

Technology geopolitics and geoeconomics in Argentina

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Abstract

This chapter outlines two main features of the geopolitics and geoeconomics of technology in Argentina. The first factor is the overarching geopolitical and geoeconomic dynamics of a specific historical period, which might enable technology development projects or may also constrain such projects due to pressures from foreign powers. The second factor is that, as a semi-peripheral state, the foreign policy orientation of Argentina fluctuates between autonomist and dependency approaches at the core, based on the foreign policy of the president in power and their preferred economic development model. We will illustrate the importance of these two dimensions with examples from the Argentine nuclear, space and digital sectors.

Keywords

Geopolitics of technology; Argentina; pressures; foreign policy; nuclear; space; digital.

Introduction

This chapter outlines the main features of the geopolitics of technology in Argentina. This South American country has an estimated population of 47 million inhabitants and is the second largest economy after Brazil. The most important export products are natural resources, mainly agricultural commodities, alongside exports of oil, gas and mining products. Additionally, Argentina possesses a relatively advanced manufacturing sector, which in the case of the automobile industry represents around 10% of national exports. During the last 20 years, knowledge-intensive related

exports have also been on the rise, especially in software services and biotechnology, as well as in the nuclear and space sectors. These exports are linked to the fact that the state has supported—during different administrations and to varying degrees—science, technology and innovation policies in strategic sectors.

Within the scope of this chapter, the aim is to outline some of the key geopolitical factors shaping technology policies in Argentina; thus, other domestic factors are beyond the scope of this short piece. These geopolitical factors will then be illustrated by synthesizing insights drawn from a literature review of studies investigating the nuclear, space and digital sectors of Argentina, mainly during the past decade.

Factors shaping the geopolitics of technology in Argentina

In this chapter, we draw insights from a historical-structural approach to geopolitics and from critical geopolitics.

A structural historical-geographical approach to geopolitics ([Flint & Taylor, 2018](#); [Flint & Xiaotong, 2019](#)) assumes that states compete for scarce resources in the global capitalist economy. However, not all the states are of the same kind; there is a political geography of states that are part of the center, where the most advances in technologies and economic processes take place, and peripheries, which are linked in different asymmetric ways with the center. In particular, a world systems perspective would argue that there are also semi-peripheral states, which are in the middle of core and peripheral ones. These states have some industrial and technological capacities, though they still remain exploited and dependent on the centers. However, these semi-peripheral states have enough capacities to also establish asymmetric favorable relations with other peripheral states.

In Latin America scholarship, structural perspectives derived from dependency theory and world systems theory have been very influential for explaining and understanding the dynamics among core, semi-peripheral and peripheral states ([Beigel, 2006](#)). A key tenet of this scholarship is that there are structural conditions that limit the possibilities of development of Latin American states. The limitations can be of diverse kinds, such as a focus on primary exports at the expense of developing manufacturing capacity or an underdeveloped national innovation system. Likewise, the intellectual property rights system poses constraints on the technological upgrading of peripheral states.

From a geopolitical perspective, in this chapter, on the one hand, we will focus on what we understand to be a crucial factor for the geopolitics of technology in semi-peripheral or peripheral states, namely, the pressures exerted by a core state on a peripheral one to align with its preferred technology policy instead of others. Numerous empirical contributions have recorded examples of such pressures (Blinder, 2017, 2022; Hurtado, 2015; Patti & Spektor, 2020), which can be of diverse kind. For example, the pressures may involve the use of coercive framing, deception, diplomatic harassment, mediated public diplomacy or sanctions (Blinder & Vila Seoane, 2023).

