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NEWS AND DEVELOPMENTS

Niobium as a Geostrategic Pillar of the 21st Century: Brazil's Centrality in the New Global Technological and Mineral Order

This article undertakes a broad analysis of the Federative Republic of Brazil's strategic role in the global scenario of niobium production and trade.

Using an interdisciplinary approach, it examines the geological, industrial, economic, legal, and geopolitical aspects that position the country as a virtually exclusive participant in the global supply chain for this critical metal. Brazil holds approximately 98 per cent of known niobium reserves and accounts for over 90 per cent of globally traded production, conferring a uniquely powerful position in the 21st century. This centrality is particularly evident in sensitive sectors such as defence, infrastructure, energy, semiconductors, emerging technologies, and the energy transition. It should be noted that this geological and commercial advantage has not yet translated into effective sovereign power. The absence of a structured, integrated, and strategic national policy for the sector reveals legal and institutional vulnerabilities, including the lack of a specific regulatory framework, selective fiscal incentives, and interministerial coordination. Present governance is marked by fragmentation and the predominance of private interests, lacking

of a new legal and economic regime for niobium, encompassing a dedicated legislative framework, industrial and fiscal policy mechanisms aimed at vertical integration, proactive mineral diplomacy, and the establishment of a public authority endowed with the technical expertise and legitimacy to coordinate national governance of this resource. In light of this context, niobium is treated not only as a commodity, but as a strategic asset for sovereignty, innovation, and geopolitical integration, particularly in an international environment marked by industrial reconfigurations, trade tensions, and disputes over critical minerals. Brazil's central role in this new global landscape requires institutional intelligence and long-term strategic planning.

- **Introduction**

  The geoeconomic landscape of the 21st century has been strongly shaped by the rise of so-called strategic or critical minerals–essential inputs for the functioning of high-technology production chains, national security, the energy transition, and scientific innovation. In this framework, niobium emerges as one of the most relevant, albeit underestimated, metals in the new global material order. It is a chemical element with atomic number 41, belonging to the group of transition metals, with distinctive physicochemical properties: corrosion resistance, lightness, high thermal conductivity, and superconductivity at cryogenic temperatures.

  Its applications are varied and structural: from the aerospace and nuclear industries to advanced civil construction; from the production of superalloys for turbines, rockets, and pipelines to cutting-edge defence systems; and from industrial infrastructure to diagnostic imaging, such as magnetic resonance devices. Niobium–often described as the "invisible element"–is an indispensable component for sustaining the complexity of the contemporary economy[1].

  What makes the geopolitics of this metal unique is Brazil's near-monopoly position. As evidenced by updated data from the United States Geological Survey (USGS, 2025[2]) and Brazil's National Mining Agency (ANM[3]), the

comparable degree of control over a mineral resource of similar strategic value. The principal production hubs are located in the States of Minas Gerais (Araxá), Goiás (Catalão and Ouvidor), and Amazonas (São Gabriel da Cachoeira), with most production carried out by two major companies: CBMM–Companhia Brasileira de Metalurgia e Mineração (Brazilian Metallurgy and Mining Company)–and CMOC Brasil, a subsidiary of China Molybdenum Co. Ltd. [4].

At the same time, the United States of America, the European Union, the People's Republic of China, Japan, and the Republic of Korea are highly dependent on Brazilian exports, lacking significant domestic production and fully functional alternatives. The United States Department of Defense has classified niobium as a critical mineral for national security, and documents released by WikiLeaks in 2010 revealed the inclusion of Brazilian mines on United States lists of global strategic infrastructure[5].

In light of this context, a central question arises: how has Brazil leveraged–or neglected to leverage–this geological and strategic advantage? This article seeks to answer that question based on an interdisciplinary analysis combining geological, industrial, economic, and legal perspectives. The proposed hypothesis is that Brazil occupies a central and privileged position in the new geopolitics of critical minerals, yet still lacks a robust state policy capable of articulating mineral sovereignty, value addition, technological innovation, and global resource diplomacy.

