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# ASYMMETRIES IN BRAZIL-CHINA ECONOMIC RELATIONS

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# ASYMMETRIES IN BRAZIL-CHINA ECONOMIC RELATIONS

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The views and conclusions expressed in this document are those of the authors and should not be interpreted as representing the official position of their institutions.

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# Executive Summary

1. **Over the past 15 years, China has become Brazil's main trade and investment partner, but the economic relation remains structurally asymmetrical and risks reinforcing dependency.**

Brazil's exports to China are concentrated in low-complexity commodities, while imports are dominated by high-value manufactured goods, limiting technological upgrading and reinforcing balance-of-payments constraints.

2. **Brazil's economic engagement with China has increased trade volumes but not necessarily economic complexity or resilience.**

Despite a surge in exports and imports since 2021, Brazil's trade structure with China suggests a trend of low diversification and limited integration into high-value global value chains.

3. **Export concentration and low technological intensity restrict Brazil's capacity to accumulate foreign exchange sustainably.**

Thirlwall's Law and CGE studies suggest that Brazil's trade structure creates external constraints on growth, particularly due to high import income elasticity and insufficient export sophistication.

4. **Chinese foreign direct investment (FDI) remains concentrated in brownfield acquisitions in energy and extractives, reinforcing commodity specialization.**

Over 80% of Chinese investment in Brazil targets resource-based sectors, with limited support to the domestic industry, innovation spillovers, or productive diversification. Although greenfield projects have become numerically dominant — reaching 79% of all Chinese ventures in 2024, the highest share since the historical series began in 2007 — mergers and acquisitions still account for 63.2% of cumulative invested value over 2007–2024, so the bulk of capital continues to flow through brownfield acquisitions in energy, oil, and mining.

5. **Greenfield and innovation-oriented investments from China are expanding rapidly but remain weakly embedded in the domestic productive structure.**

Recent initiatives in electric mobility and digital infrastructure (e.g., BYD, Huawei) show potential but there is limited evidence that these investments are translating into productivity gains through technology transfer, local R&D collaboration, or supplier-development spillovers.

6. **Brazil's current account deficits are structurally financed by volatile capital inflows, reflecting macroeconomic vulnerability.**

While FDI inflows have helped sustain external balances, portfolio flows remain sensitive to global conditions, and Brazil's overall structural dependence on commodity exports exposes it to external shocks.

7. **Chinese concessional finance and tied lending can introduce fiscal and governance risks, if not correctly addressed.**

Off-budget financing arrangements often lack transparency and bypass competitive procurement, raising concerns about debt sustainability, regulatory oversight, and en-

vironmental safeguards that warrant stronger contingent-liability and procurement frameworks.

8. **The asymmetry intensifies in the critical-minerals domain, where Brazil's reserve position is not matched by midstream or downstream capacity.**

Brazil holds approximately 23 percent of identified rare-earth reserves (the second-largest national position globally) and substantial graphite, niobium, lithium, nickel, and copper endowments, while China controls roughly 85 to 90 percent of global rare-earth separation capacity.

9. **Regulatory architecture is the binding constraint on converting reserves into industrial capability.**

Comparative international evidence from Chile, Australia, Indonesia, and the Democratic Republic of Congo, together with within-firm variation across regulatory regimes, shows that outcomes from foreign mineral capital are explained by host-country regulatory design rather than by capital nationality.

10. **Brazil's diplomatic architecture preserves structured platforms to manage asymmetries, but strategic autonomy ultimately depends on institutional capability rather than partner selection .**

Frameworks such as COSBAN enable pragmatic engagement with China and other partners, yet without complementary domestic regulatory infrastructure they cannot, on their own, prevent the entrenchment of structural vulnerabilities.

11. **The Brazil–China partnership reflects deepening interdependence that, absent active public policy, risks entrenching structural vulnerabilities.**

Stronger coordination across trade, investment, and innovation policy is required to redirect engagement toward productivity-driven growth and integration into higher value-added segments of global value chains.

12. **Policy recommendations emphasize the need to diversify trade and investment, strengthen governance of external financing, and a calibrate and consolidate regulatory architecture for critical minerals.**

Key actions include promoting export sophistication, targeted FDI incentives for innovation and supplier development, debt transparency, sectorally-targeted foreign-investment screening, sliding-scale royalties aligned with the IGF benchmark range, contract-transparency requirements, and work-program performance bonds, alongside continued diplomatic diversification.

# Introduction

This study examines the evolving economic relationship between Brazil and China through the lenses of economic growth theory, trade and foreign direct investment as potential vectors of structural transformation, balance-of-payments-constrained growth and macroeconomic interdependence, and international relations theory—with emphasis on Brazil's role as a middle power. As Brazil's principal trade and investment partner, China plays a growing role in the Brazilian economy—most notably through commodity-driven trade, infrastructure investment, and selective technological engagement. To ground these broader dynamics in a sectoral case, the study devotes particular attention to the rare earth and critical-minerals sector, where Brazil holds the second-largest global rare-earth reserves yet retains minimal midstream processing and downstream manufacturing capacity.

The focus is on identifying the extent to which these bilateral ties align with or constrain Brazil's long-term economic growth potential. Drawing on theories of structural change, balance-of-payments-constrained growth, and the political economy of middle powers, the report explores how trade composition, foreign direct investment (FDI), and sectoral patterns influence Brazil's productive structure and external sustainability. A central analytical claim—developed through comparative international evidence from Chile, Australia, Indonesia, and the Democratic Republic of Congo—is that variation in outcomes from foreign mineral capital is better explained by host-country regulatory architecture and institutional quality than by investor nationality.

Special attention is given to evidence from Computable General Equilibrium (CGE) and GTAP-based studies, which illustrate how externally driven commodity booms and investment flows affect sectoral resource allocation and long-term productivity and growth. The study also reflects on Brazil's foreign policy strategy as a middle power—seeking to secure strategic autonomy while engaging in global trade and investment regimes.

The analysis identifies key structural patterns that define Brazil–China economic relations, including export concentration in low-complexity goods, limited spillovers from FDI, and sectoral asymmetries in technology-intensive activities. These patterns intensify in the critical-minerals domain, where recent acquisitions concentrate upstream control without commensurate downstream commitments. Risks include worsening balance-of-payments constraints, macro-financial exposure, weak integration into global value chains, and erosion of policy space due to tied financing arrangements, compounded by the absence of a foreign-investment screening regime for strategic-asset acquisitions in critical-mineral sectors. Policy recommendations focus on promoting productive diversification, enhancing domestic value added and technological absorption in FDI, strengthening governance over external finance, building a calibrated regulatory architecture for critical minerals — including sectorally-targeted foreign-investment screening, sliding-scale royalties benchmarked to international standards, contract-transparency re-

quirements, and work-program performance bonds — and preserving Brazil's strategic autonomy through economic and diplomatic diversification.

The structure of the report is organized to provide a progression from theoretical foundations to applied analysis and, finally, policy guidance. The first section presents the conceptual and analytical framework, outlining the principal theoretical approaches employed to examine China's influence on Brazil's economic trajectory. This is followed by an empirical assessment of Brazil–China economic and diplomatic engagements, with a focus on trade flows, investment patterns, technological exchange, and foreign policy dynamics. A dedicated section then examines the rare earth and critical-minerals sector in detail, drawing on the comparative international evidence to identify regulatory design as the binding constraint on converting Brazil's reserve endowment into industrial capability. Building on this analysis, the study then synthesizes key structural patterns and identifies associated risks, including those specific to critical-mineral value chains. The final section offers policy recommendations aimed at enhancing Brazil's capacity to manage asymmetries, promote diversification, and align external engagements with long-term economic growth objectives.

# Conceptual and Analytical Framework

Economic growth, trade, and foreign relations form a mutually reinforcing triad. Trade is a driver of growth, granting countries access to broader markets, technological innovation, and opportunities for productive specialization. However, trade patterns and outcomes are not neutral — they are shaped by a country's production structure, diplomatic strategies, its position in the global system, and the institutional frameworks that govern international engagement. For middle powers like Brazil, foreign policy and diplomacy are essential tools for securing favorable trade terms, attracting investment, and maintaining autonomy in a competitive global landscape. In turn, sustained economic growth enhances a country's international leverage, enabling it to play a more assertive role in shaping multilateral rules and development agendas.

This section provides the theoretical underpinnings for the study, focusing on four interrelated themes: (i) the drivers of economic growth and structural interdependence (2.1), (ii) the role of trade in shaping structural transformation and growth (2.2), (iii) external constraints imposed by the balance of payments (2.3), and (iv) Brazil's positioning and behavior as a middle power in a multipolar international system (2.4).

# THEORIES OF ECONOMIC GROWTH AND STRUCTURAL INTERDEPENDENCE

The evolution of economic growth theories has transitioned from classical models emphasizing capital accumulation to more nuanced frameworks that incorporate technological innovation, human capital development, and institutional factors. The Solow-Swan model laid the groundwork by identifying capital accumulation and technological progress as key drivers of growth. However, it treated technological advancement as an exogenous factor, prompting the development of endogenous growth theories. Romer (1990) and Aghion & Howitt (1992) introduced models where technological change results from intentional investment in research and development, emphasizing the role of knowledge spillovers and innovation.

Further expanding on these ideas, Galor (2011) proposed the Unified Growth Theory, which integrates economic and demographic factors to explain the transition from stagnation to sustained growth. This theory underscores the interplay between human capital accumulation, technological progress, and institutional evolution over the course of history. Similarly, Acemoglu and Robinson (2012) highlighted the significance of inclusive institutions in fostering economic development, arguing that political and economic institutions shape the incentives for innovation and investment.

The role of foreign direct investment (FDI) in economic growth has been extensively studied. Yao (2021) investigates the influences of FDI on economic growth in selected Latin American and Asian countries, finding that FDI impacts growth both directly through capital accumulation and indirectly via technology and knowledge transfer. However, the effectiveness of FDI is contingent upon the host country's ability to absorb new technologies, which is closely linked to the level of human capital. The study also notes that trade openness enhances the positive effects of FDI, while countries with low human capital may experience limited benefits or even negative impacts.

Keohane and Nye (1977) introduced the concept of complex interdependence, emphasizing that states and their fortunes are linked through multiple channels, including economic, environmental, and social ties. They posited that this interdependence can lead to both cooperation and conflict, depending on the distribution of power and the nature of the relationships. Building on this, Baldwin (2016) discussed how global value chains have intensified interdependence, making economies more susceptible to external shocks while also providing opportunities for specialization and efficiency gains.

The literature also explores the implications of economic interdependence for national development strategies. Rodrik (2016) cautioned against premature deindustrialization in developing countries, where integration into the global economy without adequate domestic capabilities can hinder long-term growth prospects. He emphasized the need for policies that balance openness with the development of domestic industries and institutions.

## APPLIED GENERAL EQUILIBRIUM APPROACHES TO GROWTH

While analytical growth models offer theoretical insight into the drivers of long-run growth, Computable General Equilibrium (CGE) models provide a policy-relevant framework to simulate how these mechanisms interact across sectors, agents, and markets in a consistent economy-wide setting. Rooted in neoclassical general equilibrium theory, CGE models extend the traditional Solow or endogenous growth frameworks by allowing for:

- Multiple production sectors and heterogeneous factor intensities
- Linkages between household behavior, labor markets, government, and external trade
- Capital accumulation and technological change over time
- Policy shocks, such as FDI, tariffs, subsidies, or exchange rate changes

CGE models are useful for modeling medium to long-term growth scenarios where structural features — such as comparative advantage, sectoral productivity, and institutional constraints — determine dynamic trajectories. CGE models serve as a bridge between growth theory and empirical policy design. They capture the general equilibrium feedback effects that static or partial-equilibrium approaches, especially in open economies undergoing structural transformation.

One of the core advantages of CGE models is their ability to simulate structural transformation. For example, a calibrated model of the Brazilian economy can estimate how Chinese FDI in infrastructure or agro-industry might shift capital and labor across sectors, influencing productivity, exports, and income distribution. These models can also embed learning effects or externalities (e.g., technology diffusion from FDI), making them suitable for assessing growth strategies that go beyond input accumulation.

While analytical growth models provide valuable insights into the endogenous and exogenous drivers of long-term expansion, they often abstract from how countries mobilize external resources and reshape their productive structures. In open economies, sustained growth is tied to the capacity to access foreign markets, attract investment, and upgrade the composition of production and exports. These dynamics are explored in the following section, which examines how trade contributes to structural transformation and economic growth.

# TRADE, STRUCTURAL TRANSFORMATION, AND CONTRIBUTION TO GROWTH

The evolution of trade theory offers critical insights into how international exchange can contribute to economic growth, particularly through its effects on specialization, productivity, and structural transformation. It reflects the shift from classical assumptions of static comparative advantage to dynamic models that account for market imperfections, scale economies, and technological capabilities. The classical model, developed

by David Ricardo, posits that countries benefit from trade by specializing in goods for which they have comparative advantage—determined by relative labor productivity. The Heckscher–Ohlin (H-O) model later extended this logic by linking comparative advantage to factor endowments: countries export goods that intensively use their abundant factors (capital or labor).

However, empirical anomalies—such as the Leontief Paradox[1]—and changing global trade patterns led to the rise of New Trade Theory (NTT) in the 1980s. Scholars like Paul Krugman introduced models based on increasing returns to scale, product differentiation, and network effects, explaining why countries with similar factor endowments still engage in large volumes of trade. These models underscore the role of industrial structure, firm heterogeneity, and path dependency in shaping trade outcomes.

Building on this, New New Trade Theory (NNTT)[2] integrates firm-level heterogeneity into trade models, marking a major departure from previous assumptions of sectoral uniformity. Melitz (2003) demonstrated that only the most productive firms can absorb the fixed costs associated with entering export markets, making firm-level productivity a critical determinant of trade participation. Beyond this foundational insight, NNTT shows how trade liberalization drives resource reallocation within sectors—where less productive firms contract or exit, and more productive firms expand. This selection effect leads to aggregate productivity gains. Moreover, by introducing endogenous markups, pricing-to-market behavior, and labor reallocation dynamics, NNTT provides a powerful framework to understand how trade affects wage inequality, employment composition, and industrial evolution—issues that are particularly salient for developing economies undergoing structural transformation. For developing countries, these modern trade theories offer two critical insights:

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1 The Leontief Paradox revealed that real-world trade patterns do not always conform to theoretical expectations based on factor endowments—highlighting the importance of technological differences, human capital, and firm-level dynamics in trade analysis.

2 Emerging in the early 2000s, NNTT builds on Krugman's New Trade Theory by introducing firm-level heterogeneity and microeconomic foundations into trade models. Unlike earlier models that assumed all firms within a sector were identical, NNTT—pioneered by Melitz (2003)—recognizes that only the most productive firms can overcome the fixed costs of exporting. Key contributions include:

- Reallocation effects: Trade liberalization shifts market shares toward more productive firms, raising aggregate productivity.
- Selection and exit: Less productive firms shrink or exit, increasing efficiency but possibly generating adjustment costs.
- Endogenous markups: Firms set prices strategically across markets, affecting competitiveness and welfare.
- Extensions: NNTT has been expanded to examine global value chains, multinational production, labor market frictions, and the distributional consequences of trade shocks.

For developing countries, NNTT underscores that industrial capacity, policy design, and firm competitiveness—not just comparative advantage—shape trade outcomes and development paths.

- Trade is not inherently beneficial unless it contributes to learning, technological upgrading, and diversification into higher value-added activities.
- The composition of trade matters as much as the volume. Exporting unprocessed commodities may generate foreign exchange but often contributes little to technological advancement or employment-intensive growth.

These points are reinforced by scholars such as Hausmann, Hwang, and Rodrik (2007), who show that "export sophistication" (EXPY) is positively correlated with future growth. Similarly, UNCTAD (2002) emphasizes that trade policy should be designed for openness and development-oriented structural change.

Institutional and regulatory dimensions are crucial in shaping trade performance. Exchange rate misalignments can distort trade competitiveness by effectively altering tariff protections, thereby impacting market access (Thorstensen, Marçal, and Ferraz, 2014; Staigner and Sykes, 2010; UNCTAD, 2012). Persistent and significant misalignments can undermine the effectiveness of WTO rules, including those related to tariffs, antidumping, and subsidies. Building productive capacity and ensuring fair regulatory environments—particularly concerning trade remedies, subsidies, and currency alignment—is essential to making trade an engine for technological upgrading and structural transformation (Thorstensen et al, 2014).

## TRADE BALANCE, PUBLIC ACCOUNTS, AND INTERPRETIVE NUANCES

The trade balance—the difference between the value of exports and imports—is a key component of the current account within the balance of payments framework. While commonly interpreted as a health indicator of an economy's external position, a trade deficit is not inherently negative, nor is a surplus always positive.

Classical and neoclassical models often assume intertemporal neutrality: deficits may reflect rational borrowing to finance investment, while surpluses may indicate under--consumption or missed domestic investment opportunities. In developing countries, trade deficits can be used to import capital goods, technology, and inputs necessary for structural transformation—particularly in early industrialization phases.

What matters is not solely the trade balance per se, but:

- What is being imported (capital vs. consumption goods).
- How the imports are financed (FDI, debt, reserves).
- Whether exports are diversifying or upgrading in content.

Empirical work supports this nuanced view; Freund and Spatafora (2008) show that commodity-exporting developing countries often run deficits during boom periods if capital inflows or exchange rate appreciation encourage imports. But if these imports include machinery or infrastructure inputs, they can support medium-term growth.

The composition of exports affects long-run sustainability. Hausmann, Hwang, and Rodrik (2007) argue that the complexity and productivity of a country's export basket are strong predictors of future growth. A trade deficit dominated by capital goods imports and offset by rising export sophistication poses far fewer risks than one driven by consumer goods with stagnant or regressive exports.

Thus, policy evaluation should go beyond headline numbers. A growing body of literature—including work by Rodrik, Cimoli, and Thorstensen—emphasizes structural trade analysis: disaggregating the current account by sector and technological content and aligning trade rules with long-term goals.

## BALANCE OF PAYMENTS AND EXTERNAL CONSTRAINTS ON GROWTH

The balance of payments (BoP) plays a central role in shaping the long-term growth trajectories of open economies. While traditional growth models often abstract away from external sector constraints, more recent theoretical and empirical research has shown that the sustainability of growth strategies is deeply influenced by external balances. In particular, balance-of-payments-constrained growth models (BPCG) argue that a country's growth rate cannot persistently exceed the rate compatible with equilibrium in its external accounts (Thirlwall, 1979; McCombie & Thirlwall, 2004).

