

Encapsulated by great powers: Alcantara Cyclone Space and Brazilian-Ukrainian cooperation in space market and technology

Encapsulados por grandes potências: A Alcantara Cyclone Space e a cooperação brasileiro-ucraniana no mercado e na tecnologia espacial

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Abstract

The Brazilian-Ukrainian joint venture Alcântara Cyclone Space (ACS) was launched in 2006, combining Brazil's equatorial launch site with Ukraine's rocket technology to compete in the global space market. Despite its technical promise, the project was ultimately undermined by significant pressure from the United States and Russia. Using the defensive realist International Relations framework, the study explores how these great powers employed diplomatic, technological, and economic constraints to limit the venture's progress and preserve their dominance in the space sector. Drawing on leaked U.S. diplomatic cables, the analysis shows how external interference progressively constrained the partnership, culminating in its dissolution in 2015. The findings highlight the structural barriers that middle powers face in pursuing technological autonomy amid great power competition in strategic industries such as space technology.

Keywords: Alcantara Cyclone Space, Space Technology, Brazil-Ukraine relations.

Resumo

A *joint venture* brasileiro-ucraniana Alcântara Cyclone Space (ACS) foi lançada em 2006, agregando a localização equatorial do centro de lançamento brasileiro com a tecnologia de foguetes da Ucrânia para competir no mercado espacial global. Apesar de seu potencial técnico, o projeto foi, em última instância, prejudicado por pressão significativa dos Estados Unidos e da Rússia. Utilizando o arcabouço teórico do realismo defensivo, o estudo explora como essas grandes potências empregaram restrições diplomáticas, tecnológicas e econômicas para limitar o avanço da iniciativa e preservar sua dominância no setor espacial. Baseada em telegramas diplomáticos norte-americanos vazados, a análise demonstra como a interferência externa restringiu progressivamente a parceria, culminando em sua dissolução em 2015. Os resultados evidenciam barreiras estruturais enfrentadas por potências médias na busca por autonomia tecnológica em meio à competição entre grandes potências em setores estratégicos, como o da tecnologia espacial.

Palavras-chave: Alcantara Cyclone Space, Tecnologia espacial, Relações Brasil-Ucrânia

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Introduction

The cooperation between Brazil and Ukraine in the space sector – most notably through the Alcântara Cyclone Space (ACS) project – reflected both countries' attempts to expand their technological capabilities and enhance their strategic autonomy within the international system. Established in 2006, ACS was a binational joint venture designed to launch Ukrainian Cyclone-4 rockets from Brazil's Alcântara Launch Center (CLA), whose equatorial location offers significant advantages for satellite deployment. By combining Ukraine's inherited aerospace expertise with Brazil's launch site geographic positioning, the project sought to create a competitive alternative in a global market historically dominated by a small number of established spacefaring powers.

Despite these favorable conditions, the ACS initiative ultimately failed, being formally discontinued in 2015 after substantial financial investment and prolonged delays. While existing accounts emphasize technical, financial, and administrative difficulties, such explanations are insufficient to fully account for the project's trajectory. This article advances the argument that the failure of ACS cannot be adequately understood without situating it within the broader dynamics of great-power politics, particularly the ways in which external actors constrain technological development in strategically sensitive sectors.

The central research question guiding this study is: how and through which mechanisms do great powers constrain middle-power efforts to develop technological autonomy in dual-use sectors such as space launch capabilities? Building on this question, the article advances the hypothesis that such constraints are well explained through a defensive realist framework, in which great powers respond not to immediate threats, but to uncertainty regarding future capabilities and their potential security implications (Jervis, 1978; Walt, 1987; Glaser, 1995). In this context, initiatives like ACS, although formally commercial, generate security externalities that trigger precautionary balancing behavior.

The article demonstrates that the United States and Russia constrained the ACS project through distinct but functionally convergent mechanisms. The United States relied primarily on regulatory and technological instruments, including export controls and the conditioning of cooperation on the Technology Safeguards Agreement (TSA), thereby leveraging its structural position in global supply chains. Russia, in turn, exercised influence through its residual control over Ukraine's aerospace sector and its capacity to shape both supply chains and diplomatic alignments. These mechanisms did not require explicit coordination, yet produced mutually reinforcing effects that undermined the viability of the project.

Empirically, the analysis draws on four classified U.S. diplomatic cables released by WikiLeaks, complemented by secondary literature on Brazil–Ukraine cooperation and the global space industry. The documents were selected based on search queries that maximized the creation of a *corpus* connected to the research, eliminating those with no reference to the theme. The selected documents provide insight into the strategic calculations underlying U.S. and Russian behavior, as well as the perceived risks associated with the ACS initiative. Methodologically, the article adopts a qualitative case study approach, employing document-based analysis to reconstruct the pathways linking great-power behavior to project outcomes.