- **Technical Overview and Industrial Applications of Niobium**

  Niobium is a transition metal belonging to Group VB of the Periodic Table, with the chemical symbol Nb, atomic number 41, atomic mass of 92.91 u, and a melting point of approximately 2,468 °C. Its physical and chemical behaviour is characterised by high thermal resistance, ductility, good electrical conductivity, and excellent corrosion resistance, making it suitable for a wide range of industrial applications. From its identification by Charles Hatchett in 1801 to its consolidation as a critical element in the 21st century, niobium has

The principal commercial forms of niobium are diverse and serve different industrial sectors. The predominant form is ferroniobium (FeNb), an alloy of iron and niobium, which accounts for over 90 per cent of global demand and is widely used in the steel industry for the production of high-strength steels. Another relevant form is niobium oxide (Nb_2O_5), which has significant applications in the manufacture of advanced ceramics and precision optical devices. In addition, there are special alloys – such as nickel–niobium, aluminium–niobium, and titanium–niobium – which are used directly in strategic sectors, particularly the aerospace and defence industries, owing to their mechanical strength and thermal stability[6].

Furthermore, niobium plays a strategic role in several industrial sectors, particularly in the steel, aerospace, defence, energy, electronics, medical, and green technology industries.

In the steel industry, its most widespread application is in the manufacture of high-strength, low-alloy microalloyed steels, known as HSLA (High Strength Low Alloy). The addition of small amounts of niobium – a process known as microalloying – provides substantial improvements in steel performance: increased mechanical strength, improved weldability, reduced weight in metal structures, and savings in material and energy[7]. These steels are widely used in the automotive industry, particularly in the production of lightweight yet safe vehicle bodies; in civil construction and major infrastructure projects, such as bridges, pipelines, and offshore platforms; as well as in the naval and railway industries[8].

In the aerospace and defence sector, niobium is essential for the formulation of superalloys used in jet engine turbines, rocket thermal coatings, and structural components of satellites and spacecraft. Alloys such as niobium–titanium (Nb–Ti) and niobium–tin (Nb_3Sn) are employed in the manufacture of superconducting magnets for radar systems, medical equipment, and particle accelerators[9].

In the energy and electronics sectors, niobium's physical and chemical properties make it valuable for a range of applications. It is used in

and nuclear fusion projects such as ITER[10].

In medicine, niobium has been widely used for manufacturing orthopaedic and dental implants, cardiovascular stents, and high-precision surgical instruments[11].

Finally, in the so-called green technologies sector, niobium has gained prominence alongside the advance of renewable energy and the electrification of mobility. It is incorporated into wind turbines through high-strength alloys, into solid-state batteries, and into conductors for electric motors requiring greater thermal efficiency and durability[12].

Although most of Brazil's production is exported as ferroniobium, there is growing demand for higher-value products, including special alloys customised for particular sectors; niobium-doped ceramic compounds; and niobium components for chips and three-dimensional metallic microstructures.

CBMM, a global leader in the niobium products market, invests heavily in applied research aimed at developing new industrial uses for the element, focusing particularly on emerging technologies such as lithium-ion batteries containing niobium oxides. These investments include strategic partnerships with automotive companies, universities, and internationally renowned research centres, notably in Japan, Germany, China, and the United States[13].

However, such initiatives do not yet amount to a national public policy for mineral innovation. The absence of tax incentives, dedicated federal technology centres, and strategic regulation limits Brazil's progress in transforming niobium into an industrial asset.

- **Global Production and Market Control**

  Global niobium production is characterised by a geological and industrial concentration unparalleled among today's strategic minerals. Unlike other critical commodities – such as lithium, rare earth elements, and cobalt – which have multiple extraction sites across the globe, niobium is, in essence,

States Geological Survey (USGS), the country holds over 90 per cent of known reserves and accounts for approximately 90 per cent of annual global production.

