resources Satellite	1988
China-Brazil Business Council	2004
China-Brazil Climate Change and Energy Innovative Technologies Center	2009
BRICS	2009
COSBAN	2012
Ten-Year Cooperation Plan	2012-2021
Binational Brazil-China Center of Nanotechnology	2014
Chinese Academy of Agricultural Sciences	-
Joint Action Plan	2015-2021

Source: compiled by the authors.

The dialogue between Brazil and China has also advanced in a multilateral dimension - that is in the cases of the BRICS and the G-20, in order to broaden their long-term joint plans to other countries. The democratization of the access to resources, before concentrated in the International Monetary Fund or World Bank, is now happening through the mechanism of the BRICS, and its influence on global economic development is already visible. In addition, there are plenty of opportunities for Brazil to increase its position in the international scenario and China will continue to have an important part in this achievement. “Fortunately, the economical asymmetry between Brazil and China, has been accompanied of [sic] mechanisms of bilateral and plurilateral dialogues” (Rosito, 2015: 62-63) which has allowed solutions to some of the principal challenges presented. The initiatives, agreements, and joint plans have the potential to transform not only the Sino-Brazilian relationship, but also with the BRICS’ group members, through a series of annual meetings.

The BRICS represent the emergent countries that went through a quick process of development, and which also have an important role in contributing to a multipolar international scenario. The BRICS forum is a cooperative arrangement that reflects the position of the decision makers, considering those to be the ones who define strategies for acting, priorities, interests, and threats. According to the data below, the Brazilian

commercial relationship with different countries in the last few years has been varied, and it is important to note the relevance of the commercial results with China:

Table 3 – Commercial results between Brazil and the BRICS members (in millions of US\$)

Year	China	India	Russia	South Africa
2005	6.300	-65	2.195	1.030
2010	5.190	-750	2.242	557
2011	11.526	-2.880	1.272	769
2013	8.773	-3.227	298	1.117
2014	3.722	-1.847	813	494

Source: Baumann, 2015.

For the administration of Luiz Inácio Lula da Silva (2003-2010), the trade relationship with China was one of its main policies goals and that was the country's foreign policy orientation over the last two decades. Brazilian exports to China increased in the last ten years, with positive results for the trade balance. The main critique in the Becard article is "the difficulty faced by Brazil to diversify its exports and added value to their transactions with China" (Becard, 2013: 233), so Brazil mainly exports raw materials and this does not develop domestic industry by changing the focus to manufactured or semi-manufactured goods.

Despite the critiques of the Brazilian difficulty in diversifying its international economic participation through its commercial position - not only in its bilateral relations with China or under the multilateral structure of partnership - it is relevant to note that Brazil gained more international prestige. Brazil's well-known diplomacy allowed the country to be in a prominent position in recent decades, and taking part in an international cooperative structure with global impacts only reaffirms its relevance. Besides Brazil and China having similar positions on the international agenda, the multilateral dialogue created an even better economic and political position for both.

As exposed by Arbache (2011), both countries have big internal challenges, such as poverty, inequality of distribution, regional disparities, and demographic problems. Brazil suffers with deficits in its current accounts; China has suffered from a shortage of resources, energy, and food, but their particularities boosted their willingness to cooperate

and achieve social progress. Arbache (2011) arguments can be reinforced by those from Becard (2013) about the assumption that Brazil should reformulate its strategic market position, in order to broaden its sectors and benefit itself through the partnership.

The Chinese presence in Latin America, and consequently in Brazil, has been growing over the years and all the initiatives for market diversification reflect the new challenges to be overcome by Brazilian decision makers. A large number of academic studies defend Brazil using its power of influence to guide the rules of the Sino-Brazilian relationship, in order to reaffirm its national interests and leaving behind its limited role as a raw products provider. Others affirm that trade should be more balanced, in a way that China could be more open to receiving other Brazilian products/services, including those associated with strategic companies in the defense sector. The investments should also be equal, so that Brazilian companies gain benefits and opportunities for growth as well (Arbache, 2011). In the opinion of Cunha (2017), the Sino-Brazilian relationship isn't just based on commercial and investment trades; these areas are just a complement to a bigger joint plan. The capacity for scientific and technological cooperation between China and consequently extended to Latin America should not be underestimated.

The Sino-Brazilian model of cooperation established a new pattern of relations in the 2000s (South-South Cooperation), and the main area of development achieved was scientific and technological. The deepening of cooperation has come on many levels, and this represents a heterogeneous and multifaceted relationship. Also, it is worth mentioning that Brazil and China regional priorities do not overlap and are a possible way of considering security proximities or non-interference (Christensen, 2016). Considering all these dynamic relationships, it is crucial to deepen mutual knowledge, in order to obtain a more targeted strategy. There is a mismatch of political architecture and the implementation of agreements. As noted in Table 1, only a few agreements were promulgated in the area of defense. This represents a distance between what is planned and what is really executed. According to Barbosa (2017), is necessary to study the commercial strategy between both countries, define each's national interest, and promote more high-level dialogue in order to achieve a profound mutual knowledge.

Final remarks

Incentives that were part of a series of combined policies were the main reason for the establishment of renewed ways of dealing internationally in both the Chinese and Brazilian cases. In this sense, Brazilian incentives were markedly based on the inclusion

of the defense sector in a broader development policy, as well as on a cycle of investments which was put into force together with the amplification of the state's cooperation ties with China. Alongside the stimulus on new cooperation fronts, there are motivations for rebuilding old structures in renewed ways.

Observing the on-going plans on development, there is space for a coordination with win-win outputs, using gaps and the reallocation of resources to benefit both China and Brazil. The defiance in creating alternatives to the main players and provoking change in old and recent relations seems to be the new paradigm in place. Conversely, infrastructure plans were guided based on the defense sector's structure in China, whereas in Brazil it was a consequence of the whole development policies. Even though some of the most important Brazilian infrastructure companies were also willing to participate in the country defense's window of opportunity, in fact, there was not a trusting connection in the long-term and in between the sectors, in Brazil. Conversely, China had done a long-term plan as part of its development goals, that could, finally, permit new arrangements to the benefit of bilateral relations with Brazil. And that is why infrastructure is achievable and interfaces with Brazilian defense planning.

Notably in this bilateral relationship, various opportunities and synergies that are being aligned to benefit the already developed individual purposes can be seen. Even though geographical, cultural, and institutional proximity may provoke some barriers, Santoro (2012) points out that Brazilian foreign policy has maintained caution in respect to themes on the (non)democratic practices of its partners. It is, nonetheless, another avenue to explore and, inside the BRICS umbrella, it is far more likely to happen in terms of a bilateral approach using the financial mechanisms combined with those BRICS instruments to make it happen at a good pace. To be feasible, then, Brazil and China must deal with different managing capacities to enhance this formula, as imbalanced sources and investment strengths have to be considered.

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