English Edition

ISSN 2316-4891 (Online)
ISSN 2316-4833 (Print)

Coleção Meira Mattos

revista das ciências militares

Escola de Comando e Estado-Maior do Exército
v. 14 n. 49 January/April 2020

Coleção Meira Mattos

revista das ciências militares

v. 14 n. 49 January/April 2020
Rio de Janeiro

English Edition

ISSN 2316-4891 (Online)
ISSN 2316-4833 (Print)

ABOUT
The Coleção Meira Mattos is an academic not for profit publication circulated three times a year by the Military Sciences Post-Graduation Program of the Escola de Comando e Estado-Maior do Exército (ECEME) based on the policy of free access to information.

ADRESS AND CONTACT
Praça General Tibúrcio, 125, Praia Vermelha, Rio de Janeiro/RJ, Brasil.
CEP: 22290-270.
Tel: (21) 3873-3868 /Fax: (21) 2275-5895
e-mail: info.cmm@eceme.eb.mil.br

EDITORIAL SERVICES
Tikinet Edição

PRESS
Triunfal Gráfica e Editora

COVER GRAPHIC DESIGN
Designed by the Production, Publicity and Cataloging Section, based on art by Harerama Santos da Costa, ECEME Desktop Publishing Section.

AVAILABLE IN ENGLISH / DISPONIBLE EN ESPAÑOL
<http://ebrevistas.eb.mil.br/index.php/RMM/index>

Cataloging in Publication (CIP)

C691 Coleção Meira Mattos : revista das ciências militares. — Vol. 1, n. 24- .
— Rio de Janeiro : ECEME, 2007-
v. : il. ; 28 cm.

Quarterly.
Published from no. 1-14 with the title Padeceme, and from no. 15-23 with the titles Padeceme and Coleção Meira Mattos.
Padeceme e Coleção Meira Mattos.
ISSN 2316-4891 (Online). — ISSN 2316-4833 (Print)

1. DEFENSE. 2. MILITARY SCIENCE. I. Escola de Comando Estado-Maior do Exército (Brasil).

CDD 355

CONTENTS


ECEME

 DOI 10.22491/cmm.a019

CMM and PPGCM: a story in parallel

Cel Carlos Eduardo De Franciscis Ramos
Head of the Meira Mattos Institute

Dr Tássio Franchi
CMM editor

ISSN on-line 2316-4891 / ISSN print 2316-4833
http://ebrevistas.eb.mil.br/index.php/RMM/index

To disseminate knowledge in Military Sciences and correlated issues in Security and Defense, *Escola de Comando e Estado Maior* created a scientific journal in 2007 called *Coleção Meira Mattos* (CMM). In early 2020, after completing 13 years of existence, CMM deserves a brief reflection upon its trajectory and evolution as a scientific journal. For the purposes of this brief analysis and by observing the timeline since its creation, we can say CMM has experienced four very different phases thus far, all of which will be described in this editorial.

The first phase started in the year of its creation and is characterized by receiving the evolutionary legacy of school publications. The prior publications were: "Refresher Course for the Graduates of the Service Staff and Healthcare Services Courses from ECEME (CAECEME)"; "Refresher Course for the Graduates from *Escola de Comando e Estado-Maior do Exército* (CADECEME)", in 1974; and "Refresher Process for the Graduates from *Escola de Comando e Estado-Maior do Exército* (PADECEME)" – the latter is the institutional journal that established sequential numbering with quarterly periodicity, in 1991. PADECEME received its ISSN registration number in 2002 (1677-1885) and, in 2005, had a section with scientific articles after the development and stimulation actions of PRO-DEFESA[1]. This movement established the maturation of the journal, providing a new phase for CMM.

1 The Support Program to Education, Scientific Research and Technology in National Defense (PRO-DEFESA) was created in 2005 by a joint initiative of the Brazilian Ministry of Defense and the Coordination for the Improvement of Higher Education Personnel (CAPES). ECEME participated in interinstitutional research projects in partnerships with EBAPE/FGV and UFF under the PRO-DEFESA I.

The second phase begins in 2007 with the creation of CMM, which incorporated the experience gained from previous institutional journals but still shared space and ISSN number with PADECEME until 2011, when they separated definitively with CMM acquiring its own identification for its printed and digital versions (ISSN 2316-4833 and 2316-4891). Since then, CMM has been implemented to the SEER/OJS system, which leads to the third phase. It is noteworthy that these last developments occurred simultaneously at the beginning of Meira Mattos Institute (IMM) creation, in the context of the Army Transformation Process.

The third phase of CMM begun with the creation of IMM (2012) and with the approval and recommendation by CAPES of the Master's Degree of the Graduate Program in Military Sciences (PPGCM)[2], which brought many opportunities to improve ECEME graduation (NUNES, 2012). This caused a displacement of the CMM proposal, still impacted by significant endogeny and professional articles. We see a journal focused on the external public and on scientific knowledge, supported by information technology tools. This phase was characterized by the search for scientific publication patterns adopting "double blind" peer review; titles and abstracts in English; regularity of the quarterly periodicity; number of articles published; structuring of an editorial board and a group of evaluators composed of external members from both the military and academic environment; an editorial flow was established, and financial resources were provided. However, the difficulties found included periodicity, such as: articles collection, not obtaining certification in the SciELO database[3], and interruptions in the editorial flow. These factors led to the creation of "ESAON"[4] to obtain a diagnosis, ending the phase of progress and opportunities for improvement.

PPGCM matured with the proposition and approval of the Doctorate. There was also a public tender for full-time professors, which conferred stability to the Meira Mattos Program. The demand for a journal more connected with the art state of the academic world discussions became vital with the CAPES doctorate. The circulation of ideas and specialists from many areas related to the debate of national defense in a graduate program provided new articles and reviewers for CMM, promoting the journal positively.

The fourth and current phase begun in 2018. CMM was reorganized based on the diagnosis and execution of a strategic planning for the coming years, which aimed to create a journal with relevance in the Defense area. CMM assumed the mission of publishing scientific articles, selected articles, and reviews in the areas of interest of the Security and Defense Studies and Military Sciences, serving as means of exchange with higher education institutions in civil and military circles, in Brazil and abroad (FRANCHI; OKI, 2020).

2 The Graduate Program in Military Sciences, conducted by ECEME, was created in 2004 under the Army Education Law No. 9,786 of February 1999.

3 The Scientific Electronic Library Online (SciELO) is an electronic library that covers a selected collection of Brazilian scientific journals.

4 The mnemonic process adopted at the Jungle Warfare Training Center (CIGS) was applied in survival technique that established the following actions: parking (performing a longer stop and in better condition), sitting (seeking a comfortable position), self-feeding, self-guiding (topographic chart, compass, and expedited media), and navigating (guided walk towards a selected goal).

The resulting actions were: the establishment of a consultancy for academic publications under a project with *Fundação Getúlio Vargas*; the focus and scope readjustment; the financial flow planning and control for the many editorial flow phases; trilingual digital and printed publication; DOI allocation[5]; the editorial board reorganization; the reorganization and orientation of evaluators; forms reformulation and instructions on the website; other administrative measures. The search for quality indexation and dissemination by international repositories is already a reality with Latindex, Diadorim, DOAJ, Portal de Periódicos CAPES, Academia.edu, and continuous search for other indexing. The result may already be seen in the regularity and quality of the material produced in 2019. Other quality and management measures are still being implemented in order to place CMM among the superior extract journals in the Qualis-Capes system.

In the beginning of 2020, CMM, attentive to the regularity aspect – management indicator and production flow –, published its installment no. 49 in the first quarter of 2020 (Jan./Apr.). This issue consolidated an important indicator of the scientific journal quality, which is the publication regularity.

Regularity is a basic criterion. It was already recommended, for example, by the "*Grupo de Trabajo para la Selección de Revistas Latinoamericano*" at an event organized by UNESCO in Puerto Rico in 1964 (UNESCO, 1964) and indicates the maturity of the publication and that its editorial and production process is being adjusted. Regularity is also the requirement of the leading indexers worldwide, including Web of Science (Timeliness and/or Publication Volume)[6], Scopus (Publishing Regularity)[7], and SciELO (Admission Punctuality)[8]. Regularity assures authors and readers that the publication is reliable for their timely dissemination and for updating their studies in the areas of Security, Defense, and Military Sciences.

In this issue, we publish an up-to-date analysis presented by Colonel Coutinho on the geopolitical movement the Russian Federation has been currently performing, and the "challenges, threats, and opportunities" to be considered by the world and Brazil. Similarly, Colonel Oscar Filho addresses a current and fundamental theme for our sovereignty, discussing the challenges of the Brazilian Army at national borders, focusing on the Amazon, and touching on the theory of the border and frontier concepts.

In the Innovation, Defense Industry, and Defense Economics fields, we continue with the Generals Schons and Prado's article, which, as well as Colonel Galdino's, addresses the National Innovation Policy issue, bringing to the debate the importance of developing a broader and longer-term policy; Professor Gustavo Dall'Agnol's article, in turn, addresses the decision-making in acquisition and defense budget with the Joint Strike Fighter analysis.

5 The Digital Object Identifier (DOI) is used for different scientific publications

6 Available at: https://clarivate.com/webofsciencegroup/journal-evaluation-process-and-selection-criteria/

7 Available at: https://www.elsevier.com/solutions/scopus/how-scopus-works/content/content-policy-and-selection

8 Available at: http://www.scielo.br/avaliacao/Criterios_SciELO_Brasil_versao_revisada_atualizada_outubro_20171206.pdf

We closed the issue with Colonel Velôzo's article bringing a historical analysis of the Chilean Army Transformation, which started at the beginning of the 21st century, with important reflexive considerations for the Brazilian Army.

Thus, *Coleção Meira Mattos* follows its trajectory fulfilling a unique role by publishing knowledge regarding the central areas of interest of the Defense and Military Sciences, significantly contributing to the knowledge management led by the Meira Mattos Institute, which ultimately promotes (creates), shares, and stores relevant knowledge for the Defense sector, for the scientific community, and for the society.

We wish a fruitful reading and invite our readers to communicate their research in *Coleção Meira Mattos*.

References

FRANCHI, T.; OKI, C. S. O caminho da CMM. **Coleção Meira Mattos**, Rio de Janeiro, v. 13, n. 46, p. 3-7, abr. 2019. Available at: <http://ebrevistas.eb.mil.br/index.php/RMM/article/view/2440>. Access on: Jan 28, 2020. doi: https://doi.org/10.22491/cmm.006.

NUNES, R. F. Editorial. **Coleção Meira Mattos**, Rio de Janeiro, n. 25, ago. 2012. Available at: <http://ebrevistas.eb.mil.br/index.php/RMM/article/view/140>. Access on: Jan 28, 2020.

UNESCO. **Grupo de trabajo para la selección de revistas científicas latino-americanas**. Puerto Rico, 1964. Montevidéo, Centro de Cooperación Científica de la Unesco para América,Latina, 1964.


ECEME

ARTICLE DOI 10.22491/cmm.a020

National Strategy of the Russian Federation: Geopolitical Aspects

Estrategia Nacional de la Federación de Rusia: aspectos geopolíticos

Abstract: The Russian Federation aims to resume and maintain a position of political, economic and military actor of first order within the international system. As part of its national strategy, Russia has been using its ability to project power in order to seek the reconquest of its leading role, increasing its international influence. Challenges, threats and opportunities arising from this more assertive role of the Russian Federation must be understood by the other global actors, including Brazil.

Keywords: Conflict. Russian Federation. Geopolitics. International Relations.

Resumen: La Federación de Rusia desea retomar y mantener una posición de actor político, económico y militar de primer orden en el ámbito del sistema internacional. Como parte de su estrategia nacional, Rusia viene utilizando su capacidad de proyectar poder para buscar la reconquista de su protagonismo, acrecentando su influencia internacional. Desafíos, amenazas y oportunidades, derivados de este papel más asertivo de la Federación de Rusia deben ser percibidos por los demás actores globales, incluso por Brasil.

Palabras clave: Conflicto. Federación de Rusia. Geopolítica. Relaciones Internacionales.

Marco Antonio De Freitas Coutinho
Exército Brasileiro
Brasília, DF – Brasil
coutinho.marco@eb.mil.br

Received: Sep. 5, 2019
Accepted: Oct. 28, 2019

COLEÇÃO MEIRA MATTOS
ISSN on-line 2316-4891 / ISSN print 2316-4833
http://ebrevistas.eb.mil.br/index.php/RMM/index

1 Introduction

As part of its national strategy, Russia has been using its power projection capabilities to restore its leading role and influence within the international system. Given the troubled track record of regional and global conflicts of the Russian Empire and the Soviet Union, increased nationalism in the Russian Federation under President Vladimir Putin is expected to raise concern among European neighbors and the United States of America (USA). Such concern involves both sides in an action-reaction process, leading to an upward spiral of geopolitical tensions and a renewal of the mood prevailing in international affairs during the Cold War period, now in the context of a multipolar world.

The objective of this article is to describe the geopolitical position recently adopted by the Russian Federation, identifying the guidelines of the country's national strategy under Putin's leadership as well as the possible obstacles to achieving the established goals.

The study draws on extensive bibliographic and documentary research, especially official documents of the Russian government and others prepared by different actors of the international system.

This scientific article starts out from the assumption that Vladimir Putin's strategic leadership has been exercised uninterruptedly since 1999 through two terms as prime minister (1999 to 2000; 2008 to 2012) and four terms as president (2000 to 2004; 2004 to 2008; 2012 to 2016; 2016 to the present). In this sense, it considers that since 1999, the Russian Federation has followed a harmonious and continuous line of governance, particularly in relation to formulating strategies. This includes the government of President Dmitri Medvedev (2008 to 2012), since the mentor and main supporter of his candidacy was Vladimir Putin himself. Therefore, the Medvedev administration will be considered part of an overall political action.

Background information on the subject will be provided through a literature review of classical and contemporary concepts of geopolitics, including from the viewpoint of Russian academics. The preliminary stage of this study will also include a history of geopolitical action carried out during the Russian Empire, the Soviet Union and the early stages of the Russian Federation (Yeltsin government). The aim is to identify whether the actions taken by Vladimir Putin represent a continuity of or a break with the strategies adopted in previous periods.

To better identify the guiding principles of geopolitical strategy in the Putin era, the article will address the development of relevant aspects of the political, economic and military performance of the Russian Federation, particularly with regard to issues of international security and geopolitical conflicts. Regarding Brazilian geopolitical interests, this stage of the study will also identify Russian foreign policy action in Latin America.

2 Classical and contemporary geopolitical theories

> The great wars of history [...] are the outcome, direct or indirect, of the unequal growth of nations, and that unequal growth is not wholly due to the greater genius and energy of some nations as compared with others; in large measure it is the result of uneven distribution of fertility and strategical opportunity upon the face of our globe. (MACKINDER, 1919, p. 4).

According to Flint (2006, p. 1-2), geographers examine the world from a spatial viewpoint, offering new insights into other subjects. To understand geopolitics, according to Flint, one must first understand human geography. Also in his view, human geography is not determined by a single theoretical perspective but grounded in many.

Indeed, the main theories of international relations have proven relevant to the study of human geography, political science and, by extension, geopolitics. Examples include neoclassical realism, liberalism, Marxism, feminism, postcolonialism and the different forms of postmodernism (CASTRO, 2012).

The importance of combining geographical science and social science in the study of geopolitics had also been highlighted by Halford John Mackinder (1919, p. 38), considered the earliest theoretical reference in this area, when he stated that, "The influence of geographical conditions upon human activities has depended, however, not merely on the realities as we know them to be and to have been, but in even greater degree on what men imagined in regard to them."

But what would the most appropriate definition for geopolitics be?

An obligatory reference is the work *Bausteine zur Geopolitik*, edited by the German theorist Karl Ernst Haushofer, which gives a definition of geopolitics deemed to be classical, highlighting the deterministic character of geographical space over political processes:

> Geopolitics is the science of the conditioning of political processes by the earth. It is based on the broad foundation of geography, especially political geography, as the science of political space organisms and their structure. The essence of regions as comprehended from the geographical point of view provides the framework for geopolitics within which the course of political processes must proceed if they are to succeed in the long term. Though political leadership will occasionally reach beyond this frame, the earth dependency will always eventually exert its determining influence (HAUSHOFER et al. apud FLINT, 2006, p. 22).

Note that the concept presented by Haushofer may be considered quite modern, as it did not limit the influence of geographical determinants to state actors (nation states). Indeed, contemporary theories of international relations also

regard as actors of the international system individuals, families, protest groups, corporations, non-governmental organizations (NGO), political parties, rebel groups, organized workers, and others (FLINT, 2006, p. 25).

Flint (2006, p. 25) also seeks to define geopolitics, but questions its scientific character, emphasizing that:

> Geopolitics was the study, some claimed science, of explaining and predicting the strategic behavior of states. States were the exclusive agents of geopolitics. This is the period of "classic geopolitics" we discussed earlier. But, the contemporary understanding of geopolitics is much different; indeed one set of definitions would classify all politics as geopolitics, in a broad understanding that no conflict is separate from its spatial setting.

Dodds (2007, p. 44), in turn, does not define geopolitics as science either, considering that geopolitics should be understood as a form of discourse, capable of producing and circulating spatial representations of global politics. In this sense, geopolitics may be defined herein as the study (or science) that aims to explain and predict the political processes carried out by state and non-state actors, conditioned by geographical determinants.

Therefore, the political, economic and military actions carried out by different actors of the international system may be conditioned by the characteristics of the spaces they occupy. The importance of the predictive potential of geopolitics should be stressed, as this feature is extremely important in planning and evaluating national strategies.

Other concepts are also essential to the development of this work.

One is that geopolitics should be studied from two different points of view. According to Mackinder, these are the "seaman's point of view" (MACKINDER, 1919, p. 38) and the "landsman's point of view" (MACKINDER, 1919, p. 90). The former relates to countries that developed their maritime power primarily due to their geographical position. Examples are 16th-century Portugal and 18th- and 19th-century England. The latter relates to countries that mainly developed land power, as did Austria in the 18th century and Germany in the 20th century.

Mackinder (1919, p. 98) also introduced the concepts of "World-Island" and "Heartland." The World-Island corresponds to continental Africa-Eurasia as a whole. According to Mackinder's description (1919, p. 135-136):

> The Heartland, for the purposes of strategical thinking, includes the Baltic Sea, the navigable Middle and Lower Danube, the Black Sea, Asia Minor, Armenia, Persia, Tibet and Mongolia. Within it, therefore, were Brandenburg-Prussia and Austria-Hungary, as well as Russia.

Figure 1 features a visual description of the area imagined by Mackinder. The shaded area represents the addition of regions related to the Black Sea and Baltic Sea Basins, which had been omitted by Mackinder (1919, p. 130) in his first definition of Heartland in the 1904 article *The Geographical Pivot of History* (MACKINDER, p.130, fig. 24).

Figure 1 – Heartland Area

Source: Mackinder (1919, p. 130).

The present-day Russian Federation, therefore, lies in the Heartland. According to Mackinder, who rules the Heartland commands the World-Island and, consequently, the world.

Such concepts are widely used by Russian academics, especially Alexander Dugin, one of the leading geopolitical theorists today, who uses classical concepts of geopolitics with the proviso that one should not agree in advance with the circumstances that these so-called Anglo-Saxon theories attribute to Russia, as one must always evaluate them in view of local history and culture (DUGIN, 2015, p. 2).

3 Evolution of russian strategic behavior

> Russian geopolitics is by definition geopolitics of the Heartland; land-based geopolitics, the geopolitics of the land (DUGIN, 2015, p. 3).

In 1904 Mackinder delivered a speech to the Royal Geographical Society of London, on which occasion he introduced the concept of the Heartland, defining

it as the region of the globe that represented the "the geographical pivot of history" (MACKINDER, 1919). Present-day Russia, which was once part of the Russian Empire and the Soviet Union (USSR), is included in that region. It is always worth recalling that this geopolitical area also covered part of Scandinavia and Eastern Europe.

For Alexander Dugin, the Heartland is not an exclusively geographical concept, but has also a "spatial meaning" for societies distributed throughout the area, contributing to the establishment of a collective memory of belonging to a "civilization of Land" or "tellulocracy" (DUGIN, 2015, p. 3). This observation by Dugin certainly evokes the geopolitical concept of the landsman's point of view.

In this sense, Dugin (2015, p. 1) stresses that understanding Russian geopolitics inevitably requires studying the country's society, present and past. That will certainly enable a perfect understanding of how the vocation for the development of land power evolved. According to him, to understand how the Russian government relates to its land one must firstly study the structural constants of Russian society, besides the formation and development of Russian strategic behavior regarding the surrounding world.

This viewpoint justifies the importance of presenting herein a history of the geopolitical action executed in the Russian Empire, the Soviet Union and the early stages of the Russian Federation (Yeltsin government), as we shall see below in the following sections.

3.1 Strategic behavior in the Russian Empire (1721-1917)

Russia's rise as a European power is closely linked to the leadership of Peter the Great (1672-1725). Focused on revolutionizing customs, culture, the military and politics, Peter aimed to transform Russia into a powerful empire and saw that this could only be achieved by "opening the windows to Europe" (MASSIE, 2015). This was no mean task, for Russia was an economically and socially backward country, extremely closed to foreign relations.

To this end, he decided to relocate the capital from Moscow to a site that afforded direct access to Europe, which required the creation of a new metropolis on the shores of the Baltic Sea, the future city of St. Petersburg. However, as that alone was not enough, he created and developed a navy to support his geopolitical pretensions, expanding Russia's military and commercial influence to the west.

Thanks to the immense economic potential of the Russian Empire, Peter's goals continued being pursued after his death. Indeed, the consolidation of Russia as an economic and military power was achieved by Catherine the Great (1729-1796) through military conquest, territorial consolidation and trade. According to Lieven (2006, p. 9), the Russian Empire provided one of most successful examples of territorial expansion in history.

The Russian Empire reached its zenith with the victory over Napoleon in the 1812 campaign. The triumphal entry of Alexander I in Paris in 1814 and the Congress of

Vienna in 1815 marked the pinnacle of the geopolitical effort undertaken by the Romanov dynasty. The Russian Empire was then not only a European power, but actually led the political process at the time. The deliberations of the Congress of Vienna resulted in the incorporation into the Russian Empire of Finland, the Duchy of Warsaw (present-day Poland) and Bessarabia (present-day Moldova).

The formation of this great continental empire can be considered a formidable achievement given Russia's relatively unfavorable location, far from the great trade routes and traditional centers of global wealth and civilization. According to Lieven (2006, p. 15), the geopolitical explanation for this success also relates to the decline of the Ottoman Empire, which created a power vacuum in Central Asia and the Caucasus, an area that was also progressively occupied by the Russian Empire.

Despite the efforts of Peter and his successors to create and maintain a powerful navy, the Russian Empire never became maritime power or even established any strategy in this sense that would allow it to set up an overseas empire, as did other European powers. On the contrary, its only possession outside the continent, Alaska, was sold to the USA in 1867 for fear of a possible British invasion from Canada (LIEVEN, 2006, p. 564).

At the time of the fall of the Romanov Dynasty in 1917, the Russian Empire virtually occupied the entire Heartland.

