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SINO-BRAZILIAN MUTUAL INTERESTS: A COMPREHENSIVE OVERVIEW

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Abstract

Brazil-China relationship is two-fold, influencing both economic development and geopolitical strategy in Latin America. On one hand, China views Brazil as an emerging market with abundant natural resources, making sectors such as agriculture, energy, and infrastructure attractive for Chinese investment. On the other hand, Chinese investments often come with infrastructure development projects, such as the Belt and Road Initiative (BRI), which can help Brazil improve its transportation and energy sectors, as seen in the Transoceanic Railway

project. Furthermore, the countries have mutually cooperated in other areas, such as in the integration of the BRICS group, the launch of satellites through the China-Brazil Earth Resources Satellite (CBERS) program telecommunications (e.g., 5G technology), the wind energy sector, and green technologies, as well as the integration of Brazil into global value chains. Thus, this study aims to discuss the Sino-Brazilian mutual interests and contribute to the understanding of this broad subject. Our discussions and analyses suggest that it is important for Brazil and China to develop initiatives with mutual and sovereign interests aimed at establishing environmentally sustainable trade with reduced asymmetry. Areas such as the bioeconomy and global governance are of great interest to Brazil and China. The collaborative efforts of these nations can enable new initiatives with prospects to balance forces with the USA. From a macro perspective, the economic and commercial strengthening of BRICS and its relationship with the Global South could serve as a counterpoint to American influence. While BRICS may redefine global power relations, member countries of the group may face influences in managing their regional relations.

Keywords

Brazil, Bioeconomic, BRICS, China, Trade, Innovation, South-South cooperation.

Resumo

A relação Brasil-China é dupla e influencia tanto o desenvolvimento econômico quanto a estratégia geopolítica na América Latina. Por um lado, a China vê o Brasil como um mercado emergente com recursos naturais abundantes, o que torna setores como agricultura, energia e infraestrutura atraentes para o investimento chinês. Por outro lado, os investimentos chineses geralmente vêm acompanhados de projetos de desenvolvimento de infraestrutura, como a Iniciativa Cinturão e Rota (BRI), que pode ajudar o Brasil a melhorar seus setores de transporte e energia, como visto no projeto da Ferrovia Transoceânica. Além disso, os países têm cooperado mutuamente em outras áreas, como na integração do grupo BRICS, no lançamento de satélites por meio do programa China-Brasil Earth Resources Satellite (CBERS), em telecomunicações (por exemplo, tecnologia 5G), no setor de energia eólica e em tecnologias verdes, bem como na integração do Brasil em cadeias globais de valor. Assim, este estudo tem como objetivo discutir os interesses mútuos sino-brasileiros e contribuir para a compreensão desse amplo assunto. Nossas discussões e análises sugerem que é importante que o Brasil e a China desenvolvam iniciativas com interesses mútuos e soberanos, visando estabelecer um comércio ambientalmente sustentável com assimetria reduzida. Áreas como a bioeconomia e a governança global são de grande interesse para o Brasil e a China. Os esforços de colaboração dessas nações podem viabilizar novas iniciativas com perspectivas de equilibrar forças com os EUA. De uma perspectiva macro, o fortalecimento econômico e comercial do BRICS e seu relacionamento com o Sul Global podem servir como um contraponto à influência americana. Embora o BRICS possa redefinir as relações de poder globais, os países membros do grupo podem enfrentar influências no gerenciamento de suas relações regionais.

Palavras-chave

Brasil, Bioeconomia, BRICS, China, Comércio, Inovação, Cooperação Sul-Sul.

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Introduction

The establishment of official relations between Brazil and China occurred through their first treaty, the Treaty of Friendship, Trade and Navigation, signed in 1881. Following this, Brazil opened a consulate in Shanghai in 1883. At the end of the 19th century and the beginning of the 20th century, Brazil's interactions with Asia were limited to Japanese workers and unofficial Chinese migration (Oliveira, 2004). During the Cold War period, Brazil initially recognized Taiwan but later established diplomatic ties with mainland China. Throughout this era, Brazil engaged in commercial missions (both official and unofficial) to China and signed the China-Brazil Earth Resources Satellite (CBERS) agreement. The country developed economic interactions with China while focusing more on political ties with the Asian nation and maintaining economic relations with Japan (Oliveira, 2010). In the 1990s, Brazil began to deepen its economic engagement with China, accompanied by significant political elements. During this period, Brazil and China signed the Sino-Brazilian strategic partnership, which was the first such partnership promoted by China globally (Oliveira, 2010). This shift was driven by China's rapid economic growth and the challenges posed by the proposed Free Trade Area of the Americas (FTAA) (Oliveira, 2004). The deepening economic ties between Brazil and China included Chinese Foreign Direct Investment (FDI), Trade relations, and loans to Brazil. These factors pressured Brazil to adopt a more favorable stance towards China (Blanchard, 2019).