At the core of this framework lies Thirlwall's Law, which asserts that a country's long--term growth is determined by the ratio of its export growth to the income elasticity of demand for imports (Thirlwall, 1979). This creates a "BoP ceiling": when import growth—driven by domestic income expansion—outpaces export growth, external adjustment becomes unavoidable, often manifesting in contractionary fiscal or monetary policies, exchange rate depreciation, or reliance on volatile capital inflows (Moreno-Brid, 1998; Dávila-Fernández & Sordi, 2019a).

This approach is particularly relevant for developing and commodity-exporting economies, such as Brazil, that rely heavily on imported capital goods, intermediate inputs, or foreign technologies. In these contexts, growth can be derailed not by lack of investment, but by a scarcity of foreign exchange[3]. Consequently, the structure and technological composition of trade become critical. Exporting low value-added or price-volatile goods (e.g., primary commodities) generates unstable or insufficient foreign exchange,

3 *Brazil's Structural Vulnerability Despite Foreign Exchange Reserves*: While Brazil maintains substantial foreign exchange reserves (e.g., $340 billion in 2024), its reliance on primary commodity exports (e.g., soybeans, iron ore) and dependence on imported capital goods expose the economy to balance-of-payments (BoP) risks rooted in trade composition, not liquidity. Commodity price volatility (e.g., a 35% drop in iron ore prices in 2023) and high income elasticity of demand for imports (1.8 vs. 0.6 for exports) create structural imbalances, as import growth outpaces export earnings during expansions. Reserves mitigate short-term currency crises (e.g., 2024's 25% real depreciation) but do not resolve chronic vulnerabilities tied to low-value--added exports. Even with diversification efforts (e.g., processed agro-exports rising to 28% of agricultural trade), Brazil's BoP remains constrained by its export profile, validating critiques of commodity-dependent growth models (Cimoli & Porcile, 2014; ECLAC, 2024; Hiratuka, 2023).

making economies vulnerable to external shocks and exchange rate pressures.

Empirical studies (Moreno-Brid, 1998; McCombie and Thirlwall, 2004) have confirmed that many Latin American economies, including Brazil, have historically grown at rates below their potential due to BoP constraints. This constraint has also been exacerbated by episodes of capital flight and procyclical capital flows, which intensify volatility and limit the effectiveness of domestic counter-cyclical policies.

The BoP constraint has led some scholars and institutions to advocate for growth strategies that reduce external vulnerability through:

- Export diversification and upgrading (Hausmann, Hwang, and Rodrik, 2007);
- Strengthening domestic supply chains to lower import dependence;
- Strategic management of exchange rates and capital flows (UNCTAD, 2022);
- Building international reserves and regional financial safety nets.

## INTERNATIONAL RELATIONS: MIDDLE POWERS IN THE INTERNATIONAL ARENA

The concept of "middle power" occupies a central place in international relations theory as a means of understanding how states that are neither superpowers nor marginal actors exert influence in global affairs. Unlike major powers, middle powers often lack global military reach or overwhelming economic might, but they play vital roles in shaping international norms, supporting multilateral institutions, and mediating global conflicts. Rather than being defined solely by material capabilities, the classification of middle powers often rests on their behavior, strategic preferences, and normative identity.

Andrew Cooper, Richard Higgott, and Kim Nossal (1993) argue that middle powers exhibit a distinct behavioral pattern in international politics: they favor multilateral solutions and seek to strengthen global governance frameworks. Eduard Jordaan (2003) refines this understanding by distinguishing between "traditional" and "emerging" middle powers. Traditional middle powers, such as Canada or Australia, tend to reinforce existing global structures, while emerging middle powers, such as Brazil, India, and South Africa, seek reform within the international system to reflect their growing political and economic weight.

Constructivist approaches to International Relations Theory emphasize how middle powers conceive their international role and how they are perceived by others. In this view, middle powers derive their identity through normative commitments and diplomatic activism, often pursuing autonomy and legitimacy through participation in multilateral forums. Middle power diplomacy is, therefore, not only a matter of capacity but also of intentionality and self-perception. Adam Chapnick (1999) further underscores that middle powers often work to uphold international order not through coercion, but through persuasion and norm entrepreneurship.

In economic terms, a middle power can be defined as a country that possesses significant, but not dominant, economic capabilities that allow it to exert regional or selective global influence. Middle powers often play a bridging role between major and smaller powers and use their economic resources to gain diplomatic leverage, multilateral visibility and normative influence.

Economically, middle powers generally exhibit a moderate-to-high GDP, often ranking among the top 20–40 economies globally and are usually active members of international economic groupings such as the G20. Their degree of trade openness and integration into global value chains allows them to benefit from global commerce, even while remaining vulnerable to external shocks. Many middle powers simultaneously serve as both recipients and emerging providers of foreign direct investment (FDI), particularly in regional infrastructure and development initiatives (UNCTAD 2022; World Bank 2023).

Their economic influence also stems from a relatively advanced human capital and technological base, which enables participation in global innovation networks. These states often exhibit institutional maturity, with credible macroeconomic frameworks, central banks, and public finance systems that contribute to international credibility (Cox 1987; Hurrell 2006).

Middle powers frequently act as regional economic anchors. Brazil, Indonesia, South Africa, and Turkey, for instance, play leading roles in their respective regions by facilitating trade integration, offering development cooperation, and participating in regional security or infrastructure initiatives (Cooper, Higgott, and Nossal 1993). These roles extend to South–South cooperation platforms, where economic diplomacy is deployed to build strategic coalitions.

Economic middle powers also prioritize strategic autonomy[4], seeking to diversify trade and investment partners and avoid dependency on any one major power. They often implement industrial or innovation policies to strengthen domestic economic capabilities while navigating complex geopolitical landscapes (Jordaan 2003). Their ability to act as norm entrepreneurs in economic governance—advocating for equitable trade rules or institutional reform—enhances their visibility and legitimacy in multilateral settings.

The economic attributes of middle powers include not only quantitative indicators such as GDP size and trade volumes but also their qualitative capacity to deploy economic tools for diplomatic influence, regional leadership and multilateral engagement. This makes their economic profile both a foundation and an instrument of their broader international positioning.

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4 Tullo Vigevani and Gabriel Cepaluni define strategic autonomy as a country's capacity to preserve decision-making sovereignty and policy space despite external pressures. Maria Regina Soares de Lima adds that it also involves active participation in multilateral institutions to shape global norms. See Tullo Vigevani and Gabriel Cepaluni, *A Política Externa Brasileira: A Busca da Autonomia, de Sarney a Lula* (São Paulo: Editora UNESP, 2007); and Maria Regina Soares de Lima, "Instituições multilaterais e política externa: os desafios da autonomia," *Revista Brasileira de Política Internacional* 44, no. 1 (2001): 67–97.

In sum, middle powers tend to:

- Use multilateral channels and institutions to mediate or solve conflicts;
- Act as “stabilisers” and “legitimisers” of the world order, while seeking for reform of key decision fora;
- View international law as instrumental to securing their interests;
- Make relevant use of international cooperation channels, as a way to gain legitimacy in the global arena.

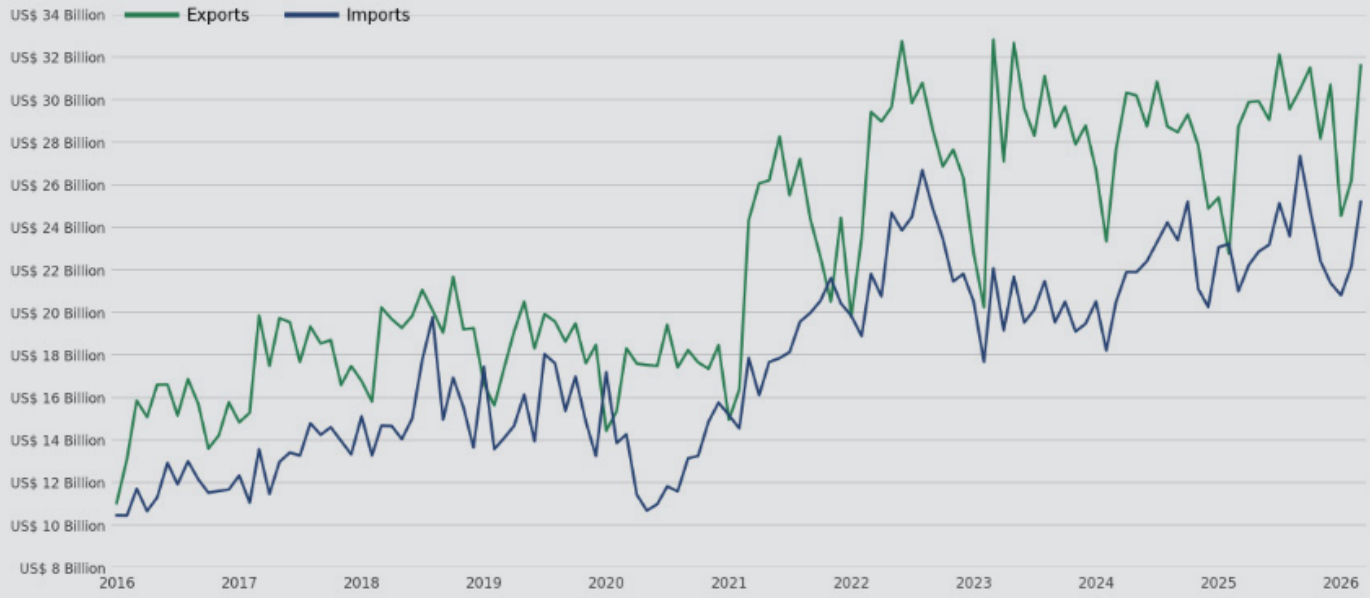
# Brazil–China Economic and International Engagements: Key Findings

## TRADE STRUCTURE AND GROWTH CONSTRAINTS

While Brazil has diversified its trade partners and maintained strong export performance in certain commodities, its overall trade openness has remained relatively low and stable over the past decade, both in absolute terms and compared to peer economies.

Between 2016 and early 2026, Brazil’s monthly trade flows display two distinct regimes (Figure 1 - Overall Brazilian Trade Evolution (2016-2026)). Through 2020, both exports (green) and imports (navy) fluctuated within a narrow band of roughly USD 12–22 billion per month. From early 2021 onward, both step up sharply — driven by the post--pandemic commodity rebound — and a persistent monthly trade surplus of roughly USD 5–8 billion has held since. The monthly view also makes the asymmetry visible: exports show a strong April–June seasonal peak driven by the harvest, while imports follow a smoother trajectory. By March 2026, monthly exports had reached USD 31.6 billion against USD 25.2 billion in imports. While nominal values are at record levels, the structure of the surplus — a small set of commodities pushing exports up — points to a structurally constrained integration into global markets, with persistent reliance on low-value-added exports and limited diversification, factors that may weigh on Brazil’s long-term growth potential.

FIGURE 1 - OVERALL BRAZILIAN TRADE EVOLUTION (2016-2026)




Source: COMEXStat.

UNCTAD's 2024 data underscores this concentration. Brazil's export concentration index (HHI) stood at 0.185 and its diversification index at 0.628. Both values are higher than those of major G20 manufacturing peers — Germany registers 0.097 (HHI) and 0.312 (Diversification), the United States 0.103 and 0.228 — indicating that Brazil's exports are spread across fewer product categories and that the overall export pattern departs more from the world average than is typical for industrialised G20 economies (Table 1 - Indices of Export Concentration and Diversification (2024)). Among the 19 G20 economies tracked, only the Republic of Korea, Argentina, the Russian Federation, Australia and Saudi Arabia rank as more concentrated than Brazil on HHI; on the Diversification Index, Brazil sits in the resource-exporter cluster, alongside Indonesia, South Africa and Argentina. Between the 2022 and 2024 vintages, Brazil's HHI ticked down marginally (from 0.196 to 0.185), confirming a very gradual broadening of the export basket while leaving the structural picture largely intact.

## TABLE 1 - INDICES OF EXPORT CONCENTRATION AND DIVERSIFICATION (2024)

| Country | HHI (Export Concentration) | Diversification Index |
|---|---|---|
| Italy | 0.062 | 0.359 |
| Turkiye | 0.066 | 0.384 |
| France | 0.072 | 0.344 |
| China | 0.082 | 0.354 |
| Germany | 0.097 | 0.312 |
| United States | 0.103 | 0.228 |
| Indonesia | 0.127 | 0.574 |
| Mexico | 0.133 | 0.440 |
| United Kingdom | 0.140 | 0.370 |
| India | 0.140 | 0.418 |
| South Africa | 0.145 | 0.553 |
| Japan | 0.159 | 0.408 |
| Canada | 0.169 | 0.381 |
| Brazil | 0.185 | 0.628 |
| Republic of Korea | 0.200 | 0.429 |
| Argentina | 0.286 | 0.671 |
| Russian Federation | 0.293 | 0.611 |
| Australia | 0.306 | 0.714 |
| Saudi Arabia | 0.549 | 0.728 |

*Source: UNCTAD, Concentration and Diversification Indices of Merchandise Exports, 2024 vintage. Both indices are normalised on the [0, 1] interval. For both columns, lower values indicate exports more similar to the world average pattern; higher values indicate greater concentration on a small set of products (HHI) or a pattern that diverges sharply from the world average (Diversification Index, Finger–Kreinin formula). Sorted by HHI ascending.*

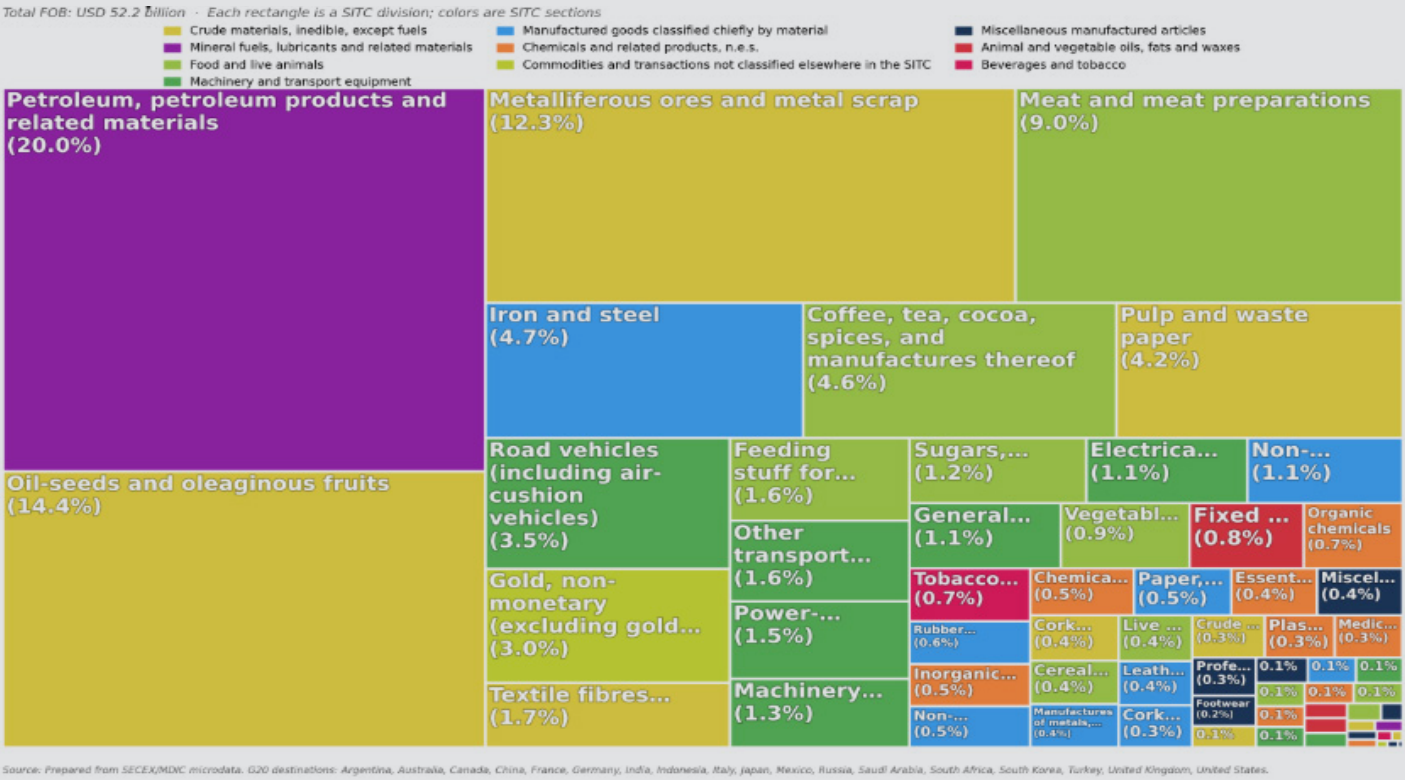
Source: UNCTAD, Concentration and Diversification Indices of Merchandise Exports, 2024.

Note: Both indices are normalized on the [0, 1] interval. HHI (Herfindahl–Hirschman): lower values indicate exports spread across more product categories. Diversification Index (Finger–Kreinin): lower values indicate an export pattern more similar to the world average. Sorted by HHI ascending.

These index values are consistent with Brazil's continued dependence on a narrow range of primary and resource-based products in its export basket. Of the USD 222.7 billion in goods Brazil exported to its G20 partners in 2025, petroleum and related materials accounted for 20.0%, oilseeds 14.4%, metalliferous ores and metal scrap 12.3%, and meat and meat preparations 9.0% — together more than 55% of the total (Figure 2 - Mix of Brazilian Exported Goods to G20). Manufactured goods classified by material and machinery and transport equipment together remain a minority of the export basket, contrasting with the export profiles of other G20 members (Figure 3 - Main Goods Exported by G20 Members). Low export complexity inhibits Brazil's capacity to accumulate foreign exchange through technologically sophisticated sectors and restricts its participation in

high-value-added global value chains.