3.2 Strategic behavior in the Soviet Union (1918-1991)

When the Bolsheviks seized power, they believed that the new regime would need no foreign policy and that their focus in international affairs would be merely to export a world revolution (KENEZ, 2006, p. 32). However, political realism soon caught up with them as they were forced to negotiate the terms of Russia's surrender in World War I.

Through a delegation headed by Leon Trotsky, the Bolsheviks were obliged to yield to the interests of the central powers (German Empire, Austro-Hungarian Empire, Bulgaria, and Ottoman Empire) in the Treaty of Brest-Litovski (1918). Negotiation ensured the survival of the new regime, but at the heavy cost of losing sovereignty over Finland, the Baltic States (Estonia, Lithuania and Latvia), Poland and Bessarabia, establishing what became known as "cordon sanitaire" (KENEZ, 2006, p. 163), a "buffer zone" for western Europe in the face of the threat posed by the new Russian communist regime.

This was a break in Russian strategic behavior, characterized by the new government renouncing the role of European power and the loss of the strategic central European portion of the Heartland.

The consolidation of the USSR was not a simple process. The future political and administrative framework of the new Soviet regime had not yet been clearly defined by the main Bolshevik leader, Vladimir Lenin. Groups bent on maintaining Russian cultural

and political predominance were confronted with a more internationalist view, which considered the interests of the various peoples that constituted the former Russian Empire.

The definitive model was carved out during the Civil War and consolidated with the emergence of the Union of Soviet Socialist Republics, whose first constitution was promulgated in 1924 (when the Soviet Republics of Russia, Ukraine, Belarus and Transcaucasia were created) (SOYUZ SOVETSKIKH SOTSIALISTICHESKIKH RESPUBLIK, 1924).

The main controversy regarding the establishment of the new republics related to the definition of their borders, which were created artificially, in a process very similar to the definition of African borders, resulting in a conflicting process from 1991 with the dissolution of the USSR.

The outbreak of World War II served as a catalyst to reestablish traditional Russian strategic behavior. According to Dugin (2015, p. 21), during the world conflict, geopolitical views were perfectly represented in the alliance against the Axis powers: the Heartland was represented by Soviet Russia and the Maritime Power by the United Kingdom and the United States.

In the so-called Big Three conferences (Tehran, Yalta and Potsdam), the main allied leaders – Stalin, Churchill and Roosevelt (Truman in Postdam due to Roosevelt's death) established agreements for the development of strategies for the war and the postwar period.

Stalin's performance at these conferences can be considered largely successful, reviving the strategic behavior adopted during the Russian Empire. As a result, the borders of the USSR were expanded and an area of Soviet influence was established in Eastern Europe, an essential factor for the consolidation of the USSR as a postwar global power.

With Stalin's iron fist imposing enormous sacrifices upon the people, Soviet participation in the Allied military campaign proved crucial, contributing decisively to the victory against the forces of Nazism and fascism in 1945. The consequence of this victory was the emergence of a global power, giving rise to the bipolar international order between the USA and the USSR that characterized the postwar era.

However, this did not result in the recognition of Russia as a European power, quite the opposite. Soviet occupation of a significant portion of Germany and of all of Eastern Europe, while reestablishing and even expanding the Russian area of influence in the Heartland, triggered an action-reaction process that led to the emergence of the North Atlantic Treaty Organization (NATO) and the Warsaw Pact.

The mobilization of the Western European bloc to create NATO can be summarized in a sentence attributed to the British Lord Lionel Ismay, the organization's first Secretary General: "To keep the Soviet Union out, the Americans in, and the Germans down" (NATO..., 2016).

Despite the more assertive posture of the USSR in the contest for global hegemony, the adopted strategy never prioritized maritime power, confirming the dominant inclination towards of the "landsman's point of view." According to Dugin (2015, p. 27), "each action was directed towards strengthening the power of the civilization of Land, expanding the Soviet government's zone of influence, and defending

strategic interests." Alexander Dugin stresses that throughout the Soviet period a consistent Eurasian geopolitical strategy was implemented.

The dissolution of the USSR was triggered by the severe economic constraints created by the inefficiency of the state model, the severe political constraints imposed by the Communist Party leadership and the reactions during World War II, particularly of the Baltic states, which never accepted their annexation.

President Gorbachev unsuccessfully sought to reverse this situation with the perestroika and glasnost policies but was unable to prevent the end of the USSR. Dugin (2015, p. 33) believes that Gorbachev's policies actually led to the collapse of the global system of influence established by the Soviets, with the vacuum being quickly occupied by the USA and NATO.

The voluntary self-destruction of the USSR was interpreted by many analysts as resulting from the action of leaderships represented by Gorbachev and Yeltsin.

3.3 Strategic behavior in the Yeltsin administration

Kenez (2006, p. 279) defined Yeltsin's decision to announce the withdrawal of the Russian Soviet Socialist Republic from the USSR as a "leap into the unknown." Moreover, his attempt to implement a change of direction based on what was known as "shock therapy" did not account for the disastrous consequences of that decision, whether for the economy, for politics or even for the safety of the budding Russian Federation.

Yeltsin's performance was arguably an absolute exception in Russian geopolitical history. According to Dugin (2015, p. 34), "Not only was the socialist system destroyed; the Heartland was destroyed from within." More than the victory of capitalism over communism, the "independence" of the Russian Federation introduced by Yeltsin represented the defeat of the civilization of Land by the civilization of Sea.

Despite being political rivals, Gorbachev and Yeltsin pursued a policy of appeasement with the Western powers, helping to break with the "Eurasian" behavior adopted by the USSR and seeking to insert Russia in the "Atlanticist" model led by the USA (DUGIN, 2015, p. 46).

The foreign policy model initially adopted by the Yeltsin administration was based on the so-called "Kozyrev Doctrine," named after the Minister of Foreign Affairs Andrey Kozyrev. According to this doctrine, global unipolarity under US leadership should be taken as a given, with the Russian Federation resigned to becoming integrated with the Western world to obtain a favorable position, as far as possible (DUGIN, 2015, p. 50).

However, President Putin viewed this strategy from a very different perspective. In his 2005 State of the Union address to the Russian Federal Assembly, he described the process that led to the collapse of the Soviet Union as the "geopolitical catastrophe of the century" (POSLANIE..., 2005).

In the same vein as President Putin, Dugin states that even the leaders most favorable to European integration, such as Peter, Catherine and Alexander II,

acted decisively to expand the Russian territory. In the same way Stalin, based on the negative experience of Brest-Litovski, soon began to act towards strengthening the USSR and recovering its leadership in central Europe.

On December 31, 1999, Yeltsin surprised the country and the world by announcing his resignation. According to Kenez (2006, p. 299), the Russian Federation was being governed by a sick man whose resignation was overdue, since he was no longer in control of the situation.

4 The Russian Federation in the Putin Era

> Unlike Yeltsin, whose ideology was anti-communism, Putin was a synthesizer. Although he distanced himself from the Soviet past and paid lip-service to the idea of democracy, he realized that the seventy-four-year-long communist history could not be eradicated from the national memory. (KENEZ, 2006, p. 300).

After President Yeltsin's troubled period, it was left to Vladimir Putin to work on building a Russian national identity. In power since 1999 in alternating terms as prime minister and president, he was largely responsible for rebuilding political, economic and military institutions, conducting the shift from the communist model to a market economy.

A common misunderstanding is that the Russian Federation is still a communist country, or even that its government is leftist. No doubt that is because the country is the origin of the international communist movement and its main leader, Putin, is a former KGB agent.

However, it is not an accurate picture. President Putin's political views and those of his supporting party, United Russia, basically favor a free market economy and tend to the right-wing end of the political spectrum.

Internally, one of President Putin's main traits is authoritarian governance, exploiting the constitutional loopholes in the Federal Constitution (ROSSIYA, 1993) drafted in the Yeltsin administration. According to Kenez, such a profile could be understood as a necessary step to stamp out the anarchy that characterized the Yeltsin government (ROSSIYA, 1993, p. 301).

The report of the "Russia and Eurasia 2020" Conference, held by the US National Intelligence Council, thus defined Russia in the Putin era:

> The regional experts who attended our conference felt that Russia's political development since the fall of Communism has been complicated by the continuing search for a post-Soviet national identity. Putin has increasingly appealed to Russian nationalism—and, occasionally, xenophobia—to define Russian identity. His successors may well define Russian identity by highlighting Russia's imperial past and its domination over its neighbors even as they reject communist ideology (UNITED STATES, 2004, p. 74)

4.1 Political performance

The Russian Federation is still a country of continental dimensions, stretching across (11) time zones if one includes the Kaliningrad enclave. Its internal political organization is complex: there are 22 semi-autonomous republics, 9 territories or Krais, 46 provinces or autonomous regions (Oblasts), 3 autonomous cities (Moscow, St. Petersburg and Sevastopol), 1 autonomous province (Jewish Province) and 4 autonomous districts (BLINNIKOV, 2011). Each of these 85 subdivisions has its own government framework, with varying degrees of autonomy from the Federation, according to the country's Constitution.

In addition to the Federal Constitution (ROSSIIA, 1993), its foreign policy is guided by various documents drafted over the years under the supervision of President Putin. The main documents that provide geopolitical guidance are "Military Doctrine" (VOENNAIA..., 2014), "National Security Strategy" (UKAZ..., 2015) and "National Goals and Strategic Objectives through to 2024" (THE PRESIDENT..., 2018).

The Russian National Security Strategy was issued in 2015 and describes the country's national strategic interests. Identifying such interests is the starting point to conduct an analysis on the Russian foreign policy today. Prominent among them are (our translation):

- strengthening the country's defense capacity, ensuring its inviolability;
- political and social stability through the development of democratic institutions;
- raising living standards for the population;
- preserving cultural values and moral and spiritual traditions of the Russian people (I highlight in this respect the growing influence of the Russian Orthodox Church in the country's political and strategic decisions);
- increasing the competitiveness of the Russian economy; and
- consolidating the Russian Federation as a world power.

To address these strategic interests, as well as guide the country's public policies, the Russian government drafted in 2018 the Executive Order on "National Goals and Strategic Targets through to 2024" (the last year of President Putin's current term). Among the established goals, the following stand out:

- ensure sustainable natural population growth;
- increase life expectancy to 78 years (80 years by 2030);
- ensure sustainable growth of real wages and pensions above inflation level;
- cut poverty by half;
- improve housing conditions (5 million households per year);
- increase the number of organizations engaged in technological innovation to 50 percent of the total;
- speed up the introduction of digital technologies in the economy and the social sphere (e-government);

- take Russia into the top five largest global economies;
- upgrade and expand core infrastructure, develop East-West and North-South transport corridors, including:
  - upgrading the motorways that are part of the Europe-China international transport route;
  - increasing the capacity of Russian seaports, including the ports of the Far East, Northwestern, Volga-Caspian and Azov-Black Sea basins;
  - developing the Northern Sea Route and increasing its cargo traffic to 80 million tonnes;
  - reducing the time to ship containers by rail down to seven days and quadrupling the volume of transit container traffic by rail between Western China and Europe;
  - creating nodal cargo multimodal transport and logistics centers;
  - increasing the throughput capacity of the Baikal-Amur e Tran-Siberian railways by 50% (to 180 million tonnes).

A previous document drafted in 2014 presented the main threats to achieving the goals of Russia's National Strategy. This is the "Military Doctrine," which defines them as the following: (our translation):

- deployment of NATO forces near borders and territorial waters of the Russian Federation;
- development and installation of anti-missile systems and other weapons of mass destruction affecting the military balance with the Russian Federation;
- use of information and communication technologies for military purposes (cyber warfare); and
- interference in internal affairs of the Russian Federation and its allies.

Regarding domestic policy, as already noted, President Putin has been in power since 1999, leading the party of his own creation, United Russia. In the last two presidential elections (2012 and 2018) Putin won by a large margin, obtaining 64% and 76.67% of valid votes, respectively (PUTIN'S..., 2019).

It is noteworthy that voting is not compulsory in Russia and that the main opposition candidates (particularly Alexei Navalny) have been constantly prosecuted or arrested, barred from running in the elections.

In addition, according to surveys by the Yuri Levada Analytical Center (PUTIN'S..., 2019), President Putin's approval rating, which soared (above 80%) after the incorporation of Crimea (2014), has fallen since 2017, currently standing at around 68%. Noteworthy is the increasing rejection rating, already exceeding 30%.

President Putin's declining popularity may be related to rising cost of living and unemployment, but mainly results from the approval of the pension reform carried out in 2018 and 2019. According to Yalowitz and Courtney (2019), recent demonstrations

against the Putin administration are directly related to wage losses and the unpopular increase in retirement age.

These adjustment measures were due to the Russian budget deficit caused by excessive defense spending and the drop in international oil prices in 2016 and 2017, which affected the country's income inflow, highly dependent on hydrocarbon exports. The recent rise in commodity prices may contribute to reverse this trend, but President Putin's political future is far from certain, as there is no political scope for a new action such as that carried out in Crimea in 2014.

Relations with the US were expected to improve significantly after the defeat of candidate Hillary Clinton in the 2016 elections, but accusations of Russian interference to favor the election of Donald Trump sparked a new crisis between the two countries and have contributed to cool down the relationship between the respective governments. Despite the unfavorable mood, Putin and Trump have given signs of appeasement, especially regarding efforts in the Syrian Civil War and, more recently, Trump's proposal to readmit Russia to G7. Russian public opinion has disagreed with the foreign policy of the Putin administration regarding the US, with the rejection rating reaching 43% (PUTIN'S..., 2019).

Concerning multilateral forums, the Russian government's scope of action was severely affected after the Crimean crisis with the various sanctions imposed by Western powers. Therefore, Russia's participation in BRICS gained prominence in the country's foreign policy. In economic terms, relations with China are key to the Russian Federation and the country's participation in the Shanghai Cooperation Organization is also considered very important.

Regarding international security and military cooperation, Russia is the head organizer and supporter of the Collective Security Treaty Organization, which includes several former Soviet states (Armenia, Kazakhstan, Kyrgyzstan, Belarus, Tajikistan and Uzbekistan).

4.2 Economic Performance

The Russian Federation is heavily dependent on hydrocarbon exports (oil and natural gas), especially to Europe and China. The latter has significantly increased its share of the Russian trade balance, accounting for 12.5% of Russia's exports in 2018 (RUSSIA..., 2019).

With regard to imports, data of the Hong Kong Trade Development Council (2019) show that Russia is a major importer of machinery and equipment (45% of the total), indicating the post-1991 decline of Soviet industry, one of the mainstays of the USSR economy. An exception is the arms industry, which has survived and been modernized due to the volume of government procurement and exports to allied countries, as seen in data collected by the Stockholm International Peace Research Institute (GLOBAL..., 2019; SIPRI, 2018).

Regarding natural gas exports to Europe, which relies heavily on this commodity for residential and industrial heating, European countries are greatly dependent on supply from Russia. In 2018, 42% of overall European natural gas imports came from Russia, according to official figures from the Statistical Office of the European Union (Eurostat), which stresses the higher dependence of major European Union economies (Germany: 50 to 75%; Austria, Hungary and Poland: 75 to 100%) (EUROPEAN COMMISSION, 2019).

A network of pipelines to meet the European demand has been exploited and expanded by Russia, thus reducing operating costs. However, following the Crimean crisis, European countries are reconsidering the convenience of such dependency, despite the considerably higher costs of other options.

China's role in world trade has become increasingly relevant and Russia has sought to improve its infrastructure to enable more Chinese products to reach European markets more directly, thus reducing costs and making them more competitive. In this sense, the building and modernization of pipelines, railways and new maritime trade routes has been a strategic objective of the Russian government.

This project, which is being dubbed the "new silk route" (and aims to integrate the Chinese strategy known as Belt and Road Initiative), also involves the development of new Arctic sea routes. This possibility has been explored with the impacts of global warming on the northern polar ice cap, which has been progressively receding and allowing a regular flow of commercial vessels.

The Arctic route has been in use since 2017. Being entirely in Russian territorial waters, it can be controlled by the Russian government, which includes the charge of transit rates. Nevertheless, the costs for Chinese and European companies are lower compared to the traditional route through the Indian Ocean, Strait of Hormuz and Suez Canal.

Not only are distances greater on the traditional routes, but rates are high and there is the risk of pirate attacks, which in itself significantly raises insurance costs of freight and vessels. The Arctic region is therefore considered a priority in Russian national strategy, including its military occupation.

A major challenge for the Russian economy has been the country's increasing population decline, a growing trend since the end of the USSR. According to a report from the UN Development Programme (UNDP, 2008, p. 129), "In coming decades Russia faces a unique and historically unprecedented challenge – to support high economic growth rates despite ongoing decline of the population, including the economically active population."

The trend has been confirmed by the most recent statistical data issued by the Russian Federal State Statistics Service (FSGS), which indicated a 2% reduction in the Russian population between 2008 and 2017 (ROSSIIA, 2018, p. 11).

Also according to the UNDP, the aging of the economically active population is likewise a worrying trend, as the percentage of older people in the workforce tends to increase in coming decades. Meanwhile, it is predicted that the percentage of young people

(under 30) will decline to less than a quarter of the working-age population, which would be absolutely catastrophic for the country's aspirations to become one of the world's five largest economies.

According to *Mapping the Global Future: Report of the National Intelligence Council's 2020 Project*, published by the US National Intelligence Council, "Russia has the potential to enhance its international role with others due to its position as a major oil and gas exporter. However, Russia faces a severe demographic crisis resulting from low birth rates, poor medical care, and a potentially explosive AIDS situation" (UNITED STATES, 2019, p. 10).

This has posed a dilemma for the Russian government: although the country is traditionally averse to encouraging immigration, the latter has become essential to reverse the demographic trend. Russia has encouraged immigration of workers from former Soviet states, particularly those who speak Russian, but the demand is unlikely to be met by this measure alone (RAGOZIN, 2017).

4.3 Military Performance

The end of the USSR led to an unprecedented crisis within the military forces of the former Red Army. Its nuclear arsenal was kept in the Russian Federation, but the conventional forces were apportioned among the various former Soviet states, accounting for a huge reduction in the operating capacity of all armies, which had to be organized from 1991.

Regarding Russia, tight budget constraints led to the almost complete obsolescence of conventional arsenals, coupled with total discouragement to pursue a military career due to extremely low wages and poor working conditions. Most of the military budget had to be directed towards maintaining the huge nuclear arsenal inherited by the Russian Army.

From the crisis with Georgia in 2008, involving a military confrontation over a border dispute for South Ossetia, President Putin ascertained the need to invest in his armed forces (SMITH, 2013). Since then an ambitious program to re-equip and transform the armed forces has been carried out. In addition, NATO's advance among the former Soviet states, which feared sharing Georgia's fate, increased concern among the Russian leadership that national security would be threatened without adequate deterrent capacity.

In a first moment, a major effort to improve the conditions of military careers was made, and a program for conventional weapons replacement was implemented as well.

New strategic nuclear weapons are currently being developed with modern technology to make them immune to any defensive measures in Western power arsenals (anti-missile shields): hypersonic missiles, nuclear-powered missiles, unlimited range non-ballistic trajectories, underwater drones intended to destroy the US

aircraft carrier fleet, among others, have been announced by President Putin as fully operational.

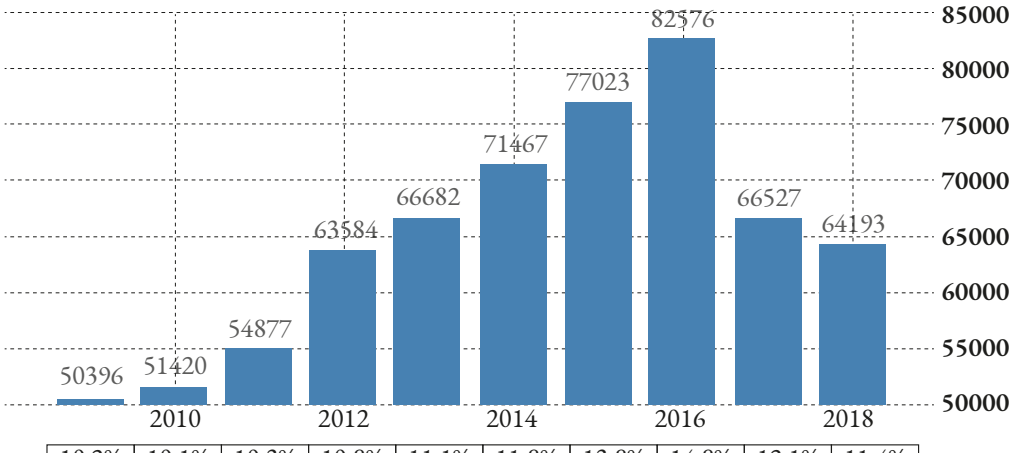
A recent incident in the Arkhangelsk region (northern Russia) revealed that a nuclear-powered missile under test had reportedly crashed and caused a radioactive leak, raising military and environmental concerns in the West regarding Russia's new military capabilities.

In order to enable the development of this ambitious program of re-equipping and transforming its armed forces, the Russian government has invested considerable portions of its budget. Graph 1 shows the evolution of the budget for defense spending between the years 2009 and 2018. An upward trend can be observed until 2016, when almost 15% of the Russian budget was allocated to the armed forces, dropping to 11.4% in 2018. In the same year, countries such as the US, China and even Brazil recorded significantly lower rates, revealing the great effort still spent on this project.

However, the oil prices drop in the foreign market, which occurred as of 2016, weighed heavily on President Putin's plans, forcing the Russian government to significantly reduce defense spending since other budget items were being neglected, affecting, in turn, various public policies and social programs and triggering the fall of the president's popularity.

Therefore, the re-equipment program was readjusted in more realistic terms, but spending continued quite high compared to other countries, as noted.

Graph 1- Comparative budget evolution (2009 – 2018)



Source: Stockholm International Peace Research Institute (2019).

4.4 Geopolitical action of global impact

The international order that followed the breakup of the USSR was progressively shaped into a multipolar model, wherein various traditional and rising actors gradually acquired political and strategic weight.

Regarding the Russian Federation, an analysis of the main geopolitical guidelines already discussed in item 4.1. as well as other bibliographic sources allows us to identify several areas of interest within Russian national strategy.

However, for the purposes of this study, only the following geopolitical issues will be addressed:

- Eastern Europe and the strategic confrontation with NATO forces;
- the conflict with Ukraine; and
- military intervention in Syria.

Although Latin America is not an area of geopolitical priority for the Russian Federation, its action in this region will also be addressed in view of the interest for Brazilian foreign policy.

4.4.1 Eastern Europe and the strategic confrontation with NATO forces

> Only by Russia's assertion of itself as a land-based regional power in opposition to the sea-based Atlanticism of the United States and NATO can Russia survive in any genuine sense (DUGIN, 2015).

Concerning Eastern Europe, it is noted that the conflict between Russia and Georgia in 2008 sounded the alarm for the former Soviet states, particularly Estonia, Lithuania, Latvia and Ukraine, as well as for former Warsaw Pact countries such as Poland. This conflict was due to fears that poorly resolved border issues, as well as the existence of large Russian communities in their respective areas, could be used by the Russian government as an excuse for confrontation and potential attempts of Russian territorial expansion. In this sense, the fear led to a rush by these countries to join NATO.