The commercial rapprochement between Brazil and China developed considerably during the administrations of President Luiz Inácio Lula da Silva (2003-2011) and his successor,

Dilma Rousseff (2011-2015) (Haibin, 2010). In subsequent years, there were some fluctuations in imports and exports between the two countries. However, Brazil's exports to China consistently grew, reaching a peak in 2023 (US$ 49.93 billion) under the new administration of Luiz Inácio Lula da Silva (2023-2026) (MDIC, 2024). Despite the commercial ties between Brazil and China being maintained during the administration of former Brazilian President Jair Messias Bolsonaro (2019-2022), Brazilian foreign policy during this period was based on the pillars of anti-globalism, anti-communism, and religious nationalism (Casarões & Farias, 2022; Jesus, 2022). During Bolsonaro's government, diplomatic relations between Brazil and China experienced the greatest distancing seen in the last three decades (Jesus, 2022).

Under the current administration of Luiz Inácio Lula da Silva (2023-2026), China remains Brazil's largest trading partner, with exports to China twice the value of imports. This trend has been consistent since 2009, including during the Bolsonaro administration (MDIC, 2024). At the International Conference "50 Years of Brazil-China Relations: Cooperation for a Sustainable World," held on April 17, 2024, Brazilian Vice President Geraldo Alckmin stated: "It is difficult to find an area where there is no partnership between Brazil and China, a friendship that only consolidates and advances" (Alckmin, 2024).

In the economic field, international relations between Brazil and China are based on the sale of commodities to China, while Brazil imports manufactured goods. Otherwise, the countries have mutually cooperated in other areas, such as in the integration of the BRICS group, the launch of satellites through the CBERS program (Lulla, Duane Nellis, & Rundquist, 2013), telecommunications (e.g., 5G technology) (Li, 2023), the wind energy sector (Gandenberger & Strauch, 2018), and green technologies (Miranda, Moletta, Pedroso, Pilatti, & Picinin, 2021), as well as the integration of Brazil into global value chains.

Brazil-China relationship is two-fold, influencing both economic development and geopolitical strategy in Latin America. On one hand, China views Brazil as an emerging market with abundant natural resources, making sectors such as agriculture, energy, and infrastructure attractive for Chinese investment (Gallagher, 2010). Furthermore, China's interest in enhancing its geopolitical standing in Latin America positions Brazil as a strategic partner (Becard & Lessa, 2021). On the other hand, Chinese investments often come with infrastructure development projects, such as the Belt and Road Initiative (BRI) (Almeida Ferreira Abrão & Amineh, 2024), which can help Brazil improve its transportation and energy sectors, as seen in the Transoceanic Railway project that can connect Brazil, Peru, and Chile (Almeida, Seleme, & Neto, 2013; Marques, Borges, De Souza Pires, & Bezerra de Souza, 2023). Thus, this study aims to discuss the Sino-Brazilian mutual interests and contribute to the understanding of this broad subject.

To address this objective, we conducted searches on the central theme of this research using generative Artificial Intelligences (generative AI) due to their ability to index and analyze large volumes of data (Morgan, 2023; The Lancet, 2024). Subsequently, we analyzed the mutual areas of interest identified in the GAIs consulted and supplemented these analyses with a Systematic Literature Review considering these areas of interest.

This approach allowed the study to be divided into four areas: (i) Sino-Brazilian mutual trade interests; (ii) Sino-Brazilian mutual economic and bioeconomic interests (e.g., Environmental Sustainability - Green Technology, Climate Change, Renewable Energy); (iii) Sino-Brazilian mutual interests in technology, research, development, and innovation; (iv) South-South Cooperation and the BRICS Alliance.

Methodology

Our study is characterized by a qualitative approach and follows an inductive logic. Due to the broad scope of the theme 'Brazil-China bilateral relationship,' we chose to use generative AI (Fonseca, Chimenti, & Suarez, 2023) to identify areas of mutual interest between the two countries. Generative AI are based on large language models (LLM) that have the ability to analyze and summarize large amounts of information, though still without the critical evaluation and original thinking of a human being (The Lancet, 2024).

To identify which LLM would be most suitable for the objectives of this study, we applied the following criteria: (i) the model must be a popular tool with a recognized capability to index both historical and current data available on the internet; and (ii) the model must be capable of searching through large volumes of scientific data. These criteria ensure that both publications by governments, official agencies, and the general media, as well as scientific publications, are considered in the searches. No temporal restrictions were applied to the results presented.

Thus, we identified the following LLM as meeting the first criterion: OpenAI's ChatGPT, Alphabet/Google's Gemini, and Microsoft's CoPilot (Masinde, 2024; Syriani, David, & Kumar, 2024). The LLM selected for this study for its ability to conduct specific searches across large volumes of academic data (e.g., Semantic Scholar) was Perplexity (https://www.perplexity.ai/). Although there are other tools similar to Perplexity (e.g., Scispace, Scite, Elicit, Consensus, etc.), we chose this one for its simplicity and for presenting results in a manner similar to the aforementioned LLM (Bolanos, Salatino, Osborne, & Motta, 2024), thereby facilitating the creation of Table 1.