This dominant position is underpinned by three principal mining hubs within Brazilian territory: Araxá, in the State of Minas Gerais, operated by the Companhia Brasileira de Metalurgia e Mineração (CBMM), which alone is responsible for more than 75 per cent of global production[14]; Catalão, in the State of Goiás, operated by CMOC International Brasil; and São Gabriel da Cachoeira, in the State of Amazonas, where significant geological potential remains either in the exploratory phase or under legal restriction due to its location within Indigenous lands. Among these, the Araxá industrial complex is regarded as the most advanced in the world in terms of niobium extraction, processing, and metallurgical transformation technology.

Beyond Brazil, the only other relevant operations, albeit on a smaller scale, are in Canada – through the Niobec mine in the province of Quebec[15] – and in certain Central African countries such as Rwanda, the Democratic Republic of the Congo, and Nigeria. In these African states, niobium extraction occurs marginally, with little industrialisation and, in many cases, links to informal practices or unstable political contexts. However, none of these territories possesses reserves comparable in volume or quality to those of Brazil, nor do they possess the technological capacity or logistical infrastructure to rival Brazil's production centre. In the United States of America, the Elk Creek Project in Nebraska is considered the sole domestic initiative with significant supply potential[16]. Nevertheless, it remains in the pre-operational stage, facing considerable environmental obstacles – such as the high cost of treating brackish groundwater – and requiring substantial financing to achieve large-scale economic viability[17].

The global niobium market is therefore not only geologically centralised but also technologically oligopolistic. CBMM – controlled by private Brazilian capital, with minority stakes held by Japanese and Chinese companies – dominates the global supply chain, acting as the near-exclusive supplier of ferroniobium to steelworks in Europe, North America, and Asia. It operates

established by long-term bilateral agreements, with limited transparency and no international regulatory oversight.

This structure confers upon Brazil a rare power in the geopolitics of critical minerals. No other nation exerts such market control with so little international competition over a resource considered indispensable for high-technology, infrastructure, and defence sectors. Paradoxically, however, this privileged position coexists with the absence of a specific national regulatory framework, the domestic deindustrialisation of the value chain, and export patterns concentrated in low-processing products, such as ferroniobium metal.

At the same time, this market structure generates latent international tensions. The United States, for instance, has no domestic niobium production and imports 100 per cent of its consumption – the vast majority sourced directly from Brazil. This absolute dependence has been formally acknowledged by agencies such as the Department of the Interior, which placed niobium on its official list of critical minerals owing to its economic and strategic importance. The Department of Defense, for its part, recognises the use of niobium across various applications in the military sector, although, as of the 2021 fiscal year, it had not included the mineral in active acquisition or stockpiling programmes via the Defense Logistics Agency. The absence of reliable and substantial alternative suppliers or buffer stocks in the Northern Hemisphere renders Brazil a pivotal actor in the stability of the production chains for metal alloys and superconductors[18].

From a geopolitical standpoint, Brazil has yet to fully internalise the strategic implications of this concentration. National production remains largely oriented towards the export of metallic raw material, without state control over international flows, minimum local content requirements for technological transformation, or structured public policies to promote value addition or the formation of strategic reserves for market stabilisation. The lack of an official international quotation even prevents niobium from being treated as a structured financial asset, limiting its circulation as a hedging or investment instrument.

simultaneously the largest holder, producer, and exporter of a resource fundamental to the energy transition, the aerospace industry, electronic devices, and the strategic defence capabilities of major world powers. This position grants the country a natural comparative advantage, yet it requires an intelligent and sovereign national strategy to convert this advantage into negotiating leverage, domestic value addition, technological innovation, and autonomous geopolitical positioning. Without such measures, Brazil's niobium monopoly will remain a dormant asset – an exporter of raw potential and an importer of industrialised solutions that could otherwise be developed domestically.

Unlike other industrial metals (such as copper, aluminium, or nickel), niobium is not traded on commodity exchanges or futures markets like the London Metal Exchange (LME) or COMEX. Contracts are negotiated directly between producers and buyers, with prices determined by private arrangements based on quality, application, term, and volume.