However, the Treaty on Conventional Armed Forces in Europe, signed in 1992, while allowing the withdrawal of a significant number of Soviet troops from Eastern Europe, also prohibited the expansion NATO forces to the east.

Ignoring this point of the agreement, the leaders of the main Western powers (USA, UK and Germany) approved the membership of former Warsaw Pact or USSR countries. The Russian Federation reacted strongly, but this was largely disregarded by NATO, since at the time Russia had no scope of action to oppose this advance towards its borders.

Another confrontational issue was the installation of the US state-of-the-art missile defense system in Poland. NATO alleged that the reason was to mount a defense against possible attacks from North Korea and Iran, but it was interpreted in Russia as an attempt to break the nuclear balance built up during the Cold War (the balance of terror), making Russian nuclear missiles obsolete.

Such initiatives progressively convinced the Russian government to invest heavily in new missile technologies, as described in section 4.3., and also contributed to undermine the framework of the various nuclear weapon disarmament and limitation treaties and agreements laboriously built up throughout the Cold War, on which the security of the international system was based.

The five main treaties signed with the USSR/Russian Federation were: Anti-Ballistic Missile Treaty (1972), Treaty on Conventional Armed Forces in Europe (1992), Intermediate-Range Nuclear Forces Treaty (1988), Strategic Arms Reduction Treaty – New START (2011) and Nuclear Test Ban Treaty. Of those, only the Strategic Arms Reduction Treaty is still in force, which certainly places world peace at an unprecedented level of risk (NUCLEAR THREAT INITIATIVE, 2019).

4.4.2 The conflict with Ukraine

Regarding Ukraine, a key factor was the coup that overthrew President Yanukovych's pro-Russian government following the so-called Maidan protests in 2013 and 2014. Russia's response was vigorous compared to its reaction towards the other former Soviet states. The general understanding is that Ukraine can be considered the "red line" established by Russia for the advance NATO forces (GADDY, ICKES, 2014).

Russia's reaction to Ukraine was not long in coming, whether in the annexation of Crimea or the explicit support to separatism in areas with a majority of Russian population in the Donbass region.

Regarding the annexation of Crimea, which was not recognized by the international community and resulted in various sanctions against the Russian government and authorities, it is estimated that the position of the Russian government is unlikely to be reversed, with major consequences for Ukraine, especially regarding the loss of important and necessary natural gas reserves in the Crimean exclusive economic zone.

Similarly, access to the Sea of Azov is now controlled by the Russian government in the Kerch Strait, where a long railway bridge linking Crimea with Russian territory was recently opened. Russian control of maritime traffic in the Kerch Strait limits or even impedes access to Ukrainian ports situated in the Sea of Azov.

President Zelensky's recent election in Ukraine was a defeat for the Ukrainian political trends that are more radical in their approach to Russia (represented by former

President Porochenko), but the new government has not yet indicated how it will deal with the crisis henceforth.

The conflict with Ukraine also involves the fate of the Donbass region, where the majority Russian population has started seeking greater autonomy or secession, probably with strong political and military support from Russia.

In this respect, two self-proclaimed republics were established in the region: the Donetsk People's Republic and the Luhansk People's Republic. The most direct consequence of this for Ukraine is certainly the impossibility to join NATO, since the organization's rules do not allow membership of countries with ongoing conflicts.

Russia is undoubtedly interested in seeing this issue become another "slumbering conflict" similar to those in other situations, such as the self-proclaimed republics of Abkhazia and South Ossetia, which have survived since the end of the war with Georgia.

Diplomatic channels have remained open for this crisis, particularly through the so-called Trilateral Contact Group (Russia, Ukraine and the Organization for Security and Co-operation in Europe-OSCE), based on the Minsk Protocol (2014).

4.4.3 Military intervention in Syria

Syria was a longtime ally of the Soviet Union and has remained a close associate of the Russian Federation, which keeps naval and air bases in the country, enabling the deployment of Russian military power in the Mediterranean.

The so-called Arab Spring, which toppled the authoritarian governments of several countries in northern Africa and the Middle East, was also felt in Syria. Russia always argued that such revolts were directly fueled and financed by Western powers and acted strongly to prevent the allied regime of Bassar El-Assad from being removed from power, which would certainly hinder Russia's strategic military presence in the country (SYRIA..., 2015).

At the same time, the Russian government also supported the Syrian government's struggle against the Islamic State (ISIL) forces that controlled a large portion of Syrian territory. In this case its interests were aligned with those of the USA, as both governments sought to eliminate the threat posed by the Islamic State (RUSSIA, 2016).

Another major player in this crisis is Turkey, as it is fighting the Kurdish forces operating on its border with Syria, which were traditionally supported by US forces. Russia has sought to capitalize on the complexity of this conflict to provoke dissension within NATO, seeking an increasingly successful rapprochement with the Turkish government.

Russian interest in Syria is not limited to military aspects. In addition to having considerable oil reserves, it is a mandatory gateway for future pipelines from the USA's ally in the region, Iraq.

Specifically in military terms, the direct participation of Russian army, air and naval forces in Syria was an excellent opportunity to deploy and hone new military doctrine

and equipment. These proved essential for the Syrian regime to swiftly reverse a situation of near defeat.

4.4.4 Action in Latin America

Despite being a region of secondary interest in Russian geopolitical strategy, particularly due to economic, operational and logistical difficulties, Latin America has received some attention from Russian foreign policy.

In some countries, its interest is based on the possibility of creating embarrassment in an area of direct influence of the US (being a "thorn in its side"), which can be used to regulate the intensity of Russian strategic actions regarding sanctions and other measures adopted by the US government that run counter to Russian interests. This seems to be the case with Cuba, Nicaragua and Venezuela.

As with Syria, Russia is interested in preserving ties with historical USSR/Russia allies, especially Cuba and Nicaragua, which are still in a position of confrontation with the US today. In the specific case of Venezuela, the interest is to prevent a regime change in a country that has been an ally since the government of Hugo Chaves.

According to research conducted by the Foreign Police Research Institute, the main areas of exchange with the cited Latin American countries are as follows (GONZALES, 2019):

- **Venezuela**: The country is the largest buyer of Russian military weapons and equipment in Latin America. About 60% of Russian military hardware exports went to Venezuela (before the Venezuelan crisis). In 2019, military cooperation with the Maduro administration increased, including the dispatch of military advisors. Russian oil companies operate in the country.
- **Cuba**: Intense military-technical cooperation with Cuba still exists. With the post-Cold War economic crisis, Russia limited the supply of spare parts and provides repair services for equipment manufactured in the former Soviet Union. A Russian military base in country is once again being considered.
- **Nicaragua**: During the Cold War, up to 90% of Nicaragua's military weapons and equipment were Soviet-made. In 2015 a treaty was signed to allow Russian warships to enter Nicaraguan ports, plus an agreement to conduct patrols in coastal waters.

However, Russian foreign policy goes beyond political realism and the country has sought to increase trade cooperation with Latin America and Caribbean countries. According to a study by Gurganus (2018), total trade between Russia and the region reached US$ 12 billion in 2016, a 44% increase compared to 2006. The study also reported that Brazil and Mexico accounted for over 50% of Russia's trade with the region over the period. Also according to Gurganus, in the last decade Russia made

significant investments in oil and gas in countries such as Brazil, Bolivia, Mexico and, particularly, Venezuela.

Regarding its BRICS partner Brazil, the study by Julia Gurganus identifies that bilateral trade relations are still largely dependent on imports of Brazilian meat and exports of Russian fertilizers. In 2016 Brazil-Russia trade reached US$ 4.3 billion. The Rosneft and Gazprom oil companies have been actively seeking participation to explore the recently discovered Brazilian pre-salt layer reserves.

In military affairs, the study shows that between 2012 and 2017 Russia accounted for 7% of weapons imported by the Brazilian armed forces, supplied attack helicopters (Mi-35) to the Brazilian Air Force and installed a maintenance center for the operation of said aircraft in Brazil. The Russian military industry is also a traditional supplier of portable anti-aircraft missiles to the Brazilian Army and Air Force (IGLA missile).

A more assertive space partnership has also been long discussed, particularly to obtain technology for the development of liquid-propellant rocket engines by the Brazilian space program, but this initiative has not yet materialized. However, the space partnership exists, as Russia has already deployed four stations of its global positioning system (GLONASS) on Brazilian soil (GURGANUS, 2018).

There is expectation regarding the potential influence of the political change in Brazil following the 2018 elections on relations with the BRICS countries in general and the Russian Federation in particular. Brazil takes the rotating presidency of the BRICS in 2019 and will have the opportunity to present its new orientation in this regard, eagerly awaited by Russian diplomacy.

The motto chosen by Brazilian diplomacy for Brazil's term in the presidency was: "BRICS – economic growth for an innovative future" (MOTE..., 2019). Environmental issues may be debated in this forum to create a joint position on such themes, potentially strengthening Brazil's position regarding sustainable development in the Brazilian Amazon region.

Should Russia and the other BRICS countries support Brazil's positions, discussions with the European Union on environmental issues and trade agreements will reach a new level. Therefore, Russia's position may prove relevant to Brazilian geopolitical interests.

Other South American countries also have bilateral relations with the Russian Federation. Peru, for example, is a traditional market for Soviet and Russian-made defense products, and currently owns a sizable fleet of Russian helicopters of various models, besides also having a maintenance center in its territory with technical support by and technology transfer from the Russian partners.

Finally, Bolivia has also been seeking to establish a strategic partnership with the Russian Federation. In this regard, several cooperation agreements have been signed in recent years, including for exchange in atomic energy, with the possible installation of a production and research complex in Bolivian territory (ENERGÍA..., 2019).

5 Conclusion

On January 27, 2018, Vladimir Putin celebrated nineteen years of leadership in Russia, becoming the country's longest-running ruler since Josef Stalin, surpassing the equally long-lived Soviet ruler Leonid Brezhnev.

Putin chose not to hold any celebrations on the occasion, which would have been common in the Soviet period. According to Glasser (2019), Putin does not want be compared to Soviet leaders, who are remembered in Russia as overly authoritarian and inefficient and whose geopolitical strategy ultimately resulted in failure.

In a lengthy interview to the *Financial Times* on June 27, 2019, Putin celebrated the decline of Western liberalism and multiculturalism, a model that European powers had been exporting to other countries for decades.

Asked which world leader he admires most, Putin did not hesitate: "Peter the Great." When it was pointed out that Peter was already dead, he stated: "Peter will live as long as his cause is alive" (PUTIN, 2019).

Given that the cause of Peter the Great was the creation and strengthening of the Russian Empire, what would the guiding principles of Russia's national strategy be under Putin's leadership? As has been shown in this study, the following main points help answer this question:

- The main geopolitical areas of interest are included in or near the region defined by Mackinder as the Heartland (Fig. 1), and are basically Eastern Europe, the Baltic, the Arctic, the Black Sea region and the Middle East (Syria).
- Any NATO action in Eastern Europe and on Russian borders will be considered a first-rate threat;
- The resumption of the nuclear arms race (with advanced technologies) is a high-risk gamble, as it may represent the end of the balance of terror; however, it is deemed inevitable in the realistic context of Russian strategy;
- At the multilateral level, the BRICS are of great relevance and will continue to play a prominent role in the multilateral facet of Russian national strategy;
- If the current level of budget disbursement is sustained, by 2025 Russia's military resources (conventional and nuclear) will provide effective support for foreign policy, with capability for power projection anywhere in the world. Funding for other social priorities, however, may be compromised; and
- The goal of maintaining its status as a global military power and becoming one of the top five economies worldwide is a major national project, funded primarily by hydrocarbon exports and the sacrifice of other public budget priorities;

This study also identified potential obstacles to the development of Russia's national strategy, among them:

- Increasing loss of workforce, with the prospect of population decline;
- Low industrial capacity, which has not yet recovered from its collapse after the breakdown of the USSR. In this sense, substantial investment is required in areas such as development of alternative energy sources, mastery of sensitive technologies and adaptability to the challenges of the 4th Industrial Revolution;
- President Putin's declining popularity may lead to internal political instability, threatening the continuity of the strategies outlined in the current government;
- The heavy reliance on international oil prices may be a major obstacle to funding planned investments, whether in infrastructure or particularly in the military area, as falling world oil prices directly affect Russia's capacity to implement strategic projects; and
- The possible emergence of a prolonged global economic crisis may directly affect the strategies outlined by the Russian government.

Although said obstacles are considerable, it is observed that the Russian Federation has heavily invested its political, economic and military capital to occupy a prominent position within the international system, resuming the geopolitical line built up over the Russian Empire and Soviet Union periods.

Putin harbors the dream of someday equaling the status of the country's greatest historical figure and founder of the Russian Empire. It is an ambitious personal goal.

One should remember that the cause advocated by Peter the Great involved the rise of Russia to be a first-rate Eurasian power. By embracing this cause, Putin, as today's main Russian leader, pursues an equally ambitious geopolitical goal.

Threats and opportunities must be perceived and evaluated by other global actors, Brazil included.

References

BLINNIKOV, M. S. **A Geografy of Russia and its Neighbors**. New York: Guilford, 2011.

CASTRO, T. **Teorias das Relações Internacionais**. Brasília, DF: Fundação Alexandre de Gusmão, 2012.

DODDS, K. **Geopolitics**: A very short introduction. New York: Oxford University Press, 2007.

DUGIN, A. **Last War of the World-Island**: The geopolitics of contemporary Russia. London: Arktos, 2015.

ENERGÍA, gas, litio y agropecuaria marcan la cooperación Bolivia-Rusia. **Comunica Bolivia**, La Paz, ano 1, n. 62, jul. 2019. Available from: https://bit.ly/2N4Fe24. Access on: Oct. 10, 2019.

EUROPEAN COMMISSION. Eurostat. **EU imports of energy products**: recent development. Luxembourg, LU: Eurostat, 2019. Available from: https://bit.ly/34gz9Fo. Access on: Oct. 10, 2019.

FLINT, C. **Introduction to Geopolitics**. New York: Routledge, 2006.

GADDY, C. G.; ICKES, B. W. Ukraine: A prize neither Russia nor the West can afford to win. **Brookings**, Washington, DC, 22 May 2014. Available from: https://brook.gs/337EPBy. Access on: July 2, 2017.

GLASSER, S. B. Putin the Great: Russia's Imperial Impostor. **Foreign Affairs**, New York, v. 98, n. 5, Sept.-Oct. 2019. Available from: https://fam.ag/2C1qhY7. Access on: Oct. 11, 2019.

GLOBAL Arms Trade: USA increases dominance; arms flows to the Middle East surge, says SIPRI. **Sipri**, Stockholm, 11 Mar. 2019. Available from: https://bit.ly/2JH9y0J. Access on: Oct. 10, 2019.

GONZALES, I. An Assessment of Russia's Military Presence in Latin America. **Foreign Police Research Institute**, Philadelphia, 18 June 2019. Available from: https://bit.ly/2BZdqpz. Access on: Oct. 10, 2019.

GURGANUS, J. Russia: Playing a geopolitical game in Latin America. **Carnegie Endowment for International Peace**, Washington, DC, 3 May 2018. Available from: https://bit.ly/2WxNOtf. Access on: Oct. 10, 2019.

KENEZ, P. **A History of the Soviet Union From the Beginning to the End**. 2. ed. Cambridge: Cambridge University Press, 2006.

LIEVEN, D. (ed.). **The Cambridge History of Russia**: Imperial Russia, 1689-1917. Cambridge: Cambridge University Press, 2006. V. II.

MASSIE, R. K. **Pedro, o Grande**: sua vida e seu mundo. Barueri: Amarilys, 2015.

MACKINDER, Halford J. **Democratic ideal and reality**: a study in the politics of reconstruction. Nova Iorque: Henry Holt, 1919.

NATO – Declassified: Lord Ismay, 1952-1957. **NATO**, 3 Dec. 2016. Available from: https://bit.ly/36lLRVr. Access on: Aug. 28, 2019.

NUCLEAR THREAT INITIATIVE. **U.S.-Russia Arms Control in Peril**. Washington, DC: NTI, 2019. Available from: https://bit.ly/2pzaQ6P. Access on: Aug 28, 2019.

POSLANIE Federal'nomu Sobraniiu Rossiiscoi Federatsii. Kreml', Moskva, 25 apr. 2005. Available from: https://bit.ly/2PFQGCW. Access on: Oct. 11, 2019.

PUTIN, V. Transcript: 'All this fuss about spies... it is not worth serious interstate relations'. [Entrevista cedida a] Lionel Barber e Henry Foy. **Financial Times**, London, 27 June 2019. Available from: https://on.ft.com/322dfEx. Access on: Oct. 14, 2019.

PUTIN'S Approval Ratings. **Levada-Center**, Moscow, 2019. Available from: https://bit.ly/2WyW2Bc. Access on: Aug. 28, 2019.

RAGOZIN, L. Russia Wants Immigrants the World Doesn't. **Bloomberg**, New York, 14 Mar. 2017. Available from: https://bloom.bg/2PNT7nd. Access on: Aug. 28, 2019.

ROSSIIA. Kreml'. **Konstitutsia Rossiiskoi Federatsii**. Moskva: Kreml', 12 dek. 1993. Available from: https://bit.ly/34qCuSx. Access on: Oct. 14, 2019.

ROSSIIA. Federal'naia Slujba Gosudarstvennoi Statistiki. **Rabotchaia Sila, Zaniatost' i Bezrabotitsa v Rossii**: ofitsial'noe izdanie: 2018. Moskva: FSGS, 2018. Available from: https://bit.ly/2r245Lf. Access on: Aug. 30, 2019.

RUSSIA. Ministry of Defence. **Mission in Syria**. Moscow: Ministry of Defence, 2016. Available from: https://bit.ly/2pzC39v. Access on: Oct. 10, 2019.

RUSSIA: country profile. **HKTDC Belt and Road Portal**, Hong Kong, 18 June 2019. Available from: https://bit.ly/34vMfir. Access on: Aug. 28, 2019.

SMITH, J. **Red Nations**: The nationalities experience in and after the USSR. London: Cambridge University Press, 2013.

SOYUZ SOVETSKIKH SOTSIALISTICHESKIKH RESPUBLIK. **Konstitutsia (Oznovoi Zakon) Soiuza Sovietskir Socialistitcheskir Respublik. Utverjdena 2º Siezdom Sovietov Soiuza SSR**. Moskva: SSSR, 31 yan. 1924. Available from: https://bit.ly/337Lvj5. Access on: July 16, 2017.

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE. **Military Expenditure Database**. Stockholm: Sipri, 2018. Available from: https://bit.ly/2PDWT-PW. Access on: Aug. 28, 2019.

SYRIA: Why Russia went in? **The National Interest**, Washington, DC, 8 Oct. 2015. Available from: https://bit.ly/323v5H3. Access on: Oct. 10, 2019.

THE PRESIDENT signed Executive Order on National Goals and Strategic Objectives of the Russian Federation through to 2024. **Kremlin**, Moscow, 7 May 2018. Available from: https://bit.ly/36uB0IT. Access on: Aug. 28, 2019.

UKAZ Prezidenta Rossiskoi Federatsi ot 31 dekabria 2015 goda N 683 "O Strategii Natsional'noi Bezopasnosti Rossiiskoi Federatsii". **Rossiiskaia Gazeta**, Moskva, 31 dek. 2015. Available from: https://bit.ly/325apOX. Access on: Aug. 28, 2019.

UNITED NATIONS DEVELOPMENT PROGRAMME. **National Human Development Report Russian Federation**: Russia Facing Demographic Challenges. Moscow: UNDP, 2008.

UNITED STATES. Office of the Director of National Intelligence. **Mapping the Global Future**: Report of the national intelligence council's 2020 project. Washington, DC: NIC, 2004. Available from: https://bit.ly/2qbXi18. Access on: Oct. 11, 2019.

VOENNAIA Doktrina Rossiiskoi Federatsii. **Rossiiskaia Gazeta**, Moskva, 30 dek. 2014. Available from: https://bit.ly/2qgfrL7. Access on: Aug. 28, 2019.

YALOWITZ, K.; COURTNEY, W. How Can the United States Support Democracies in the Former USSR? **The National Interest**, Washington, DC, 15 Sept. 2019. Available from: https://bit.ly/2PE2yVS. Access on: Oct. 10, 2019.

ARTICLE DOI 10.22491/cmm.a021

National Innovation Policy: a matter of economic growth, development, and national sovereignty

Política Nacional de Innovación: una cuestión de crecimiento económico, desarrollo y soberanía nacional

Abstract: Despite the remarkable economic expression, the impressive internal market, and the diverse innovation incentive policies, such as the 2004 Innovation Law, Brazil's National Innovation System (NIS) still has modest performance indicators. According to the 2019 Global Innovation Index report, the country is ranked 66th in the World Innovation Ranking. Based on documentary and bibliographic research, we seek to explain the reasons for the inefficiency of Brazil's NIS. To inspire appropriate policies, successful examples are reported from countries that have progressed through innovation and recent efforts promoted by the Brazilian Army in this direction. Based on these studies, we present propositions to be considered in the definition of a holistic and long-term National Innovation Policy, capable of coordinating government actions directed towards this sector and promoting economic growth, development and assuring National Sovereignty.

Keywords: National Innovation System. Innovation. Global Innovation Index. Triple Helix.

Resumen: A pesar de la destacada expresión económica, del pujante mercado interno y de las diversas políticas de incentivo a la innovación, como la Ley de Innovación de 2004, Brasil presenta indicadores de desempeño bastante modestos. Según el informe de 2019 del *Global Innovation Index*, el País se encuentra en la 66ª posición en la clasificación mundial de innovación. Basado en la investigación documental y en la bibliográfica, se busca explicar las razones de la ineficiencia del Sistema Nacional de Innovación (SNI) brasileño. Para inspirar políticas adecuadas, son presentados ejemplos exitosos de países que avanzaron por medio de la innovación. También, son enumerados emprendimientos recientes que son promovidos por el Ejército Brasileño en el campo de la gestión de la innovación. Con base en esos estudios, son discutidas propuestas que serán consideradas en la definición de una Política Nacional de Innovación holística y de largo plazo, capaz de coordinar las acciones gubernamentales que son direccionadas al sector y de promover beneficios al crecimiento económico, al desarrollo y a la Soberanía Nacional.

Palabras clave: Sistema Nacional de Innovación. Innovación. Índice Global de Innovación. Tríplice Hélice.

Décio Luís Schons
Exército Brasileiro, Departamento de Ciência e Tecnologia (DCT).
Brasília, DF, Brasil.
schons79@gmail.com

Hildo Vieira Prado Filho
Exército Brasileiro, Departamento de Ciência e Tecnologia (DCT).
Brasília, DF, Brasil.
hildoprado1960@gmail.com

Juraci Ferreira Galdino
Exército Brasileiro, Agência de Gestão e Inovação Tecnológica (AGITEC).
Rio de Janeiro, RJ, Brasil.
jfgaldino675@gmail.com

Received: Oct. 16, 2019
Accepted: Nov. 1, 2019

COLEÇÃO MEIRA MATTOS
ISSN on-line 2316-4891 / ISSN print 2316-4833
http://ebrevistas.eb.mil.br/index.php/RMM/index

1 Introduction

Throughout history, countless technological advances, originally intended for military products and systems, have generated spillovers to civilian sectors, creating disruptive innovations with major benefits for society (MAZZUCATO, 2014). Particularly in the 20th century, complex military research has driven innovations and economic growth for pioneering countries.