The study traces the evolution of Brazil-Ukraine cooperation and analyzes external influences that shaped – and ultimately undermined – the ACS venture. Drawing on three classified U.S. diplomatic cables released by Wikileaks, it provides insight into the geopolitical calculations behind American and Russian actions, interpreting them through a realist lens. These documents provide details on Brazilian and Ukrainian perceived influence of Russia¹ and highlights intervention from the U.S.

¹ Russia and the United States are considered great powers here for their ability to ensure their own security, for their military and economic capabilities and their capacity to influence the structure of the international system (Waltz, 1979).

Great powers employ a combination of diplomatic pressure, economic sanctions, and strategic trade controls to prevent middle powers from acquiring or advancing technologies that could potentially disrupt global security dynamics (Joyner, 2009). By restricting access to key technological resources and imposing legal and political constraints, great powers aim to manage the proliferation of dual-use technologies, which can serve both civilian and military purposes.

Ultimately, this strategy serves the interests of great powers by maintaining their technological superiority while managing the risks associated with technological diffusion. For defensive realism, state behavior is understood as a response to perceived threats shaped by systemic conditions and cognitive interpretation (Jervis, 1978; Walt, 1987; Glaser, 1995), building on the structural premise that states seek security under anarchy (Waltz, 1979).

Stephen Walt's balance of threat theory explains how great powers use diplomatic and economic means to limit the technological advancements of middle powers. Walt (1987) suggests that states balance against perceived threats rather than power alone, and technological advancements – especially in areas like missile technology and nuclear capabilities – can heighten these perceived threats. Great powers, therefore, employ diplomatic pressure and form coalitions to isolate and sanction middle powers pursuing disruptive technologies. By leveraging their economic and political influence, great powers can slow down or even halt the technological progress of middle powers, ensuring that the distribution of power in the international system remains in their favor. This behavior is evident in historical and contemporary examples, such as the enforcement of non-proliferation treaties and export control regimes, which target key technological sectors to maintain global security and stability.

Glaser (1995) argues that state behavior is shaped by rational assessments of threat and the security environment. In his formulation, states seek security, but their strategies vary depending on factors such as the offense–defense balance, the distinguishability of military postures, and the perceived intentions of others. Crucially, Glaser argues that cooperation is often possible under anarchy when states recognize that others are not inherently threatening, making restraint and reassurance rational strategies.

To understand how great powers reacted to the ACS initiative, assessing its threat potential, it is essential to outline relevant aspects of Brazilian and Ukrainian foreign policies and the bilateral cooperation leading to the creation of the initiative.

Brazilian and Ukrainian global insertion leading to the ACS project

Understanding the development of the Alcântara Cyclone Space (ACS) project requires situating it within the broader foreign policy trajectories of Brazil and Ukraine in the post-Cold War period. Both countries, emerging from distinct geopolitical contexts, pursued strategies aimed at increasing their international relevance and autonomy. Brazil sought to reposition itself as an active global player through multilateral engagement and diversified partnerships, while Ukraine navigated a complex geopolitical environment shaped by competing influences from the West and Russia.

During the 1990s and 2000s, both states adopted foreign policy approaches that emphasized diversification as a means of enhancing strategic autonomy. Despite differences in context, both countries shared the common objective of expanding their room for maneuver within the international system.

From the Brazilian side, Fernando Henrique Cardoso (FHC) administration represented an important shift in foreign policy. It sought to reposition the country as a proactive and credible global actor by deepening engagement with international institutions and agreements, replacing the previous inclination toward relative isolation. Through active participation in global governance structures, Brazil aimed to expand its negotiating capacity and macroeconomic stability, seeking greater influence over the norms and practices shaping the international order (Vigevani; Oliveira; Cintra, 2003; Vigevani; Oliveira; Thompson, 2007; Souza, 2009). The country sought strategic autonomy, leveraging the post-Cold War context and its internal economic stabilization (Lessa; Doratioto, 2025, p. 248-450).

Central to this strategy was the formation of strategic partnerships with major global players – including China, India, Russia, Japan, and the European Union. These relationships were essential for Brazil's ambition to consolidate itself as a global trading nation, diversify export markets, and strengthen both economic and political leverage on the world stage (Vigevani; Oliveira; Cintra, 2003). Cooperation with China in space technology and the negotiation of trade agreements with the European Union illustrated Brazil's commitment to developing robust bilateral ties that supported broader international objectives (van Loon, 2015).