On the other hand, we propose to complement a structural approach with a critical geopolitics perspective, which understands geopolitics as power relations, having territorial, economic and symbolic-discursive dimensions that can be analyzed at different scales (Agnew, 2003; Flint & Taylor, 2018). It differs from a structural approach because of the importance it gives to the political agency and, in particular, to the geopolitical imagination of actors in the international system. Therefore, instead of focusing only on structural elements, a critical geopolitics approach is also interested in analyzing geopolitical discourses. This allows scholars to see how different actors interpret and act on the particular political reality they face (Dijkink, 1998; Toal, 1996), especially via foreign policy. This matters for understanding the geopolitics of a semi-peripheral or peripheral state because according to its foreign policy, the relation to the core and the response to the pressures against a technology project—if they exist—will possibly vary.

Generally speaking, Latin American foreign policies can be classified according to whether they have as an aim autonomy from or dependency on the centers. On the one hand, the adoption of a dependent foreign policy with the hegemon is justified for the presupposed benefits that such partnerships might bring (Escudé, 2014). On the other hand, an autonomous foreign policy perceives dependency on the center as a problem to tackle. Therefore, several scholars and policymakers have put autonomy from the center as the core aim of foreign policy (Míguez, 2021). This concept has been very influential in the work of Latin American scholars and policymakers who have advocated for the advancement of science and technology as a way to achieve development and surpass dependency challenges.

Whether the main goal of a Latin American government's foreign policy is autonomy or dependency depends on the presidential ideology (Hey, 1997; Merke et al., 2020). This is also tied to the particular development model chosen by the national administration. Although a development model may have many dimensions (Busso, 2016), we want to highlight, on the one hand, liberal strategies that seek development via free markets and minimal—ideally nonexistent—state intervention, mainly by

attracting foreign investment. On the other hand, neo-developmental strategies pursue development by combining the attraction of foreign investment and export promotion with active state support for strategic technology and industrial projects.

In conclusion, elements from a structural perspective and critical geopolitics matter for understanding the geopolitics of technology in Argentina. First, the country can be considered a semi-peripheral state because it has relatively stronger industrial, science and technology capacities in comparison to other Latin American states. However, the country has been entangled in a dependency relation with core states in different sectors since its foundation. Thus, depending on the particular geopolitical context under analysis, the opportunities and threats for technology policies have differed considerably. Second, the ways in which Argentina responded to a particular geopolitical context are closely linked to the foreign policy of the administration in power and its preferred development model, which may have supported or demoted technology projects. During some periods, liberal development models aligned with the core were preferred. These tend to opt for a development model based on natural resource exports, such as agricultural products, mining or oil & gas, and technological dependence on the core. During other periods, neo-developmental strategies were pursued that, in addition to supporting extractive industries, also promoted more autonomous science and technology initiatives. In some particular geopolitical contexts, these endeavors faced pressures from core countries. In Argentina's foreign relations with China and the United States (US), several nuances stand out. Historically, Argentina has maintained an active—though at times tense—relationship with the US, a key regional and global actor. During the last decade, China has emerged as a major trade partner and strategic player in Argentine foreign policy. Its global rise has intensified geopolitical competition with the US, reflected in both American pressure and growing Chinese lobbying efforts to secure influence and business in Argentina. The next section provides examples of these factors, which are crucial for understanding the geopolitics of technology in Argentina.

Nuclear

Argentina is one of the few Global South states with a long history in the development of peaceful applications of nuclear energy, which began in the 50s, under the government of President Perón, who favored a development state model. During the following decades, Argentina accumulated different capabilities linked to civilian nuclear energy, among which the operation and construction of research reactors stand out (Hurtado, 2014). Despite the various achievements that the Argentine nuclear program reached during its first four decades, in the 1990s, the nuclear sector suffered a severe defunding that almost caused its disarticulation and

led to a standstill of ongoing projects ([Hurtado, 2014](#)). This was an outcome of the administration at the time, led by President Menem, who adopted a neoliberal economic development model and a close foreign policy alignment with the US. This led to the acceptance of US pressures to stop advancing Argentina's nuclear program due to unfounded fears of potential proliferation ([Hurtado, 2014](#)).