## FIGURE 2 - MIX OF BRAZILIAN EXPORTED GOODS TO G20



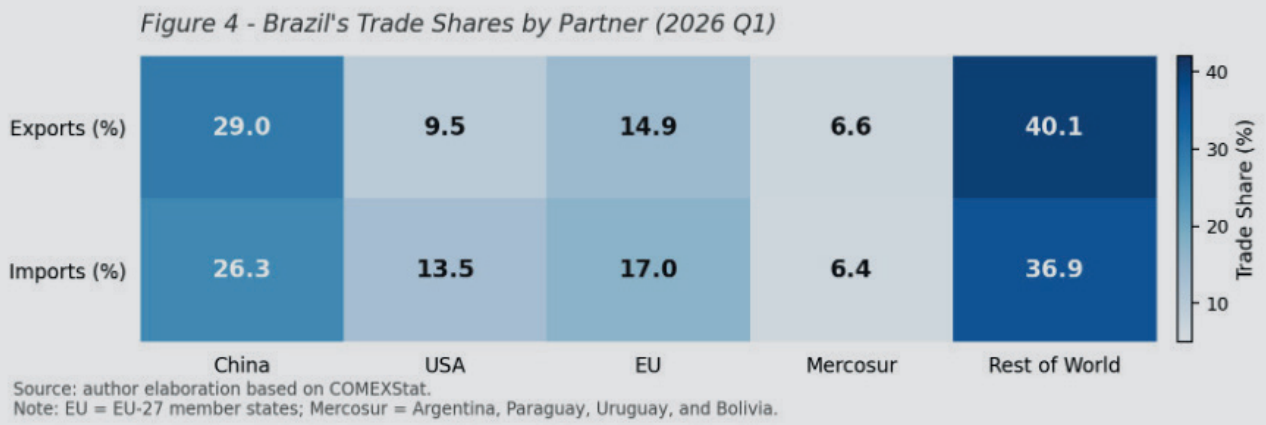

Source: COMEXStat.

## FIGURE 3 - MAIN GOODS EXPORTED BY G20 MEMBERS

Note: Prepared by SECEX/MDIC based on data from Comtrade/UN and the Standard International Trade Classification (SITC). The main SITC divisions exported/imported by G20 members are presented. Export data considers the values reported by exporters. Likewise, import data considers the values reported by importers.

Source: COMEXStat.

## FIGURE 4 - BRAZIL'S TRADE SHARES BY PARTNER (2026 Q1)



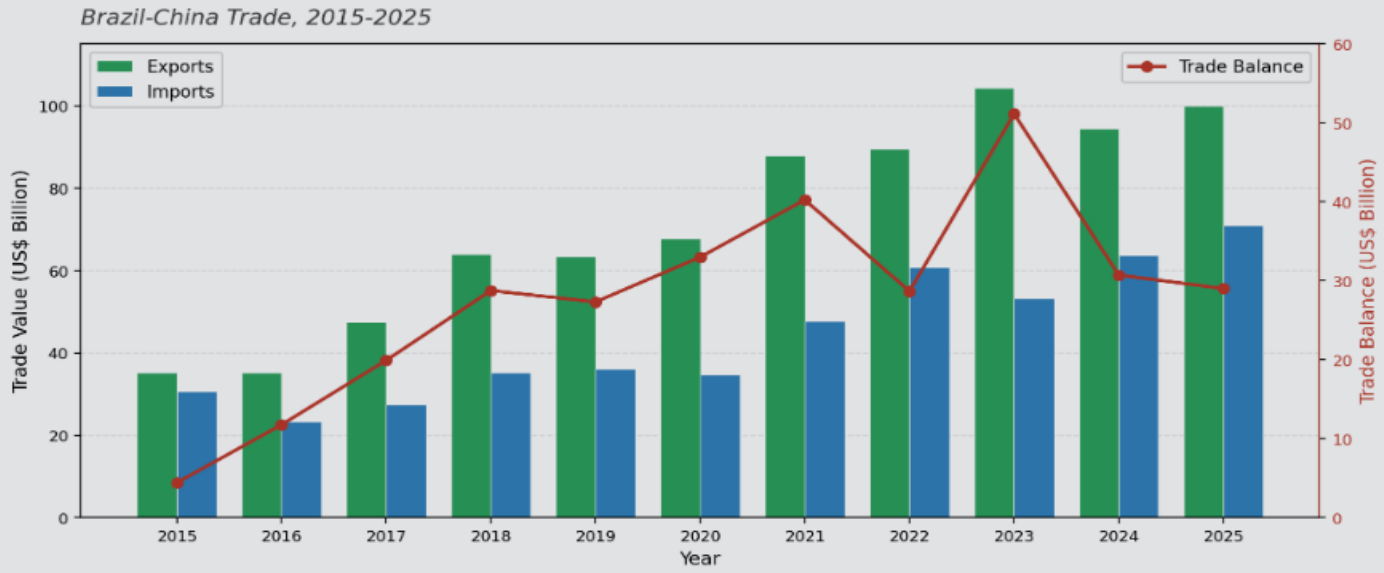

Source: author elaboration based on COMEXStat.

Note: EU = EU-27 member states; Mercosur = Argentina, Paraguay, Uruguay and Bolivia.

Notably, China has consolidated its position as Brazil's dominant trade partner, accounting for 29.0% of Brazil's goods exports and 26.3% of its imports in 2026 Q1 (Figure 4 - Brazil's Trade Shares by Partner (2026 Q1)) [5]. The bilateral trade balance, while still in Brazil's favour, has narrowed substantially: from peaks above USD 50 billion in 2022, the surplus settled at roughly USD 30 billion in 2025 as Brazilian imports from China rose sharply (Figure 5 - Brazil-China Trade: Exports, Imports and Balance (2015-2025)). Compositionally, Brazil's exports to China are far more concentrated than its exports to G20 as a whole: in 2025, soybeans alone accounted for 34.5% of the USD 99.9 billion exported to China, followed by crude petroleum (20.1%) and iron ore and concentrates (19.6%) — three commodities representing 74% of the total (Figure 6 - Brazil's Goods Exports to China (2025)). The remaining quarter is dominated by beef (8.8%), pulp (4.9%), and a long tail of other primary or low-processed goods. Imports from China, by contrast, are dominated by electronics, machinery and other high-value manufactured goods — a near-mirror image of Brazil's export profile and the clearest expression of the structural asymmetry that frames this report. The question, examined in subsequent sections, is not whether Brazil should trade with China — the volumes themselves are not the problem — but what domestic institutional architecture would convert this trade, and the capital flows that accompany it, into productive diversification rather than deeper specialization

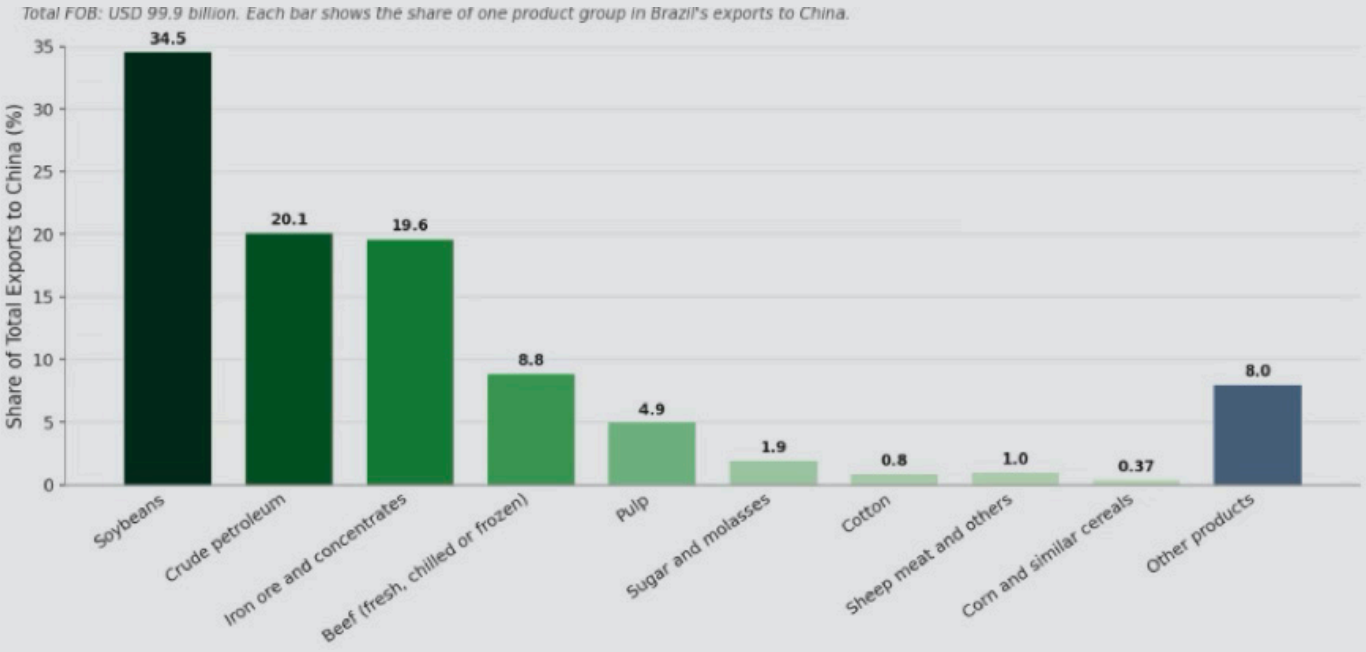
5 Important to note that China's relative share to other commercial partners does not significantly change between accumulated 2025 values and 2026 Q1 values – please refer to COMTRADE for detailed data.

## FIGURE 5 - BRAZIL-CHINA TRADE: EXPORTS, IMPORTS AND BALANCE (2015-2025)




Source: author elaboration based on COMEXStat.

## FIGURE 6 - BRAZIL'S GOODS EXPORTS TO CHINA (2025)

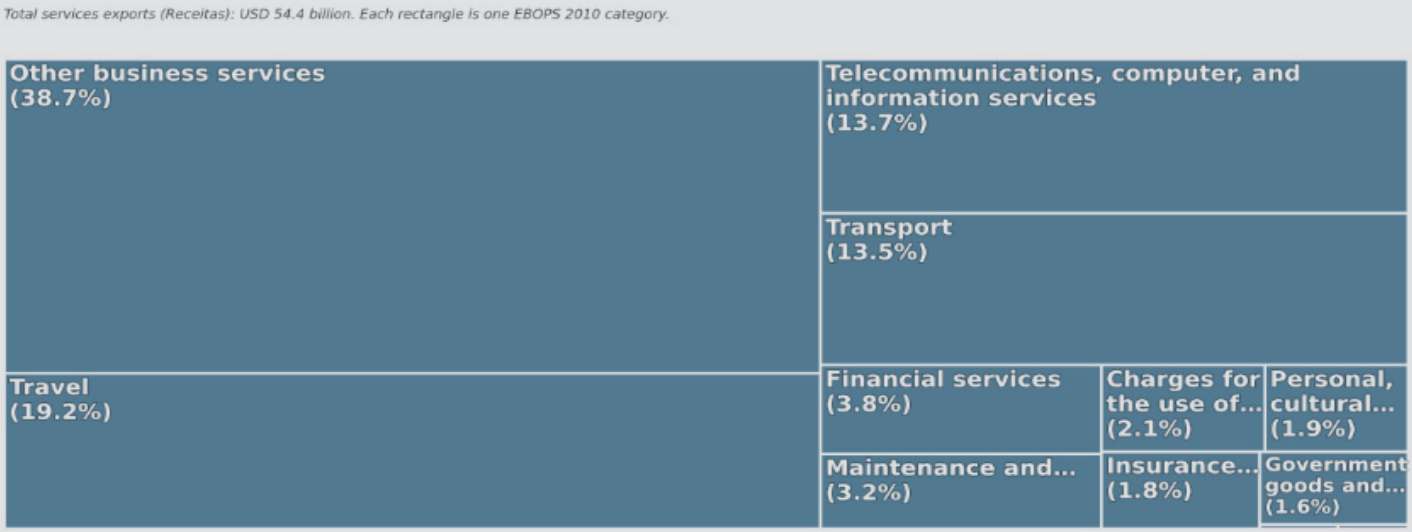



Source: author elaboration based on COMEXStat.

Beyond goods, Brazil's services trade reinforces the same pattern of narrow integration with China, while also revealing a different geography. On the export side, Brazil's USD 54.4 billion in services exports in 2025 was led by other business services (38.7%), travel (19.2%), telecommunications, computer and information services (13.7%), and transport (13.5%) — a mix that has become noticeably more diversified than in 2021, when other business services alone exceeded 48% of the total (Figure 7 - Mix of Exported Services (2025)).

On the import side, by contrast, the partner geography is far more concentrated: of the USD 99.3 billion Brazil imported in services in 2024, the United States alone accounted for 37.3% and the European Union (EU-27 plus named members) for roughly 24%, while China supplied only about 1.1% (Figure 8 - Composition of Service-import Partners to Brazil (2024)). India has emerged as the third-largest individual partner at 3.8%, ahead of the United Kingdom and France. The asymmetry is therefore twofold: Brazil's services exports are globally diversified, while its services imports remain heavily tilted toward the United States and Europe — and China's role on the import side, despite being Brazil's largest goods partner, remains marginal. This confirms that the goods-trade integration with China has not extended into services, limiting the channels through which technological spillovers from the bilateral relationship could materialize.

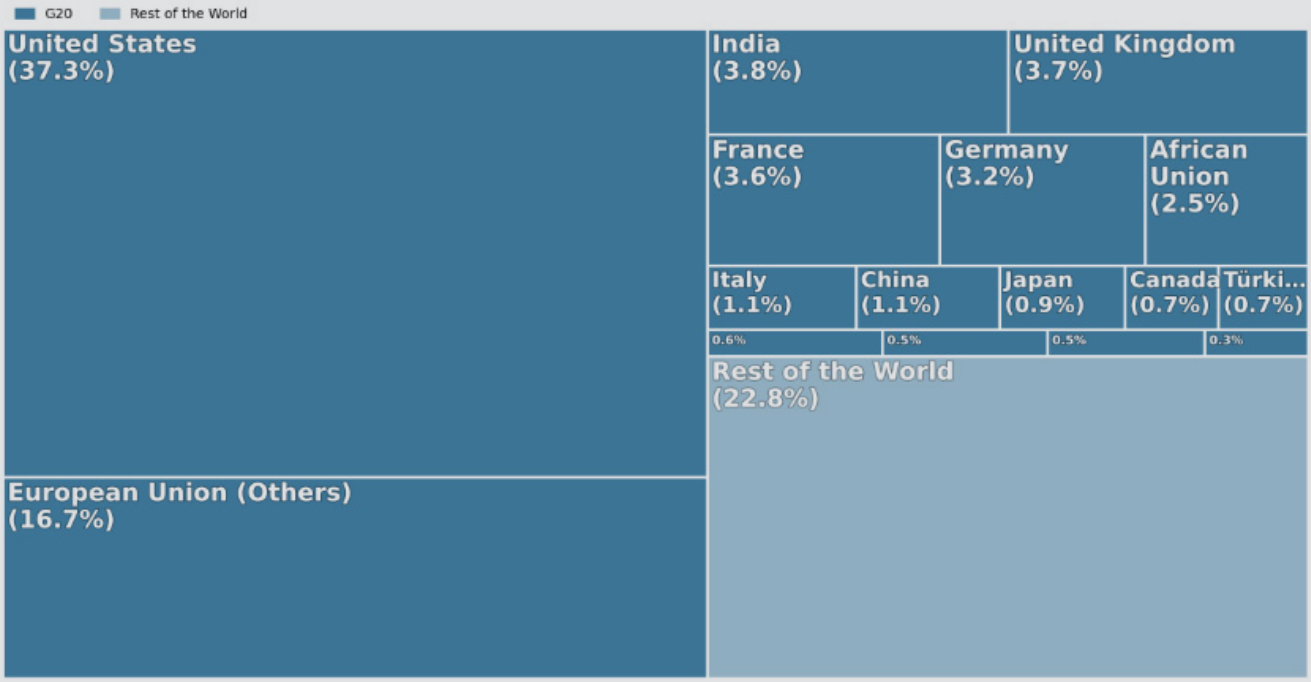
## FIGURE 7 - MIX OF EXPORTED SERVICES (2025)




Source: Banco Central do Brasil (BCB), Tabela Especiais.

Note: Total services exports (*Receitas*) USD 54.4 billion. Each rectangle is one EBOPS 2010 category.

FIGURE 8 - COMPOSITION OF SERVICE-IMPORT PARTNERS TO BRAZIL (2024)




Source: OECD-WTO Balanced Trade in Services (BaTiS), 2025 release.

Note: Total Brazilian services imports: USD 99.3 billion. G20 grouping includes the European Union and African Union; named G20 individual partners are shown separately.

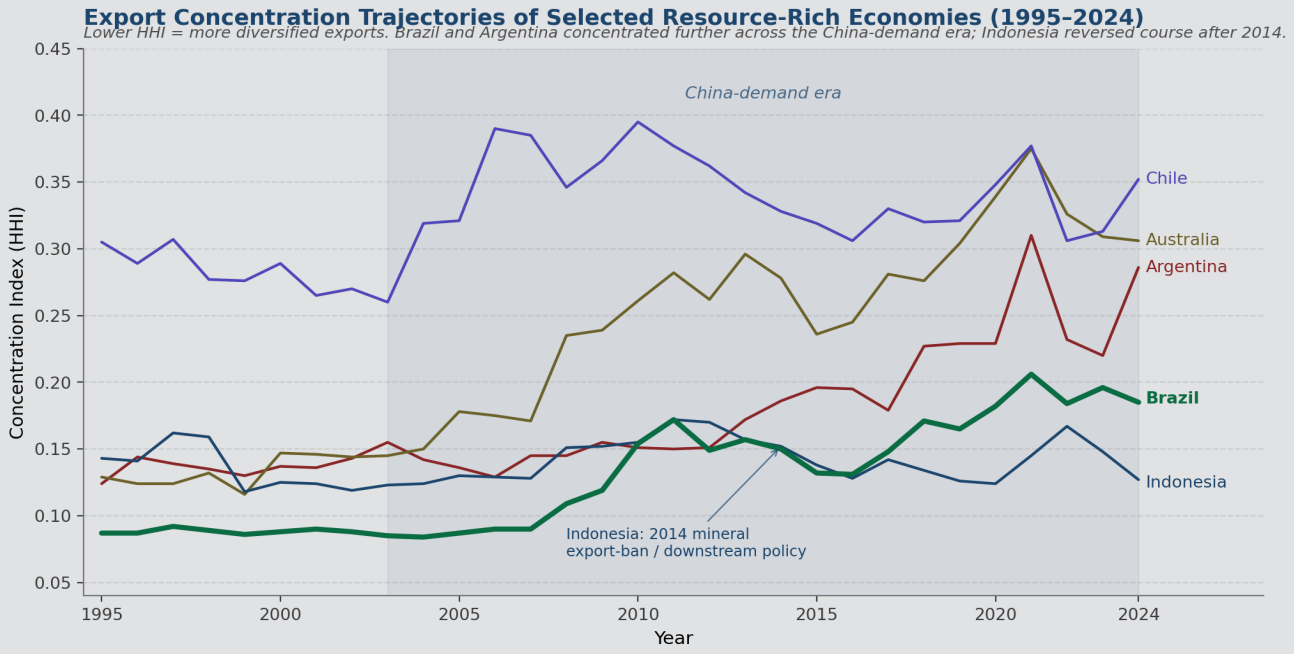
From a theoretical perspective, this trade pattern poses a constraint on Brazil's long--term growth. Thirlwall's Law (1979) posits that an open economy's growth is constrained by the rate of export expansion relative to the income elasticity of demand for imports. In Brazil's case, the need to import capital and intermediate goods to support domestic production — combined with a reliance on volatile commodity exports — creates structural balance-of-payments (BoP) vulnerabilities. These vulnerabilities are compounded by terms-of-trade cycles, which subject fiscal revenues and external earnings to high variability. The China-specific concentration documented above (74% of exports in three commodities) sharpens the point: the trade relationship that most defines Brazil's external position is also the one most exposed to commodity-price and demand shocks from a single partner. Critically, the balance-of-payments constraint operates not through trade volume but through trade composition: a relationship of any size, structured around low-complexity exports and high-elasticity imports, will reproduce the same external vulnerability regardless of who the partner is.