This period represented a transition from a defensive and inward-looking diplomacy to a more confident and globally oriented one, in which Brazil attempted to shape international norms while adapting to globalization (Lopes, 2017). There were also limits and tensions of this model. While integration increased Brazil's visibility and reliability, it also exposed the country to structural asymmetries within the global order. As a result, the FHC period laid the groundwork for the subsequent shift under Lula, who would seek to complement integration with stronger diversification and South-South cooperation (Silva, 2012; Lopes, 2017)

According to Cervo and Bueno (2020, p. 509), while FHC's foreign policy (1994-2002) was grounded in a neoliberal rationale, that of Luiz Inácio Lula da Silva (2002–2010) drew inspiration from the logistics mission of the state. The authors underscore how the rise of Global South powers during this period both influenced and was influenced by Brazil's increasingly assertive international presence. As Vigevani and Cepaluni (2007) note, Lula's foreign policy deepened this diversification movement for autonomy, culminating in the strategy defined by the authors as "autonomy through diversification." This period similarly witnessed the creation of strategic alliances, renewed emphasis on multilateralism and South-South cooperation, the central role of trade negotiations and disputes, and broader geopolitical impacts derived from Brazil's diversified partnerships (Vigevani; Cepaluni, 2007; Almeida, 2007; 2010; Faria; Paradis, 2013; Faria, 2022; Lessa; Doratioto, 2025).

During Lula's two presidential terms (2003-2010), the consolidation of an ambitious South-South cooperation agenda profoundly reshaped Brazil's external action. It was characterized by strong international activism and by the pursuit of a more prominent role for Brazil in the international system, often summarized in the notion of an "active and assertive" diplomacy (Lessa, 2010; Miyamoto, 2011).

This strategy sought to redefine Brazil's global role, reduce dependence on advanced economies, and expand its international influence. By establishing strategic coalitions with other developing countries, Brazil positioned itself as a pivotal actor in the Global South, promoting solidarity, mutual development, and greater representation in global governance (Lessa, 2010; Silva; Andriotti, 2012). "Autonomy through diversification" encapsulated this shift: rather than relying on distance from great powers, Brazil proactively diversified its partnerships to reduce vulnerability to any single country or bloc, expanding its geopolitical and economic options (Vigevani; Cepaluni, 2007; Almeida, 2010).

Indeed, diversification was the cornerstone of Lula's diplomatic strategy. Notable initiatives included the creation of IBAS (India, Brazil, South Africa) and the G-20 coalition of developing countries at the WTO. These coalitions were designed to amplify the collective voice of the Global South, strengthen Brazil's bargaining power, and counter the predominance of the United States and the European Union in trade negotiations (Vigevani; Cepaluni, 2007; Silva; Andriotti, 2012).

Multilateralism remained a defining feature of Lula's foreign policy. Brazil assumed leadership roles in WTO negotiations – particularly during the Doha Round – and adopted a more active posture in mediating international disputes. In partnership with other developing nations, Brazil advocated for fairer global trade rules and sought to reduce systemic asymmetries (Vigevani; Cepaluni, 2007).

Trade negotiations and disputes also played an important role. Brazil adopted a firm stance in the negotiations over the Free Trade Area of the Americas (FTAA), defending agricultural liberalization while resisting the inclusion of

issues such as intellectual property and investment. This assertive posture cemented Brazil's reputation as a defender of developing countries' interests. (Vigevani; Cepaluni, 2007; Silva; Andriotti, 2012).

Economic integration and the expansion of South-South trade were equally central. Trade with China grew exponentially, with China surpassing the United States as Brazil's largest trading partner by 2009. Relations with India deepened as well, demonstrating the success of Lula's diversification strategy (Silva; Andriotti, 2012).

The geopolitical implications of these diversified partnerships were profound. By expanding diplomatic and economic ties across Africa, Asia, and Latin America, Brazil sought to position itself as a leading voice of the developing world and to foster a more multipolar global order. This diversification allowed Brazil to navigate international complexities with greater autonomy (Vigevani; Cepaluni, 2007).

Despite the South-South emphasis, Lula did not neglect relations with developed countries. Recognizing their importance for economic and political stability, the administration worked to maintain and strengthen ties with the United States and the European Union. This dual approach ensured balance and pragmatism in Brazil's external relations (Silva; Andriotti, 2012).

Parallel to this diversification movement of Brazilian foreign policy, Ukraine's has been shaped by a dynamic interplay between Western aspirations and Eastern pressures, influenced by both domestic political transformations and external geopolitical forces. Upon gaining independence in 1991, Ukraine initially adopted a distinctly pro-Western orientation. Under President Leonid Kravchuk (1991-1994), the country sought integration with Western political and military structures, particularly the European Union (EU) and NATO, viewing alignment with Euro-Atlantic institutions as essential for safeguarding newly won sovereignty (Shyrokykh, 2018).