Table 1. Searches in generative AI and its respective results

Generative AI	Prompt	Results
Perplexity (Pro search - academic) https://www.perplexity.ai/	What are the mutual interests in Brazil-China bilateral relations?	Economic Cooperation (Trade Relations, Investment)
		Technological Cooperation (Science and Technology, Space Cooperation)
		Environmental Sustainability (Green Technology, Climate Change Initiatives)
		Strategic Partnerships (Defense Cooperation, South-South Cooperation)
ChatGPT 4o (free version) https://chat.openai.com/		Trade and Investment (Commodities Trade, Chinese Investment in Brazil, Brazilian Exports to China)

		Infrastructure Development (Belt and Road Initiative (BRI), Energy Cooperation)
		Technology and Innovation (5G and Telecommunications, Research and Development)
		Environmental Cooperation (Sustainable Agriculture, Climate Change)
		Multilateral Cooperation (BRICS Alliance, Global Governance)
		Cultural Exchange (Educational and Cultural Programs)
Gemini 1.5 (free version) https://gemini.google.com/		Trade
		Investment
		Economic cooperation
		Climate change
		South-South cooperation
Copilot https://copilot.microsoft.com/		Trade and Investment
		Infrastructure and Industry Development
		Technological Cooperation
		Renewable Energy
		Strategic Alignment

Source: Developed by the authors.
Note. We chose to use the term 'Brazil-China' instead of 'Sino-Brazilian' to allow for broader search results when using AI tools.

After identifying the areas of mutual interest between Brazil and China (Table 1), the authors of this study grouped the results into four central topics: (i) Sino-Brazilian mutual trade interests; (ii) Sino-Brazilian mutual economic and bioeconomic interests (e.g., Environmental Sustainability - Green Technology, Climate Change, Renewable Energy); (iii) Sino-Brazilian mutual interests in technology, research, development, and innovation; (iv) South-South Cooperation and the BRICS Alliance.

Next, after identifying and grouping the areas of mutual interest between Brazil and China, we conducted a Systematic Literature Review on each of the topics to support the subsequent discussions. We adopt the standard PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology for conducting and reporting the systematic review (Page, McKenzie, Bossuyt, Boutron, Hoffmann, Mulrow, Shamseer, Tetzlaff, & Moher, 2021; Page, McKenzie, Bossuyt, Boutron, Hoffmann, Mulrow, Shamseer, Tetzlaff, Akl, et al., 2021). According to Webster and Watson (2002), the most influential articles in the literature are typically found in leading academic journals. Consequently, the authors conducted searches on the topics identified in the previous step using SCOPUS, one of the foremost indexing databases for academic journals in social sciences.

Table 2. Systematic Literature Review framing

Database	Search string	Results	Included
SCOPUS	(TITLE-ABS-KEY (Sino-brazilian) AND TITLE-ABS-KEY (trade))	16	15
	(TITLE-ABS-KEY (Sino-brazilian) AND TITLE-ABS-KEY (economic) OR TITLE-ABS-KEY (bioeconomic))	11	10
	(TITLE-ABS-KEY (Sino-brazilian) AND TITLE-ABS-KEY (technology) OR TITLE-ABS-KEY (research) OR TITLE-ABS-KEY (development) OR TITLE-ABS-KEY (innovation))	16	15
	(TITLE-ABS-KEY (south-south AND cooperation) AND TITLE-ABS-KEY (BRICS))	72	59
Total:		**115**	**99**

Source: Developed by the authors.

We adopted the following exclusion criteria for the results of the Systematic Literature Review (SLR): duplicate records found in multiple searches and lack of relevance to the theme of "Sino-Brazilian mutual interests." Our SLR identified a total of 115 studies, of which 16 were excluded based on the aforementioned criteria. The remaining 99 studies were used to support the discussions in the following sections. However, due to the large number of documents to be considered and the limited number of pages to write this paper, the authors chose to cite more recent publications or those that provide adequate support for the discussions. The snowball technique (searching for studies cited in the SLR results but not initially identified) was used to further expand and substantiate the discussions.

Sino-Brazilian mutual trade interests

The crisis of the agro-export model in the 1930s, leads Brazil to import substitution industrialization and the shift in the 1990s from a "protected industry" model to competitive global integration (Legler, 2013). The agro-export model crisis, adopting an import substitution industrialization strategy. This led to rapid industrial growth in the latter half of the 20th century, with Brazil incorporating exports into its industrial policy by the 1960s and 1970s. Brazil's foreign policy played a crucial role, advocating for preferential treatment for developing nations in global trade, opening new markets, and fostering cooperation with other Southern hemisphere countries (Rodrigues, Urdinez, & De Oliveira, 2019).