CGE and GTAP-based studies reinforce this structural concern. For instance, Willenbockel (2007) employs a 34-sector CGE model to demonstrate that China's increased demand for Brazilian exports has led to a significant reallocation of resources toward commodity sectors, raising alarms about deindustrialization. Similarly, Paz (2016) analyses household survey data to reveal that higher import penetration from China correlates with reduced employment in Brazil's manufacturing sector. This finding is consistent with the Dutch Disease framework (Corden & Neary, 1982) and Latin American structuralist critiques (Prebisch, 1950; Cimoli & Porcile, 2014), which argue that over-specialization in raw materials inhibits industrial upgrading and dynamic productivity gains.

GTAP simulations and structural gravity models also suggest that Brazil's current export mix limits the long-run gains from trade liberalization or regional integration. Hausmann, Hwang and Rodrik (2007) show that the "export sophistication" of a country's trade basket is positively correlated with future growth. Brazil's performance in this regard remains modest, reflecting insufficient integration into higher-productivity sectors.

Comparative evidence over the past three decades reinforces the institutional reading of this constraint. Figure 9 plots the export concentration trajectories of five resource-rich economies — Brazil, Argentina, Chile, Australia and Indonesia — from 1995 to 2024. All five entered the period as commodity-intensive exporters; all five were exposed to the rise in Chinese demand from the early 2000s onward. Their trajectories, however, diverged markedly. Brazil's HHI more than doubled between 2003 and 2024 (from 0.085 to 0.185, a 118% increase), and Argentina's rose by a similar magnitude (from 0.155 to 0.286). Australia's also rose sharply (+111%), though from an institutional base — royalty regimes, sovereign-wealth-style stabilization, local-content rules — that buffered the macroeconomic consequences. Chile, anchored by Codelco-led fiscal stabilization, registered a more modest increase (+35%). Indonesia, which moved decisively toward downstream-processing requirements and mineral export bans from 2014 onward, is the clearest counter-example: its HHI is essentially unchanged across the entire China-demand era (+3%), and by 2024 it is the least concentrated of the five comparators. The lesson is empirical, not rhetorical: Chinese demand was an objective force pushing concentration upward in resource-rich economies, but the magnitude and direction of the trajectory have been shaped by the institutional response.

## FIGURE 9 - EXPORT CONCENTRATION TRAJECTORIES OF SELECTED RESOURCE-RICH ECONOMIES (1995–2024)




Source: author elaboration based on UNCTAD, Concentration and Diversification Indices of Merchandise Exports (1995–2024).

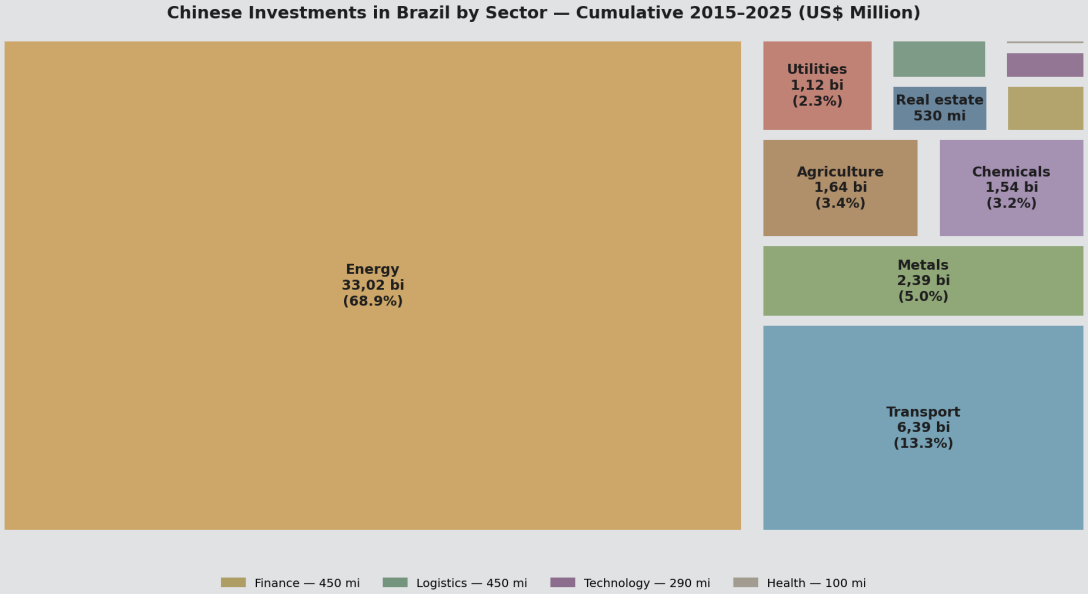
Note: Concentration Index (Herfindahl–Hirschman); lower values indicate exports spread across more product categories. Indonesia series stitched from UNCTAD's pre- and post-2002 country definitions. Shaded band marks the period of expanded Chinese commodity demand.

Despite the dramatic rise in Chinese demand since the early 2000s — which lifted Brazil's nominal export values to record levels and turned China into Brazil's principal trading partner — the country's underlying export concentration has not narrowed; if anything, it has deepened (Figure 9). The lesson of three decades is that growth in trade volume with any partner does not, on its own, deliver structural transformation. High concentration in low-complexity exports (especially towards China), weak integration into value-added chains, and persistent balance-of-payments vulnerabilities constrain Brazil's ability to leverage trade as a driver of structural transformation. The marginal improvement in Brazil's HHI between 2022 and 2024 is welcome but small relative both to the gap with G20 manufacturing peers and to the trajectories achieved by economies that adopted active downstream and regulatory policies. Whether the relationship with China contributes to sustained growth or entrenches a low-complexity equilibrium will be determined not by the scale of trade but by the regulatory, fiscal, and contractual architecture that mediates it — the question taken up in Sections 3.2 through 3.5, and again in the institutional analysis of critical minerals and rare earths.

## INVESTMENT PATTERNS AND PRODUCTIVE SPECIALIZATION

Chinese investment in Brazil between 2015 and 2025 amounted to approximately US$ 49 billion in announced commitments, according to the China Global Investment Tracker compiled by the American Enterprise Institute. Energy is by far the dominant destination, with cumulative commitments of around US$ 33 billion—close to two-thirds of the total. At a substantial distance follow transport (US$ 6.4 billion), metals (US$ 2.4 billion), agriculture (US$ 1.6 billion), chemicals (US$ 1.5 billion), and utilities (US$ 1.1 billion), while real estate, finance, logistics, technology, and health together account for less than US$ 2.0 billion (Figure 10 - Accumulated Amount of Investments by Sector (US$ Million).

FIGURE 10 - ACCUMULATED AMOUNT OF INVESTMENTS BY SECTOR (US$ MILLION)




Source: Authors' elaboration based on data from the China Global Investment Tracker (American Enterprise Institute).

These investments are predominantly brownfield operations, involving the acquisition of specific assets—such as electricity grids, oil infrastructure, and mining concessions—by Chinese state-owned enterprises (SOEs) including State Grid Corporation, China National Petroleum Corporation (CNPC), China National Offshore Oil Corporation (CNOOC), Three Gorges, China General Nuclear, and State Power Investment Corporation. Energy alone has absorbed close to 68% of all Chinese investment commitments to Brazil during 2015–2025, with energy and transport together accounting for over 80% of the total—a marked sectoral concentration that reinforces China's global resource security agenda and mirrors a broader pattern observed across Latin America.

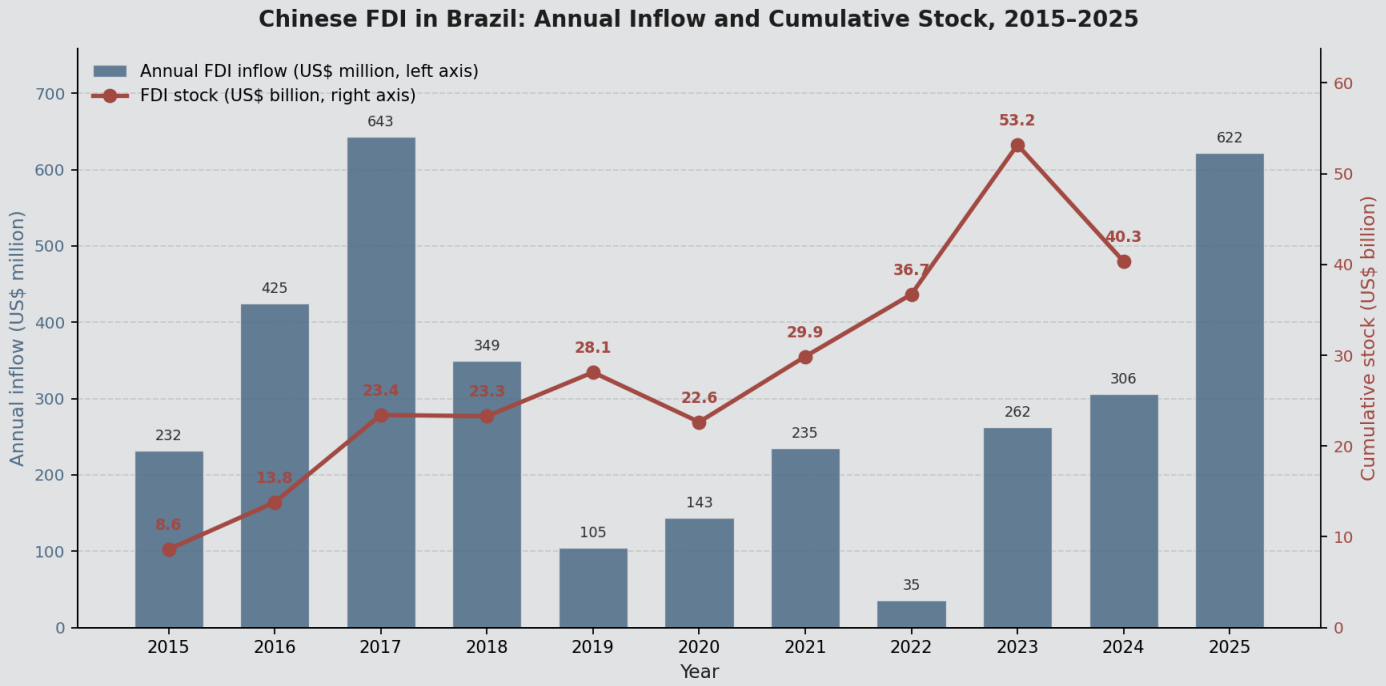
Investment flows have followed identifiable waves rather than a steady trajectory. According to Brazilian Central Bank data, direct FDI inflows from China during 2015–2025 peaked in 2017 (US$ 643 million), 2025 (US$ 622 million), 2016 (US$ 425 million), and 2018 (US$ 349 million), with marked troughs in 2019 (US$ 105 million) and especially 2022 (US$ 35 million)—the lowest point of the period under review. The estimated stock of Chinese FDI in Brazil rose nearly fivefold, from US$ 8.6 billion in 2015 to a peak of US$ 53.2 billion in 2023, before contracting to US$ 40.3 billion in 2024, when it represented roughly 4.6% of Brazil's total inward FDI stock. These cycles have generally coincided with favorable macroeconomic conditions and moments of enhanced diplomatic convergence, with peak years driven by large energy deals such as State Grid's acquisitions in 2016–2017 and the CNOOC-led oil partnerships of 2021–2022 (Figure 11 - Evolution of Total Chinese Investments in Brazil). The most recent evidence, however, suggests a discernible shift in the profile of Chinese investments in Brazil.

According to the Brazil-China Business Council's 2024 report, although the average annual value invested between 2020 and 2024 was the lowest of the past fifteen years, the average number of projects was the highest on record—indicating a clear preference for less capital-intensive but strategically valuable initiatives, with broader geographic reach across the country. In 2024 alone, greenfield projects accounted for 79% of all Chinese ventures in Brazil, the highest share since the historical series began in 2007. Notable greenfield examples in 2023–2025 include BYD's electric vehicle plant in Bahia (announced in 2023 and expanded through 2025), Great Wall Motors' Iracemápolis factory (inaugurated in August 2025), Geely's US$ 720 million transport-sector investment in 2025, GAC Motor's entry into vehicle assembly in early 2025, and CMOC Group's US$ 900 million commitment in metals at the end of 2025.

Over the longer 2007–2024 horizon, greenfield projects represented 56.2% of all confirmed deals by number, against 36.5% for mergers and acquisitions (M&A) and 7.4% for joint ventures. Yet when measured by invested value, M&A still leads with 63.2% of total commitments, against 31.3% for greenfield and 5.5% for joint ventures (Figure 12 - Chinese Investment in Brazil by Mode of Entry — Cumulative 2007–2024). This contrast is analytically significant: greenfield projects are now numerically dominant and increasingly tied to industrial capacity-building, but the bulk of capital still flows throu-

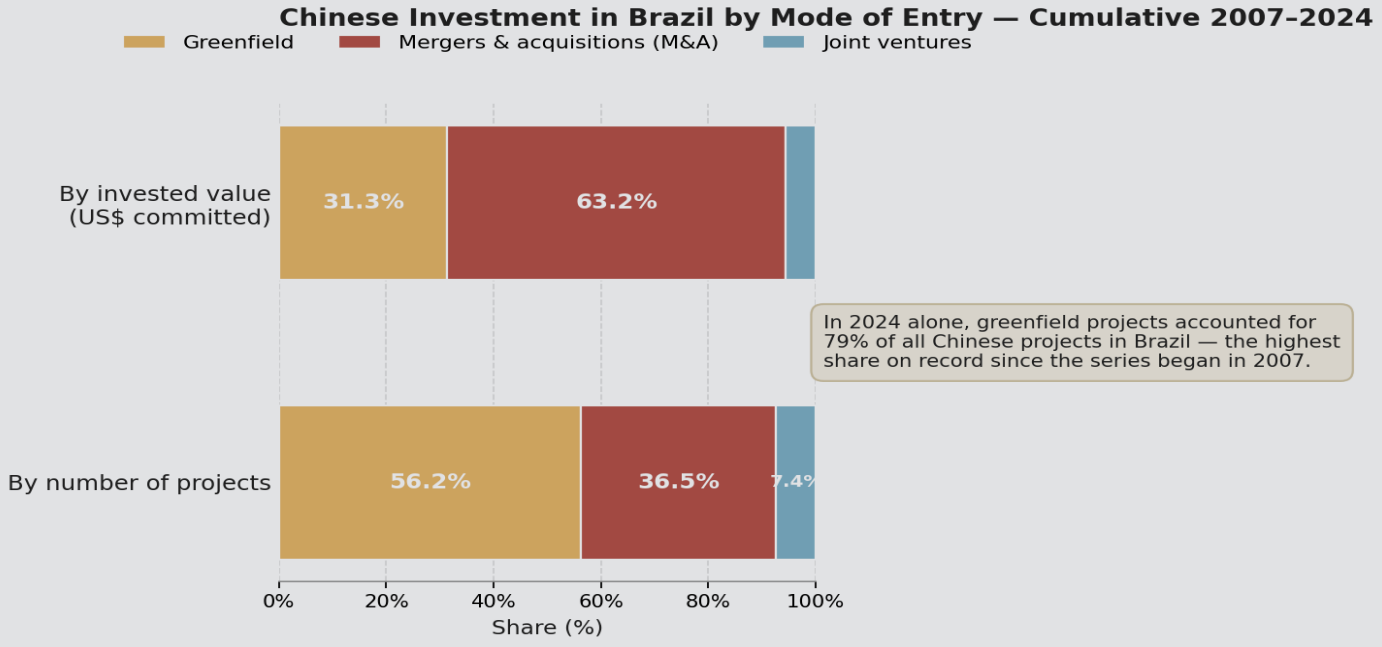
gh brownfield acquisitions of existing assets in energy, oil, and mining. The persistent dominance of energy and resource-related sectors—accounting for the overwhelming majority of cumulative inflows during 2015–2025—suggests that, despite the qualitative shift toward smaller and more diverse projects, Chinese FDI in Brazil continues to reinforce the country's pre-existing comparative advantages while only modestly catalyzing structural diversification.

## FIGURE 11 - EVOLUTION OF TOTAL CHINESE INVESTMENTS IN BRAZIL




*Source: Authors' elaboration based on data from InvestVis (MDIC) and Banco Central do Brasil.*

## FIGURE 12 - CHINESE INVESTMENT IN BRAZIL BY MODE OF ENTRY — CUMULATIVE 2007–2024




Source: Authors' elaboration based on data from the Brazil-China Business Council (CEBC), Chinese Investments in Brazil 2024: Reindustrialization and Energy Transition (September 2025).

China's infrastructure investments—spanning energy, transportation, and digital sectors—have helped address critical bottlenecks in Brazil's development. Major projects include hydropower plants, port expansions, and 5G networks led by firms such as State Grid and Huawei (Gallagher & Myers, 2021; ECLAC, 2021). These investments are aligned with China's resource security objectives, exemplified by logistical corridors facilitating soybean exports to Asia. The partnership between Brazil's National Development Bank (BNDES) and Chinese entities on projects such as the Ferrogrão railway reflects a pragmatic convergence of interests, albeit reinforcing Brazil's specialization in primary commodities (Abeliansky & Martínez-Zarzoso, 2019).