A more complex and pragmatic phase emerged under President Leonid Kuchma (1994-2005), whose tenure proved foundational in defining Ukraine's foreign policy identity. Confronted with competing pressures from Russia and the West, Kuchma adopted a strategy of "multi-vectorism," aimed at balancing relations between major geopolitical centers without fully committing to either. Ukraine participated in NATO's Partnership for Peace while simultaneously preserving close ties with Russia, illustrating its attempt to maintain strategic flexibility in a contested regional environment (Kuzio, 1997; Shyrokykh, 2018).

According to Chekalenko and Fedunyak (2010), a key component of Ukraine's foreign policy during this period was the pursuit of long-term, comprehensive relations with partner states. This approach sought to secure political and military guarantees and foster economic cooperation on the basis of mutual respect and sovereign decision-making. By positioning itself within an emerging multipolar order, Ukraine aimed to ensure recognition of its independence, enhance its international influence, and safeguard its national interests in an increasingly interconnected global landscape.

Multi-vectorism required maintaining balanced relations with major global actors, including the United States, Russia, and the European Union. This equilibrium-oriented approach was perceived as essential for strengthening Ukraine's role as a regional leader, advancing European integration, and sustaining stable relations with neighboring states. For Ukraine, such balance was not merely diplomatic positioning but a critical strategy for national security and economic development amid the complex dynamics of post-Cold War international politics (Chekalenko; Fedunyak, 2010).

The Orange Revolution of 2004 ushered in a renewed pro-Western phase with the rise of Viktor Yushchenko (2005-2010). Yushchenko's administration prioritized integration with the EU and NATO, framing Western alignment as both a geopolitical imperative and a domestic reform agenda. Democratic governance, institutional modernization, and stronger ties with Euro-Atlantic partners became central themes, despite persistent internal divisions and external challenges (Shyrokykh, 2018). European integration, as Chekalenko and Fedunyak (2010) note, represented not only a

foreign-policy objective but also a strategy for economic modernization, attracting investment, and enhancing the competitiveness of Ukrainian producers.

Viktor Yanukovych's presidency (2010-2014) marked a return to multi-vectorism, although in practice it tilted increasingly toward Russia. Despite initial commitments to European integration, Yanukovych's refusal to sign the EU Association Agreement in 2013 – following substantial financial incentives offered by Moscow – triggered mass protests and political turmoil. This decision became the catalyst for the Euromaidan movement, which ultimately led to his removal from office (Shyrokykh, 2018).

The 2014 Revolution of Dignity produced a decisive reorientation in Ukraine's foreign policy. Under Petro Poroshenko and subsequently Volodymyr Zelensky, Ukraine firmly committed to EU and NATO integration. Russia's annexation of Crimea and the continuing war in the Donbas significantly strengthened domestic support for closer alignment with Western political, economic, and security frameworks. Since 2014, Ukraine's foreign policy has been defined by a clear and sustained shift toward the West, accompanied by efforts to counter Russian influence and strengthen national resilience (Shyrokykh, 2018).

Overall, the evolution of Ukraine's foreign policy reveals a persistent effort to reconcile Western integration with the realities of Russian influence and domestic political constraints. From the initial post-independence pro-Western trajectory to the alternating periods of multi-vector and Western-oriented strategies, Ukraine's foreign policy reflects the challenges of navigating a complex geopolitical environment while striving to assert sovereignty and advance national interests.

Brazil-Ukraine Relations in the 1990s and 2000s, space programs and the creation of Alcantara Cyclone Space

The Brazilian government acknowledged Ukraine's independence in December 1991 and established diplomatic relations on February 11, 1992. After declaring its independence, Ukraine manifested its interest in discussing bilateral relations, starting with the opening of a resident embassy in Brasília in 1993, a gesture reciprocated by Brazil in 1995 with the installation of its embassy in Kyiv (Brasil, 2023).

As evidenced in the previous sections, both countries had in the diversification of their foreign relations a strategy to enhance their role in the international arena. According to the Brazilian Ministry of Foreign Affairs (Brasil, 2023), following the establishment of diplomatic relations, the development of the bilateral relationship was favored by the mutual perception of a strategic partnership. In 1995, the two countries signed an Economic and Trade Cooperation Agreement, initiating dialogue in the commercial and technological sectors. In a significant step forward, in 2003, an agreement was signed to use the Ukrainian Cyclone-4 rocket for satellite launches at the CLA, seen at the time as the main pillar of the relationship.

The bilateral relationship kept steady, without further significant factors for roughly one decade. At the end of 2013, the outbreak of the "Euromaidan" revolution, followed by the onset of conflicts in Crimea and Donbas, led to profound shifts in Ukraine's economy and politics. The economic crisis drastically reduced trade with Brazil, while politically, Ukraine became focused on the aforementioned conflicts. During this period, the Brazilian government decided to withdraw from the bilateral space project. Negotiations to liquidate the binational public company ACS culminated in its dissolution in 2019 (Brasil, 2020).