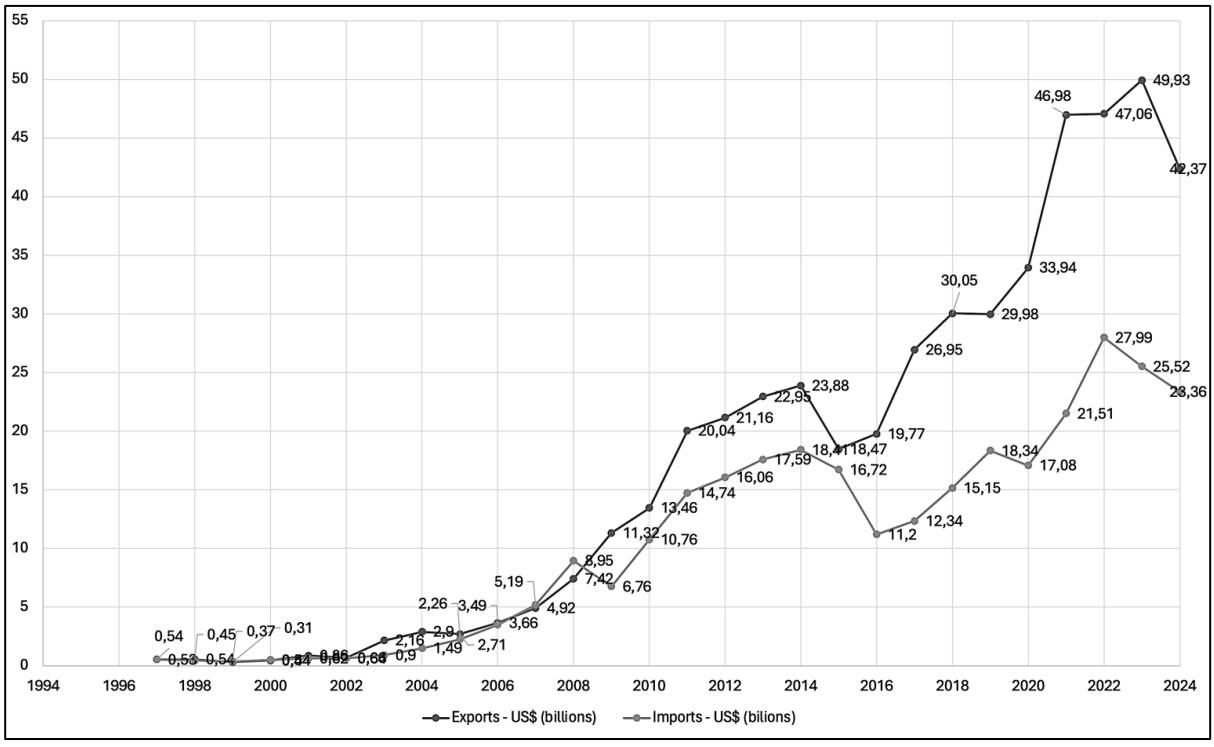
Brazil's transition to democracy was driven by economic challenges and a severe fiscal crisis. This period saw the liberalization of Brazil's industrial sector to global competition, coinciding with the end of the Cold War and the shift from military to democratic rule (Santarcángelo, Schteingart, & Porta, 2017). The new foreign policy paradigm of "autonomy through participation" (Amorim Neto & Malamud, 2015; Fonseca Jr, 1998) marked a departure from the defensive postures of the military regime, advocating for

active engagement in international regimes. Following this new approach, Brazil experienced its first significant commercial alignment with China, marked by the signing of the Sino-Brazilian strategic partnership in the 1990s (Oliveira, 2010). This was the first of several important engagements that followed (Arbache & Condi, 2022; Cardoso, 2013; Whalley & Medianu, 2013).

Currently (2024), the trade balance between Brazil and China shows that exports (2023 – US$ 49.93 billion) are double the value of imports (2023 – US$ 25.52 billion). These data suggest an economic interdependence, particularly in sectors such as soybean production (2023 – 37% of Brazilian exports to China), crude petroleum oils (19%), and iron ore and its concentrates (19%) (MDIC, 2024).

According to Figure 1, Brazil's imports from and exports to China began increasing throughout the 1990s. In 2009, the value of exports to China surpassed the value of imports for the first time in history.

Figure 1. Graph of Imports and Exports from Brazil to China



*Values are showed in billions of US dollars per year.
**Data updated in June 6, 2024.

Source: https://comexstat.mdic.gov.br/en/geral

Brazil's export portfolio to China is characterized by a diverse range of products, predominantly raw materials and agricultural goods (Jenkins, 2012). This composition underscores the bilateral trade dynamics between the two countries, with Brazil serving as a fundamental supplier of essential commodities to China's burgeoning economy.

Soybeans are the most significant export from Brazil to China, accounting for 37% of the total exports (MDIC, 2024). This high percentage reflects China's demand for soybeans, driven by its extensive use in animal feed and as a raw material for various food products. Brazil's vast arable land and favorable climate conditions position it as a leading global producer and exporter of soybeans (Rocha, Majo, & Silva, 2022).