From a structural growth perspective, the value-weighted concentration of investment in natural resource sectors continues to reinforce Brazil's commodity-based specialization, even as the recent surge in greenfield manufacturing projects—particularly in vehicles, batteries, and electronics—introduces a partial counter-trend. Computable General Equilibrium (CGE) models calibrated for Brazil–China dynamics (Delgertsetseg, 2019) demonstrate that resource-oriented Chinese FDI typically induces a reallocation of capital and labor toward extractive activities. This process reflects a classic Dutch Disease trajectory (Corden & Neary, 1982), weakening the competitiveness of domestic manufacturing and constraining industrial diversification. Such findings are echoed in Latin American structuralist critiques (Prebisch, 1950; Cimoli & Porcile, 2014), which underscore how externally driven growth can entrench low-complexity equilibria when not accompanied by active domestic policies.

The financial architecture supporting this engagement compounds the specialization bias. China's policy banks—including the China Development Bank and the Exim Bank—extend concessional or tied finance to projects aligned with Chinese industrial strategies and, in BRI partner countries, with Belt and Road Initiative (BRI) priorities. Although Brazil has not formally joined the BRI, similar financing logics nevertheless shape Chinese capital flows to the country. Additional mechanisms, such as the China–LAC Cooperation Fund, reinforce the nature of these flows. While these instruments have supported essential infrastructure upgrades in Brazil, they raise concerns about alignment with national development priorities. The IMF (2023) warns of growing risks when concessional loans are guided by geopolitical objectives rather than commercial viability or development effectiveness.

Yet even as Chinese capital diversifies into new sectors, value-added spillovers to the Brazilian economy remain weak. Research by Hiratuka (2022) and the Peterson Institute (2022) highlights the absence of contractual requirements for enhancing domestic value added, technology transfer, workforce training, or R&D collaboration in Chinese-financed projects. Without such provisions, even the more sophisticated greenfield ventures risk reinforcing external dependence—through reliance on imported Chinese capital goods, components, and technical services—rather than building domestic productive capabilities.

From a balance-of-payments and macroprudential perspective, Brazil's debt exposure to China remains limited compared with lower-income economies that have relied heavily on Chinese policy-bank financing. Even so, the country's growing engagement with tied financing arrangements—export credit facilities, state-to-state lending, and public–private partnerships backed by Chinese concessional instruments—has drawn the attention of international financial institutions and credit rating agencies. These mechanisms can accelerate infrastructure delivery and ease short-term financing constraints, but they tend to create contingent liabilities outside the formal budget and frequently rest on project-level agreements whose disclosure practices fall short of those required by traditional multilateral creditors, particularly when they embed equipment procurement from Chinese suppliers or other conditionalities. The combined effect is greater opacity in sovereign risk assessment, reduced procurement competition, and diminished long-term fiscal and policy flexibility.

Taken together, the evidence reviewed in this section suggests a configuration in which Chinese capital reinforces, rather than transforms, Brazil's productive structure. The recent diversification of project types, most visibly the surge of greenfield manufacturing investments, represents a meaningful but still subordinate trend within an investment portfolio overwhelmingly concentrated, by value, in resource and energy assets. Whether this composition contributes to structural transformation or merely deepens Brazil's integration into China's resource-security architecture will depend less on Chinese investment patterns themselves than on Brazil's capacity to design domestic regulatory frameworks — covering local content requirements, technology transfer provisions, ESG conditionalities, and fiscal-disclosure standards — that align foreign capital with national developmental priorities. These conditions, in turn, are inseparable from the macroeconomic and balance-of-payments dynamics examined next.

## MACROECONOMIC INTERDEPENDENCE AND BALANCE OF PAYMENTS DYNAMICS

Brazil's balance of payments (BoP) trajectory over the past three decades reflects a dynamic interplay between trade integration, capital flows, and persistent structural constraints. Since the liberalization of the 1990s, the country has alternated between periods of current account deficits and surpluses, shaped by fluctuations in global commodity prices, shifts in exchange rate regimes, and evolving trade partnerships.

In the early 2000s, surging commodity prices and expanding exports to China contributed to robust trade surpluses and a temporarily favorable current account position. This period also saw significant inflows of foreign direct investment (FDI), particularly in infrastructure and extractive industries. These dynamics enabled a build-up of international reserves—reaching over USD 380 billion in the 2010s—providing Brazil with important buffers against external shocks (Banco Central do Brasil, 2023).

However, structural vulnerabilities have persisted. Despite consistent trade surpluses, Brazil's current account has remained in deficit for most of the post-2014 period, largely due to persistent outflows from the income account—driven by profit remittances and interest payments. Portfolio capital has grown more volatile, with inflows and outflows influenced by changing global liquidity conditions, interest rate differentials, and domestic macroeconomic uncertainty.

FDI inflows have remained strong, averaging approximately USD 70 billion annually over the post-2015 period (Banco Central do Brasil, 2026). Yet, these flows are concentrated in brownfield investments and capital-intensive sectors, with limited contribution to export diversification or productivity spillovers—raising questions about the sustainability and developmental quality of these investments.

Structurally, Brazil's income elasticity of imports continues to exceed that of its exports, consistent with the balance-of-payments-constrained growth hypothesis (Thirlwall, 1979; McCombie & Thirlwall, 2004). This asymmetry limits Brazil's potential growth rate unless its export base becomes more diversified and technologically complex. Critically, the constraint operates through trade composition rather than trade volume: a relationship of any size, if structured around low-complexity exports and high-elasticity imports, will reproduce the same external vulnerability regardless of who the trading partner is.

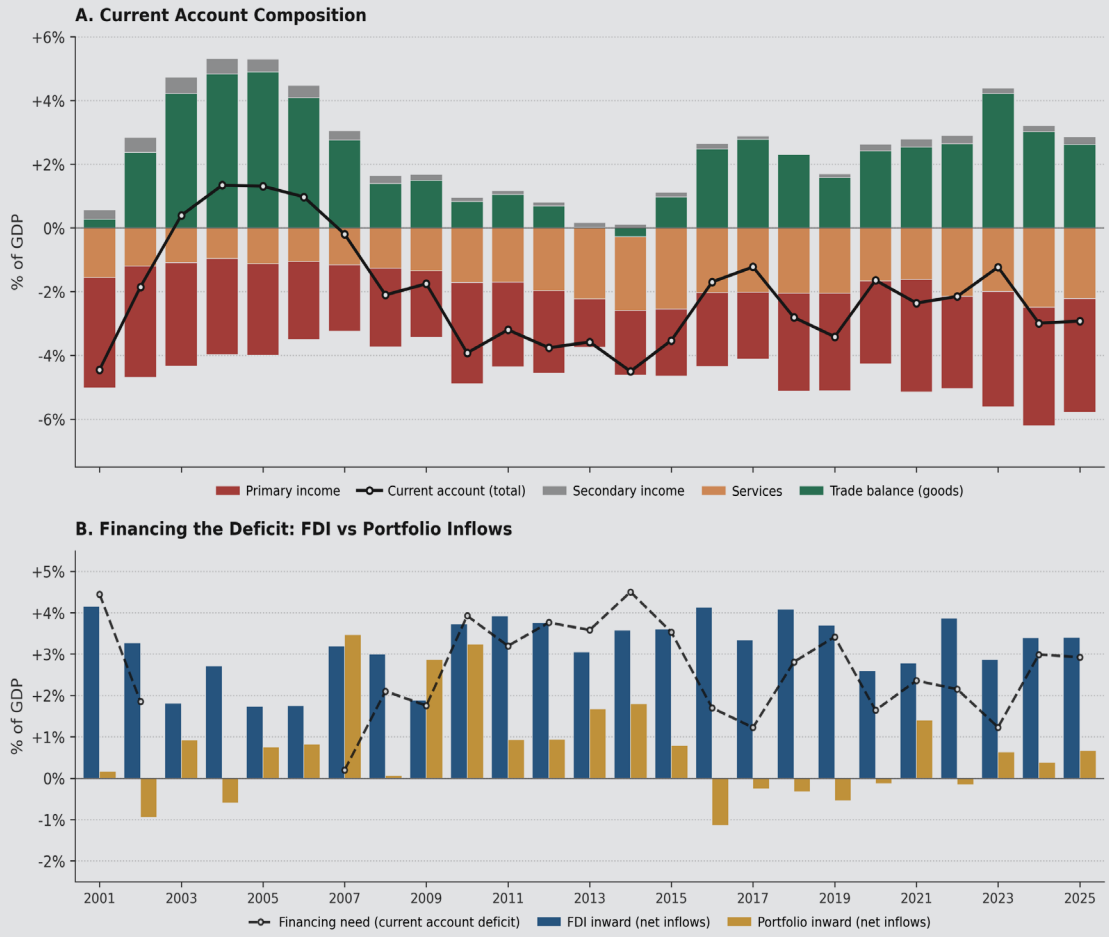
The closing of 2025 reinforces these structural concerns. Brazil's current account deficit reached USD 66.7 billion (2.93 % of GDP), broadly stable relative to the revised 2024 closing of USD 65.3 billion (2.99 % of GDP) and the third consecutive year of widening external imbalances relative to the cyclically narrow 2023 deficit (1.23 % of GDP). The trade balance surplus narrowed from USD 65.8 billion in 2024 to USD 59.7 billion in 2025, even as both exports and imports of goods reached record nominal values (USD 350.5 billion and USD 290.8 billion, respectively). The narrowing surplus reflected softening commodity prices on the export side and strong domestic absorption pulling in capital and intermediate goods on the import side — a pattern fully consistent with the BoP-constrained growth dynamic identified by Thirlwall (1979) and Moreno-Brid (1998) (Banco Central do Brasil, 2026).

The services balance posted a deficit of USD 50.6 billion in 2025, marginally smaller than the USD 54.3 billion recorded in 2024 — partly because, since January 2025, online betting operators must register as resident entities, removing those flows from external-sector statistics (a one-off compositional effect rather than a structural improvement). The primary-income deficit, by contrast, remained essentially unchanged at USD 81.3 billion, driven principally by profit and dividend remittances of USD 39.6 billion and net intercompany interest payments of USD 14.7 billion. As Panel A of Figure 12 makes visible, the primary-income line is now the binding component of Brazil's external deficit: trade surpluses, even at their cyclical peaks, no longer cover the recurring outflows generated by the cumulative stock of foreign liabilities. This is the structural mechanism through which prior FDI inflows translate into ongoing recurring outflows in the current account. Whether this mechanism amplifies or attenuates Brazil's external vulnerability

depends on the institutional architecture under which the original capital was admitted: capital embedded in local supply chains, technology partnerships, and reinvestment obligations generates a markedly different income-account footprint than capital that operates principally as a remittance pipeline. The aggregate primary-income deficit is therefore not a verdict on foreign investment as such, but on the regulatory regime that shaped its composition.

On the financing side, foreign direct investment continues to play the central anchoring role. Net FDI inflows reached USD 77.7 billion in 2025 (3.41 % of GDP), the highest annual value since 2018 and a 4.8 % increase relative to the revised 2024 figure of USD 74.1 billion (3.39 % of GDP). As Panel B of Figure 13 - Composition of Brazil's Balance of Payments (2001–2024, % of GDP) shows, FDI has single-handedly exceeded the current-account financing need in every year since 2017. Of the 2025 inflow, USD 62.4 billion entered as equity participation and USD 15.3 billion as intercompany lending — a composition still tilted toward brownfield acquisitions in resource and energy sectors over greenfield manufacturing or technology-intensive activity, as Sections 3.2 and 4 examine in detail (Banco Central do Brasil, 2026).

## FIGURE 13 - COMPOSITION OF BRAZIL'S BALANCE OF PAYMENTS (2001–2025, % OF GDP)




Source: author elaboration, using data from BCB.

Note: Values expressed as a share of nominal GDP in US$. Panel A stacks the four current-account components (positive bars above zero, negative below); the solid line is the resulting current-account total. Panel B shows annual FDI and portfolio inflows; the dashed line is the absolute size of the current-account deficit (financing need).

Portfolio flows behaved unevenly through 2025 but with materially less acute episodes than in late 2024. The 2025 net portfolio inflow of USD 15.1 billion was the strongest in three years, composed of USD 20.1 billion in fixed-income inflows offset by USD 4.6 billion in equity divestments — a different composition from earlier periods, when equity inflows had played a more significant role (Banco Central do Brasil, 2026). The contrast with December 2024 — when net portfolio outflows of USD 12.6 billion in a single month, the second-highest monthly figure on record at the time, were driven by market apprehension over fiscal trajectory and global interest-rate differentials (Reuters, 2025) — illustrates the volatility of portfolio relative to direct investment, and underscores the centrality of FDI as the durable component of Brazil's external financing.

These dynamics underscore a single proposition. Composition rather than volume is the operative variable in Brazil's external position: the same headline FDI/GDP ratio can describe radically different external positions depending on whether the underlying capital is greenfield industrial investment, brownfield resource acquisition, or short-cycle financial intermediation. This composition is not an attribute of the source country — it is governed by the rules of entry that the host jurisdiction sets: fiscal regimes, sectoral safeguards, performance requirements, and contracting templates.

The structure of Brazil's trade with China amplifies this constraint. As documented in Section 3.1, exports to China are concentrated in three commodities — iron ore, soybeans, and crude petroleum — accounting for roughly 74 % of bilateral exports, while imports are dominated by capital and high-value manufactured goods. This composition aligns the Brazil–China trade relationship precisely along the axis Moreno-Brid (1998) and Dávila-Fernández and Sordi (2019) identify as the most BoP-restrictive: high-elasticity imports financed by low-elasticity, price-volatile exports. The structural constraint, in this reading, is not an attribute of trading with China specifically but of the asymmetric composition of the relationship — a composition that domestic regulatory choices can either compound or unwind.

The instructive observation, however, is not that Brazil is over-exposed to any particular partner. It is that three decades of integration — through commodity booms and busts, through changes in the principal trading partner, through expansions and contractions of FDI — have left the underlying external pattern substantially intact: commodity-anchored exports, manufacturing-heavy imports, and a recurring income deficit driven by profit remittance. The lever capable of altering this pattern is regulatory rather than commercial: it operates on the conditions under which goods and capital enter the country, not on whether they enter at all. The institutional architecture that mediates entry — fiscal regimes, sectoral safeguards, performance requirements, contracting templates — is the subject of the following sections.

# TECHNOLOGICAL EXCHANGE AND INNOVATION

While Brazil–China trade has historically been dominated by commodities, the engagement is visibly diversifying into industrial and technological sectors, with three concurrent developments illustrating the shift. First, BYD's acquisition of the former Ford plant in Camaçari, Bahia, has converted a deindustrialized site into Latin America's largest dedicated electric-vehicle production facility, with locally assembled vehicles entering the market in 2025 and announced initial annual capacity in the order of 150,000 units. Second, Huawei has remained one of the principal equipment suppliers for Brazil's 5G rollout — itself reaching effective coverage of all state capitals during 2024–2025 — making Chinese technology central to the architecture of the country's next-generation telecommunications infrastructure. Third, and most consequentially in institutional terms, the 36 cooperation acts signed during President Lula's state visit to Beijing on 12–13 May 2025 included a Memorandum of Understanding between MDIC and the National Development and Reform Commission on cooperation in Artificial Intelligence and a separate MoU on the joint establishment of a Technology Transfer Centre between MCTI and China's Ministry of Science and Technology, alongside a renewed local-currency swap agreement and a framework agreement aligning the New PAC, Nova Indústria Brasil, and the Belt and Road Initiative (Itamaraty, 2025; Planalto, 2025; Poder360, 2025). These developments unfold within an institutional architecture that, as this section argues, has yet to show its capacity of generating productive spillovers.

The proposition that foreign technology does not automatically generate domestic capability has substantial empirical support. Aitken and Harrison's (1999) study of FDI in Venezuela, Görg and Greenaway's (2004) meta-analysis spanning thirty-seven host countries, and Javorcik's (2004) work on backward linkages converge on a single finding: positive spillovers from foreign investment are conditional on host-country absorptive capacity and on the contractual structure under which the investment enters. Where joint-venture obligations, supplier-development requirements, and skills-formation commitments have been embedded in the entry architecture, productivity spillovers have been substantial; where they have not, the effect on domestic productivity has ranged from weak to ambiguous, with several documented cases of negative spillovers as foreign entrants displaced incumbent domestic firms without compensating capability transfer. The East Asian record reinforces the same point: the technological deepening of South Korea, Taiwan, and Singapore through the 1970s and 1980s rested explicitly on performance requirements imposed by the host state — local-content quotas, export-earning targets, joint-research mandates, and licensing obligations conditioning continued market access (Amsden, 2001; Wade, 1990; Lall, 1992; Chang, 2002; Cimoli, Dosi and Stiglitz, 2009). These are not heterodox prescriptions; they are the documented mechanisms through which late industrialisers converted foreign investment into domestic capability.

Brazil's domestic absorptive capacity is, by these standards, structurally inadequate. R&D expenditure has stagnated at approximately 1.21 % of GDP for over a decade (MCTI,

2024), well below the OECD average of 2.7 %, around half of China's 2.4 %, and roughly a quarter of South Korea's 4.9 %. The composition of this expenditure is also inverse: the public sector contributes close to half of the total, against twenty-five to thirty per cent in advanced innovation systems where business R&D dominates (OECD, 2024). Within the private sector, R&D is concentrated in a small number of firms, and the most recent IBGE Innovation Survey records innovation rates declining over the post-2014 period (IBGE/PINTEC, 2024). As Mazzucato (2013, 2021) argues, in such conditions state capacity is not a substitute for private initiative but its precondition: shaping markets, providing directionality, coordinating absorptive-capacity investment, and conditioning catalytic finance on technological deepening. Brazil's institutional capacity to play this role exists in formal terms — through MCTI, BNDES, FINEP, and EMBRAPII — but is fragmented across mandates, episodically funded, and weakly coordinated with the regulatory frameworks governing foreign engagement (Hiratuka, 2022).