Bilateral relations between Brazil and Ukraine benefit from the presence of a Ukrainian-descendant community in Brazil, estimated at around 450,000 people – the third-largest in the Americas, after the United States and Canada. Concentrated in the state of Paraná, this community has supported initiatives aimed at strengthening ties with Ukraine, such as university student exchanges and the teaching of Portuguese at the Taras Shevchenko National University. (Brasil, 2020; 2023).

Since 2013, a joint venture between the Ukrainian company Indar and Bahiafarma has contributed to the establishment of the first insulin crystal production plant in Brazil. Since 2018, a Productive Development Partnership (PDP) between the Brazilian Ministry of Health, Indar, and Bahiafarma has ensured the importation of NPH insulin from Ukraine and the transfer of technology for production in Brazil by Bahiafarma. Under the agreement, Bahiafarma became responsible for supplying significant share of the most commonly used types of insulin within Brazil's Unified Health System (SUS): Regular (R) and the long-acting NPH insulins (Bahia, 2018; MRE, 2023).

After the collapse of the Soviet Union in 1991, the newly independent Republic of Ukraine inherited a vast and highly developed space sector. At its peak, the industry employed around 100,000 people – today reduced to about 16,000, still roughly equivalent to NASA's workforce (Spacenews, 2023; Via Satellite, 2023). Ukraine produced the renowned Zenit, Cyclone, and Dnieper rockets, as well as a wide range of aerospace components. To preserve and capitalize on this technological legacy, the country quickly sought international partnerships that could provide access to markets, financing, and cooperative projects. Since independence, Ukraine has signed more than 30 international agreements related to space activities, including three with Brazil (Nascimento, 2013; Monserrat Filho, 2018).

Brazil's trajectory was shaped by the development of the CLA, which began operations in 1989 and enabled the launch of various sounding and meteorological rockets. The geographical location of the CLA confers a significant comparative advantage in the global launch services market, primarily due to its proximity to the Equator (approximately 2° south latitude). This position allows rockets to benefit from the Earth's rotational velocity, reducing the amount of propellant required to reach orbit and enabling either lower launch costs or greater payload capacity. Empirical estimates suggest fuel savings of up to 30% relative to higher-latitude launch sites such as Cape Canaveral, which directly enhances commercial competitiveness (Zaparolli, 2020; Lôbo *et al.*, 2024).

From a broader aerospace economics perspective, equatorial launch sites such as Alcântara are structurally advantaged in accessing geostationary and low-inclination orbits, which are central to telecommunications and Earth observation markets. In addition, Alcântara's eastward-facing Atlantic coastline permits safer launch trajectories and reduces energy losses associated with orbital inclination corrections, further reinforcing efficiency gains (Lôbo *et al.*, 2024; Lebre; Swainston; Martin, 2025).

Brazil placed its first satellites – SCD-1 (1993) and SCD-2 (1998) – into orbit using U.S. Pegasus rockets. The creation of the Brazilian Space Agency (AEB) in 1994 marked a turning point, allowing the country to expand international cooperation, most notably the 1988 partnership with China that generated the CBERS program. More recently, Brazil has sought to modernize CLA and open it to international use, attracting companies such as Virgin Orbit and Innospace. These initiatives, along with launches of the fully Brazilian-made VSB-30 suborbital rocket, illustrate Brazil's growing ambitions in the global space sector (Monserrat Filho, 2018; Brasil, 2022; Martínez Álvarez, 2023).

In 1995, the Ukrainian design bureau Yuzhnoye – developer of the Zenit rocket – joined Boeing (USA), RSC Energia (Russia), and Kvaerner (Norway) to create Sea Launch, an international consortium offering commercial satellite launches from an ocean-based platform positioned at the equator. The first successful launch took place on March 27, 1999 (Boeing, 2002; Monserrat Filho, 2018). Sea Launch represented an innovative model of space commercialization, maximizing payload efficiency through equatorial launches and using the mobile Ocean Odyssey platform to reduce fuel consumption.

Brazil's decision to commercialize the Alcântara Launch Center aligned with the global trend toward privatization and internationalization of launch services. As mentioned, launches near the equator benefit from Earth's rotational velocity, offering strategic advantages for geostationary orbit missions. The government sought to professionalize and modernize the site by involving Infraero – traditionally responsible for airport administration – to

manage infrastructure and logistics (Monserrat Filho, 2018). This approach followed global shifts with the rise of public-private partnerships as countries adapted to the booming commercial satellite market (Larson; Pranke, 2003).