However, in the last thirty years, globalization has intensified, supported by impressive advances in digital communications with planet coverage; and, more recently, in the wake of the Fourth Industrial Revolution, by the pace of innovation that reached unusual levels in human history (SCHWAB, 2016). In summary, with governments supporting basic and applied research, developments focused on the civilian market have become the major drivers of scientific and technological advances.

Several factors contributed to this context, such as the Open Innovation model (CHESBROUGH, 2012); the creation of innovation networks that cross national borders; and the proliferation of innovation environments, such as science parks, centers, and districts. Currently, there are numerous demonstrations of "Spin-in" in which innovations intended for the conventional market are enhanced and integrated in order to generate new capabilities in the area of Defense (LESKE, 2018). As a result, greater synergy between military and civilian research and development (R&D) sectors, as well as the adoption of the Open Innovation and Triple Helix (ETZKOWITZ, 2005, 2010) models in Defense, constitute a global trend guiding the planning of national directives.

Development and Defense strategies are increasingly dependent on innovations (GALDINO, 2019b). Indeed, in a globalized world, guided by great competitiveness, where new and challenging asymmetric threats emerge, innovation becomes fundamental for increasing productivity, economic growth, and autonomy in sensitive areas of the National Defense.

The Defense area is highly demanding of science, technology, and innovation (LONGO, 1984). Because of this, the Defense White Book (BRASIL, 2016a), National Defense Policy and National Defense Strategy (BRASIL, 2016b) emphasize the association, linkage, and mutual dependence between the Defense Strategy and the Development Strategy, as well as the need for scientific and technological development to promote autonomy in important areas such as cybernetics, nuclear, and space areas. The synergy between civilian and military institutions that engage in promoting innovation can make the use of public resources more efficient, effective, and streamlined, especially in a country under-developed in several sectors of society and with reduced resources to invest in science and technology, especially in the area of Defense.

The Brazilian Army's Science, Technology, and Innovation System (SCTIEx) is currently in a transformation process, aiming to create a good innovation environment; strengthen the Brazilian Industrial Defense Base; and, in particular, increase integration and cooperation between academia, government, and industry.

Considering the interaction of the Sectoral Innovation System of the Defense Sector and, in particular, of the SCTIEx with the National Innovation System (NIS) (AZEVEDO, 2018, p. 151), it is natural that the innovation capability of the former depends primarily on the latter. Therefore, having a strong and thriving NIS, compatible with Brazil's size, economy, market, and wealth, is essential for the National Defense.

Despite the various policies and actions toward innovation over the last fifteen years, Brazil's innovation capability is quite modest, as suggested by several indicators. For example, Brazil ranks 66th in the international innovation ranking, according to report of the 2019 Global Innovation Index[1].

Therefore, it becomes imperative to establish a broad National Innovation Policy (NIP) to take the country out of this uncomfortable and risky situation, especially nowadays, when knowledge is the most important resource. While raw materials accounted for 30% of the world's gross product in the 1960s, today they represent less than 4% (OPPEINHEMER, 2011, p. 9). Empirical evidence obtained from recent history of many countries, such as Finland, shows that technological innovations transform production and cause disruptions that maintain the dynamism of the economy, contributing more to the country's Gross Domestic Product (GDP) than natural resources exploration (MONTEIRO, 2019a).

Innovations are not completely the result of scientific research. A classic example is the "container", according to Longo (1989), a technology that greatly impacted the transportation sector over recent decades. However, several studies (AMARANTE, 2009; CHESBROUGH, 2012; FIGUEIREDO, 2015; LONGO, 1984; ROSENBERG, 1991; SCHWAB, 2016) show that the innovations capable of boosting the economy, development, and autonomy in strategic sectors of a country's defense area increasingly depend on high investments in Science and Technology, especially on basic and applied research, as well as R&D projects.

From this perspective, innovations depend on long-term policies and actions. They result from a time-consuming process that begins with the development of ideas and concepts, progress on successive levels of technological maturation, and finalizes with the production and marketing of products and services (AFUAH; BAHRAM, 1995; TROTT, 2008).

The Armed Forces' strategic projects also progress on a long development cycle, comprising the training of specialized personnel, and advancing from state-of-the-art research, to the full mastery of R&D and production capabilities for Defense Systems and Products, particularly the critical technologies embedded in them. These are the developments of high technological value, such as the Software-Defined Radar and Radio Program, under the responsibility of the Army Technology Center, and the Army Strategic Projects, managed by the Army Projects Office, whose portfolio consists of several complex systems, such as the Sisfron (Integrated Border Surveillance System), Guarani (family of wheeled armored vehicles), and Astros 2020 projects.

1 Available from: https://www.globalinnovationindex.org/gii-2019-report. Access on: Oct. 23, 2019.

In developing countries, that don't own the production of sensitive technologies, the innovation process is slow. This process becomes instable when the NIS is inefficient, as it happens in Brazil. In this context, long-term policies are essential. Several countries, such as Israel, South Korea, and Finland, implemented long-term policies and have become true champions of innovation, economic growth, and social development.

In addition, in some high-tech areas, the existence of a State policy is essential to compensate for market failures, since the investment's returns to corporations are uncertain, slow, and often small when compared to the benefits to society. This is particularly important in the case of the Defense Industry, which produces for a monopsonistic market and whose capacity must be maintained and improved for the benefit of National Sovereignty.

Given the late industrialization process, an inefficient innovation environment, and the precarious mastery of basic technologies, how to develop a long-term NIP capable of putting Brazil among the innovative countries?

Based on documentary and bibliographic research, this article aims to shed light on this problem. It seeks to explain the reasons for the inefficiency of the NIS and poor results of public policies toward the sector in recent years. In an attempt to inspire appropriate policies, it refers to successful examples of countries that advanced, by innovation, throughout the 20th century, and recent ventures of the Brazilian Army to boost their innovation system. Based on the diagnosis and successful experiences, it is discussed topics to be considered in the development of a comprehensive and long-term NIP.

2 Diagnosis of Brazil's National Innovation System

Innovation is a complex and multidisciplinary phenomenon that goes beyond the scientific and technological field and interacts with various sectors of society. It results directly or indirectly from several actors and factors that constitute the so-called NIS (CIMOLI, 2014; GODIN, 2009; LUNDVALL, 2010; NICOLAU; PARANHOS, 2006).

The term "National Innovation System" was coined by Freeman (1995) to designate elements whose activities and interactions contribute to the creation, advancement, and dissemination of a country's technological innovations. The intention in adopting the term "System" is to show that the efficiency of the innovative process depends not only on the performance of isolated elements but on the interactions between them. Accordingly, the term "National" was included not only to define the unit of analysis (country), but also to reflect the holistic nature of the subject. Therefore, innovation does not depend only on companies, universities or research organizations but also on how they interact with one another and with several other actors, and how institutions, including political ones, affect the development of the system (CASSIOLATO; LASTRES, 2005). Interconnections are crucial to the concept of the system and may have the form of joint research, personnel exchange, intangible assets protected in co-ownership, purchase of equipment for collective use, sharing of laboratory infrastructure, technological transfer, etc. (MONTEIRO, 2018).

The real perception of the holistic nature of innovation and the need for interconnections between the various actors involved in its process is essential for an in-depth understanding of a NIS and its dimensions, as well as to conduct analyses, studies, and diagnoses. These, in turn, will support strategic planning aimed at triggering policies and actions to make the national innovation process more efficient and create conditions to increase productivity, competitiveness of the economy sectors, economic growth, and national development, aiming at autonomy in areas that are strategic for national defense.

Measuring the capability of a country's innovation system is a very complex task, but necessary to support the definition of public policies and evaluate the results of strategic actions arising from these initiatives (KHEDHAOURIA; THURIK, 2017). Several studies and researches are conducted with the objective of developing innovation indicators (TOPÇU, 2016). Significant advances have occurred in this area, such as the Innovation Efficiency Rate produced by the Global Innovation Index (GII), which combines more than eighty variables that attempts to reflect a NIS[2].

Several studies analyze the NIS of Brazil in order to identify its main bottlenecks and trends (DE NEGRI, 2018; DE NEGRI; SQUEFF, 2016; GALDINO, 2018, 2019a; MENEZES FILHO et al., 2014). Despite the diversified methodological approaches, indicators, and time-series windows adopted in these analyses, the conclusions regarding the essential aspects are similar. The discussion on bottlenecks sheds light on the major national challenges to be overcome to make the innovation environment efficient and effective.

Considering the GII, Brazil has not obtained satisfactory innovation indices. For example, since 2013, when this organization consolidated the architecture of indicators, composed of subindices, pillars, and subpillars, Brazil does not rank among the sixty most innovative countries in the world. The situation is even worse regarding the Innovation Efficiency Rate. In this case, Brazil is not even included among the ninety most efficient countries in the world.

Moreover, trend studies based on these indicators do not suggest a better future if current trajectories are maintained (GALDINO, 2018, 2019a). On the contrary, they foresee an increasing distancing from developed countries. According to these studies, the main bottlenecks to innovation are Business Environment, Political Environment, Education (elementary, secondary, and higher education), General Infrastructure, Credit, and Innovation linkages (Triple Helix). They also indicate that the Brazilian NIS is bureaucratic, unstable, inefficient, and insecure, making private investments difficult, especially medium and long-term ones. Therefore, strategic planning prioritizing policies and actions that contribute to reduce the bottlenecks mentioned above and creating favorable conditions for the development of innovation in Brazil is urgent, subject to progressive loss of competitiveness and distancing from the Global Value Chain and incessant increase in the risk of Brazil appearing in the globalized world as mere market and supplier of *commodities*, mineral resources and small value-added products.

2 Further information on GII indicators may be obtained from https://www.globalinnovationindex.org.

The very low quality of secondary and elementary education is one of the main national bottlenecks. In the OECD Programme for International Student Assessment (PISA), Brazil ranked among the last ones in mathematics tests (SASSAKI et al., 2018). Higher education also had a very poor evaluation, resulting from the small number of professionals linked to the areas of exact sciences and engineering. Brazil's strength was the exceptional performance of R&D activities, despite the small number of researchers per million inhabitants, when compared with the world averages and, particularly, with those of the most innovative countries (GALDINO, 2019a).

In an apparent paradox, Brazilian scientific production has grown in recent years. The percentage production of scientific articles by Brazilian authors in the world production increased from approximately 1.2% in 1991 to more than 3% in 2015 (DE NEGRI, 2018). Despite this very significant increase, the quality of the national academic production, expressed in terms of citations, has not been growing in the same proportion. On the contrary, Brazil is falling behind in this respect. It is relevant to highlight that the national scientific production is very low in the areas that foster innovation in the Knowledge Era and Fourth Industrial Revolution, such as engineering, computer science, and materials science. This scientific production profile is very different from that of innovative countries, in which publication in these areas represents a very significant portion of the total production. In Brazil, the areas that have a higher performance percentage are Dentistry, Veterinary Medicine, Arts, and Humanities (DE NEGRI, 2018; MENEZES FILHO et al., 2014). From this perspective, the Brazilian conjuncture shows no reflections of a comprehensive and long-term national policy capable of creating a human resources training structure focused on innovation. What exists is a disconnection between the areas in which Brazil has greater competence and those that generate innovation and economic growth with greater efficiency and effectiveness. By analyzing the areas more connected with innovation, it is observed that scientific production in Brazil is below the world average and much lower than in highly innovative countries.

In terms of patents, Brazil has a very modest performance. Besides, 80% of the patents filed in the national territory come from non-residents and only 7% come from national companies. This situation is quite different from what occurs in highly innovative countries, in which residents account for a large percentage of filings, most of which are from companies (DE NEGRI, 2018; MENEZES FILHO et al., 2014), a sector responsible for promoting innovation with the launch of new products and services in the market.

Even in areas in which Brazil has good academic competence, excessive bureaucracy, and a lethargic and protectionist business environment make it difficult to exploit the knowledge produced in universities for the design of new products. The 2004 Innovation Law led to the creation of Technological Innovation Centers and increased incentives for the protection of intangible assets originating in Scientific, Technological and Innovation Institutions (STI). Also, invention patents started to be considered as a way to evaluate national researchers by funding agencies. As a result, the number of patent applications from Brazilian universities increased. However, there are no indications of an

increase in the number of technology licensing or negotiations of these patents. Therefore, increasing the number of patents is not enough: the desired outcome is that such patents be transferred to the productive sector and generate innovations.

The number of researchers per million inhabitants in Brazil is very low, even lower than in Argentina and Chile, and most of them are outside of the industrial sector, but in academia and public agencies. The number of engineers per million inhabitants is also quite small. Despite that, there is still unemployment in the engineering sector, and average wages are kept stable over time, indicating that there is no market to absorb a higher percentage of graduates from engineering fields. Indeed, the national market is not competitive and requires little in terms of innovation.

Collaborations between the government, academia, and companies have been promoted by several policies, such as the Innovation Law, and funding models, such as EMBRAPII and Inova applications, but the results are not satisfactory. In fact, GII indicators show a decrease in indices that evaluate these collaborations in the last five years (GALDINO, 2019a). Developing a culture of innovation to reduce fragmentation and discoordination between NIS actors is essential, particularly of members of the Triple Helix (AZEVEDO, 2018; CUNHA; AMARANTE, 2011).

Tax incentives for innovation (Law of Good and Computer Law) have increased over the recent years in relation to gross domestic product (GDP), credits for innovation from BNDES and FINEP grew considerably from 2007 to 2014, and so did the domestic expenditure in R&D relative to GDP, however, innovation indicators do not detect a trend of improvement.

In Brazil, universities – whose main vocations are knowledge generation, training, specialization, and improvement of human resources – are home to the largest share of scientific research infrastructure. Differently from which occurs in developed countries, in Brazil there are few structures or institutions dedicated exclusively to applied scientific research, such as EMBRAPA, FIOCRUZ, the Brazilian Center for Energy and Materials Research, and military STIs, such as the Army Technology Center.

In a broad survey conducted by IPEA (Institute of Applied Economic Research) on the domestic research infrastructure, covering about 2,000 national laboratories, it was found that Brazil has few large laboratories, indicating that investments are spread largely for small laboratory infrastructures (DE NEGRI; SQUEFF, 2016).

Unlike highly innovating countries, in Brazil, ministries, such as Defense, Health, and Agriculture, have reduced resources to invest in innovation. Truly, MEC and MCTIC account for the vast majority of investments in research. This has an important consequence: in countries where these ministries have a significant volume of resources to invest in innovation, there is a greater propensity for the development of Science and Technology as a mission, therefore, to solve real medium and long-term problems, driving the generation of innovations within the corresponding sectors. On the contrary, in Brazil S&T prioritizes the generation of knowledge rather than its appropriation for economic growth and social development.

Regarding Infrastructure, the mean of global indicators has been growing at a faster rate than the national indicators. With the exception of the ICT area, Brazil has been losing positions in the international ranking, according to GII indicators of the last five years.

Among the national indicators obtained by the GII, those associated with institutions, the political environment, regulatory environment, and business environment are ranking poorly. According to these indicators, Brazil is among the countries with the worst performance[3]. Reforms are urgent in order to automatize and simplify tax charges and procedures for opening and closing companies, as well as reducing bureaucracy and providing legal certainty to medium and long-term private investments.

This summarized diagnosis highlights some of the main challenges in the search for improvement of the Brazilian innovation capability. It is interesting to mention the adoption of some initiatives carried out over the last 15 years aimed at solving some of the problems previously pointed out, but without significant results (MORAIS, 2017). A striking example is the Law of Good (Law No. 11,196/2005), which implements mechanisms to attract more PhDs and masters to the industrial sector, by remunerating these researchers with government funds. However, this approach does not seem to be effective, especially regarding PhDs, since most of them remain employed in the public sector, as already mentioned. This issue needs to be dealt with holistically: if the market does not demand innovation, specific incentives are ineffective.

3 Successful International Experiences in Innovation

South Korea has managed to overcome its economic difficulties and become prominent in technological innovation. Since the 1980s, this country has adopted some public policies aimed at scientific and technological development and at obtaining a high-tech industrial base by training and attracting high-level scientists and engineers, strengthening education, conducting training programs abroad, and repatriating talented individuals. It increased industrial productivity by promoting partnerships between STIs, universities, and companies and cooperation with other countries. It recognized the importance of science and technology for the development of the country and created research institutes in specialized fields. It prioritized the development of technological capability by training scientists and engineers. It attracted young people for science, incentivized the development of industrial property, and opened the market (FREITAS et al.,1989; PONTES, 2019).

Another example of success is Japan, which has become a world power due to its scientific and technological development. To achieve development goals in the 1980s, there were major investments in R&D both by the government and the business sector (SICSÚ, 1989, p. 37). Knowledge about global legislation on industrial property was emphasized and the education sector was given top priority, giving Japan one of the best educational systems in the world. Thus, they built an exceptional capacity to innovate

3 In the 2019 report, Brazil appears in the 80th position in a set of 120 countries. https://www.globalinnovationindex.org/analysis-indicator

through imitation by acquiring imported products that were improved and launched in the domestic and international markets.

In Israel, which has also become prominent in the technology sector, education is the government's priority. In addition, also in the late 1980s, the country already had a considerable level of interaction between industries and universities (CALÁBRIA; SICSÚ, 1989).

This brief report shows that countries with disparate sociocultural realities prioritized the provision of exceptional quality education at all levels, focused on the training of personnel in areas dedicated to innovation, established good coordination between research centers, the government, and the productive sector, introduced policies to foster R&D activities, valued the production and dissemination of knowledge, as well as its practical application and consequent appropriation, through intellectual property.

The fascinating book "Enough of Stories! The Latin American Obsession with the Past and the 12 Keys of the Future", by journalist laureate Andrés Oppenheimer, shows how the education improvement at all levels, especially in elementary and secondary degrees, the valuation of professional educators, and the incentive of science, technology, and innovation have transformed, over the past century, the trajectories of countries such as Finland, Singapore, South Korea, India, China, and Israel. The trajectory of these countries is compelling empirical evidence that improving education, science, technology, and innovation is not an impossible task. It also shows that the countries that advance are not those that sell raw materials or basic manufactured products, but those that produce goods and services of higher added value, for a very simple reason: we are currently experiencing the knowledge era in the economy.

It is intriguing to realize that the policies above worked very well in countries with such unequal political, economic, and social structures. Other studies show that practices such as emulation, the adoption of industrial policy, investment in technological innovations, and active participation of the government led countries with large sociocultural differences to development (ZAGATO, 2019).

An invitation to reflection, the book highlights the need for a strategy that values earlier educationfocused on sciences, without leaving aside humanistic values. It shows the importance of valuing, recognizing, respecting, and rewarding the professional educator at all levels with the best wages in order to attract young people to this profession. This is certainly a very inspiring practice!

Suzigan and Albuquerque (2008) found that the accumulation of monetary and financial resources was another factor that contributed to the scientific and technological progress of several nations, as it enabled the creation of credit for funding research and development, as well as fostering the industrialization process. Based on the outcomes of the New Deal[4] American program, they conclude that a solid financial system – along with the consolidation of public finances with fiscal and tax austerity – was a precondition for an efficient innovation system to be created in the U.S., with significant federal public spending on research and development, which enabled the country to excel since the 1950s.

4 The *New Deal* was the name given to the series of programs implemented in the United States between 1933 and 1937 with the aim of recovering and reforming the American economy.

Analyzing the American NIS, Rosenberg (2000) compares the universities in the USA with those of other countries. Based on his findings, he concluded that scientific and technological institutions will better contribute to technological development if they respond to economic demands; decentralize activities; need to compete for resources with other STIs to carry out their projects; compose a wide network of information that enables a high degree of specialization and diversity; and remain committed to applied research since the academic training of human resources.

These factors bring scientific and technological institutions closer to companies and keep them aware of the real demands of the market. The closer this relation, the greater the positive impact on economic growth and the efficiency of the NIS.

4 The Brazilian Army's Contributions to Foster Innovation

As a result of a broad study conducted by the Chief of Staff of the Brazilian Army (EB) a transformation process began with the primary objective of transmuting the structures conceived under the Industrial Age into an organization capable of facing the challenges posed by the Knowledge Age (BRASIL, 2010; PRADO FILHO, 2014).

This transformation process is supported by actions grouped into seven vectors (BRASIL, 2010), being the "S&T and Modernization of the Material" the most interesting in the area of technological innovation. In this direction or vector, it is highlighted the technologies that compose the Knowledge Age and the Fourth Industrial Revolution, technological intelligence and forecasting, as well as organizational changes, including with the creation of new structures and processes, such as the Technology Management and Innovation Agency of the Brazilian Army (AGITEC).

At the core of the transformational process of the Army Science, Technology, and Innovation System (SCTIEx), AGITEC deals with crucial areas of the Knowledge Age and with modern innovation models, whose implementation, in its fullness, will represent a breakthrough in the actual model still in use by the SCTIEx, particularly regarding R&D activities.

Knowledge Management, Intellectual Property Management, Technological Information and forecasting, and Innovation Culture are complex, multidisciplinary, and comprehensive areas that start to gain prominence in the Brazilian Army with the creation of AGITEC. Accordingly, the Open Innovation and Triple Helix models (CHESBROUGH, 2012; ETZKOWITZ, 2005), which have long been proposed and discussed worldwide, are difficult to implement, especially in the area of Defense and National Security, particularly when political, economic, and social structures have developed over centuries a culture of little interdependence and cooperation between the main actors of a NIS and, especially, when the concept of National Sovereignty is not among the basic and pressing needs of society.

Moving from a traditional innovation model, commonly called Closed Innovation, in which civilian participation in Defense R&D activities occurs mainly in the form of contracts, to a cooperative model of innovation in which diverse actors (Armed Forces, Universities, incumbent companies and startups, Angel Investors, and

Development Agencies) participate in the same enterprise and share results, imposes important and intricate challenges, such as the management of secrecy, intellectual property, technology licensing and innovation returns, aside from the common challenges of creating innovation in an area of high added value and high technological risk, such as Defense. Despite these challenges, the rupture of the actual model becomes imperative, because the increase of the participation of Brazilian society in Defense, especially in those focused on the areas of Science, Technology, and Innovation, is a necessary condition to meet the demands of a continent country, sovereignly. With the creation of SisDIA (Defense, Industry, and Academy Innovation System) and AGITEC, the Army put a high priority on strengthening the links between academia, industry, and government.

Committed to its constitutional mission, the Army undertakes an endless journey to improve management and governance processes using established concepts, modern procedures, and good practices in several areas under its operation. Along its transformational process, the Army identified the technological forecasting as an essential area that needs improvement to support high-level decision-makers regarding the knowledge and technologies that must be obtained in the medium and long term for the benefit of the Permanent National Goals (ESCOLA SUPERIOR DE GUERRA, 2019).