This fragmentation is visible in the design of the actual instruments through which foreign capital has entered Brazilian high-technology sectors. The 5G spectrum auction conducted by ANATEL in November 2021 admitted Huawei on competitive terms across commercial networks without imposing sector-wide local-content, joint-research, or supplier-development obligations on equipment vendors; the only conditioning measure of consequence — restriction of so-called untrusted equipment in federal-government networks — was a national-security provision rather than an industrial-policy instrument (ANATEL, 2021). The Inovar-Auto program (2012–2017), which had attempted explicit local-content and R&D requirements in the automotive sector, was successfully challenged at the World Trade Organization (Brazil — Certain Measures Concerning Taxation and Charges, DS472/DS497, Appellate Body Reports adopted 2019), narrowing the policy space available to Brazilian designers and prompting a redesign in which the binding character of the requirements was softened. The successor instrument — the Mover Program established by Lei 14.902/2024 — conditions tax incentives on firm-determined R&D commitments and a graduated local-content score, but the enforcement architecture is administrative rather than performance-conditioned, and the binding thresholds for local content are markedly less stringent than those of Inovar-Auto. BYD's Camaçari operation falls under this regime: through 2025 the plant was operating largely on the basis of imported components with assembly in Brazil, and the Mover incentive structure does not bind the firm to a deepening localization trajectory until late in the decade. The pattern is general rather than sector-specific. Lei do Bem, Brazil's main R&D tax incentive (Lei 11.196/2005), has been shown to deliver weak additionality, with much of the fiscal benefit accruing to firms whose R&D would have occurred regardless (Kannebley and Porto, 2012; De Negri and Lemos, 2009). Programs targeted at strategic sectors — PADIS for semiconductors, the Lei de Informática for ICT manufacturing — have been repeatedly underfunded and weakened in successive reforms.

This pattern of mechanism-design weakness is evident in the most recent framework. The May 2025 Memoranda of Understanding on Artificial Intelligence cooperation (MDIC–NDRC) and on the joint Technology Transfer Centre (MCTI–MoST) — the two acts

in the 36-act package most directly relevant to this section's concerns — are signed and politically endorsed but, as of early 2026, have not been operationalized: no joint governance body, no published performance metrics, no domestic counterpart institution, and no operational mandate had been disclosed. The Technology Transfer Centre, in particular, has no announced staffing, budget, work program, or sectoral focus. Whatever the merits of these documents in principle, in their current form they are political instruments rather than institutional ones — agreements to cooperate, without the conditioning architecture that converts cooperation into capability transfer. The asymmetry is consequential: Chinese counterparts engage through state-coordinated industrial-policy entities (NDRC, MoST) operating with multi-year planning horizons and enforceable performance metrics, while Brazilian counterparts engage through ministries operating with annual budgets, dispersed mandates, and political-cycle horizons. The engagement architecture is therefore defined predominantly by the Chinese side's institutional templates, with Brazilian institutions in a reactive posture.

What working architectures look like is, by contrast, well documented. The Singapore–Suzhou Industrial Park, established in 1994, embedded technology-transfer obligations and joint-management structures into the entry framework, with productivity-spillover effects measurable two decades later. Vietnam's industrial-park architecture in the 2010s combined Chinese capital with binding supplier-development quotas, vocational-training obligations financed by the investor, and explicit IP-sharing terms; the result was the emergence of a domestic supplier base in electronics that has since expanded into intermediate-technology exports. The South Korean and Taiwanese cases of the 1970s and 1980s, drawing on the same logic but with stronger state direction, were more interventionist still. The common thread across these cases is not the volume of foreign capital admitted but the prior existence of a host-country institutional capability sufficient to negotiate, monitor, and enforce the conditioning instruments. Where this capability is present, Chinese capital — like any other source of capital — generates domestic productivity gains. Where it is absent, the same capital generates enclave operations. The Brazilian institutional capability for this task exists in fragments but has not been organized, funded, or politically backed at the level the task requires.

As in the trade and capital-flow domains examined in the preceding sections, the technology dimension presents an architecture rather than a quantity question. The relevant variable is not whether Chinese firms operate in Brazil — they do, and at increasing scale — but whether the rules of engagement convert presence into absorption: through component-localization requirements, joint-R&D obligations, supplier-development quotas, IP-sharing templates, and skills-formation conditions tied to market access. These are not heterodox or protectionist instruments; they are the standard toolkit of late-industrialiser technology policy, deployed by every East Asian economy that successfully closed the technology gap in the post-war period. Their absence from the current Brazil–China architecture is therefore not a feature of nascency but of design choice — choices narrowed by WTO disciplines but not foreclosed, and entirely reversible within the existing legal envelope.

Brazil–China technological cooperation, in summary, is not nascent. It is structurally under-designed. Three decades of empirical and theoretical work in development economics converge on the proposition that the developmental pay-off from foreign engagement depends overwhelmingly on the institutional architecture under which the engagement occurs — on rules of entry, contracting templates, performance-conditioned incentives, public–private coordination, and absorptive-capacity investment in the host's firms and universities. The current Brazilian framework is deficient on every one of these dimensions, and the deficiency is the result of specific design choices rather than of insufficient time, of partner behavior, or of inherent features of Brazilian institutions.

## BRAZIL AS A MIDDLE POWER

Brazil has long displayed characteristics that align with the profile of an emerging middle power. Its international behavior reveals a consistent emphasis on multilateralism, regional leadership, and strategic autonomy vis-à-vis major powers. Throughout the twentieth and twenty-first centuries, Brazil has constructed a foreign policy narrative centered on non-interventionism, peaceful dispute resolution and institutional reform.

In its relations with superpowers, Brazil has historically pursued a strategy of autonomy and diversification, with few exceptions. During the Cold War, it sought to avoid excessive alignment with either the United States or the Soviet Union. In the post-Cold War era, Brazil has deepened ties with the United States, the European Union, and China, while maintaining a non-aligned posture. Its participation in South–South cooperation fora, particularly through the IBSA Dialogue Forum (India, Brazil, South Africa) and BRICS, reflects this same logic of diversification across rather than within blocs (Nolte, 2010).

Brazil's bilateral relationship with China can be understood within the broader context of Brazil's international strategy as a middle power. The diplomatic recognition of the People's Republic of China by Brazil in 1974 marked a significant geopolitical shift during the Cold War, as Brazil sought to diversify its foreign policy beyond traditional Western alignments.

From 1974 through the late 1990s, the bilateral relationship remained limited in scope: political dialogue was modest, trade volumes were negligible, and institutional arrangements were weak (Pecequilo, 2009). Post–Cold War liberalization and a growing interest in South–South cooperation gradually expanded trade and investment ties, marking the transition from political recognition to pragmatic economic approximation.

The most substantive transformation in the bilateral relationship began in 2002. The creation of the High-Level China–Brazil Commission for Coordination and Cooperation (COSBAN) in 2004 institutionalized the bilateral dialogue, establishing a mechanism to coordinate sectoral cooperation across more than twenty subcommittees. This included areas such as science and technology, agriculture, finance, energy, education, and climate policy. In 2012, Brazil and China elevated their ties to the status of a Global Strategic

Partnership, reinforcing their commitment to mutual coordination in global governance institutions (CEBRI 2020). These developments coincided with China's rise as Brazil's main trade partner—a position it has held since 2009—and a surge in Chinese investment in Brazil's infrastructure, energy, and agribusiness sectors.

The classical category of structural dependency, as theorized by Cardoso and Faletto (1970) or Dos Santos (1978), captures the present configuration only imperfectly. Brazil retains formal policy instruments, diplomatic leverage, and a diversified set of partners—including through what has been described as "coalitions of variable geometry". Yet, as the preceding sections demonstrate, the binding question is not whether such instruments formally exist but how, and how effectively, they have been deployed. The architectural deficiencies identified in trade composition (Section 3.1), investment patterns (Section 3.2), balance-of-payments dynamics (Section 3.3), and technological cooperation (Section 3.4) reflect not partner-imposed constraints but domestic design choices that have left existing mechanisms operating well below their potential as instruments for shaping the terms of bilateral engagement.

Brazil's engagement with China is structured along the same template of formal bilateral dialogue it maintains with other strategic partners—the High-Level Commission (CAN) with Russia since 1997, the Global Partnership Dialogue and the Joint Commission on Science and Technology with the United States, the Strategic Partnership with the European Union since 2007 (with over thirty sectoral dialogues), and analogous mechanisms with India and South Africa. These commissions provide a common architecture for policy alignment, technical cooperation, and conflict management; their developmental yield, however, depends not on the existence of the architecture itself but on the substance of what is brought to it.

Within this framework, COSBAN remains the most consolidated bilateral institutional mechanism Brazil possesses with a major partner. Its scope—more than twenty subcommittees spanning science and technology, agriculture, finance, energy, education, and climate policy—provides precisely the platform on which the architectural choices identified in Sections 3.1 through 3.4 could be operationalized: contracting templates, performance-conditioned incentives, supplier-development requirements, and absorptive-capacity commitments tied to market access. Whether the bilateral relationship converges toward broad-based development or entrenches a low-complexity equilibrium will be determined less by the volume of bilateral flows or by Chinese intentions than by Brazil's willingness to use institutional mechanisms to redesign the terms of engagement along the lines surveyed in the preceding sections.

# The Case of China-Brazil in the Rare Earth Sector

## CONCEPTS: RARE EARTH ELEMENTS, CRITICAL MINERALS, AND STRATEGIC MINERALS

The energy transition, semiconductor manufacturing, and the modernization of defense systems have placed a heterogeneous set of mineral inputs at the center of strategic and economic-policy discussion in major economies. Three terminologies — rare earth elements, critical minerals, and strategic minerals — circulate, often interchangeably, but the distinctions matter for policy design. Rare earth elements (REE) are a chemically defined group of seventeen metals — the lanthanides plus scandium and yttrium — that are not in fact rare in the Earth's crust but rarely occur in concentrated, economically extractable deposits and are technically demanding to separate. The heavy rare earths dysprosium and terbium are particularly strategic as inputs to the high-temperature neodymium-iron-boron (NdFeB) permanent magnets used in electric-motor traction, wind generation, and guided munitions.

Critical minerals, by contrast, is a policy-defined category combining high economic importance with high supply risk. The United States Geological Survey lists fifty minerals as critical (USGS, 2022); the European Union's Critical Raw Materials Act (2024) designates thirty-four, of which seventeen are further classified as strategic. Brazil's National Policy on Critical and Strategic Minerals (Política Nacional de Minerais Críticos e Estratégicos, PNMCE), advancing through Bills 2.780/2024 and 4.443/2025, will establish a domestic list once enacted. Brazil holds globally significant reserves in niobium, rare earth elements, graphite, lithium, nickel, and copper — minerals that appear on every major critical-mineral list — and is therefore directly exposed to the policy logics being assembled abroad.

## GLOBAL CONTEXT: RESERVES, DEMAND, AND STRATEGIC POSITIONING

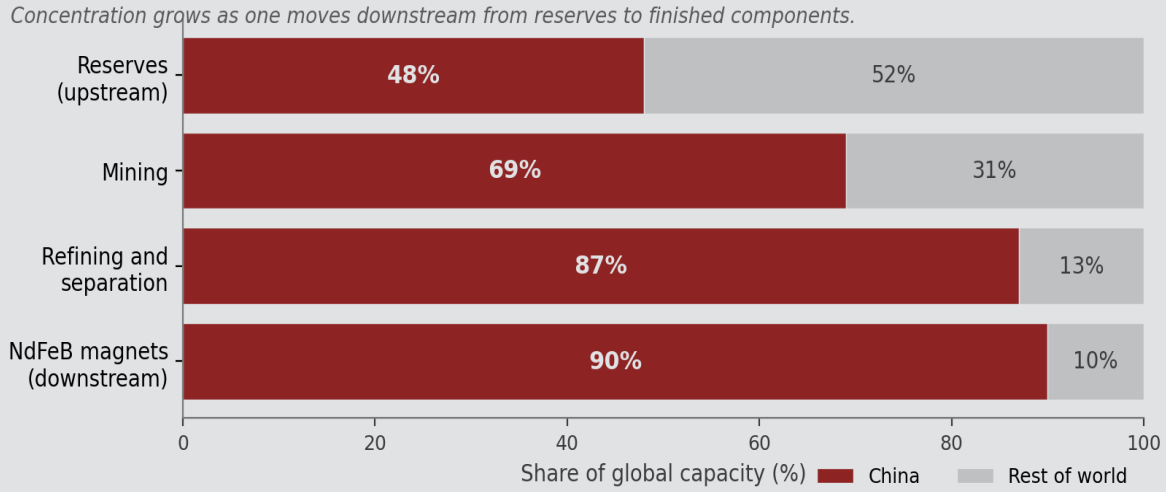
Global reserves of critical minerals are concentrated in a small number of countries. According to the United States Geological Survey (Mineral Commodity Summaries 2026), China holds approximately 44 million tonnes of rare-earth reserves — close to half of the global total of 92 million tonnes — while Brazil holds approximately 21 million tonnes (around 23 percent), the second-largest national position in the world. The Democratic Republic of Congo holds roughly half of identified cobalt reserves; Indonesia and Australia lead in nickel; the lithium triangle of Chile, Argentina, and Australia dominates lithium resources, joined by China and Brazil's Jequitinhonha valley; Brazil holds approximately 26 percent of natural-graphite reserves and accounts for approximately 93 percent of current niobium production. Demand for these inputs is being pulled by the energy

transition, semiconductor manufacturing, and defense applications, with the International Energy Agency projecting that demand for several of these minerals will multiply by factors of two to five through 2040 (IEA Global Critical Minerals Outlook 2025, Stated Policies Scenario).

## CHINA'S POSITION: CONCENTRATION ACROSS THE MINERAL VALUE CHAIN

The most consequential feature of the current global market is not the distribution of reserves but the concentration of midstream and downstream capacity. China's share rises sharply as you move downstream along the value chain[6] (Figure 14 - China's share across the rare earth value chain). At the upstream stage, China holds approximately 48 percent of identified rare-earth reserves and produces approximately 69 percent of mined output (USGS 2026; IEA 2025); Brazilian reserves are the second-largest in the world, even though Brazilian production remains negligible relative to its endowment. At the midstream stage, approximately 85 to 90 percent of global rare-earth separation capacity is located in China, with comparable patterns in lithium-chemical refining (about 65 percent), cobalt refining (about 75 percent), and battery-grade graphite processing (about 70 percent). At the downstream stage, China produces an estimated 90 percent of the world's high-performance NdFeB permanent magnets and approximately 75 percent of global lithium-ion battery cells. For a country with substantial reserves but limited refining and component-manufacturing capacity, the binding constraint is therefore not access to ore but access to processing.

FIGURE 14 - CHINA'S SHARE ACROSS THE RARE EARTH VALUE CHAIN




Source: author elaboration with information from: Reserves —USGS Mineral Commodity Summaries 2026, Rare Earths chapter, released February 2026; Mining —IEA Global Critical Minerals Outlook 2025 (released May 2025); Refining and separation —IEA Global Critical Minerals Outlook 2025; NdFeB permanent magnets —IEA's Regional composition of rare earths and permanent magnet production, 2024 chart.

6 Reserve, production, and value-chain figures cited here reflect USGS Mineral Commodity Summaries 2026 (released February 2026) and the IEA Global Critical Minerals Outlook 2025 (released May 2025). Magnet-share estimates vary across sources (USGS-cited 60–70 percent of total NdFeB output; IDTechEx and IEA approximately 90 percent of high-performance NdFeB capacity); the figure adopted here is the high-performance segment, the strategically relevant one. The China export-control sequence and the Goiás MoU dates should be re-verified immediately before publication, as these dossiers are moving.

China's recent use of export controls reinforces the strategic importance of midstream concentration. Beginning in July 2023 with licensing requirements on gallium and germanium, the Ministry of Commerce has progressively extended controls to graphite (October 2023), antimony (August 2024), a December 2024 dual-use export ban directed at the United States, and tungsten and several other elements (February 2025). Rare-earth controls were tightened in April 2025 on alloys, oxides, and compounds; an October 2025 expansion to additional heavy rare earths was suspended for one year in November 2025, while the April controls remain in effect with general export licenses being issued to selected exporters. The technical specificity of these instruments — applied at the level of compounds, alloys, and processed forms rather than raw metal — signals an explicit recognition that the leverage lies in midstream value-chain control rather than in the underlying resource.

A number of multilateral and bilateral arrangements have been developed in this domain by other jurisdictions: the Mineral Security Partnership (2022), bilateral Critical Minerals Agreements signed by the United States with various partners, Strategic Partnerships established by the European Union with third countries under the Critical Raw Materials Act (2024), and bilateral arrangements led by Japan and Korea. Brazilian government-to-government engagements in this area include the 2025 Brazil–China Plan of Action for Sustainable Mining Cooperation, signed by the MME and the National Development and Reform Commission on 13 May 2025; a non-binding Memorandum of Understanding with India on critical minerals and rare earths, signed on 21 February 2026; a joint declaration of intent on research and innovation in critical minerals between the MCTI and Germany's Bundesministerium für Forschung, Technologie und Raumfahrt (BMFTR), signed on 20 April 2026; and an emerging Brazil–European Union task force on critical raw materials announced at Hannover Messe 2026.

# BRAZIL: RESERVES, INSTITUTIONAL ARCHITECTURE, AND BINDING CONSTRAINTS

## RESERVES AND TERRITORIAL DISTRIBUTION

As established in Section 4.2, Brazil holds approximately 23 percent of identified rare-earth reserves — at roughly 21 million tons, the second-largest national position globally — together with approximately 26 percent of natural-graphite reserves, approximately 93 percent of current niobium production, and significant endowments in nickel, copper, lithium, and tin (USGS Mineral Commodity Summaries 2026). The reserves are geographically concentrated in a small number of states, principally Minas Gerais, Goiás, Bahia, Pará, and Amazonas. Production capacity has been only partially developed, and the ownership of operating assets has shifted significantly in recent years. CBMM's Araxá niobium operation in Minas Gerais and CMOC's Niobrás operation in Goiás — acquired from Anglo American in 2016 — account jointly for the bulk of global niobium output. The Pitinga tin-niobium-tantalum-REE complex in Amazonas, formerly held by Peru's

Minsur, was acquired by China Nonferrous (CNT) in November 2024 for approximately US$340 million. Heavy rare earths from ionic clays are produced at the Pela Ema mine and processing plant in Minaçu, Goiás, operated by Serra Verde Group—the only large-scale producer outside Asia of all four magnetic rare earths (neodymium, praseodymium, dysprosium, and terbium).

Following a US$465 million U.S. International Development Finance Corporation loan approved in November 2025, on 20 April 2026 Serra Verde was the subject of a definitive agreement to be acquired by USA Rare Earth Inc. (Nasdaq: USAR) for approximately US$2.8 billion (US$300 million in cash plus 126.849 million USAR shares), with closing expected in the third quarter of 2026 subject to regulatory approvals and including a 15-year offtake agreement covering 100 percent of phase-I production through a U.S.-government-backed special-purpose vehicle. The transaction has triggered immediate institutional contestation.