It was in this context that, in 1997, Ukraine welcomed a proposal from the Italian aerospace firm Fiat Avio to establish a consortium with Brazil for the launch of Cyclone-4 rockets from the CLA. Negotiated through Infraero, the initiative aimed to exploit the site's equatorial advantage, while the Cyclone-4 – an upgraded version of the Cyclone-3 with over 200 successful launches – offered proven reliability (Monserrat Filho, 2018). However, the partnership soon faced obstacles. From the start, the United States raised concerns about potential missile-technology transfers, prompting Fiat Avio to withdraw. Brazil and Ukraine nonetheless continued negotiations, eventually forming the Alcântara Cyclone Space (ACS) joint venture (Braun, 2004; Azevedo, 2007; Pantoja; Ribeiro, 2015).

ACS, headquartered in Brasília, was tied to both countries' space agencies and launched with an initial investment of US\$ 4.5 million. The Cyclone family's strong track record combined with CLA's projected 13-31% fuel savings (Sousa Jr., 2007; Azevedo, 2007) made the project commercially promising. A Memorandum of Understanding signed on April 7, 1998 by Infraero, Fiat Avio, Yuzhnoye, and Yuzhmash formalized intent to create a launch consortium; Motorola even expressed interest as a first client (Monserrat Filho, 2018).

However, the U.S. State Department discouraged Motorola's participation and advised the Italian government – via a “non-paper” – to oppose Fiat Avio's involvement. Despite Brazil's 1996 accession to the Missile Technology Control Regime (MTCR) and its export-control legislation, Washington cited concerns over Brazil's Satellite Launch Vehicle (VLS-1) program and argued that Brazil remained an unreliable partner. As a result, negotiations stalled (Monserrat Filho, 2018).

Brazil subsequently launched an intensive diplomatic effort, which included direct dialogue between Presidents Fernando Henrique Cardoso and Bill Clinton, eventually securing an agreement to negotiate technology-safeguards measures. After several months, the TSA was signed on April 18, 2000. With diplomatic obstacles eased, Brazil resumed discussions with Ukraine, and on November 18, 1999, the two countries signed a Framework Agreement for Cooperation in the Peaceful Uses of Outer Space, marking a new stage in bilateral collaboration.

However, the political, financial, and technical difficulties that would ultimately doom the project still lay ahead. Until its termination in 2015, Brazil and Ukraine invested approximately US\$ 500 million each, yet expected commercial returns never materialized (Shevtsov; Kashanov, 2014; Spacenews, 2015; Dien', 2016). Internal instability in both countries compounded these problems. Externally, the Russian Federation and the United States played decisive roles in undermining ACS. According to Zaitsev (2008), Russia exploited environmental concerns over hypergolic fuels – eventually leading Kazakhstan to ban launches of certain Russian rockets from Baikonur – and subtly encouraged Brazil to pursue “green” launch vehicles, diverting interest away from Cyclone-4. Meanwhile, the deteriorating Russia-Ukraine relationship caused Russian suppliers to restrict critical inputs to Ukraine's aerospace industry, jeopardizing its capacity to support the project. Writing in 2008, Zaitsev predicted that Brazilian cancellation was inevitable due to Russia's leverage.

As part of bilateral cooperation, the Embassy of Ukraine in Brasília facilitated academic exchanges for Brazilian students (Nascimento, 2013). Nonetheless, the project's outcomes affected multiple stakeholders: the United States, which actively sought to impede Brazilian rocket development, and Russia, which pressured Ukraine to limit its foreign partnerships. Insight into these dynamics emerges from leaked U.S. diplomatic cables – analyses of which will follow.

WikiLeaks files on US balancing against Alcântara Cyclone Space

The documentary evidence provided by *WikiLeaks* cables offers an interesting reconstruction of external constraints that shaped the trajectory of the ACS project – supporting the interference arguments provided by Zaitsev

(2008). Several communications from the U.S. Embassy in Brasília reveal a consistent pattern of monitoring and conditional engagement by the United States regarding both the CLA and the Brazilian–Ukrainian partnership.

A 2004 cable reporting the U.S. Ambassador’s call on Brazilian Defense Minister José Viegas Filho (USA, 2004) makes clear that Washington imposed significant restrictions on Brazil’s space program, particularly by conditioning the participation of U.S. firms in commercial launches from Alcântara on the ratification of a TSA. Although a TSA had been signed in 2000, it remained stalled in the Brazilian Congress due to sovereignty concerns, and negotiations over revisions were ongoing. The U.S. position emphasized the need for stringent safeguards to prevent unauthorized technology transfer and mitigate risks associated with missile proliferation.