Therefore, the Brazilian Army – despite its staff reduction process by 10% over the next 10 years – created AGITEC, a novel Military Organization with the important objectives of identify prominent future technologies with the potential to have a central role in Brazil's Defense and Security; promote the culture of innovation; protect the institution's intangible assets, and manage scientific and technological knowledge, particularly within its R&D projects. To that end, investments were made in human resources training and large and sophisticated laboratory and physical infrastructure.

The Defense area requires absolutely all kinds of knowledge. However, no country can remain at the edge, or even at high levels of development, in all areas of human knowledge. Prioritization is imperative, but it needs to be conducted with criteria and caution, taking into account opportunities, needs, the national competence and, fundamentally, the notion of what it is intended to be as a nation. In this regard, the Army has been developing methodologies to support the strategic alignment of forecasted technologies, to support decision making in strategic plannings. Such alignment is carried out by assessing the impact of potential future technologies on the operational capabilities required by the Army in the medium and long term.

Despite the complexity of these tasks, a methodology is under development to identify critical technologies that can be denied or, when imported, create vulnerabilities in military systems.

Therefore, in integrating the facets of technological forecasting, criticality, and strategic alignment, one can provide accurate information to the Brazilian Army decision-makers, for they better position themselves in relation to areas that should be studied in master's and doctoral programs in Brazil and abroad, the research areas and themes that should be incentivized, R&D projects that should be created nationally or in collaboration with other countries, as well as the critical areas that need immediate development by licensing or transferring technologies, often using offset contracts.

Furthermore, in parallel with the technology forecasting work, other tasks aim to map researchers, STIs, startups and national companies with knowledge about technologies and areas targeted by the Brazilian Army, to identify potential joint R&D enterprises. These tasks also involve foreign countries and institutions that have technical conditions of collaborating and accelerating the impending R&D initiative.

The Scientific and Technological Knowledge Management is another area that receives investments from the Army. Currently, tacit knowledge is preponderant, research and development of the strategic projects involve many actors of diverse expertise and are long term. Therefore, the management of critical knowledge and human resources plays a key role. Accordingly, it increases the importance of proposing methods, processes, and procedures to adequately manage the knowledge generated by the Brazilian Army, specifically in the scientific and technological field. This is a challenge that has been faced with an ingenious combination of art and science.

The Brazilian Army structured its Technological Innovation Hub (NIT), whose mission is to protect the intangible assets generated within the Army and to boost the portfolio of these assets, which is very modest, despite the development of sophisticated generic and dual technologies of high value-added. Thus, the Army does not only aligns itself with the Innovation Law but might also contribute to economic growth and job creation by exchanging its core proprietary technologies with external actors.

In addition, based on the scale of level of technological readiness (FRANÇA JUNIOR; GALDINO, 2019), the Army is developing a methodology to promote clear, concise, and objective communication between the various stakeholders of SCTIEx in order to promote trust and collaboration in projects related to the innovation area, thus following a trend observed in other agencies and sectors (AGÊNCIA ESPACIAL BRASILEIRA, 2018; FRANÇA JUNIOR; LAKEMOND; HOLMBERG, 2017; INNOVAIR, 2016; ROCHA, 2017; STRAUB, 2015).

5 Public Policy Proposals for the Innovation Sector

There are several obstacles to be overcome so that Brazil can become prominent in the field of Innovation. In addition to the aspects presented, the continental dimension, the great physiographic diversity, regional inequalities, and national competence should be considered important conditions in planning and studies to develop policies focused on innovation. Promoting innovation in a country with these characteristics is even more challenging.

However, it is necessary to define what Brazil intends to be as a nation and conduct strategic studies to prioritize the actions to be triggered to make the desired future a reality. Consequently, in order to define the National Innovation Policy (NIP), here are some important issues that, in addition to those presented before, particularly in Section 2, need to be discussed:

- What is desired related to innovation: to short the technological gap by following the path of pioneers, or advance the knowledge frontier in emergent areas with potential future and aligned with the national competence?

- How to identify strategic areas, technologies with potential future and how to be an important global actor in the medium term in these areas?

- What are the most promising international partnerships and cooperations in the fields of Science, Technology, and Innovation?

- How to measure the technological advancement of the country in strategic areas?

- How to prevent the escape of talents, repatriate Brazilian researchers, and attract foreign researchers to Brazil?

- Given the scarcity of resources, globalization of markets, knowledge and competition, what areas should Brazil focus on in terms of innovation (considering its virtues and capabilities)?

- How to align initiatives between the three dimensions of the Triple Helix?

- How to address the long-term issue in an era in which changes are intense, unpredictable, volatile, and complex?

- How to promote partnerships between the various S&T entities?

- How to disseminate and provide transparency to initiatives, enabling the mass participation of society in projects of public interest?

- How to eliminate "feuds" in each of the three "helixes," driving initiatives so they have strategic value for the country and fostering collaboration between such components?

- How to exploit the knowledge generated in universities in favor of the economic growth and social development of Brazil?

- How to ensure the continuation and realization of State policies?

- How to promote scientific and technological development as a mission?

- How to increase resources for investments in Science, Technology, and Innovation allocated for the ministries, in particular the Ministry of Defense?

- How to involve citizens and the private sector in fostering technological innovation?

- How to increase Brazil's life quality through technological innovation?

- How to improve the innovation culture and, with that, enhance the Triple Helix interaction, aiming to boost the innovation process?

- How to promote clear, concise, and objective communication between diverse stakeholders of the NIS so that trust and collaboration are fostered?

As discussed in the previous sections, many of these issues were addressed and overcame by other countries. In addition, some proposals are being implemented by the Army to solve the SCTIEx problems that are partially similar to the Brazilian NIS. Below, there are discussions on topics that should be discussed in the course of the preparation of the NIP.

a) Prioritization of investments in R,D&I

The examples of success extracted from the international community show that it is necessary to prioritize investments on innovation based on a well-established strategy that considers the actual needs and capabilities of the country, focusing efforts and resources on clear and specific objectives in certain sectors that have the potential to leverage the economy (CORREA FILHO et al., 2013).

The dispersion of financial resources with investment in various sectors, as occurs in Brazil (DE NEGRI, 2018), may be attractive from a political point of view, but it is inadequate for economic growth, since in order to leverage a given sector that is relevant to the economy it is necessary to concentrate resources (MONTEIRO, 2018). Accordingly, it is essential to map the sectors that have the potential to become the drivers of the country's economic development, especially those of high technology that adds substantial value and require a higher labor´s specialization, as they may provide larger returns on investments and better wages (FERNANDES, 2007 apud MONTEIRO, 2019a).

Thus, developing technology forecasting methods to identify potential technologies for the future and consistent with national demands is crucial. It is expected that the new products developed by these technology-intensive sectors will trigger the emergence of related supplier activities and service providers involving advanced technologies, leading the development of other sectors, a fact that expands economic activities in which the country can operate, enabling the internalization of technologies and fostering research and development focused on innovation.

It is acknowledged that the development of high-tech sectors may provide an advantage for the country to be actively introduced into the geopolitical and international economic scene. Prioritizing government investments, concentrating resources on strategic sectors that are capable to control sensitive technologies with great potential to generate innovation, can bring changes to the NIS. Such innovations have the potential to generate new materials, products, and services, creating areas of economic activity that

will result in organizational changes in Brazilian companies and their relations with the market (MONTEIRO, 2019a).

These strategic sectors need to be selected based on the versatility of technologies in order to impact as many sectors as possible so that the innovations generated become a bedrock of the national reindustrialization. A good NIP needs to keep the focus on the economic aspect, prioritizing what can effectively generate a new product or service with commercial value, regardless of the personal desires of groups that see Science as an end in itself.

b) Strengthening the Brazilian National Innovation System

Section 2 shows that the Brazilian NIS presents numerous deficiencies that need to be dealt with. These deficiencies involve all pillars of the Global Innovation Index, so they transcend aspects related only to the field of science and technology and should be treated holistically. Above all, it is necessary that the market demands innovation. Therefore, related initiatives should be triggered by the ministries, whose strategic policies and actions should be complementary and coordinated. For example, to increase the supply of engineers is inefficient if there is no market to absorb them; to increase the number of patents is inefficient if they are not negotiated; or to share public laboratory infrastructure is inefficient in an environment where legal uncertainty prevails. It is essential to develop the innovation culture, seeking to expand the interaction and integration between all actors of the Innovation System, focusing on certain values, beliefs, and behavior patterns (AZEVEDO, 2017, 2018).

Despite the broad nature of the topic, particular attention should point to institutions involved with generation and appropriation of knowledge, as well as to the links between these institutions (ZHANG; CHEN; FU, 2019).

The deficiencies in the research, development, and innovation processes result in organizations having difficulties in appropriating the innovation, given its scarce internal mechanisms for identification and consolidation of knowledge, protection, and exploitation of technologies and innovations created. Failures, gaps, and antinomies need to be solved in procedures and specific legal standards that provide protection to the innovation-oriented research and development process in the country. Efficient appropriation of immaterial assets and the adoption of proactive measures that meet opportunities for improvement in the research, development, and innovation process are of particular importance for the effectiveness of the NIP, as they represent a source of revenue for investments in Scientific and Technological Institutions and an important differential for the development of the national industry, due to the possibility of ensuring the economic advantages arising from intellectual property (MONTEIRO, 2018).

In order to improve Triple Helix mechanisms, academia, industry, and the government need, together, to discuss the NIP direction. The Triple Helix model has been used by several countries to trigger the emergence of centers for technological innovation and technology transfer, business incubators, new laws, and new funding mechanisms. However, in Brazil, the interaction between research institutions and companies is limited

to points of contact, as a probable consequence of the late emergence of both research institutions and Brazilian industrialization (SUZIGAN; ALBUQUERQUE, 2008).

In summary, there are several cases of successful initiatives in other countries that need to be analyzed for the construction of a policy adjusted to the national reality. It is essential that public policies are interrelated in order to ensure, in addition to the allocation of financial resources and implementation of tax incentives, the development of infrastructure and skilled human resources that effectively enable innovation. The promotion of technological and innovative development needs to be treated integratively with industrial development; accordingly, it is possible to affirm that the generation of innovation depends on the National Innovation Policy and on the National Industrial Policy, consistently prepared and implemented aimed at upholding the industry.

c) Efficient Government Technology Procurement

The Legal Framework for Science, Technology, and Innovation represented a paradigm shift regarding public procurements for Research, Development, and Innovation. This was an important initiative to stimulate innovation and technological development because the State has been an innovation protagonist in the main economies of the world, and an efficient and effective legal framework enables safe and swift contracting of companies and institutions dedicated to this need. However, despite recent efforts, difficulties remain for full utilization of the technology procurement mechanism (MONTEIRO, 2019b).

Hence, it is relevant to analyze the American experience, which created a whole legal framework for this purpose through the United States of America Federal Acquisition Regulation (FAR). The FAR is introduced in title 48, chapter 1, of the United States Federal Regulation Code. Each U.S. federal department can supplement the FAR according to the nature of its executive agencies. The U.S. legislation aims to deliver swiftly, the best value product or service to the customer, maintaining the public trust, and meeting the policy objectives (FAR section 1,102[a]).

The FAR comprises the recognition of the U.S. government that certain acquisitions are influenced by subjectivity and the economic and social impact, such as those focused on research, development, and innovation. Consequently, the FAR suggests, in several parts, that the acquisition price should not be the only element to be considered, but also an appropriate approach to the issue of technological development and innovation needs to be taken into account. Because it recognizes the importance of technological development, this regulation treats differently the acquisition processes involving risk, high complexity, and information asymmetry. Thus, the State's relationship with private suppliers in R&D acquisitions is faced as a "partnership" and not merely as a usual contract. Moreover, in order to search and interact with the market, the FAR strongly recommends the use of "Request for Information" (FAR, subsection 52,215-3) before making contracts; it also recommends that bidding public notices should be differentiated when technological risk is in place, risen from the nature of the knowledge and technique

involved (RAUEN, 2014). It is recognized that the U.S. legislation inspired the Brazilian S, T&I Legal Framework, however, the former is much more flexible and effective, since the latter still contains the rigidities of previous legislation, the General Tender Law, since it requires that the selection process contains previous and certain criteria concerning the contracted object, with little margin of freedom for the contractor to innovate according to the real needs of the market and according to the perceptions of the risks involved.

d) Improvement in Governance Criteria

In addition to the use of sophisticated tools of market intelligence, technological forecasting, strategic alignment, criticality, and communication mechanisms, to promote governance and innovation management it is essential to develop reliable indicators of innovation. Despite the advances, such as those achieved by GII, there are still many opportunities to improve in this area of research.

The evaluation of the performance of innovation-related policies traditionally focuses on static analyses of innovation inputs and outputs, as occurs, for example, with GII. However, this approach has limitations already pointed by the OECD (Organization for Economic Cooperation and Development), because, despite presenting an important source of information about the content and direction of technological research and development, it is not able to reflect the actual degree of economic productivity and growth occasioned by innovations. This conventional model provides a static framework that does not take into account the dynamics of interrelationships between actors working in the innovation process.

Recent models seek to highlight the importance of interactions or links between the people and the institutions that integrate the NIS and, therefore, are involved with innovation. Accordingly, it is necessary to establish procedures for data gathering about knowledge flows that occur between institutions during the innovation process and to map innovation environments to identify those involved and their Interrelationships. The OECD has already taken the initiative to develop new types of innovation flow indicators, including statistically human resource mobility, knowledge dissemination, and the classification of innovative companies.

Adequate innovation policies need to emphasize the role of joint research activities and technical collaborations between companies and public institutions. Thus, incentives and suitable legal frameworks that enable and promote partnerships related to research of critical technologies with government participation are of great value. Therefore, an efficient policy will seek to foster innovation networks and design information flows, links, and partnerships efficiently.

Finally, the integration and coordination of public policies with impacts on innovative processes, use of conventional indicators and knowledge flow indicators, mapping of national innovation environments, tools for technology prospection and market intelligence, strategic alignment, and criticality constitute an important framework to conduct the management and governance of the NIS.

6 Final Considerations

Motivated by the poor performance indices of the Brazilian NIS, this article addressed the phenomena of innovation, particularly on topics that should be widely discussed to support the development of a comprehensive NIP, as the issue requires.

It was clear that the Sectoral Innovation System of the Defense Sector is inseparable from the Brazilian NIS. Science and Technology were prominent as a necessary condition to boost the national innovation environment.

The long-term nature of the accumulation of technological capabilities was emphasized, especially in developing countries that don't have control over critical technologies such as Brazil. Thus, it was emphasized that the NIP embraces long-term strategic actions.

A brief diagnosis of the Brazilian NIS was presented evidencing the main bottlenecks, which must be addressed holistically and not in isolation, as in the case of several actions undertaken by Brazil over the last few years.

Some similar and successful experiences and practices adopted in countries of diverse cultures and realities were discussed. Hence, it is highlighted the universality of practices such as a solid education dedicated to the areas that leverage science, technology, and innovation and the imperative value of professionals who work in education at all levels.

It was shown that the Army is aware of the issue and since 2009, when it began its transformation process, it has made efforts to increase its capacity for innovation and thus create the means to fulfill its constitutional goals in an increasingly dynamic and uncertain context.

Inspired by established theories and practices, the Army's actions are ongoing, often involving organizational changes, such as the creation of new structures.

More emphasis started to be given to the importance of dual technologies, in order to exchange the knowledge generated internally and with its partners to contribute more effectively to national development; to enhance its modest portfolio of intangible assets; and to create better conditions to increase the participation of the Brazilian society in the Defense area, especially in the field of S, T&I.

It is necessary to highlight that the Army has made efforts to increase its competence in technological forecasting and strategic alignment fields. Therefore, it seeks to prioritize its strategic actions, its human capital, and its financial resources, identifying, still in the phase of initiation and growth of the technology life cycle, those with potential for the future and that may greatly impact the operational capabilities required by the Army in the medium and long term.

It was presented some central questions, which answers can support the design of Brazil's NIP. Finally, it was discussed some proposals to be included in the NIP, such as the strengthening of Brazil's NIS, the efficient use of the government technology procurement resource, the improvement in governance criteria, and the prioritization of investments focused on R,D&I.

Investments in forecasting and strategic planning tools, as well as the definition of goals and objectives, focused on potential areas for the future, are increasingly important. Medium and long-term planning becomes crucial to reverse Brazil's poor performance on innovation, moving it to a position compatible with its physiographic and economic potential, especially in core areas of the Fourth Industrial Revolution. The often unsuccessful attempt to shorten the "technological gap," especially in areas belonging to the Industrial Era, must be reviewed.

Brazil is a country of great opportunities, endowed with many resources that need to be exploited in a sustainable way, and full of talented individuals in various areas of knowledge that need to be properly mapped, supported, and employed.

In addition to being one of the largest markets in the world, Brazil has numerous competencies, one of the largest biodiversities and abundance of mineral and natural resources, which generates a wide range of possibilities for innovation. Brazil is not located in regions marked by the main worldwide tensions, there are no separatist movements, and, despite the continental dimensions and regional specificities, the same language and strong cultural ties are shared. There are sophisticated innovation environments in the South and Southeast of Brazil, not forgetting that the national deficiencies can be transformed into great opportunities.

In order to be prominent in the field of science, technology, and innovation, it deems necessary to rely on highly qualified human capital, at all levels; to have a state-of-the-art research infrastructure; to have a sound, consistent and unbureaucratic regulatory environment that fosters long term and risky private investments; to comply with agreements, contracts, and laws; to have an agile intellectual property system that guarantees investment returns; and to have a market structure that incetivize competition without protectionism. Nevertheless, is essential to have basic education with quality to shape instructed citizens and demanding customers. This will boost the innovation market and create the conditions to start a virtuous circle.

Acknowledgements

The Strategic Studies Management Center, for the questions formulated that constitute a challenging invitation to reflect on key topics for the development of Brazil; and the members of the Department of Science and Technology, for their valuable contributions to this article.

References

AFUAH, A. N.; BAHRAM, N. The Hypercube of Innovation. **Research Policy**, Amsterdam, v. 24, n. 1, p. 51-76, 1995.

AGÊNCIA ESPACIAL BRASILEIRA. **Introdução ao IMATEC como ferramenta de avaliação de maturidade tecnológica em projetos espaciais**. Brasília, DF: Agência Espacial Brasileira, 2018.

AMARANTE, J. C. **O voo da humanidade e 101 tecnologias que mudaram a face da Terra**. Rio de Janeiro: Biblioteca do Exército, 2009.

AZEVEDO, C. E. F. **Incremento da cultura de inovação**: passo essencial para o desenvolvimento da base industrial de defesa e ampliação do poder dissuasório. 2017. Trabalho de Conclusão de Curso – Escola Superior de Guerra, Rio de Janeiro, 2017.

AZEVEDO, C. E. F. Os elementos de análise da cultura de inovação no setor de Defesa e seu modelo tridimensional. **Coleção Meira Mattos**: revista das ciências militares, Rio de Janeiro, v. 12, n. 45, p. 145-167, dez. 2018.

BRASIL. Estado-Maior do Exército. **O processo de transformação do Exército**. 3. ed. Brasília, DF: EME, 2010.

BRASIL. Ministério da Defesa. **Livro Branco de Defesa Nacional**. Brasília, DF: Ministério da Defesa, 2016a. Versão sob apreciação do Congresso Nacional (Lei Complementar 97/1999, art. 9º, § 3º). Available from: https://bit.ly/2qpIoV1. Access on: Mar. 30, 2017.

BRASIL. Ministério da Defesa. **Política Nacional de Defesa e Estratégia Nacional de Defesa**. Brasília, DF: Ministério da Defesa, 2016b. Versão sob apreciação do Congresso Nacional (Lei Complementar 97/1999, art. 9º, § 3º). Available from: https://bit.ly/2NHGZBv. Access on: Mar. 30, 2017.

CALÁBRIA, C. O.; SICSÚ, A. B. Política científica e tecnológica em Israel. *In*: SICSÚ, A. B. (org.). **Política científica e tecnológica no Japão, Coreia do Sul e Israel**. Rio de Janeiro: CTEM/CNPq, 1989. p. 173-210. (Série Estudos e Documentos, 10).

CASSIOLATO, J. E.; LASTRES, H. M. M. Sistemas de inovação e desenvolvimento: as implicações de política. **São Paulo em Perspectiva**, São Paulo, v. 19, n. 1, p. 34-45, jan./mar. 2005.

CHESBROUGH, H. **Inovação aberta**: como criar e lucrar com a tecnologia. Porto Alegre: Bookman, 2012.

CIMOLI, M. National System of Innovation: a note on technological asymmetries and catching-up perspectives. **Revista de Economia Contemporânea**, Rio de Janeiro, v. 18, n. 1, p. 5-30, 2014.

CORREA FILHO, S. L. S.; BARROS, D. C.; CASTRO, B. H. R.; FONSECA, P. V. R.; GORNSZTEJN, J. Panorama sobre a indústria de defesa e segurança no Brasil. **BNDES Setorial**, Rio de Janeiro, n. 38, p. 373-408, 2013.

CUNHA, M. B.; AMARANTE, J. C. A. O livro branco e a base científica, tecnológica, industrial e logística de defesa. **Revista da Escola de Guerra Naval**, Rio de Janeiro, v. 17, n. 1, p. 11-32, jan./jun. 2011.

DE NEGRI, F. (org.). **Novos caminhos para a inovação no Brasil**. Washington, DC: Wilson Center, 2018.

DE NEGRI, F.; SQUEFF, F. H. S. (org.). **Sistemas setoriais de inovação e infraestrutura de pesquisa no Brasil**. Brasília, DF: Ipea, 2016.

ESCOLA SUPERIOR DE GUERRA (Brasil). **Metodologia do planejamento estratégico**. Rio de Janeiro: Ed. ESG, 2019.

ETZKOWITZ, H. Reconstrução criativa: hélice tripla e inovação regional. **Revista de Inteligência Empresarial**, Rio de Janeiro, n. 23, 2005.

ETZKOWITZ, H. Hélice Tríplice: metáfora dos anos 90 descreve bem o mais sustentável modelo de sistema de inovação. [Entrevista cedida a] Luciano Valente. **Conhecimento & Inovação**, Campinas, v. 6, n. 1, 2010.

FIGUEIREDO, P. N. **Gestão da inovação**: conceitos, métricas e experiências de empresas no Brasil. 2. ed. Rio de Janeiro: LTC, 2015.

FRANÇA JUNIOR, J. A.; GALDINO, J. F. Gestão de sistemas de material de emprego militar: o papel dos níveis de prontidão tecnológica. **Coleção Meira Mattos**: revista das ciências militares, Rio de Janeiro, v. 13, n. 47, p. 155-176, 2019.

FRANÇA JUNIOR, J. A.; LAKEMOND, N.; HOLMBERG, G. Mechanisms of Innovation in Complex Products Systems: an innovation system approach. **Revista Militar de Ciência e Tecnologia**, v. 34, n. 1, p. 47-54, 2017.

FREEMAN, C. The 'National System of Innovation' in Historical Perspective. **Cambridge Journal of Economics**, Cambridge, v. 19, n. 1, p. 5-24, 1995.

FREITAS, A. G.; SICSÚ, A. B.; SILVA, N. P.; MELO, L. C. P. Política científica e tecnológica na Coreia do Sul. *In*: SICSÚ, A. B. (org.). **Política científica e tecnológica no Japão, Coreia do Sul e Israel**. Rio de Janeiro: CTEM/CNPq, 1989. p. 127-172. (Série Estudos e Documentos, 10).