In contrast, in 2012, under the Kirchner administration that prioritized a neo-developmental state model and South-South partnerships, Argentina and China signed a series of nuclear cooperation agreements. In November 2015, these exchanges culminated with an agreement for the construction of the fourth and fifth nuclear power plants in Argentina. One would use the Canadian CANDU-type design that the Argentine nuclear technology community had already mastered, and another one would use Chinese technology, branded as Hualong One. Since then, the implementation of these agreements has been delayed due to various reasons. Among them, the most important one has been the pressure from US public officials, who, amidst their rivalry with China, repeatedly warned Argentine public officials against advancing with such projects ([Blinder & Vila Seoane, 2023](#)). The reasons involved the potential security risks of installing Chinese nuclear technology. These pressures caused a division within the ruling coalition, with some public officials aligned with the US position, while others advocated for continuing cooperating with China. According to our research, the former prevailed to delay the project ([Blinder & Vila Seoane, 2023](#)). These pressures were geopolitical, because they emanated from the US geopolitical discourse that anything done by Chinese actors is a security risk to the US, and to the rest of the world. Thereby, this kind of pressure sought to limit the rise of China in nuclear technology worldwide, and in Argentina in particular. After the libertarian and pro-US Milei administration came to power in 2023, this project with China was finally abandoned.

Space

Argentina has been a pioneer South American state in the development of space technologies. Since the 1960s, the country has accumulated capabilities in this sector incrementally. President Frondizi (1958–1962) created the National Commission on Space Research (CNIE), under military control. Several extraordinary goals were achieved, such as the Rockets Alfa, Beta and Gamma Centauro, the rockets Orion, Castor, Rigel and Tauro and, especially, the Canopus II Rocket, with which a monkey was sent to space and brought back alive ([Blinder, 2015](#)).

One of the key developments that had a crucial geopolitical dimension was the Condor II project. This initiative started during the last military dictatorship (1976–

1983), which sought to develop a medium-range missile. After the country democratized, President Alfonsín (1983–1989) continued with the project, which was financed by companies of Germany, France and Italy and tied to Egypt and Iraq. However, in practice, the advancements were slow on the one hand due to the economic hurdles in Argentina. On the other hand, it was because the US pressured Argentina to stop the project for fear that it would lead to the proliferation of such missile technologies to other countries.

In the 90s, the Menem administration, which was aligned with the US and adopted a neoliberal model, accepted the US pressures and cancelled the Condor II project. The Menem administration also passed the space program under the purview of a new civilian-led agenda, The National Space Activities Commission (CONAE). Moreover, the alignment with the US led to different space strategic cooperation projects with NASA. These had as an outcome the launch of different satellites, such as the μ SAT-1, the experimental satellite Victor in 1996, the SAC-B in 1996 to study the sun, the Nahuel-1A in 1997, the SAC-A in 1998 with experimental objectives and the SAC-C in 2000 for earth observation. All these satellites were launched by other countries, sending a clear signal to the US that Argentina would not develop its own dual-use missile capabilities. Therefore, stopping the project the US opposed, and aligning with US preferences, led to more cooperation in space activities in this case.

Notwithstanding, the space sector was further bolstered during the Kirchner administration. Indeed, in 2003, the government adopted a neo-developmental state model, which considered space as a strategic sector. This approach led to the creation of a state-owned enterprise, Argentina Soluciones Satelitales (ARSAT), which had the purpose of designing geostationary satellites for telecommunications. Additionally, the state-run INVAP was involved in the design and construction of these and other satellites, such as the SAC-A, SAC-B and SAC-C, the SAOCOM, the SAC-D/Aquarius and two geostationary ARSAT satellites for the national space system. In part, this was due to the development of capabilities via having cooperated with US partners.

During these years, the government also sought to increase space cooperation with China, for example, by installing an antenna aiming telemetry and observing deep space for scientific purposes (Frenkel & Blinder, 2020). However, as it happened with the nuclear sector, this initiative was highly questioned and opposed by the US (Blinder, 2015; Blinder 2022), which presented the project as a security risk for its potential military uses.