This restrictive stance is further elaborated in the confidential cable titled “Ukraine Requests USG Support for Ukrainian–Brazilian Space Launch Joint Venture at Alcântara” (USA, 2008). In this communication, the U.S. Embassy in Brasília seeks guidance on how to respond to Ukrainian efforts to reverse Washington’s earlier refusal to support the ACS initiative. Ukrainian representatives advanced three central arguments in favor of U.S. backing: first, that Ukraine could leverage its influence within the Brazilian Congress to facilitate the approval of the long-delayed U.S.–Brazil space cooperation agreement; second, that Ukraine’s existing collaboration with the American company Orbital Sciences could generate commercial opportunities for U.S. firms; and third, that access to Alcântara could reduce launch costs by up to 30% for U.S. satellite operators. Most significantly, Ukrainian officials warned that, absent U.S. support, Russia would likely fill the vacuum and become Brazil’s primary partner in space cooperation – a prospect that, according to the cable, already enjoyed high-level political support within Brazil.

This same cable notes that Brazil–Russia space launch cooperation had high level political support in Brazil, and Ukrainians were concerned of Russian representatives movements to block the Ukrainian cooperation. The cable cites president Medvedev visit to Brazil as part of this strategy.

The U.S. response to these overtures is clarified in the cable “Responding to Ukrainian Questions Concerning USG Support for Ukrainian–Brazilian Slv Joint Venture at Alcantara” (USA, 2009), classified as confidential and dated January 14, 2009. This communication, sent from the Secretary of State to the U.S. Embassy in Brasília, provides explicit instructions on how to address Ukrainian inquiries. The central point of the message is unambiguous: the United States would not permit the launch of U.S. satellites – or foreign satellites incorporating U.S.-licensed components – from Alcântara until the TSA was ratified. The agreement was explicitly framed as a mechanism to prevent unauthorized transfers of rocket technology that could enhance Brazil’s indigenous Space Launch Vehicle (SLV) program, a development that, according to the cable, the United States had historically sought to avoid encouraging, particularly in the context of Missile Technology Control Regime (MTCR) member states. While expressing nominal support for the Brazilian–Ukrainian partnership, the U.S. made clear that such support was strictly conditional on the protection of its technological assets. The absence of Senate ratification in Brazil therefore functioned as a decisive barrier, effectively blocking any launches involving U.S.-linked technologies.

Initially, Russia supported the project, with Sberbank participating in financing the development and construction of the Cyclone-4 rocket (Kyiv Post, 2011). The cable “Ukraine: Space Deal” highlights that Cyclone-4 was not fully Ukrainian-controlled, as Russia retained a stake in its design and production. A key component – the first-stage engine – was produced by a Russian state company (Energomash). As insiders mentioned in the cable note, the project would hardly be able to secure a necessary agreement with Russia and make it partners with Ukraine in building the launch vehicle. The cable cites estimates that Ukraine owns 95% of the Cyclone-4 design and Russia owns the remaining 5%. Even this minor (5%) ownership share gave Russia blocking power over key decisions – particularly regarding intellectual property and export authorization.

Russian efforts to establish a partnership at the CLA are evidenced in the leaked cable “The Brazil-Russia Partnership: Coffee and Sympathy” (classified confidential, dated December 12, 2008), which records discussions regarding potential cooperation at the launch site. Beyond technical considerations, the cable adopts an ironic tone when referring to Russians’ stance on the social dimensions of the project, notably reflecting a lack of understanding of the situation of quilombola communities in the CLA area and suggesting that they could simply be “packed up and moved elsewhere.”

Taken together, these cables reveal a coherent pattern of external constraint that goes beyond *ad hoc* diplomatic friction and instead reflects deeper structural dynamics. The ACS project, by combining Brazil’s advantageous equatorial launch site with Ukraine’s inherited aerospace capabilities, had the potential to alter the distribution of capabilities in a strategic sector characterized by high barriers to entry and strong links to national security. The space launch industry is not merely a commercial domain but a dual-use technological field in which civilian and military applications are deeply intertwined. As such, even ostensibly commercial initiatives may generate security externalities that trigger precautionary responses from established powers.

Following Stephen Walt (1987), state behavior is driven not simply by the distribution of capabilities, but by threat perception, which depends on factors such as aggregate power, proximity, offensive potential, and perceived intentions. In this case, the Brazilian–Ukrainian partnership did not constitute an immediate military threat to either the United States or Russia. However, it introduced uncertainty regarding future capabilities, particularly in a domain – space launch technology – with clear implications for ballistic missile development. This uncertainty is sufficient, within a defensive realist framework, to trigger balancing behavior.

The United States’ conduct can thus be interpreted as a rational response to the security dilemma, as conceptualized by Robert Jervis. Measures taken by Brazil and Ukraine to enhance their technological autonomy – such as developing an independent launch capability – could be perceived by Washington as potentially eroding existing nonproliferation regimes or facilitating latent military capabilities. In response, the United States adopted a strategy of conditional engagement, using regulatory instruments such as export controls and the TSA requirement to limit the diffusion of sensitive technologies. Crucially, these measures did not require overt coercion; instead, they operated through the structural centrality of U.S.-licensed components in the global space industry. This form of constraint aligns with Charles Glaser’s argument that states seek to minimize risks and avoid worst-case scenarios under conditions of uncertainty, even when dealing with partners whose intentions are not overtly hostile.