GALDINO, J. F. Sistema nacional de inovação do Brasil. **Coleção Meira Mattos**: revista das ciências militares, Rio de Janeiro, v. 12, n. 45, p. 129-144, dez. 2018.

GALDINO, J. F. Análise de desempenho dos insumos de inovação do Sistema Nacional de Inovação do Brasil. **Exacta**, São Paulo, v. 17, n. 2, p. 75-93, abr./jun. 2019a.

GALDINO, J. F. Reflexos da Era do Conhecimento e da 4ª Revolução Industrial na Defesa, **Artigos Estratégicos**, Brasília, DF, v. 6, n. 1, p. 7-27, 2019b.

GODIN, B. National Innovation System: the system approach in historical perspective. **Science, Technology, & Human Values**, Thousand Oaks, v. 34, n. 4, p. 476-501, July 2009.

INNOVAIR. **The Swedish Aerospace Research and Innovation Agenda**. [*S. l.*]: [*s. n.*], 2016.

KHEDHAOURIA, A.; THURIK, R. Configurational Conditions of National Innovation Capability: a fuzzy set analysis approach. **Technological Forecasting and Social Change**, Amsterdam, v. 120, p. 48-58, July 2017.

LESKE, A. D. C. A Review on Defense Innovation: From spin-off to spin-in. **Brazilian Journal of Political Economy**, São Paulo, v. 38, n. 2, p. 377-391, June 2018.

LONGO, W. P. **Tecnologia e soberania nacional**. São Paulo: Nobel, 1984.

LONGO, W. P. Ciência tecnologia: evolução, inter-relação e perspectivas. ENCONTRO NACIONAL DE ENGENHARIA DE PRODUÇÃO, 9., 1989. **Anais** [...]. Rio de Janeiro: Abepro, 1989. V. 1. p. 42-49.

LUNDVALL, B.-Å. **National Systems of Innovation**: Toward a theory of innovation and interactive learning. [*S. l.*]: Anthem, 2010.

MAZZUCATO, M. **O Estado empreendedor**: desmascarando o mito do setor público vs. o setor privado. São Paulo: Portfolio-Penguin, 2014.

MENEZES FILHO, N.; KOMATSU, B.; LUCCHESI, A.; FERRARIO, M. **Políticas de inovação no Brasil**. São Paulo: Insper, ago. 2014. (Policy Paper, 11).

MONTEIRO, M. **O fortalecimento do Sistema Nacional de Inovação para o desenvolvimento econômico brasileiro**. Rio de Janeiro, 2018. Não publicado.

MONTEIRO, M. **Apropriação do esforço de inovação tecnológica no exército brasileiro**: o caso do rádio definido por *software*. 2019. Dissertação (Mestrado) – Academia de Propriedade Intelectual, Inovação e Desenvolvimento, Instituto Nacional da Propriedade Industrial, Rio de Janeiro, 2019a.

MONTEIRO, M. **Desafios para a implementação da encomenda tecnológica nas contratações públicas brasileiras**. Rio de Janeiro, 2019b. Não publicado.

MORAIS, J. M. (org.). **Políticas de apoio à inovação tecnológica do Brasil**: avanços recentes, limitações e propostas de ações. Brasília, DF: Ipea, 2017.

NICOLAU, J. A.; PARANHOS, J. Notas sobre o conceito de inovação. **Textos de Economia**, Florianópolis, v. 9, n. 1, p. 23-37, jan./jun. 2006.

OPPEINHEMER, A. **Basta de histórias!** A obsessão latino-americana com o passado e as 12 chaves do futuro. São Paulo: Objetiva, 2011.

PONTES, N. Entenda como a Coreia do Sul passou da miséria à potência tecnológica. **G1**, [São José dos Campos], 3 dez. 2015. Available from: https://glo.bo/2PMotum. Access on: Set. 22, 2019.

PRADO FILHO, H. V. **A transformação do exército brasileiro e o novo sistema de ciência, tecnologia e inovação do Exército**: contribuições para a soberania nacional. Brasília, DF: Escola Superior de Guerra, 2014.

RAUEN, A. T. Encomendas tecnológicas nos Estados Unidos: possibilidades do Regulamento Federal de Aquisições. **Radar**, Brasília, DF, n. 36, p. 49-56, dez. 2014. Available from: https://bit.ly/36A1Xuo. Access on: Set. 21, 2019.

ROCHA, D.; MELO, F. C. L.; RIBEIRO, J. Uma adaptação da metodologia TRL. **Revista Gestão em Engenharia**, São José dos Campos, v. 4, n. 1, p. 45-56, 2017.

ROSENBERG, N. Critical Issues in Science Policy Research. **Science and Public Policy**, n. 18, n. 6, p. 335-346, 1991.

ROSENBERG, N. **Schumpeter and the Endogeneity of Technology**: Some American perspectives. London: Routledge, 2000.

SASSAKI, A. H.; DI PIETRA, G.; MENEZES FILHO, N.; KOMATSU, B. **Por que o Brasil vai mal no PISA?** Uma análise dos determinantes do desempenho no exame. São Paulo: Insper, jun. 2018. (Policy Paper, 31).

SCHWAB, K. B. **A Quarta Revolução Industrial**. São Paulo: Edipro, 2016.

SICSÚ, A. B. Política científica e tecnológica no Japão. *In*: SICSÚ, A. B. (org.). **Política científica e tecnológica no Japão, Coreia do Sul e Israel**. Rio de Janeiro: CTEM/CNPq, 1989. p. 3-5. (Série Estudos e Documentos, 10).

STRAUB, J. In Search of Technology Readiness Level (TRL) 10. **Aerospace Science and Technology**, Amsterdam, v. 46, p. 312-320, 2015.

SUZIGAN, W.; ALBUQUERQUE, E. M. **A interação entre universidades e empresas em perspectiva histórica no Brasil**. Belo Horizonte: UFMG/Cedeplar, 2008. (Série Texto de Discussão, 329).

TOPÇU, U. C. **Innovation Measurement Revisited Comparison Of Three Main Measures**. Zagreb: [*s. n.*], 2016. p. 245-253.

TROTT, P. **Innovation Management and New Product Development**. Upper Saddle River: Financial Times/Prentice Hall, 2008.

ZAGATO, L. Ainda é possível que os países em desenvolvimento façam seu *catching up* no século XXI? **Brazilian Journal of Political Economy**, São Paulo, v. 39, n. 3, p. 527-543, jul./set. 2019.

ZHANG, Y.; CHEN, K.; FU, X. Scientific Effects of Triple Helix Interactions Among Research Institutes, Industries and Universities. **Technovation**, Amsterdam, 2019. No prelo.

ARTICLE DOI 10.22491/cmm.a022

Analysis of High-Cost Long-Term Defense Programs: A Case Study of the Joint Strike Fighter

Análisis de los Programas de Defensa a Largo Plazo y de Alto Costo: Un estudio de caso del Joint Strike Fighter

Abstract: The present paper discusses the decision-making process in defense acquisition and budgeting. While the budget for defense services and for defense in general usually presents itself as stable, the same is not true for specific programs. Certain programs reveal the political turmoil that underlies defense acquisition. This paper investigates why programs differ in terms of budget volatility and what are the main factors that drive it. To attain this purpose, our first topic is a theoretical debate about decision-making, its main actors, and the budgeting process. This is followed by a description of the United States budgeting process. The case of the Joint Strike Fighter is then studied. Complemented by literature on innovation processes, our last topic is dedicated to the following hypothesis: since the F-35 program presents itself as essentially stable in acquisition and budgeting terms, it is argued that what distinguishes it from volatile programs is its elite consensus and a suitable Defense Industrial Base. This model intends to shed light on high-cost, long-term defense programs and their volatility.

Keywords: Defense. Acquisition. Decision-Making. Budget. F-35.

Resumen: Este artículo discute el proceso de toma de decisiones en la adquisición y presupuestación de la defensa. Si bien el presupuesto para los servicios de defensa y para la defensa en general suele presentarse como estable, no ocurre lo mismo con los programas específicos. Ciertos programas revelan la confusión política subyacente a la adquisición de la defensa. Este artículo investiga por qué los programas difieren en términos de volatilidad presupuestaria y cuáles son los principales factores que la impulsan. Para lograr este propósito, nuestro primer tema es un debate teórico sobre la toma de decisiones, sus principales actores y el proceso presupuestario. A continuación se describe el proceso de presupuestación de los Estados Unidos. Posteriormente, se estudia el caso del *Joint Strike Fighter*. Complementado por la literatura de Innovación, el último tema de este trabajo está dedicado a las siguientes hipótesis: dado que el programa F-35 se presenta como esencialmente estable en términos de adquisición y presupuestación, se argumenta que lo que lo distingue de los programas volátiles es su consenso de élite y una Base Industrial de Defensa adecuada. Este modelo pretende aclarar los programas de defensa a largo plazo de alto costo y su volatilidad.

Palabras clave: Defensa. Adquisición. Toma de decisiones. Presupuesto. F-35.

Gustavo Fornari Dall'Agnol
Pontifícia Universidade Católica de Minas Gerais (PUC Minas)
Belo Horizonte, MG, Brasil.
gustfd@gmail.com

Received: Apr. 16, 2019
Accepted: Oct. 22, 2019

COLEÇÃO MEIRA MATTOS
ISSN on-line 2316-4891 / ISSN print 2316-4833
http://ebrevistas.eb.mil.br/index.php/RMM/index

> *The victories and defeats, the compromises and the bargains, the realms of agreement and the spheres of conflict in regard to the role of national government in our society all appear in the budget. In the most integral sense the budget lies at the heart of the political process* (Wildavsky, 1964. p. 5).

1 Introduction

This paper's general theme is decision-making in defense; more specifically, in the underlying process of defense acquisition programs. The geographical scope of the paper is the United States, with a specific focus on post-Cold War programs. Its main goal is to understand volatility and stability in these projects – i.e., how and why these characteristics vary from program to program. Why are some programs volatile and others stable? What are the main variables influencing the defense budgeting, procurement and acquisition process? What are the roles of the different actors involved in the decision-making of the acquisition process? Acquisition is a complex process that depends on the interaction of multiple actors whose relationships have a bearing on the final result. In any case, the hypothesis of this paper is that *elite consensus* and the qualities of the Defense Industry are key variables for the understanding of volatility.

This paper also seeks to explain the budgeting, procurement and acquisition process for concrete defense programs. To this end, it discusses the specific case of the Joint Strike Fighter program. Defense budget in the United States is highly important because of its scope, supported by the jobs and taxes of millions. It is also extremely important for the country's economy. The defense budget and its distribution across different programs is the material core of the country's geopolitical strategy. It has powerful military consequences, as it can determine who lives and who dies. The decision to cut spending on radars, for example, may cost lives.

The methodology employed here is a combination of literature review, data analysis and case study. The F-35 case study will be approached from a *process-tracing* perspective[1]. Although single-case studies have weaknesses in regards to their potential for generalization, details revealed by the process-tracing methodology can bring up good insights for further research, hypothesis testing and theory building.

In order to accomplish the paper's objectives and address its main research problems, this article starts by reviewing the state-of-the-art in research on the budgeting processes and actors involved in defense decision-making. The second section corresponds to the case study, exploring and analyzing the F-35 program, its evolution, and issues. Finally, the final section aims to combine insights from the

1 The case-Study and process-tracing methodologies used in this paper are based on the works of Levy (2007); Gerring (2004); Silva e Cunha (2017).

theoretical debate with collected data, so as to explain the phenomena of volatility and stability in defense programs.

2 Budget Process-Tracing

The purpose of this section is to investigate the Budget Process underlying defense acquisition and appropriation in the United States. These are extremely important and complex budgetary components, and their implications range from ensuring jobs to political constituencies to the achievement of overarching strategic goals. In the first part, we discuss some theories and authors concerned with defense decision-making in general. The state-of-the-art research provides meaningful insights about decisive actors of the budget, appropriation and acquisition process. In the second part, this process will be described focusing mainly on program acquisitions, the scope of this article. This descriptive work will be complemented by some problematic questions, in order to advance this paper's objective.

2.1 Some Considerations on Incrementalism

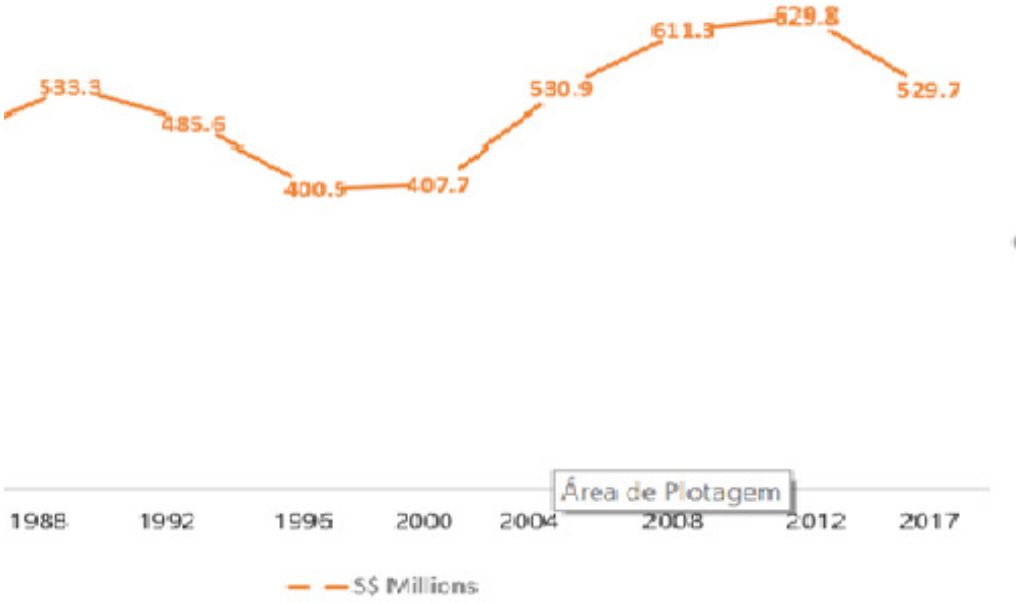
The predominant theory in budgeting is the Incremental Theory, put forward by Aaron Wildavsky (1964). According to this theory, one year's budget is always very similar to that of the previous Fiscal Year (FY), small upward or downward adjustments notwithstanding. For the author, this is a typical feature of wealthy nations, with their stable economies and considerable fiscal power. The main argument supporting Wildavsky's and Dempster's work with Incremental Theory[2] is that relative budget stability stems from the fact that individuals face hard trade-offs in the decision-making process. Budgetary decision-makers must rely on last year's budget, as management and administration processes allow no time for the budget-building process to begin all over again, every year, with all possible alternatives being reconsidered. This results in a kind of bureaucratic inertia. In the 1980s, decrementalism, a notion put forward by Allen Schik, supplemented Incremental Theory, arguing that budget cuts would generate great instability and conflict. Completing these theoretical insights, Herbert Simon's (1945) "boundedly rational" analysis demonstrated that decision-makers take shortcuts and simply cannot act in a strictly rational manner (i.e., in a manner that takes into account all possible outcomes of a decision).

Jones and Baumgarter (2005) argue that Incremental Theory is usually precise, although in cases of dramatic changes – due to political instability or external events, for instance – its explanatory power can leave something to be desired. In the case of defense politics, this argument is empirically verifiable: threat-driven wars, innovation and emulation processes tend to disrupt budgetary inertia. There are scarce studies specifically dedicated to analyzing the defense budget in these terms[3], so this issue is discussed below.

2 For insightful critiques of incrementalism in budgeting, see Wanat (1974), and LeLoup (1978).

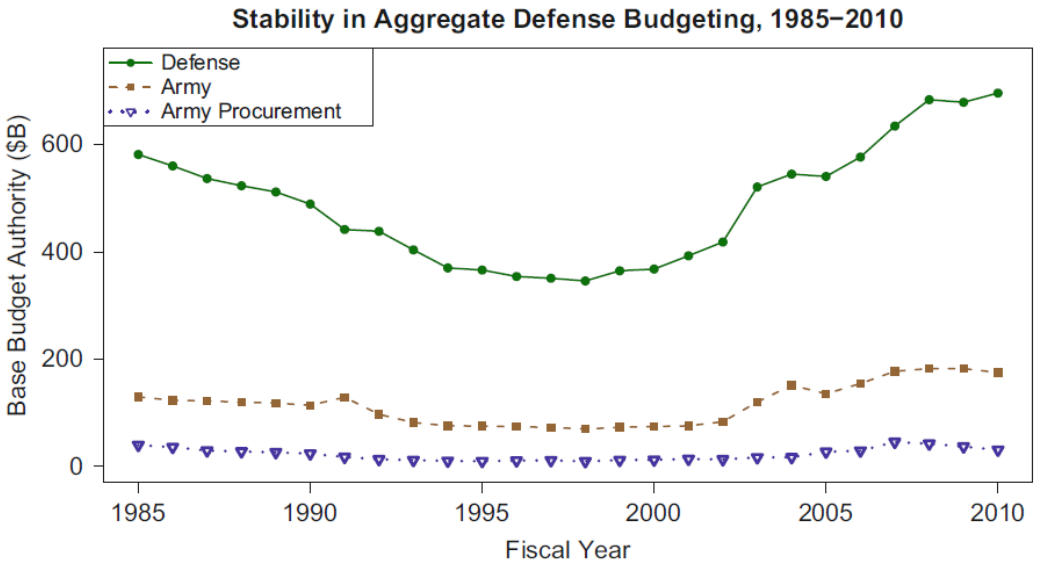
3 See, for example, Kanter (1975), Schick (1983), and Korb (1977).

Graph 1 – Variation in Military Expenditure (1988-2017) Constant 2009 (US$)



Source: Stockholm International Peace Research Institute (2018).

Graph 2 – Incremental Theory



Source: Demarest (2017, p. 75).

As both graphs indicate, Incremental Theory is right when it comes to the overall, service-level, and procurement fractions of the defense budget. Jones and Baumgartner (2005) are also correct, since both the War on Terror and Reagan's anti-Soviet military build-up in the 1980s effectively interrupted Incremental budgetary modifications.

Demarest (2017) argues that while aggregate budgets, defense budgets and service budgets are all incremental, *program funding is not*. Since this paper is concerned with long-term programs, this theory will be further explored in our discussion of the Joint Strike Fighter program, even though Demarest (2017) has already collected evidence to strongly substantiate this statement. Other authors, such as the proponents of the Military-Industrial-Complex approach, identify determinant actors in budgetary fluctuation and outcome. The next section will explore the literature regarding the main actors that can influence acquisition, budget and appropriation.

2.1.1 The main actors

One issue of foreign policy decision-making theories is that each author identifies different main variables as decision determinants. Valerie Hudson (2014, p. 11), for example, sorts out three main variables defining foreign policy: the actor's interests; domestic institutions and the distribution of information between actors. Hellen Milner, Alex Mintz and Karl de Rouen, on the other hand, have overlapping, but distinct defining variables for decision-making[4]. Although all these variables may be important, this study focuses on the ones we regard as most directly linked to defense program acquisition and budgeting.

The literature identifies some main actors who have a bearing on foreign policy and defense decision-making processes in general, and specifically on budgeting. These are: the President; the National Security Establishment; Bureaucracy; Congress; and the Defense Industry. This section briefly discusses some of the literature's insights in order to scrutinize some of its conclusions.

Hilsman (1987) argues that the President does in fact have great power. The author claims that this figure's power is derived from constitutional authority, from the right to participate in the legislative process, and from its distinguished role in foreign policy and defense as the protector of the sovereign nation-sate. Reputation and prestige as well as media attention are also great sources of power for the presidency. But Hilsman cautions that the person of the president, his political skills and uniqueness may be decisive when dealing with a strong opposition. Sarkesien, Williams and Cimbala (2013, p. 128-129) also investigate the powers of the presidential person and office, as well as the National Security Establishment. Their conclusion, however, is more nuanced. The President, in order to succeed, has to have a skillfully established and understanding relationship with both the National Security Establishment and Congress. This would depend on a number of factors, such as the president's personality and leadership style. To stay in power and achieve National Security Goals, the president has to deal a number of constraints. Fichel (2017, p. 45-47) studies the National Security policy community, such as the National Security Council (NSC). He argues that there is a complex policy-implementation structure in service of the executive branch, which is enabled and constrained by legislation, bureaucratic structure and by the degree of resources allowed by Congress.

4 For Hellen Milner (2015) The President is constrained by: a) public opinion; b) governmental agencies; c) Congress; d) interest groups; e) partisanship opposition. Alex Mintz and Karl de Rouen (2010, p. 130) identify five determinants for foreign policy: a) the economic environment; b) economic interests; c) public opinion; d) electoral cycles; e) two-level games.

As for bureacracy, Hilsman (1987, p. 179) argues that bureaucrats are power centers[5]. Their power is based on division of labor and regulations. They are quite independent, and act as legislators and innovators. Bureaucrats have long-term careers in the Department of Defense, the Central Intelligence Agency, Congress and other niches of power. Some are appointed by the President, so, in Hilman's view, they share a portion of overall power as a middle ground in the structure of decision-making. Disagreeing with some authors, Hilsman (1987, p. 178) points out that congressional power is limited, since it is only effective if shared with the Presidency and the bureaucratic establishment. The author does recognize, however, that the United States Congress is more powerful than its counterparts in other democracies, since it truly legislates.

The Defense Industry is a more controversial actor. Proponents of the Military-Industrial-Complex approach (MILLS, 2010; GHOLZ, SAPOLSKY, 2006) argue that the behemoth military industries of today have a tremendous amount of power over decision-making. Other authors like Demerast (2017) argue that funding volatility is insensitive to contractors' needs. In any case, we must acknowledge that, in the US and worldwide, defense industry companies are some of the biggest and most profitable enterprises. We must not overvalue or undervalue their influence.

The purpose of this section was to discuss some of the main actors influencing decision-making processes and defense politics in their interaction with the budget cycle. This discussion will be revisited further along in the article, as our analysis develops.

2.2 The US Defense Budget Cycle

As mentioned above, the US budget process is tremendously complex, involving multiple actors and affecting the lives of millions of people. The defense budget is even more difficult to analyze: besides being the source of the lion's share of defense agencies' funding, it has the unique characteristic of being discussed during six-year plans elaborated ahead of schedule by the Pentagon. This is because large procurement programs are complex and hard to develop, both from a technical and political standpoint.

The present section discusses the acquisition, budget and appropriation process within Defense planning and execution. To fulfill this task, we rely on the work by Demarest (2017), as well as supplementary authors and data, to try to summarize and simplify this process. In the Army alone, around 300 hundred programs are evaluated every single year by the Pentagon and by the Congress (DEMAREST, 2017). To understand how a single project is developed in the long run, this section first approaches the process that begins with conceptualization and ends with delivery (military use) of the program in the Pentagon. Subsequently, we seek to understand the budget cycle in the context of the Congress. This section is mainly descriptive, but may provide fruitful insights for further investigations.