This model, known as an opaque market or performance contract, prevents financial speculation but simultaneously restricts market transparency and liquidity. As a result, there is no daily public price for niobium; strategic stocks are held privately; and hedging strategies (financial risk protection) are limited. This arrangement benefits major producers – especially CBMM – which imposes its technical and commercial standards as the global benchmark.

At present, there are no direct substitutes equivalent to niobium in its most critical applications, particularly in the manufacture of microalloyed steels and high-performance superalloys. Materials examined as partial substitutes include vanadium – with inferior thermal resistance; titanium – which is more costly and less ductile in certain alloys; and rare earth elements – which have greater chemical instability and are largely dependent on China.

From an industrial perspective, replacing niobium would entail increased structural weight, reduced material durability, higher costs, and the necessity of new certification tests – factors that make substitution economically unattractive in the short and medium term.

several nations.

In this context, it is pertinent to note that, when signing the Executive Order of 30 July 2025, then-President of the United States, Donald Trump, declared a national state of emergency under the International Emergency Economic Powers Act (IEEPA), holding the Government of the Federative Republic of Brazil responsible for practices deemed to undermine the national security, economy, and foreign policy of the United States. As a consequence, an additional 40 per cent tariff was imposed on Brazilian products, resulting in a total taxation level of 50 per cent[19]. At the same time, certain items were explicitly excluded from this surcharge, and niobium was among the goods exempted, thereby being removed from the additional tariff. This measure demonstrates that President Trump was fully cognisant of niobium's strategic importance, particularly in the context of critical industrial supply chains and the national security of the United States.

- **The Geopolitics of Niobium's External Dependence**

  The near-total concentration of niobium reserves and production in the Federative Republic of Brazil has transformed this resource into a highly sensitive geopolitical variable. While most strategic minerals have a relatively diverse geographic distribution – such as lithium, found in the so-called "Lithium Triangle" (Argentina, Bolivia, and Chile), or copper, mined in Chile, Peru, China, and the Democratic Republic of the Congo – niobium is an exception: over 90 per cent of its practical availability, in technical, legal, and logistical terms, is concentrated in Brazil. This natural monopoly confers upon Brazil a unique position in the critical industrial supply chains of the 21st century, especially within a context of energy transition, green re-industrialisation, and global shifts in power[20].

  Niobium's external dependence is not solely economic but also strategic. Several industrialised countries – including the United States of America, the Federal Republic of Germany, Japan, and the Republic of Korea – rely on Brazilian imports to sustain sensitive sectors of their technological, military, and energy infrastructure. The North American case is particularly illustrative.

originates from Brazil, with the remainder sourced, to a lesser extent, from Canada. Since 2018, the mineral has been included on the official list of critical minerals published by the United States Department of the Interior, pursuant to Executive Order 13817, in recognition of its essential role in strategic sectors and its high vulnerability in the event of a supply disruption. Technical reports prepared by the Pentagon and opinions from United States strategic intelligence agencies, combined with documents released through WikiLeaks, indicate that Brazilian reserves – in particular, the Araxá mine in the State of Minas Gerais – are regarded as assets of vital geostrategic interest to the national security of the United States[21].

This vulnerability has prompted industrial powers to pursue diversification strategies. Canada operates the Niobec mine in Quebec, which accounts for about 8 per cent of global ferroniobium supply, although its scale remains incomparable to that of Brazil[22]. The United States is assessing the Elk Creek Project in Nebraska, led by NioCorp Developments Ltd., but this venture has yet to enter commercial operation and faces significant challenges in financing, environmental regulation, and logistics[23].

The People's Republic of China, by contrast, has pursued a different strategy, acquiring equity stakes in Brazilian niobium and phosphate assets through CMOC Brasil, and positioning itself today as the second-largest producer of niobium globally[24]. This approach has placed niobium squarely within the Sino-American contest over critical minerals and technological leadership in the 21st century.

This scenario reveals a geopolitical paradox: Brazil holds an extraordinary potential position of power, yet has not consolidated this advantage as an instrument of diplomacy, economic leverage, or industrial policy.