Crude petroleum oils and bituminous minerals constitute 23% of Brazil's exports to China (MDIC, 2024). On one hand this category underscores the strategic importance of energy resources in the trade relationship (Cáceres, 2011; Castro, Peiter, & Góes, 2020). On the other hand, Brazil seeks technology transfer from China for energy resources in Brazil (Castro et al., 2020). Iron ore and its concentrates represent 19% of the export share, highlighting Brazil's role as a key supplier of raw materials for China's steel industry (Castro et al., 2020). The extensive iron ore reserves in Brazil provide a steady supply to meet China's infrastructure and construction needs (Cáceres, 2011). The export of fresh, chilled, or frozen beef accounts for 5% of the total exports and Cellulose exports make up 3.8% of the trade. Pulp trade between Brazil and China intensified after the BRICs were formed (Soares, Viana, & Rego, 2020). Finally, raw cotton constitutes 2.5% of exports between Brazil and China, underscoring the agricultural sector's contribution to the trade mix.

After analyzing Brazil's exports to China, we will now examine the Chinese products imported by Brazil.

Products imported by Brazil from China highlight a diverse array of goods with varying degrees of technological complexity and industrial application. Leading the imports are thermionic valves and tubes, cold cathode or photo-cathode, diodes, and transistors, which collectively constitute 8.9% of the total (MDIC, 2024), reflecting Brazil's substantial demand for advanced electronic components vital for both consumer electronics and industrial applications (Hauser, Zen, Selao, & Garcia, 2007). Following closely are telecommunications equipment, including parts and accessories, which account for 5.5% (MDIC, 2024), underscoring the significance of the telecommunications sector in Brazil's economy and its reliance on Chinese technology. Other categories include various products from the manufacturing industry (4.9%) (MDIC, 2024), passenger motor vehicles (4.9%), and a range of organo-inorganic compounds, heterocyclic compounds, nucleic acids, and their salts, as well as sulfonamides (3.6%)(MDIC, 2024), which are essential for both pharmaceutical and chemical industries.

In general, soybeans, crude oil, and iron ore are the main products exported by Brazil to China, while China exports to Brazil products with varying degrees of technological complexity (Giraudo, 2020; MDIC, 2024). This difference in the level of complexity (Gala, 2017) of imported and exported products between the two countries is a source of criticism (China exports manufactured goods to Brazil, while Brazil exports commodities to China) (Giraudo, 2020; Rodriguez & Hounie, 2016) and raises questions about the symmetry of Brazil-China cooperation, which resembles a center-periphery dynamic (Romano Schutte & Campos, 2022). The two conceptual paradigms of center-periphery thinking significantly influence the policy formulations and strategic perspectives of the

Economic Commission for Latin America and the Caribbean (ECLAC) (Bonzanini, Menuzzi Diverio, Zuliani da Silva, & Olesiak, 2018).

ECLAC's efforts primarily focus on shaping the region's development through initiatives aimed at economic diversification, with the goal of reducing vulnerabilities in the face of global dynamics (Gala, Camargo, & Freitas, 2018). This focus has been a constant feature of ECLAC's framework since its 1968 founding document, where Prebisch critiqued David Ricardo's theory of static comparative advantage (Marca, Bertol, Fernando, & Filho, 2021). Prebisch highlighted the deterioration in terms of trade, which favored manufactured goods over primary goods (Souza, 1999)[1].

ECLAC's structuralist perspective advocated for transforming Latin American economies through an import substitution program. This approach involved establishing domestic industries to produce goods that were previously imported (Marca et al., 2021). Countries such as Brazil, Mexico, and Argentina implemented this policy most directly between the 1950s and 1970s (Souza, 1999).

Sino-Brazilian mutual economic and bioeconomic interests

As noted in the previous section, the Sino-Brazilian commercial dynamic is characterized by Brazil's export of commodities (e.g., soybeans) and its import of manufactured goods from China. In this context, Brazilian commodities, particularly grains and meat, contribute to China's food security policies, as well as its social stability and development (Romano Schutte & Campos, 2022). While China pursues a broader development strategy, Brazil relies on its commodities (e.g., soybeans and iron ore) as its primary export products (Romano Schutte & Campos, 2022).

The process of Brazil's productive reprimarization began in the late 1990s and early 2000s, driven by the robust economic growth of developing countries such as China, which led to a surge in international demand for agricultural and mineral commodities, both metallic and non-metallic (Portugal Júnior, Reydon, & Portugal, 2012). During this period, Brazil-China trade grew at an average rate of 29% per year, making China Brazil's largest trading partner and primary destination for agricultural exports by 2009 (Lima, 2016). This closer relationship was facilitated by the geopolitical alignment between the two countries, further reinforced during the Lula and Dilma administrations (Lima, 2016).