However, under the Milei presidency (2023–2027), the libertarian ideology that underpins the government, which seeks to privatize every state company,

threatens the state-led space sector of Argentina. Indeed, the government has significantly reduced funding for the sector and suspended various projects.

Digital technologies

Regarding the development of digital technologies, Argentina has diverse kinds of dependence with the core, which varies according to what aspect of digital policies is considered.

Regarding the export of knowledge-intensive services, during the last 25 years, the country has developed a dynamic software services industry that exports mainly to the US. This resulted from a favorable geoeconomic context in which primarily US companies sought to offshore segments of their value chains, alongside Argentine government policies aimed at promoting software firms capable of integrating into US-led global value chains. Mercadolibre and Globant are two of the national unicorns that represent the success of such national policies. However, the relationship between these software firms and the core has remained highly asymmetric. Recent studies suggest a form of capacity extraction from Argentine software workers ([Baum et al., 2022](#)), as they are often employed by foreign companies offering higher salaries, a process that undermines the growth of national companies. In conclusion, the software sector exemplifies a dependent cooperation with the core, persisting over time despite changes in national administrations.

In many other crucial policy areas in the digital agenda, Argentina is also highly dependent on core countries, mainly the US. For example, in artificial intelligence policy, the Macri administration, which had a foreign policy aligned to the US and favored a liberal development model, passed a plan that sought to develop capacities in the area, mainly by linking to US multinational companies ([Vila Seoane, 2021](#)), providing no support to local development projects. The following administration, led by President Fernández, abandoned this plan and sought to develop artificial intelligence capabilities via funding research and development projects of national research teams. However, such funding was interrupted after the taking of office of the next President, Milei. His self-proclaimed libertarian and pro-US administration aims to position Argentina as the “fourth pole of AI” by attracting investments from US digital companies, offering highly favorable conditions for investments. Similar to the Macri administration, it has marginalized the development of national AI projects, thereby exemplifying another case of dependent development. Another area that shows dependence on the core is cybersecurity. In this crucial policy domain for national and international security, most of the normative and legal

capabilities in Argentina are linked to the US or other Western countries ([Vila Seoane, 2022](#)).

Despite the US influence in Argentina's digital policies being significant, during the last decade, Chinese companies have also become important partners in different digital-related sectors. For instance, as is happening elsewhere ([Vila Seoane, 2022](#)), Chinese companies such as Huawei and ZTE have been successful in providing telecommunication infrastructure in Argentina. Moreover, platform companies like Didi and TikTok are competing on equal footing with Western companies. Additionally, many municipalities have purchased Chinese surveillance technology for citizen security projects. Due to the tense rivalry with China, the US has exerted diverse pressures against Argentina's cooperation with Chinese digital companies due to the purported threat that such cooperation represents to national security. This included the campaign against Chinese 5G companies and also criticisms of citizen security projects based on Chinese digital technologies ([Vila Seoane & Morena Álvarez Velasco, 2024](#)). At least in these cases, the national administrations in power have not acquiesced to the US pressures to ban Chinese digital companies.

Conclusion

In the case of a semi-peripheral state such as Argentina, the geopolitical context matters for understanding the opportunities in and threats to national technology projects. In tense contexts, core states may pressure against a particular technology policy that diverges from the preferences of the centers. On the one hand, the development of nuclear, space and digital technologies requires a favorable geopolitical and geoeconomic context for their progress, supported by policies that foster technological niches. On the other hand, the geopolitical scenario and the global productive structure can also push through pressures upon a country to not develop certain technologies that the core does not want the semi-periphery to develop, maintaining the status quo.

Whether or not Argentina acquiesces to or rejects such pressure hinges upon the President in power, whose preferred foreign policy and development strategy may support dependency on the center or a certain degree of autonomy. In addition, whether or not the technology project or sector under consideration is entirely state-led or private-led may influence as well the response to such pressures.

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