At the same time, these policies had the effect of preserving U.S. structural advantages in the global launch market. The prevalence of American components in satellite systems meant that Washington could effectively exercise veto power over launches conducted from third countries, including Brazil. This created a form of indirect technological dependency that constrained the strategic options available to middle powers. Importantly, within a defensive realist framework, such outcomes need not be interpreted as evidence of deliberate hegemonic expansion, but rather as by-products of risk-averse strategies aimed at maintaining existing security arrangements.

Russia’s role, though indirectly documented in the cables, can be understood through similar logic. As the successor to the Soviet Union, Russia retained significant influence over Ukraine’s aerospace sector, including control over supply chains, industrial infrastructure, and key technological inputs. The ACS project introduced the possibility of Ukraine reducing its dependence on Russian systems and diversifying its partnerships beyond the post-Soviet space. From Moscow’s perspective, this represented a potential shift in the regional balance of capabilities and a weakening of its strategic position vis-à-vis Ukraine. Consequently, Russian actions – ranging from political pressure to constraints on industrial cooperation – can be interpreted as efforts to prevent unfavorable changes in relative power rather than as purely expansionist behavior.

The convergence of U.S. and Russian constraints, despite the absence of explicit coordination, underscores a central insight of defensive realism: states responding to similar uncertainties may independently adopt policies that produce mutually reinforcing outcomes. In the case of ACS, both powers acted to limit the emergence of a new autonomous launch capability that could introduce unpredictability into a strategically sensitive domain. For Brazil and Ukraine, these external pressures translated into increased costs, delays, and ultimately the erosion of the project's viability.

Conclusion

The ACS project constitutes a paradigmatic case of the structural constraints faced by middle powers attempting to advance technological autonomy in strategically sensitive sectors. As demonstrated throughout this study, Brazil and Ukraine pursued a cooperative initiative grounded in complementary capabilities – geographic advantage and aerospace expertise – yet ultimately encountered systemic barriers that cannot be fully explained by technical or financial shortcomings alone. Rather, the project's trajectory reflects its insertion within an international system in which great powers actively shape the conditions under which technological development occurs.

From a theoretical perspective, the findings reinforce key insights of defensive realism. The reactions of the United States and Russia are consistent with balance-of-threat logic, as both powers responded not to an immediate challenge, but to the uncertainty generated by the potential evolution of Brazilian–Ukrainian capabilities in a dual-use technological domain. The ACS initiative, while formally commercial, became securitized due to its latent implications for missile technology and strategic autonomy. In this sense, the case illustrates how technological cooperation can be reinterpreted through a security lens, triggering precautionary balancing behavior.

Empirically, the analysis of diplomatic cables provides concrete evidence of how such balancing operates in practice. The United States employed regulatory and technological constraints – particularly through export controls and the TSA – to limit the diffusion of sensitive capabilities, effectively exercising indirect veto power over the project. Russia, in turn, leveraged its residual influence over Ukraine's aerospace sector and its position within critical supply chains to constrain the partnership. Later, Russia also explored its improved proximity to the Brazilian government to substitute Ukraine as the chosen partner at CLA. These mechanisms operated through different channels, yet converged in their effects, illustrating how uncoordinated actions by great powers can produce structurally reinforcing outcomes.

The case also underscores the importance of structural dependency in shaping the prospects of technological autonomy. Brazil and Ukraine, despite their ambitions, lacked full control over key components, supply chains, and regulatory frameworks necessary to sustain an independent launch capability. This dependence increased their exposure to external pressures and amplified the impact of great-power intervention. In this respect, ACS demonstrates that technological capability alone is insufficient; autonomy in strategic sectors requires control over the broader ecosystem in which such technologies are embedded.

More broadly, the failure of ACS highlights the limits of diversification strategies pursued by middle powers. While both Brazil and Ukraine sought to expand their international partnerships and reduce dependence on traditional centers of power, their initiative ultimately triggered countervailing responses that reaffirmed existing hierarchies. The case thus suggests that diversification, while enhancing diplomatic flexibility, does not eliminate structural constraints in sectors characterized by high security sensitivity and concentrated technological control.

In conclusion, the ACS project reveals that the pursuit of technological autonomy by middle powers is deeply conditioned by the dynamics of great-power politics. The interplay of regulatory regimes, supply-chain dependencies, and threat perceptions constrains the range of viable strategies available to emerging actors.

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