China itself has assisted in the expansion of soybean production in South America, particularly in Brazil (Giraudo, 2020). Despite Chinese companies investing in soybean production in Brazil, Chinese investors are not the dominant players in Brazilian agricultural land acquisitions (Oliveira, 2018). Investors from the Global North (e.g., the USA and EU countries) surpass China in land acquisitions in Brazil (Oliveira, 2018).

Brazil's trade dependence on China, particularly in exporting resources like soybeans, oil, and iron ore, imposes structural constraints on Brazil's ability to transition to a low-

[1] Prebisch demonstrated that the terms of trade between primary goods and manufactured goods, which stood at 1:1 at the end of the 19th century, shifted to 0.687:1 by the mid-20th century (Prebisch, 1949).

carbon bioeconomy (Rodríguez, 2021). On one hand, China aims to peak carbon emissions before 2030 (Liu, Jiang, Tang, & Han, 2022) and achieve carbon neutrality by 2060 (Jia & Lin, 2021). On the other hand, Brazil's heavy reliance on exporting its high-environmental-impact agricultural commodities faces social, environmental, and corporate governance challenges to meet Chinese demands (Bulla, Denny, Burnquist, & Peneluppi Junior, 2022). From a Brazilian internal perspective, large conglomerates in soy, sugarcane, and meatpacking dominate the bioeconomy agenda (Lima, 2021). The significant dominance of agribusiness in Brazil negatively influences natural ecosystems (Rodríguez-Morales, 2018), as the main drivers of deforestation and land-use change (e.g., soybean plantations, cattle ranching) may gain economic and political incentives, as well as greater social legitimacy under the bioeconomy framework (Lima, 2021).

Finally, in the quest to replace fossil fuels, Brazil has recently facilitated the construction of a factory by the Chinese electric vehicle company BYD. This initiative aims to reduce the costs of such vehicles for the Brazilian market and to begin replacing the national fleet with electric vehicles. Brazil has a particular interest in transitioning its fleet to electric vehicles because, despite its significant potential for domestic fossil fuel production (e.g., pre-salt oil and ethanol), the country's electricity is generated from renewable sources (Baran & Legey, 2013). The production of the Chinese factory in Brazil, combined with the country's self-sufficiency in electricity production, could make electric vehicles an attractive alternative for a low-carbon economy (e.g., Al-Wreikat and Sodré, 2023; Liu, 2022).

Sino-Brazilian mutual interests in technology, research, development, and innovation

For decades, China has consistently financed science and technology development, focusing particularly on so-called cross-cutting technologies with the potential to permeate and transform various productive sectors (IPEA, 2024). Technological relations between China and Brazil have evolved over the years, emphasizing collaboration and mutual benefits. Both countries have strengthened their ties through various initiatives (Haibin, 2010).

The China-Brazil Earth Resources Satellite (CBERS) program, operational since 1999, exemplifies technological cooperation between the two countries and has contributed to the use of remote sensing technologies and geoinformation (Lulla et al., 2013). In the 2010s, Chinese technology firms such as Huawei and ZTE began playing a significant role in Latin America's telecommunications sector (Ellis, 2013). Huawei established a strong presence in Brazil, becoming a key player in developing the country's telecommunications infrastructure, including the deployment of 4G networks and preparations for 5G networks (D. S. R. Becard & Macedo, 2014). In the subsequent decade (2020), despite geopolitical pressures favoring American 5G technology adoption (Li, 2023), Brazil opted for Huawei in developing its 5G telecommunications network (Zeng, 2024).

In the field of green technologies, China has initiated more programs compared to Brazil, including sustainable agriculture, water treatment, waste management, green energy, and carbon reduction (Bulla et al., 2022). While Brazil has potential in these areas, it has not matched China and India, its BRICS partners, in implementing such practices to the same extent (Miranda et al., 2021).

In the wind energy sector, Brazil and China have developed significant initiatives. Despite both countries being latecomers in this sector, their approaches to balancing national and foreign technology differ (Gandenberger & Strauch, 2018). In China's case, the balance has gradually shifted from foreign to domestic technology. Brazil has successfully attracted foreign direct investment and built a domestic supply chain (Gandenberger & Strauch, 2018). However, Brazil remains highly dependent on foreign technologies and has a negative trade balance in high-tech goods, indicating reliance on imported technologically advanced products while specializing in low to medium-low technology goods (Chiarini & da Silva, 2019).

We observe that Brazil's integration into global value chains (GVC) has been focused on technological groups where the country holds static comparative advantages. However, China has moved towards more dynamic technological groups, indicating a more advanced position in GVC (Araújo & Diegues, 2022). The Chinese economy maintains an advantage in participating in more dynamic sectors with higher levels of technological intensity, whereas Brazil concentrates its participation in less technologically intensive sectors (Araújo & Diegues, 2022).