5 Graham Allison and Philip Zelikow (1999) propose a theory of decision-making based on an understanding of bureaucracy.

2.2.1 The Pentagon Acquisition process

The Pentagon acquisition process is inherently protracted and complex. The institutions involved in this work are highly regulated, and military certification requirements are heavily audited. From start to finish, the delivery of a single program can take an average of 8 to 12 years. The long duration of this cycle is a matter for debate. The Pentagon's task is to translate the president's National Security Strategy (NSS)[6] to a highly detailed and cost-effective spending strategy, with all expenditures being tactically and technically justified. However, as argued by Demarest (2017, p. 32) "translating text like 'promoting a just and sustainable international order' into a specific number of Javelin missiles is very hard, and subject to interpretation."

Funding categories include: operations and maintenance (OMA), military personnel, procurement, research, development, testing and evaluation (RDTE), and military construction. This article will focus mostly on procurement and RDTE, with some considerations on OMA, since it directly pertains the Joint Strike Fighter program and other similar large-scale programs. This categorical division, however, entails an empirical obstacle for the analysis of single programs, since most data are organized according to the abovementioned categories, rarely delving into individual program spending.

Until the end of World War II, each of the Armed Forces services had almost complete control of the acquisition process. In 1947, however, the National Security Act attempted to transfer the coordination of all acquisition activities and services to the Department of Defense. It was not until 1971 that Deputy Secretary of Defense David Packard restructured the system, so as to prevent corruption and abuse. Most defense acquisition policies still reflect Packard's original principles (FERRARA, 1996, p. 113-115).

There are four main steps in the defense acquisition process: Material Development Decision, followed by Milestones A, B, and C. The first step is the genesis of a program, providing the military with the authority to investigate current capability and initiate acquisition activities[7]. A small group of companies are then called in to propose ideas, in order to encourage competition (DEMAREST, 2017, p. 40). However, the program is only effectively initiated after Milestone B is reached. In this step, preliminary tests are held by the military and closely watched by Congress and the Defense Industry. If these tests are successful, the program reaches solid status. By Milestone C, the

6 The National Security Strategies are available from: http://nssarchive.us/. Access: Jan. 1, 2019.

7 Demarest (2017, p. 38) explains that "programs belong to one of three Department of Defense acquisition categories (ACAT), mostly based on dollar value. ACAT I programs are classified as major defense acquisition programs, and typically include large, expensive equipment like the M1 Abrams tank and the Stryker, or programs requiring sophisticated information technology."

program is no longer entirely within RDTE; procurement begins as well as a low-rate initial production. If, after these steps, the program is approved by Congress and by the Secretary of Defense, it can finally enter the full-rate production and deployment phase, which leads to final delivery.

The Pentagon's acquisition process is overlapped by the annual process of *budgeting*. The Pentagon is expected to deliver a Budget Request to be signed by the president and then sent to Congress by the first Monday of February of every FY. This procedure is guided by the Planning, Programming, Budgeting, and Execution System (PPBE), developed by Secretary of Defense Robert McNamara in 1961 (ADAMS; WILLIAMS, 2010; MCCAFFERY; JONES, 2004; SAPOLSKY; GHOLZ; TALMADGE, 2009).

Several important actors are involved in the PPBE process, which will be explored in greater detail later. *Planning*, for instance, is essentially the translation of the President's National Security Strategy into military language by the Joint Chief of Staff (JCS). The result is the National Military Strategy, a more in-depth strategic military document. Meanwhile, the Defense Planning and Programming Guidance (DPPG), issued by the Secretary of Defense, establishes the topline for each service, as an amount of the budget's ceiling (DEMAREST, 2017, p. 2017).

In the *Programming* phase, the Army, Navy and Air Force prepare their budget requests and submit them to the Secretary of Defense. This happens in August of each FY[8]. The proposals are analyzed by the JCS and by the Secretary of Defense, who make recommendations. Afterwards, the Deputy Secretary of Defense tries to contemplate these recommendations, and prepares the Program Decision Memorandum by approximately November of the FY. During the *budgeting phase*, this document is altered to conform to requests by the Office of Management and Budget, and then incorporated to the President's federal budget request. The *Execution* phase was instituted by Secretary of Defense Donald Rumsfeld in 2003, obligating the Pentagon to monitor spending and return unspent money to the Treasury.

2.2.2 Congressional appropriation disputes

The Congress' FY budgeting and appropriation cycle overlaps with the Pentagon's acquisition and budgeting process. The relationship between the two is dynamic, intense and usually conflictive. Some variables that can influence the process are constituency, partisanship, lobbying and the actions of key members of the committees who hold the most influent in Capitol Hill politics.

8 A service's budget request is called a Program Objective Memorandum, or POM. The POM includes funding of up to six years for every program the service believes necessary to provide a capability for countering the threats enumerated in the planning documents (DEMAREST, 2017, p. 52).

Chart 1 – The Defense FY Budget Process

DoD	Execution	Execution/ DASC's Paredes	Execution	Execution
DoD (Simultaneously)	*Planning*	*Planning*	*Programming*	*Budgeting*
Congress	Budget Arrives on Capitol Hill	*HASC/ SASC*	*HAD-D/SAC-D* CDAA	Congress votes Bill
FY	Jan Feb Mar	Apr. May Jun	Jul Aug Sep	Oct Nov Dec

Source: The Author (2019).

Chart 1 illustrates, in a very schematic manner, the process overlaps between Congressional and Department of Defense (DoD) FY activities regarding budgeting, acquisition and appropriation. The President's budget arrives on Capitol Hill on the first Monday of every February, every FY.

The first committees to analyze the proposal are the House Armed Services Committee (HASC) and the Senate Armed Services Committee (SASC). The professional staff of the HASC reviews the budget in order to make adjustments. By May, their work is usually complete. The HASC has about 40 professional staff members. The SASC has to make do with only 13. It delivers its remarks in June. Both committees are functionally authoritative, and they prepare a document known as the "National Defense Authorization Act." These bodies are responsible for reviewing and discussing the budget, and are in constant contact with members of Congress for advising them and preparing them for hearings on significant budgetary items (DEMAREST, 2017). The Congressional Budget Office (CBO), meanwhile, also has an important role in this process. Every FY, it prepares detailed analyses of the military's long-term plans, in form of published documents[9] entitled "The Long-Term Implications of Current Defense Plans."

While the HASC and SASC are elaborating their remarks and the National Defense Authorization Act, the Pentagon, through its Department of the Army Systems Coordinators, or DASCs – which directly represent the program manager inside the Pentagon – remain in constant contact with the committee's members, answering to their questions and presenting their arguments. Other important actors in the process within the Pentagon are the G-3, the G-8 and the ASA(ALT), as explained by Demarest (2017, p. 61):

9 These documents are available from: https://www.cbo.gov/topics/defense-and-national-security/defense-budget. Access: 1 Jan. 2018.

> The G-3, G-8, and ASA(ALT) are the Army's three primary decision-making organizations on questions of funding priorities in the Army's budget. The G-3, or operations directorate, manages requirements. Remember, a capability cannot be developed by the acquisition system without first meeting a valid requirement. The G-3 vets requirements from units and adjudicates their validity. The G-8, or resource management directorate, is responsible for prioritizing resources [...] ASA(ALT), or the office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology, is primarily responsible for the acquisition cycle. The triduum is exceptionally important in the Army's internal budget process, but can also affect congressional funding decisions. Occasionally, representatives from each of the three organizations will brief congressional staffers on particular programs. If the Army's position is not uniform, the congressional staffer will easily detect incongruence and the program becomes more susceptible to shifts in funding.

The authorization issued by the SASC and the HASC is not mandatory for the appropriation process or for budgeting, but their remarks are taken very seriously by the appropriators, the House Appropriation Subcommittee for Defense (HAC-D), and the Senate Appropriation Subcommittee for Defense (SAC-D). These members of Congress have one of the most prestigious tasks in all public policy. The HAC-D has 14 professional staffers, while the SAC-D has 12 (DEMAREST, 2017, p. 57). Richard Fenno (1973, p. 2) argues that the Appropriations Committee is the most powerful and most important of all committees. But they are not all powerful, nor strictly what George Tsebelis (2002) would refer as "veto players." There are twelve separate subcommittees which have to reconcile for an appropriation to happen. The HAC-D and the SAC-D publish their remarks between July and August, which, according to Demarest (2017, p. 58), results in changes to over 40 percent of the Pentagon's programs, usually through earmarks[10] in the final conference on the Defense Appropriations Act, held in August or September. The Bill is finally voted by Congress before the new FY in October 1st, and sent to the White House to be signed by the President.

As expected, the DoD is highly active during this process. Through presentations, hearings, and constant bargaining and discussion, the Pentagon lobbies Congress mainly through its Chief Legislative Liaison (OCLL), the program's manager, or its Senior Army Leaders. The OCLL is headed by a two-star general and lobbies the Appropriation Committee through the Budget Liaison Office (SAFM-BUL), which employs eight officers. The legislative liaison officers are expected to provide interface between the committee's staff and the Armed Forces. When Congress asks for information regarding programs, they are expected to provide it. The program managers are expected to know detailed information regarding a program and are in close interaction with the respective contractor companies. As for Senior Defense Leaders, in the case of the Army, for example:

10 Earmarks are provisions inserted into a discretionary spending appropriations bill that directs funds to a specific recipient.

> Senior Army leaders include four-star general officers and civilians of equivalent rank in the Army headquarters. These individuals often engage directly with members of Congress and professional committee staffs. "If the Vice Chief of Staff of the Army cares enough to leave his office and go up to the Hill to deliver a message, they'll listen," explained one liaison officer (DEMAREST, 2017, p. 60).

As we have previously mentioned, other actors can be highly influential throughout this process. The most obvious is the Defense Industry, who relies on profits that stem mainly from governmental acquisition contracts. These companies engage in anticipated and fierce competition to develop technology and meet the requirements of the DoD. Their professional lobbyists are stationed in Washington to provide members of Congress with information about projects and capabilities[11]. The media, through papers and specialized "think tanks," can have a considerable influence over the Congress, since they mobilize public opinion and provide information to decision-makers.

The purpose of this section was to describe the acquisition, budgeting and appropriation process within and between the Pentagon and Congress. Other actors were also seen to be influential. In the next topic, the paper will analyze the Joint Strike Fighter program, from its origins and conceptualization to its testing and delivery.

3 The Joint Strike Fighter Program: Conception, Development and Procurement

This section discusses the Joint Strike Fighter Program (JSF), understood as a case study of what we have discussed so far. To this end, we investigate the technical needs and political motivations that gave birth to the JSF. Afterwards, we briefly analyze the F-35, the JSF final product, its costs and technical and tactical justifications. Finally, we discuss the turmoil generated by concerns from important political actors regarding the program. As technological details are outside the scope of this paper, greater attention will be given to the political process.

3.1 The origins of the Joint Strike Fighter

The Joint Strike Fighter Program was conceived as an affordable fifth-generation aircraft for the Air Force and the Navy[12,13]. The Program mas mandated by Congress to

11 For a significant collection of defense industry information and discussion of the difficulties of soliciting information from defense contractors, see Adams (1981).

12 Strike fighters are dual-role tactical aircraft capable of both air-to-ground (strike) and air-to-air (fighter) combat operations.

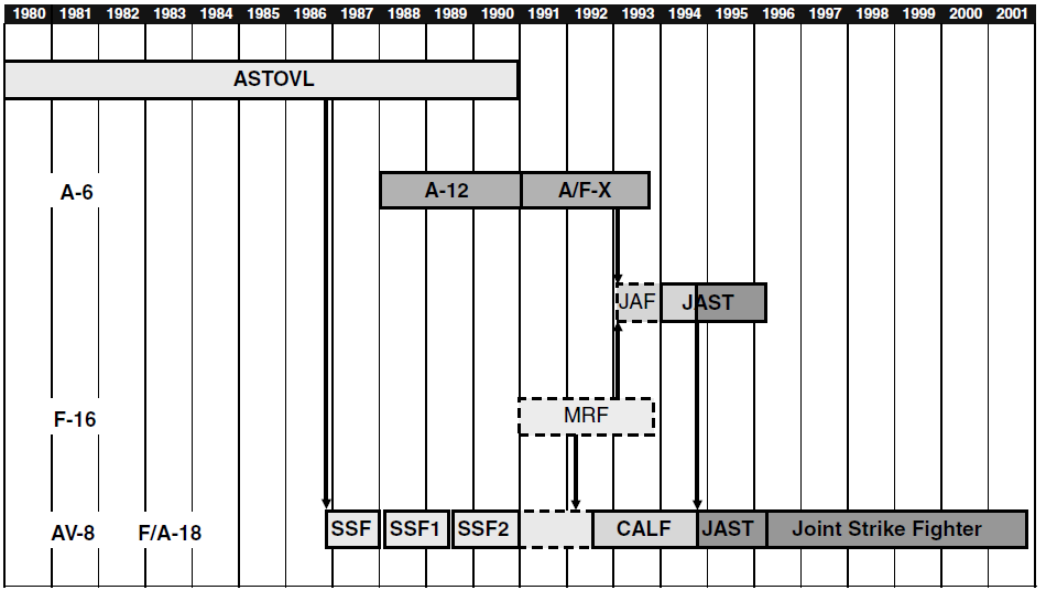
13 "Fifth-generation" aircraft incorporate the most modern technology, and are generally considered to be more capable than earlier-generation aircraft. Fifth-generation fighters combine new developments such as thrust vectoring, composite materials, stealth technology, advanced radar and sensors, and integrated avionics to greatly improve pilot situational awareness. Among fighters currently in service or in regular production, only the Air Force F-22 air superiority fighter and the F-35 are considered fifth-generation aircraft. Russia and China have flown prototype fifth-generation fighters with the ability to go supersonic for short periods, as well as advanced stealth characteristics (GERTLER, 2018, p. 1).

spearhead the Marine Corp's effort to replace its AV-8B Harrier. This would avoid greater development and defense-budget procurement costs. A brief history of the program's origins is presented below.

The origins of the JSF can be traced back to the Cold War. Knowing that fourth-generation fighters (Air Force F-16 Falcon, U.S. Marine Corps AV-8B Harrier, and U.S. Navy F/A-18 Hornet) would have to be replaced, each of the services began developing programs for a fifth-generation replacement aircraft. Budget constraints meant that there was not enough money to fund three separate programs. At the time, the technical challenge of developing a supersonic, vertical takeoff and landing (VTOL) aircraft was also a huge constraint.

Programs in the 1970s were unsuccessful in developing supersonic fighter jets. VTOL aircrafts like the AV-8 tested by the Navy in the 1980s had no supersonic capabilities. Lockheed Martin's SkunkWorks was already involved in the process. Working with NASA and the Defense Advanced Research Projects Agency (DARPA), the company tried to meet the challenge of developing an aircraft whose engine could provide enough vertical thrust for short takeoffs and vertical landings while remaining small enough to avoid excessive supersonic drag (BEVILAQUA, 2009, p. 1826-1827). They came up with the dual-cycle operation propulsion system, which would become the cornerstone of the future F-35.

Figure 1 – The History of the Joint Strike Fighter



Source: Bevilaqua (2009, p. 1833).

The concept of the new propulsion system was developed by SkunkWorks and DARPA throughout the late 1980s. These two organizations continuously briefed both the Pentagon and the U.S Congressional budget committees in order

to secure funding for the program. At first glance, the Air force appeared to lack interest in the ASTOVL, as it was developing its own aircraft, a conventional takeoff and landing (CTOL) MultiRole Fighter (MRF). DARPA lobbied high officials in the Pentagon and in 1992 convinced it to begin a STOVL/ CTOL Strike Fighter Program (JAST), with an initial appropriation of US$ 65 million by the Congress (BEVILAQUA, 2009, p. 1833).

In March 1994, the Congress appropriated US$ 6 million for the development of the STOVL and cruise project, followed by an additional US$ 10 million in the next year. Boeing entered the competition by matching the money with its own resources. The program was still incipient, but its prospects were great as the results of the President Clinton's Bottom-up Review Strategy

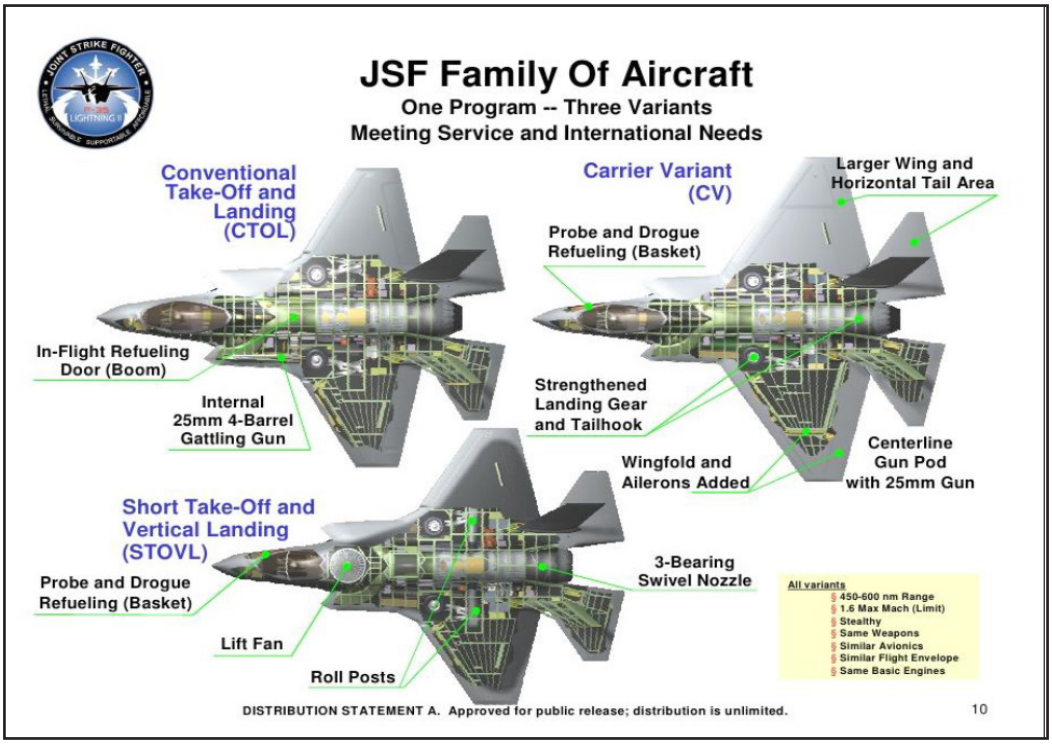
> ... were announced in September 1993. It was decided to cancel the MRF and A/F-X programs and to develop technologies for a Joint Attack Fighter that would replace the AV-8, F-16, and F-18 when they were retired beginning in 2010 ... Undersecretary of Defense for Acquisition and Technology Paul Kaminski changed the program to an acquisition category 1D program and renamed it the Joint Strike Fighter program, reflecting the greater scope and cost of the next phase of development and making it clear to U.S. Congress that JSF was an aircraft development program. In November 1996, Boeing and Lockheed Martin were selected to build concept demonstrator aircraft (BEVILAQUA, 2009, p. 1833).

The proposals were submitted in February 2001, and in October 2001, the JSF Program Office announced Lockheed Martin as the winner of the competition. The JSF program entered the system development and demonstration (SDD) phase, with SDD contracts awarded to Lockheed Martin for building the aircraft and to Pratt and Whitney for building the aircraft's engine (GERTLER, 2018, p. 11). By February 2006, the first Air Force F-35-A (named by Lockheed within its F-35 Lightning II Program) was rolled out of the factory; it was flown in December 2006. The STOVL F-35-B made its first flight in 2008. According to Bevilaqua (2009, p. 1836), the JSF "will achieve significant saving in aircraft production and life cycle costs ... All of the JSF variants have essentially the same airframe, engine, avionics and subsystems."

3.2 The F-35

The F-35 is the result of the Joint Strike Fighter program. As a multi-service jet, it has three versions: The F-35-A, a conventional takeoff and landing (CTOL) version for the Air Force; the F-35-B, a short take-off and vertical landing version (STOVL); and the F-35-C, a carrier-suitable CTOL version.

Figure 2- The Joint Strike Fighter's aircrafts



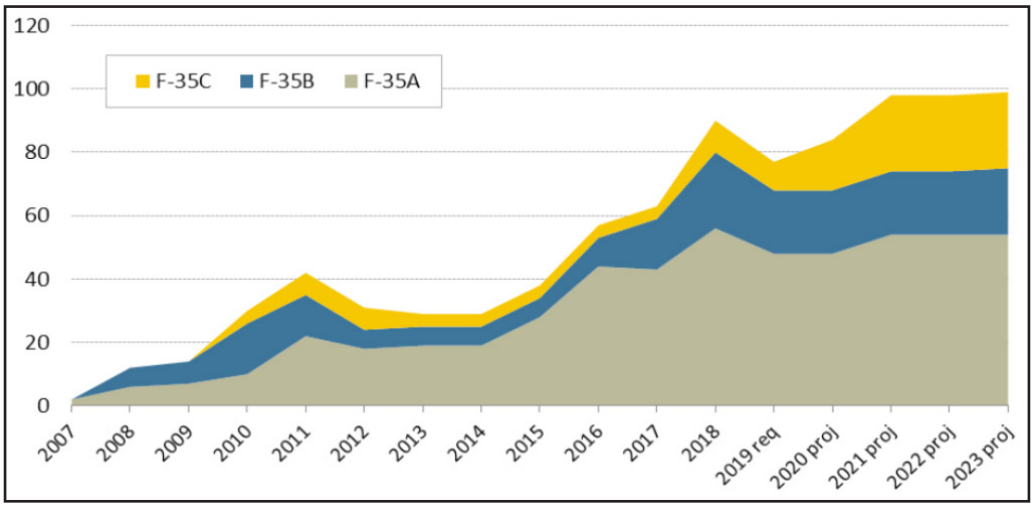
Source: Gertler (2018, p. 2).

According to Gertler (2018, p. 3), the Air Force plans to acquire 1,763 F-35-As to replace their F-16 fighters, A-10 attack aircraft, and possibly their F-15 fighters. The F-35-A is not as stealthy or as capable in air-to- air combat as the F-22, but it is designed to be more capable in air-to-ground combat than the F-22, and stealthier than the F-16 (TRIMBLE, 2010). Stealthy aircrafts are designed with reduced radar signature, using special coatings and gap sealing. Stealth technology also reduces the aircraft's signature in other aspects, such as engine heat, electromagnetic emissions, and emissions from radars or communications. All these features compound to make it very difficult for the enemy to detect these aircraft.

Gertler (2018, p. 3-4) points out that the Marine Corps plans to procure 353 F-35-Bs, to replace their AV-8B Harrier vertical/short take-off and landing attack aircraft and their F/A-18A/B/C/D strike fighters, which are CTOL aircraft. The Marine Corp's purpose with these acquisitions is to support the Marine Air Ground Task Force. The Marines also plan to acquire 67 F35-Cs. As for the Navy, it plans to procure 273 F-35-Cs, to operate carrier air wings combining the F-35-Cs with the fourth-generation F/A-18E/Fs.

The F-35 engine is the Pratt & Whitney F135. It is produced in East Harford, Middletown, CT. Another company involved is Rolls-Royce, which builds the vertical lift system for the F-35, subcontracting for Pratt & Whitey. The F35 is currently in low-rate initial production, with 280 aircraft delivered as of April 2018 (GERTLER, 2018, p. 5).