There is no structured national policy of mineral sovereignty for niobium. Governance of the sector is fragmented, characterised by the absence of robust state guidelines, the private concentration of technical expertise, and insufficient coordination between foreign policy, scientific research, and value-added industrial development.

largely upon CBMM's historic reliability as a supplier. However, this stability is fragile in the face of climate-related risks, trade disputes, diplomatic tensions, or domestic political shocks. What is presently perceived as a predictable supply chain could, in a time of crisis, become a global bottleneck.

Niobium, therefore, is not merely a technical commodity but also a sovereign asset, a driver of international influence, and a potential pillar of 21st-century industrial policy. Understanding this geopolitical dependence is the first step towards Brazil's strategic repositioning on the global stage. The following sections will examine Brazilian mineral governance and the opportunities to convert this comparative advantage into a driver of effective leadership.

- **Why Brazil Still Does Not Have a National Niobium Policy? Legal, Institutional, and Strategic Diagnosis**

  Brazil's near-absolute control over global niobium reserves and production has yet to translate into a coordinated, systemic, and sovereign national policy. Although the country occupies a unique position on the international stage, equivalent to a global natural monopoly, the governance of this asset remains diffuse, captured by private interests, lacking a specialised legal framework, and disconnected from the diplomatic and industrial strategies of the Brazilian State.

  The Brazilian legal system does not have specific legislation regulating strategic minerals such as niobium – a serious regulatory gap when compared to other major geoeconomic powers. At present, niobium is regulated only in a generic manner by Decree-Law No. 227/1967 (Mining Code) and through the residual competences of the Agência Nacional de Mineração (ANM – National Mining Agency), whose remit is limited to the technical and fiscal oversight of mining activities. Although Brazil established, via Decree No. 10.657/2021, the Política de Apoio ao Licenciamento Ambiental de Projetos de Investimento em Minerais Estratégicos (Policy to Support Environmental Licensing of Investment Projects in Strategic Minerals), creating the Comitê Interministerial de Análise de Projetos de Minerais Estratégicos (Interministerial Committee for the Analysis of Strategic Mineral Projects – CTAPME) and including niobium

standpoint of national security, industrial policy, and the country's strategic geoeconomic positioning[25].

Unlike the United States (which regularly publishes lists of critical minerals under special protection regimes), the European Union (which maintains the European Observatory for Critical Raw Materials), and the People's Republic of China (which sets quotas, builds strategic stockpiles, and provides incentives for technological transformation), Brazil does not legally recognise the exceptional status of niobium. Consequently, there is no strategic legal classification for substances of sovereign interest.

This omission compromises the regulatory autonomy of the Brazilian State, prevents the strategic use of niobium in international agreements, and renders impossible the adoption of policies for vertical integration, inventory control, fiscal incentives, and local content clauses – all fundamental instruments of Economic Law and contemporary mineral policy.

Brazil's niobium production chain is highly concentrated in private hands, with absolute dominance by the Companhia Brasileira de Metalurgia e Mineração (CBMM) and, to a lesser extent, CMOC Brasil – a subsidiary of the Chinese multinational. The State has no mechanism for strategic control over trade flows, pricing, reserves, or the geopolitical allocation of the product.

The absence of a state-owned or mixed-capital company dedicated to the sector – akin to Petrobras in oil or Indústrias Nucleares do Brasil (INB) in uranium – represents an institutional vacuum, denationalising mineral policy and subjecting a geopolitically significant input to purely corporate criteria. Furthermore, the private contractual framework between foreign producers and buyers, conducted without public auction, regulated market, or international quotation, undermines transparency, hampers tax collection, and deprives the State of influence over the value chain.

This state of affairs implicitly contravenes the principle of the supremacy of the public interest over the private interest – fundamental to Brazilian Administrative Law – and compromises the foundations of Regulatory Law by

Public governance of niobium in Brazil is marked by chronic institutional fragmentation. Responsibilities relating to mining, science and technology, foreign trade, national defence, foreign affairs, regional development, and technical education are dispersed among various ministries and agencies, without functional integration or coordination by a higher-level body.