Nevertheless, due to political and diplomatic alignment between Brazil and China in the early years of the Lula government, their participation in the BRICS group, bilateral agreements (e.g., Sixth Meeting of the Sino-Brazilian High-Level Commission for Consultation and Cooperation - COSBAN) (Brasil, 2024c) and the Belt and Road Initiative (BRI) may offer opportunities for scientific (Leta, Machado, & Canchumani, 2019) and technological cooperation between the two countries, despite existing asymmetries (Oliveira & Myers, 2021).

Even during the period of Brazil's economic re-primarization, policies and efforts were made to promote local industry (Portugal Jr; Reydon & Portugal, 2012). Examples include initiatives such as the Industrial, Technological, and Foreign Trade Policy (ITFTP) from 2004 to 2007, the Growth Acceleration Program (GAP) in 2007, the Productive Development Policy (PDP) from 2008 to 2010, and the Greater Brazil Plan in 2011 (Portugal Júnior et al., 2012). In more recent years, particularly from 2016 to 2022, Brazil did not effectively implement an industrial policy. However, with the new government under Lula, the New Brazil Industry (NBI) was established, focusing on neo-industrialization and grounded in strategic investment areas with potential impacts on social and economic development for the period 2023-2033 (Brasil, 2024a). The NIB is organized into six missions, aiming to integrate economic, social, and environmental objectives while complementing other public policies (Mazzucato, 2024).

The NBI's Action Plan encompasses the following missions: i) sustainable and digital agro-industrial chains; ii) the health economic-industrial complex; iii) sustainable infrastructure, sanitation, housing, and mobility; iv) digital transformation of industry;

v) bioeconomy, decarbonization, energy transition, and security; and vi) technologies of interest for national sovereignty and defense (Brasil, 2024b). To achieve these missions, key instruments include local content requirements, government procurement, technology transfer, public investment, and preferential margins (Brasil, 2024b), which may influence Brazil's external relations and contribute to the enhancement of Brazilian products in global value chains.

South-South Cooperation and the BRICS Alliance

Brazil has emerged as a regional power in Latin America, particularly in the southern region, due to its economic and territorial advantages (Bernal-Meza, 2022). Its geographic stability allowed Brazil to resolve territorial and border issues earlier than its neighbors, facilitating regional consolidation post-mid-20th century (Kozlova, 2023). This aligns with Brazil's ambitions to play a significant role in global affairs, aspiring for parity with northern hemisphere powers (Berringer & Ferreira, 2022).

Brazil's participation as a belligerent in World War I ensured its representation at the 1919 Paris Peace Conference, where it advocated for minor states' rights and sought to reform the League of Nations' collective security framework (United Nations, n.d.). Brazil's founding membership in the United Nations (UN) and the General Agreement on Tariffs and Trade (GATT) exemplifies its active involvement in international affairs. The presidencies of Luiz Inácio Lula da Silva (2003–2011) and Dilma Rousseff (2011–2015) (Silva & Pérez, 2019), emphasized engagement within the South-South axis amid rising protectionism and challenges in Northern markets (Rizzi & Antunes, 2017). Furthermore, Brazil has been pivotal in regional blocs like MERCOSUR (Almeida, 2018) and UNASUR (Vaz, Fuccille, & Rezende, 2018), promoting regional integration through "autonomy through participation" (Amorim Neto & Malamud, 2015; Giacalone, 2012; Lima & Hirst, 2006).

Brazil aspires to be recognized as a global player, aiming for a permanent seat on the UN Security Council (UNSC) (Valença & Carvalho, 2014). However, this ambition faces resistance from regional players like Argentina and Mexico, which prefer increasing non-permanent UNSC members (Valença & Carvalho, 2014). Lacking regional support, Brazil sought backing from sympathetic nations, forming the IBSA (India-Brazil-South Africa) initiative (Visentini, 2019). This coalition underscores a regionalist argument for representation from Africa, Southeast Asia, and South America in global decision-making bodies (Leisering, 2021). Brazil's foreign policy has evolved significantly, marked by strategic shifts in response to economic challenges and global dynamics. While maintaining a focus on economic development and regional stability, Brazil has increasingly sought active participation in international affairs, aspiring to assert itself as a global player on par with industrialized powers (e.g., China) (Oliveira, 2010).

However, over the decades, Brazil and China have developed an asymmetrical strategic partnership (Romano Schutte & Campos, 2022), but at the same time one of dependence, especially on the Chinese side with regard to Brazilian commodities. Both countries exhibit markedly distinct economic, military, and political characteristics. China

holds a seat on the United Nations Security Council (UNSC), is a nuclear power, and boasts the world's second-largest economy (Cardoso, 2017). Chinese international engagement strategies focus on infrastructure investments, direct aid programs to countries, debt forgiveness for poorer nations, and a policy of non-interference to secure privileged access to markets and resources (Pecequilo, 2014). While China is Brazil's largest trading partner, the reverse is not true.