Together with the MMG–Anglo American nickel transaction discussed below, the Serra Verde case illustrates the institutional gap analyzed in Section 4.3.2: in the absence of a formal screening regime calibrated for strategic-mineral assets, scrutiny is being attempted through ad-hoc constitutional litigation. The Anglo American Brazilian nickel portfolio (Barro Alto and adjacent operations in Goiás and Mato Grosso) is currently the subject of a pending US$500 million sale to MMG Singapore, a subsidiary of China Minmetals, discussed below. Several reserves sit within or near the border zone (faixa de fronteira), Indigenous lands, or environmentally sensitive areas, invoking specific federal restrictions.

## INSTITUTIONAL ARCHITECTURE

The Brazilian framework for mineral exploitation rests on Article 176 of the 1988 Constitution—establishing mineral resources as Union property—and on the Mining Code (Código de Mineração, Decree-Law 227/1967), which sets out three regimes: authorization for prospecting, concession for mining proper, and licensing for limited categories. The National Mining Agency (Agência Nacional de Mineração, ANM), established in 2017, regulates concessions and collects the Financial Compensation for the Exploitation of Mineral Resources (Compensação Financeira pela Exploração de Recursos Minerais, CFEM) at 3 percent of net revenue for most critical minerals. Foreign ownership in the border zone and in rural areas more broadly is subject to Law 5,709/1971, administered by the National Institute of Colonization and Agrarian Reform (Instituto Nacional de Colonização e Reforma Agrária, INCRA); environmental licensing is divided between the Brazilian Institute of Environment and Renewable Natural Resources (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis, IBAMA) and state environmental agencies; merger and acquisition review is conducted by the Administrative Council for Economic Defense (Conselho Administrativo de Defesa Econômica, CADE) under Law 12,529/2011.

A new layer of architecture specific to critical minerals is currently being assembled but is incomplete. The National Policy on Critical and Strategic Minerals (PNMCE) has not been enacted: Bill 2.780/2024 awaits a floor vote in the Chamber of Deputies (Câmara dos Deputados), and Bill 4.443/2025 cleared the Senate's Committee on Economic Affairs (Comissão de Assuntos Econômicos, CAE) on 9 December 2025. The National Mining Policy Council (Conselho Nacional de Política Mineral, CNPM) was installed on 16 October 2025; its working group on critical minerals (CNPM Resolution No. 3/2025) has not yet delivered a national strategy. The Technical Committee for Mining Policy Support (Comitê Técnico de Apoio à Política Mineral, CTAPME), in force since Decree 10,657/2021, maintains the operative critical-minerals list under CTAPME Resolution No. 2/2021, with an energy-transition sub-list in MME Ordinance No. 120/2025.

What is conspicuously absent from this architecture is any foreign-investment screening regime specifically for critical-mineral acquisitions. Brazil has no analogue of Australia's Foreign Investment Review Board, the U.S. Committee on Foreign Investment in the United States, or Canada's Investment Canada Act critical-minerals policy. CADE's merger review is competition-based; INCRA's Law 5,709 review is land-tenure based. The MMG–Anglo American Brazilian nickel acquisition (US$500 million, currently pending review at CADE, INCRA, and the European Commission's Phase II merger review) illustrates the institutional gap: the bodies engaged are doing competition, land, and foreign-merger work, but no Brazilian institution is reviewing the transaction on strategic-asset grounds.

## BINDING CONSTRAINTS ON CONVERSION

Brazilian conversion of endowment into capability faces four binding constraints. The first is technology: Brazil has no commercial-scale rare-earth separation capacity and limited refining capacity for lithium chemicals, battery-grade graphite, and NdFeB-grade rare-earth oxides. The Mineral Technology Center (Centro de Tecnologia Mineral, CETEM) and the Brazilian Geological Survey (Serviço Geológico do Brasil, SGB-CPRM) conduct relevant research and mapping but do not operate industrial-scale processing facilities. The second is capital: midstream investment requires patient long-cycle financing that Brazilian capital markets have not historically supplied at scale, and Chinese foreign direct investment in Brazilian mining and adjacent sectors reached approximately US$4.18 billion in 2024 (CEBC 2024), directed predominantly at acquisitions of going-concern operating assets rather than greenfield processing capacity. The third, and the constraint that organizes the others, is the regulatory architecture itself: the absence of a critical-minerals screening regime, a CFEM rate that does not recoup commodity-cycle rents, the lack of contract-transparency requirements in mining concessions, and weak ANM enforcement capacity together produce an environment in which foreign capital can acquire upstream assets without commitments to downstream investment.

# FOREIGN CAPITAL, REGULATORY REGIMES, AND MINERAL OUTCOMES: EVIDENCE

This subsection consolidates the international and quasi-experimental evidence base on foreign mineral capital, regulatory regimes, and host-country outcomes. The literature is organized around five diagnostic questions, each addressed in peer-reviewed empirical research, structured comparative case studies, or rigorous quasi-experimental work. The synthesis supports a single overarching claim: variation in outcomes from foreign mineral capital — Chinese or otherwise — is better explained by host-country regulatory regime and institutional quality than by capital nationality.

| Diagnostic question | Evidence and sources | Implication |
|---|---|---|
| **1. Does investor nationality (Chinese vs. Western) explain divergent outcomes from foreign mineral capital?** | No. The same firm — CMOC — operates without comparable controversy at Niobrás and Copebrás (Goiás, approximately 5,000 employees, record 2024 niobium production) but faced a US$7.6 billion under-reporting claim and an approximately US$800 million settlement at Tenke Fungurume (Democratic Republic of Congo). Within the DRC, Glencore-KCC, Sicomines, and CMOC all faced the same Gécamines renegotiation campaign; within Indonesia, Tsingshan and Indonesian-owned smelter partners share the same labor regime. Chile's FNE imposed eleven behavioral remedies on Tianqi-SQM (2018–2025, closed in April 2025 with no breach); Australia (FIRB, multiple disposal orders in 2024) and Canada (Investment Canada Act, October 2022 critical-minerals policy) channel Chinese capital into governance-compatible structures.<br>***Sources:*** *USGS Mineral Commodity Summaries 2026; ANM; FNE Acuerdo Extrajudicial 2018; Andrelli et al. 2025 (OECD Trade Policy Paper).* | Within-firm variation across regimes exceeds cross-national variation within regimes. The investor-identity frame is empirically weaker than the host-regime frame. |
| **2. Do mandatory processing or local-content requirements produce host-country industrial emergence?** | Partially, and only on the narrow metric of facility investment. Indonesia's nickel-ore export ban (2014, fully reimposed in 2020) increased the smelter count from 2 to 43 and nickel-related exports from US$6 billion in 2013 to approximately US$30 billion in 2022, but Indonesian firms hold only 10–13 percent of refining capacity, with Chinese capital holding 65–75 percent. Independent assessments find no measurable manufacturing value-added or GDP effect. South Africa's Mining Charter and the DRC's 2018 Mining Code generate rents without downstream emergence. Brazil's pré-sal local-content rule of at least 65 percent reduced project IRR by 3–5 percentage points without producing durable supplier upgrading; Sete Brasil entered judicial recovery in April 2016 and bankruptcy in December 2024.<br>***Sources:*** *Andrelli et al. 2025; Delgado, Febraro, and Roitman 2017 (Offshore Technology Conference); Kasahara and Botelho 2019 (Comparative Politics).* | Smelter investment is not host-country industrialization. Mandatory percentage scoring at auction underperforms contractual obligations with productivity benchmarks. |
| **3. Do contractual rent-capture instruments outperform auction-scoring designs?** | Yes. Chile's 2018 CORFO renegotiation — sliding-scale royalty of 6.8 to 40 percent of LCE price, R&D minima, and indigenous-community contributions — yielded US$3.07 billion from SQM in 2022 alone. Australia's Minerals Resource Rent Tax (in force from 2012, repealed in 2014) collected approximately A$340 million against an A$22.5 billion projection — under 2 percent of forecast — illustrating how concentrated rent-bearers can politically destroy theoretically sound rent taxes (Freebairn 2015). The international research consensus has shifted from auction-mechanism design toward contract-and-administration design.<br>***Sources:*** *CORFO public records; SQM SEC Form 6-K April 2018; Albemarle disclosures; IGF Mining Policy Framework 2023; IGF/OECD Ring-Fencing Toolkit 2025; CCSI 2026.* | Sliding-scale royalties, ring-fencing, contract transparency, and tranched performance bonds have stronger evidence than mandatory percentage scoring at auction. |

| Diagnostic question | Evidence and sources | Implication |
|---|---|---|
| **4. Is the CBMM niobium retention model a replicable template for other Brazilian critical minerals?** | No. CBMM's outcomes are explained primarily by world-class Araxá pyrochlore geology, an approximately 80 percent global market share that confers pricing power, and patient family-capital governance — not by auction or concession architecture. The 30 percent foreign consortium stake's reported lack of board representation rests on incomplete public disclosure. CMOC's Niobrás operation shows comparable operational performance under foreign control, with record 2024 production of 104,000 tonnes of niobium and approximately 5,000 employees. Brazilian public rent capture via CFEM at 3 percent of net revenue sits below the IGF benchmark range of 40–60 percent average effective tax rate.<br>***Sources:*** *USGS Mineral Commodity Summaries 2026; ANM; IGF Mining Policy Framework 2023.* | The CBMM model is non-generalizable absent unique conditions. The actionable pathway for Brazilian critical minerals is administrative reform — sliding-scale royalties, contract transparency, and work-program enforcement — rather than the pursuit of further national champions. |
| **5. What do rigorous quasi-experimental studies say about the Brazilian channel from mineral rents to welfare?** | Domestic political and regulatory institutions are the binding constraint. Caselli and Michaels (2013) exploit the offshore-oil royalty natural experiment to show that windfalls in Brazilian municipalities with weaker accountability translate into rent-seeking and political capture rather than public goods. Brollo, Nannicini, Perotti and Tabellini (2013), using FPM regression discontinuity, find that intergovernmental transfer windfalls increase corruption and reduce challenger entry where political-accountability institutions are weak.<br>***Sources:*** *Caselli and Michaels 2013 (American Economic Journal: Applied Economics 5(1)); Brollo, Nannicini, Perotti and Tabellini 2013 (American Economic Review 103(5)).* | Domestic regulatory and political architecture — not investor identity — is the binding constraint converting Brazilian mineral rents into welfare. |

Source: author elaboration base on specified studies.

Read together, the evidence assembled above supports a clear claim: variation in outcomes from foreign mineral capital is better explained by host-country regulatory regime and institutional quality than by investor nationality. The corollary is that the absence of a coherent Brazilian regulatory architecture is itself a strategic risk. As of April 2026[7], the National Policy on Critical and Strategic Minerals (PNMCE) has not been enacted: Bill 2.780/2024 awaits a Câmara floor vote, and Bill 4.443/2025 cleared the Senate's Committee on Economic Affairs (CAE) on 9 December 2025. The Conselho Nacional de Política Mineral (CNPM) was installed only on 16 October 2025, and its working group on critical minerals — constituted under CNPM Resolution 3/2025 — has not yet delivered a national strategy. Brazil has no FIRB- or CFIUS-style screening regime for foreign acquisitions in critical-mineral sectors; the CFEM remains at 3 percent of net revenue and does not recoup commodity-cycle rents.

7 Legislative and deal status reflects information available as of April 2026. The PL 2.780/2024 Câmara floor schedule, the PL 4.443/2025 substitutivo final text, and the CADE/EU/INCRA outcomes for the MMG–Anglo nickel acquisition should be re-verified immediately before publication, as these dossiers are moving.

## REGULATORY DESIGN AS THE BINDING CONSTRAINT

The evidence assembled in this section[8] supports a single overarching claim: variation in outcomes from foreign mineral capital — Chinese or otherwise — is better explained by host-country regulatory regime and institutional quality than by investor nationality. Within-firm variation across regimes, within-country convergence across investor nationalities, and rigorous quasi-experimental evidence on the Brazilian channel from rents to welfare converge on the same conclusion: the binding constraint is domestic regulatory design.

The analytical implication for Brazilian critical-mineral policy is that the right object of policy attention is not the nationality of the investor but the architecture of the framework that governs all investors. The institutional vacuum documented in Section 4.3 — no foreign-investment screening regime, a CFEM rate that does not recoup commodity--cycle rents, no contract-transparency requirements in mining concessions, and weak enforcement capacity at the Agência Nacional de Mineração — is itself the strategic risk. Rising Chinese investment in Brazilian mining is being absorbed by an institutional environment that was not designed to convert upstream concession into downstream capability, and the prospective MMG–Anglo American Brazilian nickel acquisition is the highest-stakes regulatory test case currently in train. The policy recommendations that follow concentrate, by the logic of the evidence, on closing the regulatory-design gap rather than on capital-nationality discrimination.

# Synthesis of Findings and Identification of Risks

This section consolidates the main empirical and theoretical findings presented in the previous chapters, drawing together insights from Brazil's trade dynamics, investment patterns, technological engagement, and diplomatic positioning vis-à-vis China. While the Brazil–China engagement has deepened over the past two decades—spanning infrastructure, commodity flows, and digital connectivity—this relationship remains asymmetrically structured and sectorally concentrated. The evidence reveals persistent patterns of primary export dependence, limited value-added spillovers, and macro-financial vulnerabilities that pose constraints to Brazil's long-term growth trajectory. At the same time, recent shifts—such as green industrial investments and digital integration—suggest potential for higher value-added forms of engagement. The evidence specific to

8 Some points of the empirical claims that support this synthesis rest on incompletely audited public information. The CBMM consortium's reported lack of foreign-board representation rests on FinanceAsia (2011) reporting that no information could be ascertained on the matter, and the company's average effective tax rate is an informed estimate rather than an audited disclosure. The Corex US$900 million counter-bid in the MMG–Anglo American Brazilian nickel acquisition is sourced from an adversarial filing in the CADE proceedings and has not been independently corroborated.

critical and strategic minerals, developed in Section 4, intensifies several of these patterns and surfaces a particular regulatory-design challenge that this synthesis incorporates.

## KEY STRUCTURAL PATTERNS IDENTIFIED

The preceding analysis of trade flows, investment dynamics, and technological exchange between Brazil and China reveals several persistent structural patterns that shape the contours of their bilateral engagement. These patterns are consistent across economic dimensions and carry significant implications for Brazil's long-term growth trajectory.

**First, Brazil's export profile remains concentrated in primary commodities, notably soybeans, iron ore, and crude petroleum.** Despite the scale of trade expansion—driven in large part by Chinese demand—this pattern reflects a path-dependent specialization that reinforces Brazil's historical role as a provider of low value-added goods. As demonstrated in Section 3.1 and supported by CGE simulations (Delgertsetseg, 2019), the surge in commodity exports to China has induced a reallocation of capital and labor toward extractive sectors at the expense of manufacturing, aligning with classical Dutch Disease dynamics (Corden & Neary, 1982). This shift limits productivity gains and deepens exposure to terms-of-trade cycles.

**Second, Brazil's services trade with China remains marginal.** Brazil's exports to China are dominated by traditional sectors, while knowledge-intensive services—such as IT, finance, or professional consulting—are virtually absent. This absence indicates a low level of integration into high-complexity global value chains and limits the potential for diversification through services, which increasingly drive growth in advanced and emerging economies alike.

**Third, the composition of Chinese foreign direct investment (FDI) in Brazil is heavily skewed toward brownfield acquisitions in energy and extractives.** More than 80% of total Chinese investment—estimated at over US$ 80 billion—is concentrated in these sectors (Section 3.2, Figure 9). This reinforces commodity dependence and does little to expand Brazil's productive frontier. Although there are emerging investments in digital infrastructure and green mobility, such as Huawei's 5G deployment and BYD's EV plant, these remain isolated cases rather than evidence of a structural shift. This pattern intensifies in critical-minerals sectors, where recent acquisitions — including the China Nonferrous Pitinga acquisition (November 2024) and the pending MMG–Anglo American Brazilian nickel acquisition (announced February 2025) — concentrate upstream control without commensurate downstream commitments (Section 4).

**Fourth, technological spillovers from Chinese investment are limited.** As discussed in Section 3.3, the absence of contractual requirements for R&D collaboration or workforce development weakens the potential for Brazil to absorb and adapt foreign technologies. Empirical studies (Hiratuka, 2022; Peterson Institute, 2022) show that despite the physical presence of Chinese firms in high-tech sectors, their operations are rarely embedded in local innovation ecosystems, resulting in minimal knowledge transfer. Section 4's evidence indicates that the binding constraint is regulatory architecture rather than

investor nationality, with outcomes depending on whether the institutional framework establishes enforceable mechanisms for technology transfer and supplier development.

**Sixth, the asymmetry intensifies in critical-mineral sectors specifically.** Brazil holds the second-largest global rare-earth reserve position (approximately 23 percent of identified reserves), substantial graphite and niobium endowments, and meaningful nickel, copper, and lithium reserves, but Brazilian production and especially midstream conversion remain limited relative to the endowment. As Section 4 establishes, the binding constraint is not the resource itself but the regulatory architecture governing foreign capital — an institutional vacuum that includes the absence of a foreign-investment screening regime for critical minerals, a CFEM rate that does not recoup commodity-cycle rents, and the lack of contract-transparency requirements in mining concessions. The pending MMG–Anglo American Brazilian nickel acquisition is the most consequential current test of this institutional architecture.

**Lastly, the overall bilateral dynamic remains asymmetrical.** While China continues to diversify its sources of raw materials and expand its industrial and technological presence abroad, Brazil faces the challenge of deepening its position in global value chains and avoiding a pattern of specialization limited to low-value-added sectors. The structure of bilateral trade and investments shows that Brazil exports unprocessed inputs and imports high value manufactures and digital technologies. This configuration limits Brazil's capacity for structural transformation unless proactively counterbalanced by targeted domestic policies for trade and innovation.

**These patterns reveal a deepening interdependence that, while economically significant, may not inherently promote diversification, complexity, or resilience**. They highlight the need for policy coordination to ensure that the regulatory architecture for foreign engagement, alongside engagement with China, supports Brazil's national development objectives, rather than reproducing historic constraints under new geopolitical conditions.

# RISKS IDENTIFICATION

Building on the structural patterns identified in the preceding sections, Brazil's economic engagement with China presents a series of interrelated risks that span trade, investment, macroeconomic management, and technological development. These risks do not imply an inevitability of dependency but highlight key vulnerabilities that could undermine Brazil's long-term development ambitions if left unaddressed.