For example, there is no Conselho Nacional de Minerais Estratégicos (National Council for Strategic Minerals) or an interministerial committee with decision-making powers on the matter. This absence prevents the formulation of integrated multi-year plans, local content targets, industrial financing policies, or mineral diplomacy strategies based on national interests. The result is the perpetuation of a reactive, unstructured public policy limited to the technical-operational scope of the ANM.

From the perspective of Public Policy Law, this is a case of systemic governance failure, in which the absence of a coordinating authority prevents the transformation of mineral assets into levers for development. The lack of unified command undermines the possibility of long-term planning and denies the country full regulatory sovereignty.

Brazil's tax system makes no distinction between the fiscal burden on exports of raw ferroniobium and on exports of products with a higher degree of technological transformation, such as superalloys, specialised oxides, or composite materials. This fiscal neutrality discourages domestic industrialisation of the niobium production chain, reducing the country to the role of global supplier of basic inputs without retaining added value domestically.

Furthermore, the Compensação Financeira pela Exploração de Recursos Minerais (CFEM – Financial Compensation for the Exploitation of Mineral Resources), provided for in Article 20, §1 of the Federal Constitution, is applied uniformly, without selective criteria to reward projects incorporating innovation, sustainability, or value addition. Fiscal policy, as an instrument of public policy, is in this respect underutilised.

goods, and tax credit lines linked to niobium-based research, technical training, and energy transition projects. The current fiscal omission reinforces Brazil's entrapment in a logic of dependent extractivism, incompatible with its geoeconomic potential.

Despite Brazil's growing international relevance as a niobium supplier – particularly to the United States, Japan, Germany, and China – the subject remains absent from the country's foreign policy agenda and geopolitical strategy. The Ministry of Foreign Affairs has yet to structure a specialised mineral diplomacy, as countries like Canada, Australia, and India have done, nor does it use niobium as a bargaining instrument for geoeconomic advantage, scientific cooperation, or the development of technological partnerships.

The absence of a "soft mineral power" strategy constitutes a squandered opportunity, especially as niobium's centrality is set to increase in the era of renewable energy, microelectronics, and the aerospace industry. By failing to employ niobium as a bridge to integrate universities, innovation centres, and strategic alliances, Brazil forgoes legitimate international influence based on its unique mineral endowment.

From the standpoint of International Relations and International Economic Law, the country remains peripheral despite being central to the supply of a critical resource. Formal sovereignty over subsoil resources does not translate into active geopolitical sovereignty – a paradox of significant strategic weight.

The lack of a national niobium policy is, above all, symptomatic of profound institutional disarticulation, regulatory inertia, and a limited vision of Brazil's role in the 21st century. Overcoming these barriers requires mobilising the instruments of Administrative, Fiscal, International, and Regulatory Law, combined with a new model of public mineral policy.

Transforming niobium into an asset of sovereignty, innovation, and international prominence depends on the simultaneous adoption of five fronts: the creation of a specific legal framework; permanent interministerial

- **Final Considerations**

  The consolidation of a National Niobium Policy in Brazil presupposes, above all, the recognition of this resource as an asset of national sovereignty, of inestimable geopolitical and technological value. Such a policy must be supported by a new legal framework that formally recognises niobium as a strategic mineral, granting it special legal status in light of the principles of Brazilian Administrative Law and Economic Law.

  This legislation should enable the State to act not only as a regulator but also as the coordinator of a public agenda focused on value creation, industrial innovation, and international recognition. Furthermore, it is essential to establish a public authority with the technical and legal expertise, international legitimacy, and executive capacity necessary to coordinate interministerial policies and formulate national guidelines for the governance of critical minerals.