Despite significant power asymmetries between the two countries, Brazil has proven to be a key partner in establishing and expanding BRICS (Brazil, Russia, India, China, and South Africa) and its extension to BRICS+ (including Egypt, Ethiopia, Iran, Saudi Arabia, and the United Arab Emirates) (Coquidé, Lages, & Shepelyansky, 2023). In 2023, during a visit to China, Brazilian President Luís Inácio Lula da Silva proposed to President Xi Jinping the creation of a BRICS-backed commercial currency. BRICS has emerged as a group capable of influencing global governance (Duggan, Hooijmaaijers, Rewizorski, & Arapova, 2022), internet governance (Hurel & Rocha, 2018) and international relations (Sergunin, Konyshev, & Fei, 2020).

However, the unity of BRICS countries may have regional implications for Brazil, given its historical leadership in similar initiatives in South America such as UNASUR and MERCOSUR. Brazil's involvement with BRICS countries could weaken relations with other South American nations and potentially diminish regional defensive regionalism (Vadell & Giaccaglia, 2020, 2021) characteristic of Latin America (Quiliconi & Espinoza, 2017; Vivares, 2021).

From the Chinese perspective and its participation in BRICS, Beeson and Zeng (2018) argue that China's dominance within BRICS could lead to conflicts, as it may seek to consolidate regional hegemony over other member nations (e.g., Russia and India). An example of such tensions is India's boycott of China's Belt and Road Initiative (BRI) due to sovereignty and security concerns, particularly regarding projects like the China-Pakistan Economic Corridor (CPEC) (Beeson & Zeng, 2018). Moreover, Chinese environmental policies driven by domestic political pressures may not align with expectations of global leadership within BRICS (Beeson & Zeng, 2018). Asymmetries are already apparent among BRICS countries in sustainable development initiatives, particularly in Green Technologies, where China and India lead compared to Brazil, Russia, and South Africa (Miranda et al., 2021).

Despite the potential impacts of BRICS on member countries and their regions, there is a clear motivation among BRICS nations to seek alternatives to the dominance of the US dollar, which has strengthened their relationships (Kondratov, 2021). In this context, Coquidé et al. (2023) suggest that if a BRICS currency becomes a reality, there are favorable prospects for its dominance in international trade.

Final considerations

At this juncture, it is opportune to revisit the objective that guided this study - to discuss the Sino-Brazilian mutual interests and contribute to the understanding of this broad subject. Our discussions and analyses suggest that it is important for Brazil and China

to develop initiatives with mutual and sovereign interests aimed at establishing environmentally sustainable trade (e.g., Bulla et al., 2022) with reduced asymmetry. Areas such as the bioeconomy and global governance are of great interest to Brazil and China. The collaborative efforts of these nations can enable new initiatives with prospects to balance forces with the USA.

Brazil and China are nations that exhibit considerable asymmetry in their economic and hard power characteristics. While Brazil seeks growth opportunities from China, China views Brazil as a resource base to meet its internal demands, especially regarding Chinese food security. However, we emphasize that the challenges are not solely on the Brazilian side. Despite China's increased global influence, its economy still faces instabilities. Currently (2024), China is confronting new challenges in seeking internal balance and revising its growth model (World Bank Group, 2024).

From a macro perspective, the economic and commercial strengthening of BRICS and its relationship with the Global South could serve as a counterpoint to American influence, reducing the role of the US dollar in the global economy and Federal Reserve System (FED) monetary policy. However, while BRICS may redefine global power relations, member countries of the group may face influences in managing their regional relations, particularly Brazil, which has traditionally based its international relations on defensive regionalism.

Finally, we consider that the Brazil-China relationship has potential for bidirectional expansion. Brazil can continue its approach with China in developing Brazilian infrastructure (e.g., electrical, telecommunications, and railways) and industry. Technological cooperation between Brazil and China can assist in expanding and modernizing Brazilian 5G telecommunication networks and facilitating innovations in the country. In this sense, BRICS can serve as a platform to accelerate this technological cooperation. In the strategic field, the two countries can strengthen South-South cooperation and increase the voice and representation of developing countries in international affairs.

On the Chinese side, besides securing commodity-based resources that fuel the Chinese economy and enable its growth, the multifaceted relationship with Brazil is characterized by cooperation in key sectors such as agriculture, energy, and industry. China's investments in Brazil's renewable energy sector expand its global energy footprint. Furthermore, strategic coordination in international structures and agreements on the digital economy, logistics, and environmental cooperation supports China's global influence and sustainable development goals.

Even though strict methodological criteria were followed in this study, certain limitations must be considered. The systematic literature review conducted yielded a considerable number of results, and the selection and interpretation of these results were performed inductively by the authors. This approach is subject to the authors' own limitations and/or analytical biases. Furthermore, it was not possible to address all the phenomena discussed in the studies identified in the systematic review that involve Sino-Brazilian mutual interests. Therefore, we believe there is room for further studies that aim to explore in depth one of the themes presented in this study or all of them collectively.

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