### 1. Furthering of Trade Concentration and External Constraints on Growth

Brazil's heavy reliance on a narrow set of commodity exports overall, strengthened by China's presence—principally with soybeans, iron ore, and crude oil—exposes the country to external demand shocks and volatile terms of trade. This over-specialization can crowd out more dynamic sectors, reduce export sophistication, and intensify Brazil's balance-of-payments (BoP) constraint. The combination of high import income elasticity

and concentrated exports limits Brazil's sustainable growth rate, particularly in the absence of structural upgrading or diversification.

### 2. FDI Misalignment with Productive Upgrading

Chinese FDI remains concentrated in brownfield acquisitions and resource-intensive sectors, with minimal backward linkages to domestic supply chains. While infrastructure and energy investments fill critical gaps, they may reinforce Brazil's specialization in low-complexity activities. Without a well-structured regulatory environment to foster technology transfer, enhance domestic value added, or R&D collaboration, these flows risk reproducing enclave-type dynamics typical of earlier resource extraction models. The CGE-based evidence suggests that such sectoral FDI patterns constrain reindustrialization and learning effects—undermining Brazil's capacity to leverage foreign capital for innovation-led growth. As Section 4 develops, the binding constraint on conversion of foreign investment into domestic capability is regulatory architecture — specifically, the absence of foreign-investment screening, calibrated rent capture, and contract-transparency requirements — rather than the nationality of the investor

### 3. Technological Lock-In and Limited Spillovers

Foreign investment in high-complexity sectors, in the absence of enforceable mechanisms for technology transfer, workforce development, or component localization, has not delivered systemic gains in Brazil's domestic innovation capacity. The pattern is visible in Chinese investment in telecommunications (Huawei) and electric mobility (BYD) but is not specific to it. Brazil risks lock-in to lower-value segments of global value chains — importing innovation rather than generating it — unless the institutional framework establishes enforceable contractual conditions for industrial deepening.

### 4. Macroeconomic Vulnerabilities and External Exposure

Brazil's growing dependence on commodity exports to finance capital and intermediate goods imports reinforces classic BoP vulnerabilities. Although the country currently maintains a trade surplus with China, the quality and volatility of that surplus—driven by primary goods—create cyclical instability. Furthermore, increasing bilateral settlements in RMB may reduce Brazil's reliance on the U.S. dollar, supporting diversification of external financing channels. However, it also introduces new currency exposure and operational complexities, particularly as the internationalization of the renminbi remains limited and subject to capital controls. While Brazil's macroprudential framework is relatively robust, increased oversight may be necessary to manage potential mismatches and ensure alignment with broader financial stability objectives.

### 5. Erosion of Autonomy in International Engagements

Asymmetries in the bilateral economic relationship with China—particularly in trade and foreign direct investment (FDI) flows—can undermine Brazil's bargaining capacity with the Chinese government in the medium and long-term. If not properly managed, Brazil's growing reliance on China as a leading trade partner and investor may limit its ability to advance its development agenda. Brazil has positioned its relationship with China

as a counterbalance to established partners such as the United States and the European Union. This strategy remains relevant but requires ongoing adjustment in response to shifting global economic conditions. Institutional mechanisms, including COSBAN, play an important role in addressing these asymmetries by offering structured platforms to ensure reciprocity, support informed decision-making, and safeguard Brazil's normative and reform-oriented engagement in international affairs. In the critical-minerals domain specifically, the 2025 Brazil–China Plan of Action for Sustainable Mining Cooperation, signed on 13 May 2025, is currently the only government-to-government framework Brazil has signed in this area. Other multilateral and bilateral arrangements active in the field — the Mineral Security Partnership, bilateral Critical Minerals Agreements signed by the United States with various partners, and Strategic Partnerships established by the European Union with third countries under the Critical Raw Materials Act — have been concluded among other groups of participating countries.

**These risks do not imply a predetermined trajectory of dependency.** However, they underscore the importance of aligning economic engagement for financial transparency, regulatory architecture for foreign capital, technological upgrading, and macroeconomic management. Failure to address these vulnerabilities may entrench a growth model marked by external fragility, technological subordination, and limited structural transformation.

# Policy Implications and Recommendations

The synthesis of the evidence on trade, investment, and technological dynamics between Brazil and China reveals a deepening economic relationship that, while offering opportunities, also reproduces vulnerabilities associated with externally driven growth based on low-complexity exports. To transform this bilateral engagement into a foundation for long-term development, Brazil should adopt a forward-looking policy stance anchored in structural transformation, institutional coherence, regulatory architecture for foreign capital, and international diversification.

### 1. Promote Diversification in Trade and Investment

Brazil should shift from a commodity-dependent export profile toward a more complex and resilient trade structure. This requires an assertive policy stance to strengthen sectors with higher productivity potential—such as agro-industrial chains, specialized manufacturing, and technology-intensive services—and to better integrate these into global value chains. Trade policy should prioritize products with higher income elasticity and technological spillovers, leveraging targeted export promotion, regulatory streamlining, and trade facilitation for value-added sectors.

Green and brownfield investments should better align foreign capital with long-term domestic priorities (such as growth and inequality reduction). Rather than imposing rigid

requirements, regulatory frameworks can be enhanced to encourage voluntary domestic value addition, supplier development, and workforce training. This can be achieved through institutional mechanisms such as streamlined regulatory approvals, reviewed eligibility criteria for fiscal incentives linked to innovation and technology transfer, and structured public–private financing platforms. Blended finance instruments—such as guarantees, first-loss provisions, or concessional tranches—can be deployed to catalyze private investment in sectors with high spillover potential. Public financial institutions can help reinforce these efforts by acting as anchor investors, thereby strengthening the investment environment without increasing fiscal burdens. Such measures aim to create clear, predictable rules that reward alignment with national priorities while preserving investor confidence and market efficiency.

Modernizing Brazil's trade and investment agreements, particularly with large partners, should also include instruments for intellectual property sharing, dispute prevention, and value-chain integration, balancing market access with domestic value capture. A granular industrial policy—focused not on sector-picking but on addressing coordination failures and scaling innovation ecosystems— is critical to sustain these transitions.

### 2. Enhance Governance of External Financing and FDI

Brazil's growing reliance on tied loans, concessional instruments, and state-to-state financing arrangements calls for the institutional upgrading of its external financing governance. Rather than blanket restrictions, the emphasis should be on enhancing transparency, ensuring contract quality, and reinforcing oversight mechanisms. Key steps include:

- Standardizing debt transparency through full integration of contingent liabilities, subnational guarantees, and off-budget operations into fiscal risk assessments, consistent with global best practices in debt management.
- Embedding competitive safeguards in procurement for foreign-financed infrastructure projects, ensuring a level playing field for domestic firms and preventing cost inflation or rent extraction through opaque contracting.
- Institutionalizing parliamentary and audit oversight for complex FDI arrangements—especially in sectors involving natural monopolies—ensuring ex-ante scrutiny and clear benchmarks for performance.
- Limiting fiscal risks from export credit and blended finance instruments by applying economic additionality criteria and requiring co-financing from credible domestic or multilateral sources.

### 3. Build Critical-Minerals Regulatory Architecture

Brazil's position as a major holder of critical-mineral reserves — second globally in rare-earth reserves and significant in graphite, niobium, lithium, nickel, and copper — is not currently matched by an institutional architecture calibrated to convert upstream concession into domestic value capture and capability. As Section 4 establishes, the bin-

ding constraint is regulatory design rather than investor nationality. The following instruments would close the principal gaps in the current architecture, are independently grounded in the comparative evidence reviewed in Section 4.4, and are within the institutional capacity of the Agência Nacional de Mineração, the Conselho Administrativo de Defesa Econômica, BNDES, and the Serviço Geológico do Brasil:

- Establish a sectorally-targeted foreign-investment screening regime for critical-mineral acquisitions, modeled on the Chilean Fiscalía Nacional Económica's behavioral-remedies approach (Tianqi-SQM, 2018-2025) rather than the Australian Foreign Investment Review Board block-or-approve binary. The list of covered minerals can be aligned with Resolução CTAPME nº 2/2021 and Portaria MME nº 120/2025.
- Calibrate a sliding-scale royalty regime against international benchmarks (the IGF average effective tax rate range of 40 to 60 percent), modeled on the Chilean CORFO sliding-scale royalty applied to lithium (6.8 to 40 percent of LCE price), to capture commodity-cycle rents that the current 3 percent CFEM does not recoup.
- Introduce contract-transparency requirements for mining concessions in critical-mineral sectors, with time-limited confidentiality, modeled on the open-contracting standards established in Brazilian oil and gas concessions and the international consensus reflected in the IGF Mining Policy Framework 2023.
- Replace the current open-ended exploration-permit system with work-program performance bonds released in tranches against milestone achievement, with clawback provisions for unmet commitments — addressing the speculative-tenement-holding pattern that affects approximately 70,000 mining titles under the current ANM regime.
- Establish a critical-infrastructure call-in mechanism for transmission and other essential infrastructure with foreign-state-controlled ownership above defined thresholds, possibly using elements from the United Kingdom National Security and Investment Act and the German Außenwirtschaftsgesetz. This addresses the State Grid concentration of approximately 10 to 13 percent of the Brazilian transmission system documented in Section 3.3.
- Deploy targeted public-equity participation through BNDES in strategic ventures, structured as passive financial instrument rather than operational control to capture commodity-cycle rents without operational interference in commercial decision-making.

The architecture above should apply to all foreign investors, not capital-nationality discrimination. Its cumulative effect is to convert Brazil's substantial reserve position into bargaining leverage capable of attracting downstream investment commitments, technology transfer, and processing-capacity localization — from China, the United States, the European Union, Japan, Korea, or any other source of capital.

### 4. Consolidate and upgrade bilateral institutional frameworks

Brazil's engagement with China must remain embedded in a broader diplomatic architecture that reinforces its strategic autonomy and mitigates the risks of power asymmetries. To that end, Brazil should:

- Consolidate and upgrade bilateral institutional frameworks as a way to address emerging asymmetries, ensure reciprocity in sectoral cooperation, and create binding commitments in sensitive areas such as technology, environmental safeguards, and industrial policy. These platforms are critical to shaping a rules-based and development-oriented bilateral agenda.
- Actively deepen political and economic ties with other middle powers and regional blocs to avoid excessive exposure to a single partner.
- Continue to utilize its structured partnership with China as a platform to advocate for the reform of global governance institutions.
- Strengthen federal-subnational coordination on foreign-engagement policy in mineral-rich states, ensuring that subnational memoranda and cooperation agreements with foreign governments and state-owned enterprises are calibrated to national strategic positioning rather than negotiated in isolation.

# Conclusion

Brazil's economic engagement with China has deepened over the past two decades, contributing to the country's trade structure, investment patterns, and international positioning. This partnership has yielded tangible benefits—boosting exports, attracting capital, and expanding infrastructure—but it has also reinforced structural vulnerabilities that operate through three distinct channels: a trade composition skewed toward low-complexity exports, import competition pressing on Brazilian manufacturing (Paz, 2016; Willenbockel, 2007), and foreign investment that, absent conditioning architecture, displaces incumbent domestic firms and supply chains without compensating capability transfer (Aitken and Harrison, 1999; Javorcik, 2004). The first channel fits the balance-of-payments-constrained growth framework (Thirlwall, 1979): the 2025 closing — a current-account deficit of 2.93 percent of GDP and a primary-income deficit of USD 81.3 billion that is now the binding component of the external deficit (Banco Central do Brasil, 2026) — is the long-run footprint of FDI composition decisions taken at entry.

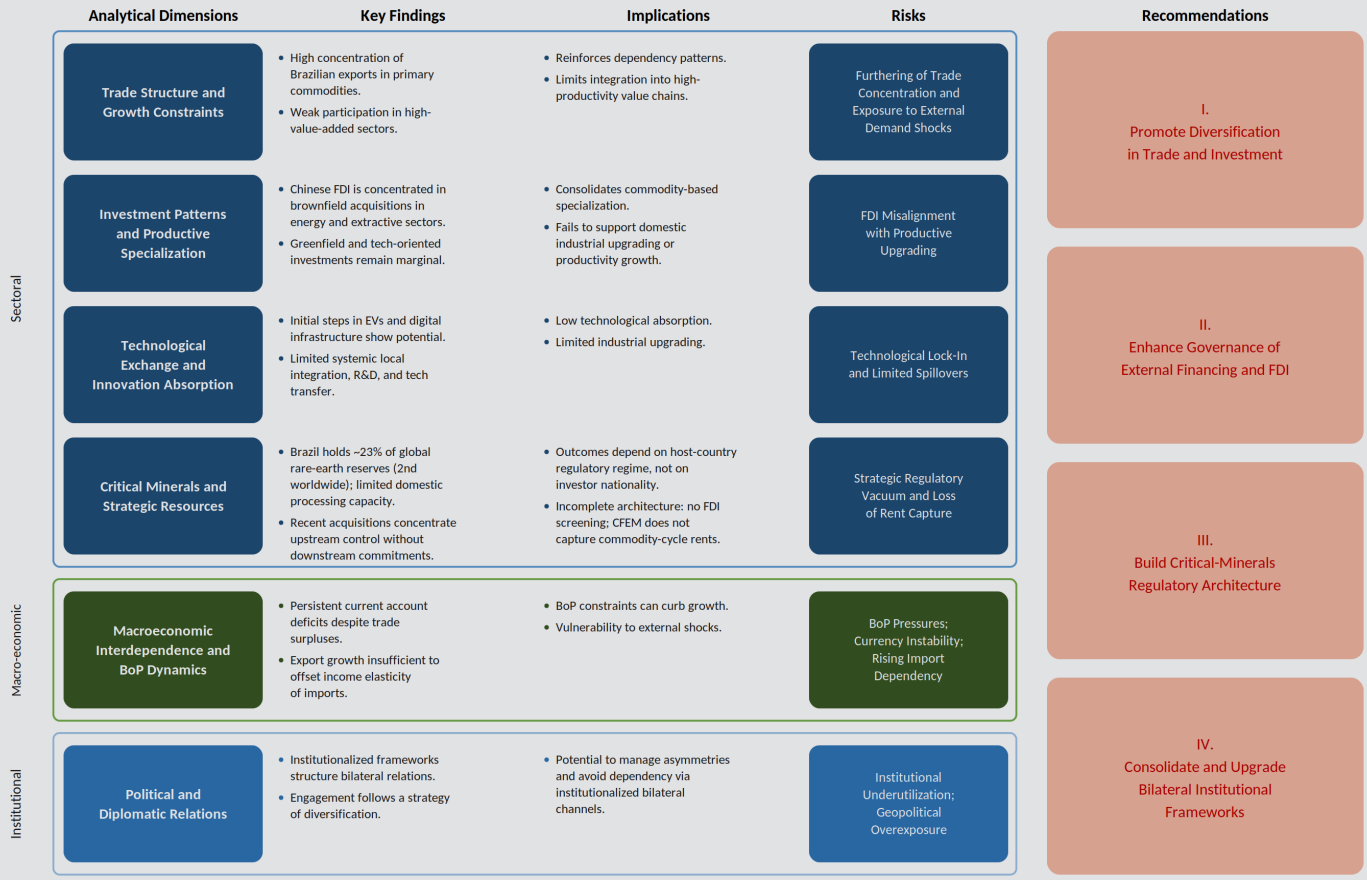
The evidence reveals a relationship still skewed toward commodity specialization and brownfield acquisitions, with limited integration into high-productivity sectors or advanced supply chains. Brazil's export concentration index (HHI = 0.185) places it in the resource-exporter cluster of G20 economies, well above industrial peers such as Germany (0.097) (UNCTAD, 2024); 63 percent of cumulative Chinese investment between 2007 and 2024 entered through mergers and acquisitions in energy and resource sectors, even as

greenfield projects became numerically dominant (CEBC, 2024). Emerging cooperation in digital infrastructure and transport electrification — BYD's Camaçari plant, Huawei's role in the 5G rollout, the May 2025 Memoranda of Understanding on Artificial Intelligence and a joint Technology Transfer Centre — operates under an institutional architecture under-designed for the conversion of foreign engagement into domestic capability: signed memoranda without operational governance, R&D stagnant at 1.21 percent of GDP (MCTI, 2024), and conditioning instruments that fall short of the late-industrialiser toolkit through which East Asian economies converted foreign investment into domestic capability (Amsden, 2001; Chang, 2002). The overall profile of Brazil–China economic ties still reflects asymmetrical complementarities rather than dynamic interdependence.

The diagnosis sharpens in the critical-minerals domain. Brazil holds the second-largest national rare-earth reserve position globally — approximately 23 percent of identified reserves — alongside substantial graphite, niobium, lithium, nickel, and copper endowments, while China controls roughly 85–90 percent of global rare-earth separation capacity (USGS, 2026; IEA, 2025). Within-firm variation across regulatory regimes (CMOC's Niobrás versus its Tenke Fungurume operation), the comparative track record of contractual rent-capture instruments (Chilean CORFO versus the Australian Minerals Resource Rent Tax), and quasi-experimental evidence on the Brazilian channel from rents to welfare (Caselli and Michaels, 2013; Brollo, Nannicini, Perotti and Tabellini, 2013) converge on a single proposition: variation in outcomes from foreign mineral capital is better explained by host-country regulatory regime and institutional quality than by investor nationality. The corollary is that the absence of a coherent Brazilian regulatory architecture — no foreign-investment screening regime, a CFEM rate that does not recoup commodity-cycle rents, no contract-transparency requirements, and weak ANM enforcement — is itself the strategic risk. This re-frames the policy question consistent with Brazil's emerging middle-power positioning: strategic autonomy is a function of institutional capability, not of declared diplomatic preference or partner selection (Cervo, 2010).

For Brazil to harness this relationship as a driver of structural transformation rather than path dependence, public policy should play an active role in redirecting trade and investment toward wider diversification and integration, and in establishing the regulatory architecture under which foreign capital — Chinese, U.S., European, Japanese, or Korean — enters strategic sectors. This will require coherent strategies across industrial, trade, and innovation policy; a sectorally-targeted foreign-investment screening regime modelled on the Chilean FNE behavioural-remedies approach; sliding-scale royalty calibration aligned with the IGF Mining Policy Framework benchmark range; performance-conditioned mechanisms for technology transfer and supplier development; stronger governance over external financing and contingent liabilities; and a continued diplomatic commitment to economic diversification and strategic autonomy, anchored in bilateral institutional frameworks — COSBAN foremost — as platforms for binding reciprocity. The pending MMG–Anglo American Brazilian nickel acquisition is the highest-stakes regulatory test case currently in train, and the legislative window for the National Policy on Critical and Strategic Minerals remains open. The cost of acting late is materially higher than the cost of acting now.

# TABLE 2 - POLICY AREAS AND RECOMMENDATIONS




Source: author elaboration.

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