  The tax system must be repositioned to shift from being merely a revenue-generating instrument to becoming an incentive instrument: fostering the domestic industrialisation of the niobium supply chain, rewarding local content, research, and vertical integration initiatives, and discouraging the simple export of raw alloys. Simultaneously, Brazil must launch a proactive mineral diplomacy that employs niobium as a vector for strategic insertion into global value chains in clean energy, defence, aerospace, microelectronics, and emerging technologies. This diplomacy must be underpinned by bilateral scientific cooperation agreements, technology security protocols, and multilateral initiatives positioning Brazil as a reliable and innovative supplier of critical raw materials.

  In the current international scenario, niobium is gaining centrality as a geopolitical asset in strategic negotiations between Brazil and the United States, particularly in light of the potential reconfiguration of United States foreign policy with Donald Trump’s return to power. Trump’s global project is essentially based on three pillars: national reindustrialisation, combating strategic dependence on rival powers (especially China), and reviewing

with a pronounced protectionist bias and a technocratic view of critical resources and sensitive production chains.

In this context, niobium – a key input for advanced metal alloys, superconductors, defence technologies, and aerospace infrastructure – assumes the status of a priority raw material in the national security strategy of the United States. The country's greatest vulnerability lies in its near-total dependence on Brazil for this mineral, given that its own reserves are insignificant and its strategic stocks limited. Trump's potential re-election to the White House would intensify the United States' focus on securing a stable, predictable, and politically reliable supply of niobium, thereby increasing Brazil's bargaining power to an unprecedented degree.

It is therefore imperative that Brazilian diplomacy avoid reactive and emotional responses, and instead adopt a cool, strategic, and technically informed posture, operating from the Executive Branch with interministerial coordination, and avoiding isolated protagonism by the Judiciary. The recent crisis involving decisions of the Supreme Federal Court that directly affected large American technology corporations (such as Google and Meta) has raised alarms in Washington about the legal and reputational risks of operating in Brazil. Although legitimate from the standpoint of jurisdictional sovereignty, such decisions generated institutional discomfort within the United States Department of State and provoked behind-the-scenes pressure in the United States Congress. The centrality of niobium, however, must be understood as part of a broader spectrum of strategic assets under the stewardship of the Brazilian State, whose mobilisation can strengthen Brazil's position in negotiations with the United States.

In short, it is evident that the Federal Executive Branch is not limited to niobium as the sole mineral asset capable of strategic mobilisation in relations with the United States. Brazil possesses a wider range of geoeconomic assets that can be deployed in bilateral negotiations. The ongoing crisis demands a coordinated approach at the diplomatic, political, and commercial levels, guided by strategic rationality and institutional coordination.

Bolsonaro. The hallmark of Trump's political conduct is pragmatism, and his foreign strategy has consistently been guided by the defence of the objective interests of American corporations. In this context, Brazilian court decisions directly affecting such companies – often perceived in the United States as arbitrary or incompatible with fundamental guarantees and human rights – came to be regarded as institutional affronts, thereby legitimising, in Trump's view, an assertive posture towards the Brazilian Judiciary.

This was one of the political strands underpinning Trump's actions in exercising his sovereignty, particularly through the extraterritorial application of United States law – a recurring instrument of American foreign policy in the defence of its strategic and commercial interests.

What Trump may fail to appreciate is that, within the Brazilian institutional framework, the Judiciary enjoys even greater independence and autonomy than is provided for in the North American system. Furthermore, decisions issued by the Supreme Federal Court are jurisdictional in nature and are not, under any circumstances, subject to the authority or responsibility of the Executive Branch, owing to the strict separation of powers enshrined in the 1988 Constitution.

Accordingly, a clear distinction must be maintained in trade negotiations between impasses arising from the actions of the Judiciary and matters strictly related to bilateral economic relations. The Brazilian Judiciary is responsible for its own actions, including at the international level, although it may be institutionally assisted by the Office of the Attorney General in the exercise of its defence before other jurisdictions.

However, relations and commercial ties between the two countries must proceed autonomously and in parallel, preserving their own logic and institutional continuity, regardless of any internal jurisdictional disputes that may occur within the Brazilian State.

Given this context, Brazil must formulate structured, state-to-state negotiations with the United States, conducted with clarity as to the competing strategic interests, in order to safeguard its internal regulatory

vector for diplomatic détente and economic reconfiguration within the framework of the new United States industrial policy. This is not a matter of subservience, but of geostrategic intelligence: by accurately identifying the United States' core objectives – such as secure access to critical raw materials, diversification of supply chains, and revitalisation of its industrial base – Brazil positions itself as an indispensable partner. In return, it can seek political space, technology transfer, co-production agreements, and reinforcement of its standing as a geoeconomic power in the Global South.

The Brazilian Government cannot be held responsible for the acts of another sovereign state, much less for those of an entire population.

The Office of the Attorney General defends this prerogative by representing the political agents of the Brazilian Judiciary against potential interference by a foreign court in their functional autonomy. However, this institutional defence – also exercised pursuant to Article 131 of the Federal Constitution and Article 22 of Law No. 9,028/95 – is not necessarily a political component of trade negotiations between the two countries, despite appearing to be so in Trump's view[26].

If it is true that Brazil, through the Supreme Federal Court, has exercised its sovereign powers, it is equally true that the United States, through its Executive Branch, when applying the Executive Order Addressing Threats to the United States by the Government of Brazil, would also be exercising its sovereign powers, insofar as it applies a law approved by its National Congress and within its domestic jurisdiction, with transnational, economic, technological, and financial repercussions[27].

There can be little doubt that the underlying political motivation for Trump's actions was not the result of manipulation by the Bolsonaro family – and even less by Eduardo Bolsonaro – but rather politically calculated decisions based on the transnational effects of Supreme Federal Court rulings on the economic interests of major United States companies of substantial social and political significance in that country.

comment on certain decisions of the Supreme Federal Court of Brazil, under the rapporteurship of Justice Alexandre de Moraes, in cases involving the convictions of individuals who had been at the encampment in front of the Court on 8 January 2024.

In the decisions I examined, I observed that there had been violations of human rights, as strict (objective) criminal liability was applied. A statistical study would be necessary on the number of decisions issued in the same vein and following the same pattern: absence of individualisation of conduct, imposition of objective liability for the mere fact of having camped in front of the Supreme Federal Court, and a presumption of responsibility for an anti-democratic act.

There have also been statements and protests in Brazil from numerous institutions, including the Brazilian Bar Association itself, against the arbitrariness committed in the so-called “fake news inquiry” and against the violation of professional prerogatives and restrictions on rights of defence. However, there are no statistical studies demonstrating or proving a systemic erosion of human rights stemming from these decisions.

The political rationale underpinning United States tension and interventionism must be correctly identified. To what extent has the Supreme Federal Court of Brazil become a global legal risk to the human rights protected by the United States?

In this context, it is clear that this discussion takes on its own contours, and that the role of the Office of the Attorney General is to defend, in legal terms, the justices of the Supreme Federal Court and any other political agents affected by foreign jurisdiction as a result of official acts performed in office.

Nevertheless, the allegation that such acts violated the human and fundamental rights of American companies – or even those of Brazilian citizens – must be debated in the appropriate forum, and cannot, and should not, be conflated with trade negotiations concerning relations between the two countries and the interests of their respective peoples.

de Moraes ordered the preventive detention of former President Jair Messias Bolsonaro for persistent non-compliance with court-imposed precautionary measures. The ruling established that Bolsonaro had repeatedly and wilfully circumvented restrictions – including the prohibition on using social media directly or through third parties – by orchestrating and participating in public communications designed to undermine the authority of the Court and to interfere unlawfully in ongoing judicial proceedings. The decision, grounded in the need to protect the integrity of criminal investigations and to safeguard national sovereignty from coordinated attempts to destabilise Brazilian institutions, underscores that judicial determinations of this nature are matters of domestic legal order, immune to external political bargaining. As such, they must be understood as the exercise of Brazil's sovereign jurisdiction, entirely distinct from – and not to be conflated with – the negotiation of economic or diplomatic agreements.

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