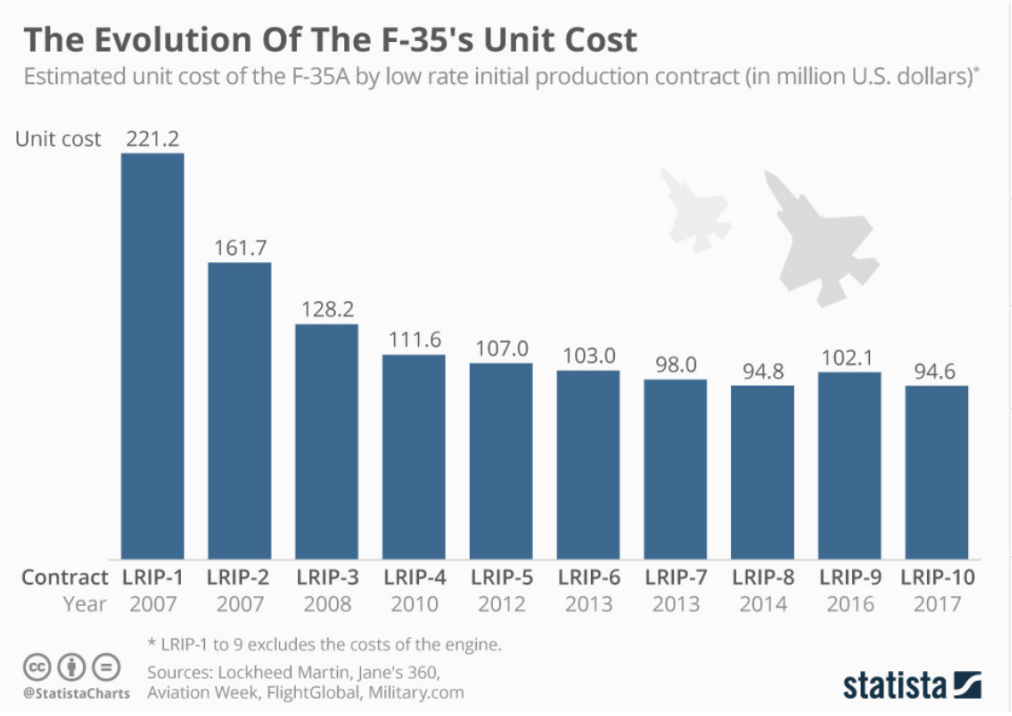
Graph 3 – Procurement Quantities



Source: Gertler (2018, p. 15).

In total, the procurement of 2,456 aircraft for the Air Force, Marines and the Navy is estimated. Among these, 13 are meant for research and development and 2,443 are production aircraft. The procurement began in FY 2007 (cf. UNITED STATES, 2018). Graph 3 shows the procurement quantities since then, and the projected procurement for the following FYs.

Graph 4 – F-35 Unit Cost



Source: McCarthy (2018).

As seen in Graph 4, the unit cost of the F-35 has experienced a dramatic decrease, with a subsequent stabilization. The decrease is expected, given production scale and productivity gains. Stabilization, however, demands more attention. The total estimated acquisition cost of the F-35 (in FY 2012 dollars) was about US$ 325 billion (GERTLER, 2018, p. 21). The biggest cost concern is sustainment. The F-35 fleet's lifecycle sustainment costs have been estimated at more than US$ 1 trillion (CAPACCIO, 2018). The cost of units, the program and its sustainment have been a matter of great intrigue between Lockheed Martin and the government, as we will see in the next section. Other issues regarding F-35-related political constraints are also relevant, and will be highlighted below.

3.3 Concerns and disputes regarding the program

Although the F-35 program appears unequivocally successful, it has not been immune to the political turmoil of budget and acquisition. Uncertainties regarding technical capabilities, costs, competition, possible block buys and contracts have been part of the F-35 program's trajectory so far. This section explores these disputes.

The first signs of problem arose in 2010. The DoD demanded a 13-month delay of the SDD phase, and withheld US$ 614 million from contractors, arguing poor performance. On March, the DoD announced that the JSF had exceeded the cost specified in the Nunn-McCurdy cost containment law[14]. This required the Secretary of Defense to notify Congress of the breach and to "present a plan to correct the program and to certify that the program is essential to national security before it can continue" (GERTLER, 2018, p. 12). In 2012, other problems emerged as the F-35 procurement was stretched (Graph 3) beyond FY 2017. This process allowed the Treasury to save US$ 15 billion.

Another issue that concerns the government are additional upgrades made by the contractor, since these can significantly increase final cost. The Government Accountability Office questioned the DoD's ability to sustain the F-35 program, given the required budgets. Even if it is already in production, the aircraft is still subject to testing and revision. These revisions might cause cost uptakes not included in the lot's negotiated price. Long-term sustainment conjectures must include inflation, labor costs, fuel costs and other factors outside the program's control. Conflict is almost inevitable.

An important congressional concern regards the development of the F-35 Block 4 software, part of an effort now known as Continuous Capability Development and Delivery (C2D2), expected to cost as much as US$ 10.8 billion over the next six years (GERTLER, 2018, p. 31). For regulation purposes, Congress demands the program's upgrade from a traditional procurement program to a Major Defense Acquisition Program (MDAP) (INSINNA, 2016), which would entail much stricter auditing rules. Although the F-35 has evolved together with its budget, Congress remains unsure:

14 For a history of the Nunn-McCurdy law and a discussion on its future possibilities, see Schwartz and O'Connor (2016).

> The F-35's cutting-edge capabilities are accompanied by significant costs. Some analysts have suggested that upgrading existing aircraft might offer sufficient capability at a lower cost, and that such an approach makes more sense in a budget-constrained environment. Others have produced or endorsed studies proposing a mix of F-35s and upgraded older platforms; yet others have called for terminating the F-35 program entirely. Congress has considered the requirement for F-35s on many occasions and has held hearings, revised funding, and added oversight language to defense bills (GERTLER, 2018, p. 30).

A major concern for Congress and for the United States in general reflects the manner in which defense contracts have been rewarded. Competition during the initial phases stimulated the development of the F-35 alternate engine program. Since there are few sources of supply available for high-technology systems, Congress is discussing maintaining competition while the procurements are still in progress. The F-35's high-cost sustainment issue, for example, could inspire Congress to open sustainment to competition. In the same direction, there are worries about Boeing losing its ability to continue its R&D programs after missing such a big contract, raising questions about the United States Defense Industrial Base. Since foreign companies are allowed[15] to participate in the F-35 program, another issue regarding the industrial base are the impacts caused by this type of competition.

So far, this paper has discussed some of the literature's contributions to the understanding of the decision-making process underlying defense projects and budgeting. Specifically, the F-35 program was discussed, from the origins of the aircraft's concept to its procurement phase. Some issues regarding costs and other political constraints affecting the F-35 were also discussed. In the next topic, this study attempts to establish a relationship between theoretical debates on this subject and this article's case study of the Joint Strike Fighter. In order to do so, we will approach some variables and documents regarding the JSF as a whole. Finally, in the conclusion, we question whether high-cost long-term budgeting in defense projects is stable or volatile. To this end, we bring up other examples besides the F-35. Moreover, we attempt to identify what are the key variables that generate a stable or volatile long-term high-cost program.

4 Acquisition and Budget for long-term Procurement Defense Programs

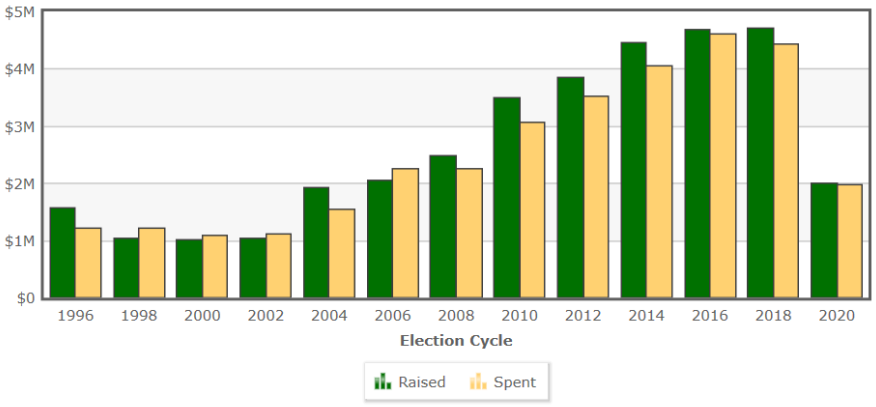
This last topic interconnects the previous two. It discusses the F-35 program in light of insights provided by the state-of-the-art research on the budgeting, acquisition and procurement process. In order to do so, we first discuss some key actors, using the F-35 case study to raise important issues regarding the main features of long-term budget defense programs.

15 The JSF is a joint effort of the United States with the United Kingdom, Italy, Netherlands, Canada, Denmark, Norway, Turkey, Israel and Singapore. Exports have been made to Japan and South Korea. This paper focuses only on the United States.

4.1 Defense Industry, Congress and the establishment of the long-term budget

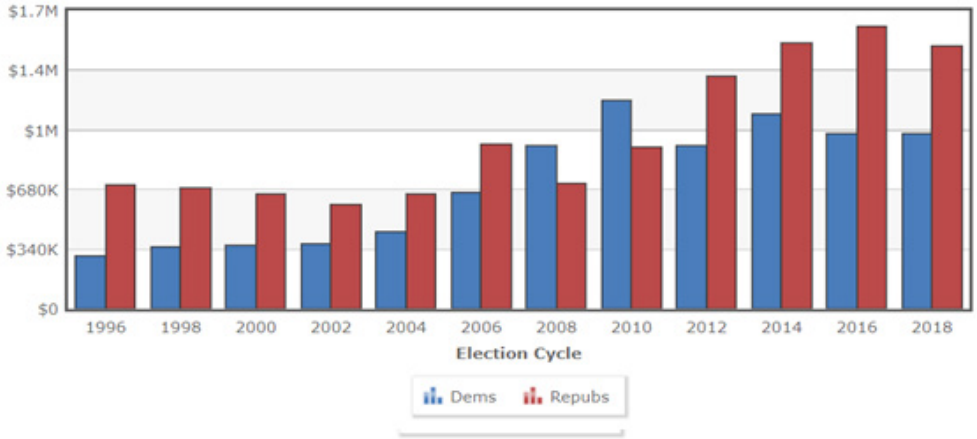
Lockheed Martin Corp. is the world's largest defense company, with approximately 100 thousand employees and a total net worth of US$ 100 billion (2018) (LOCKHEED MARTIN NET..., 2019). During its F-35 procurement years (2007–2019), the corporation reached a net nominal value of approximately US$ 100 billion, from a previous US$ 27 billion. A company this big, alongside its subcontractors, is certainly expected to have decisive influence on the state's budgeting and procurement process. A key feature to understand long-term defense programs lies in Lockheed's anticipation of DoD needs for a fifth-generation fighter. As previously pointed out, even decades before procurement, Lockheed was already investing in R&D for this kind of project. Only a highly profitable, big company would have the resources to take such a risk.

Graph 5 – Lockheed Martin's donations for Congress elections (1996-2018)



Source: Lockheed Martin Summary (2019).

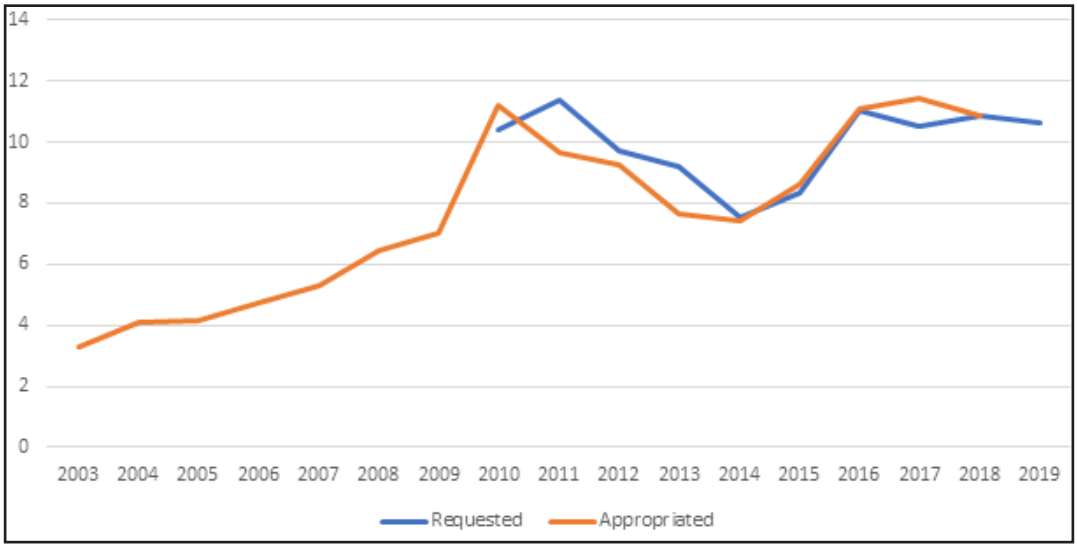
Graph 6 – Lockheed Martin's donations for Congress Elections by Party (1996-2018)



Source: Lockheed Martin Summary (2019).

Lobbying data is hard to find, and even harder to correlate with government policy. Much of the company's effort to influence government depends on personal relations, i.e. informal conversations. Many former military servicemen are employed in the Defense Industry. And many Defense Industry former-top employees are appointed to government. These types of connection are meaningful. Graphics 5 and 6 show that Lockheed's lobbying efforts grew a significant amount after the start of the F-35 procurement cycle. Companies are strong actors, but they still have to meet the DoD requirements.

Graph 7 – Requested vs. Appropriated F-35 Budget (Current US$ Billions)



Source: DoD Budget... (2014).

As shown in Graph 4, the F-35 program is essentially stable. There is no significant difference between requested and effectively appropriated budgets. The main volatility can be seen in the period between 2010-2014, which is explained by the previously discussed conflicts. This does not mean that Congress and its committees are not powerful. Instead, it means that despite criticism and dispute, Congress and the military are essentially aligned to the program's objectives, even if partisanship variables are incorporated into the analysis.

4.2 Are high cost long-term budget defense programs volatile or stable?

After the review of the literature on budgeting and defense decision-making actors, and analyzing the F-35 case to illustrate its main points, this work in now in a position to return to its main question. Budgeting, acquisition and procurement are part of a complex process, as we have argued. There are innumerous variables and actors that have to be considered, such as: the role of Congress; the power of Congress committees; technical feasibility; the military's role; the Defense Industry; the innovation process; the

media; public opinion; the economy; the international environment and its perceived threats. This paper does not focus on international threats or environment variables, nor does it pretend to generalize its findings to all countries[16].

As pointed out in the first section of the present paper, Incremental Theory is the prevailing budget analysis theory. We saw how incrementalism is empirically accurate while describing overall budget, the defense budget, and service (Army or Air force) budget. At a program level, however Demarest (2017) presents several examples to argue that the acquisition process is highly volatile. According to the author, no single factor can explain this finding. The funding volatility at the program level would be insensitive to vendors, jobs, elections, acts of engagement (by actors of the process), number of engagements, or engagement type. His explanation for volatility relies on engagement quality and subjective interrelationships between people (DEMAREST, 2017, p. 118). He suggests that, in the Army's case, an incremental strategy is the best alternative to prevent volatility:

> The Army can best achieve its own funding objectives (stability, predictability, and appropriations closely approximating the President's budget request) by developing a consistent, coherent plan and incrementally shaping the budget request to achieve the plan over time (DEMAREST, 2017, p. 187).

Although Demarest's thesis and insights are highly detailed, they do not apply to our F-35 case study. This does not in any way disprove his findings, however, as the author recognizes that "major acquisition programs" like the F-35:

> ... are difficult to cancel ... If programs successfully navigate the obstacle course of reports, tests, and independent evaluations required by the acquisition process and answer a valid requirement, they are generally never terminated altogether. Programs develop constituencies, create jobs, and supply money to towns and businesses. While beginning a program is hard, ending one is usually much more difficult (DEMAREST, 2017, pp. 32-33).

The question remains: why are some programs canceled, or appear to be more volatile than others? The remainder of this section discusses this issue, comparing the Future Combat Systems programs with the F-35, as well as other examples.

Future Combat Systems (FCS) was a collection of Army programs that intended to face the challenge of modernizing combat. The FCS was developed in 2003 as a "system of systems," given its amalgamation of multiple programs. It was designed to contemplate the Army's organizational change into Brigade Combat Teams, each comprised of about 4,000 soldiers, which intended to accomplish rapid mobilization and tactical success, seen

16 For an analysis comparing domestic and international factors in defense decision-making, see: Posen (1984); Fordham (2012).

as more dynamic and modern tactics. Initially, the industry and Congress supported the program. No one disagreed, especially in the face of War on Terror, that the Army needed modernization. However, the program's process of acquisition remained highly volatile throughout the years, and it was finally cancelled by the Secretary of Defense in 2009 (DEMAREST, 2017, p. 164-168).

The FCS was necessary, but it lacked *elite consensus*. First of all, the contracting structure transferred all responsibility – including administrative duties – to the contractor, Boeing. The Pentagon could not oversee expenses in subcontracting, for instance. The Defense Industrial Base of the period was the same as of that of the F-35, but Boeing had difficulty proving it could handle major defense programs such as the eight Manned Ground Systems. Each program required a huge effort to develop and demonstrate.

> FCS was complicated, and the Army could not provide Congress with a consistent narrative or convincingly demonstrate the return on billions of dollars appropriated for research and development. No matter how often Army officials discussed FCS with members or professional staffers, funding projections remained unstable (DEMAREST, 2017, p. 166).

Although large programs are rarely canceled when they have already reached a mature phase, the FCS was. This resulted from a lack of organic agreement between key members of the Army, members of Acquisition and Arms Procurement Committees, and the Industry. This increased cost projections on a regular basis (DEMAREST, 2017). Some degree of volatility due to cost issues and sustainment projections notwithstanding, the F-35, on the other hand, was much more stable. This was mainly because of an agreement between *elites*.

Two other examples are interesting. NASA's Apollo Program represented 20.8% of all R&D funding in 1966, while it employed 92,000 scientists and engineers, costing billions of dollars every year (ZEGVELD; ENZING, 1987, p. 29). The main actors of the system were tightly working together towards the goal of winning the space race. Although, at the time, the Defense Industry did not have the same technical capabilities, those could be developed in the medium term. Reagan's Strategic Defense Initiative was seen as technically impossible. Nevertheless, it received huge amounts of R&D funding in the 1980s. Political, Military and Industrial elites consented that the program was a top priority, and advantageous. Today, missile defense has reached acquisition stage.

This paper reinforces that long-term budgeting, procurement and acquisition are complex processes. Its variables influence are difficult to measure. Nevertheless, we can emphasize two variables that seem to have a strong volatility-diminishing impact on programs such as the ones we have discussed.

This paper proposes a preliminary model for explaining volatility in such programs. The variable identified as X1 (elite consensus) represents the compatibility of

objectives between key Defense Industry, Military and Congressional actors. The more closely in agreement these elites are, the more likely that the Acquisition Program will be stable. However, although necessary, this is not the only condition for success. The success or failure of a *High-Cost Long Term Defense Acquisition Program* depends on a Defense Industrial Base capable of developing the required projects for the elites. Thus, X2 (Defense Industrial Base) is also a necessary condition that, by itself, remains insufficient. Although further research is needed, this paper suggests that X1 and X2 put together have a strong bearing on explaining Y (*Volatility of High-Cost Long Term Defense Acquisition Program)*. The Elite Consensus and Defense Industrial base conditions can be explored in a qualitative, *process-tracing* manner, although possible quantitative and comparative studies cannot be discarded as methods to explore these variables.

5 Concluding Remarks

The main objective of this paper was to analyze high-cost, long-term acquisition defense programs. More specifically, we intended to discuss predictability issues regarding their volatility or stability. Some programs are volatile, while others are stable. Large programs seem to be more stable, since they require tremendous efforts and their cancelation would contradict considerable interests. However, that is not always the case. Explaining that discrepancy was the objective of this study.

In order to do so, the first section was dedicated to a literature review and qualitative description. The paper reviewed the main-stream consensus on budgeting theory and theories regarding actors in the overall defense and foreign policy decision-making process. The first section also described the budgeting, procurement and acquisition process within the Pentagon and Congress fiscal years. As many actors are involved and influence this process, Demarest (2018) is correct to point out that, at the program level, incrementalism does not always apply.

Testing the application of this hypothesis to the F-35 case study, this paper revealed that, in this specific case, the program is satisfactorily explained by incrementalism. Although there some level of volatility and conflict was ascertained, the program was generally stable in terms of budget, procurement and acquisition. Finally, the third section was aimed at explaining the reasons for the program's stability. We noticed that the Military, Congress and Industry were aligned in their efforts to ensure the program's success.

The remainder of the third section compared the F-35 and the FCS programs. It was noted that a crucial variable for program success is elite cohesion and consensus regarding feasibility and strategy. Finally, based on these case studies, this paper proposed a model for understanding long-term high-cost acquisition programs in defense.

This research sustains some limitations that must be addressed. More case studies are needed, regarding different time periods and with different characteristics, so the pertinent variables can be isolated. Adding the international environment and threats as variables could also refine the model, making it more accurate. These are subjects for further research.

References

ADAMS, G. **The Politics of Defense Contracting:** The Iron Triangle**. New York:** Council on Economic Priorities**,** 1981.

ADAMS, G.; WILLIAMS, C. **Buying National Security**. New York: Routledge, 2010.

ALLISON, G.; ZELIKOW, P. **Essence of Decision**: explaining the Cuban missile crisis. 2. ed. London: Longman, 1999.

BEVILAQUA, P. M. Genesis of the F-35 Joint Strike Fighter. **Journal of Aircraft**, Reston, v. 46, n. 6, p. 1825-1836, 2009.

CAPACCIO, A. Lockheed Gets Edict to Cut F-35's $1.1 Trillion Support Bill. **Bloomberg**, New York, 5 Apr. 2018. Available from: https://bloom.bg/34jhk8W. Access on: Jan. 1, 2019.

DEMAREST, H. B. **US Defense Budget Outcomes**: volatility and predictability in army weapons funding. Cham: Palgrave Macmillan, 2017.

DOD BUDGET Request. **Under Secretary of Defense (Comptroller)**, Washington, DC, 31 Jan. 2014. Available from: https://bit.ly/34iZ7s0. Access on: Jan. 1, 2018.

FENNO, R. **Congressmen in Committees**. Boston: Little, Brown, 1973.

FERRARA, J. DoD's 5000 documents: evolution and change in defense acquisition policy. **Acquisition Review Quarterly**, Fort Belvoir, v. 3, n. 2, p. 109-130, 1996.

FISHEL, J. T. **American National Security Policy**: authorities, institutions and cases. Lanham: Rowman and LittleField, 2017.

FORDHAM, B. O. Domestic Politics, International Pressure, and the Allocation of American Cold War. **The Journal of Politics**, Chicago, v. 64, n. 1, p. 63-88, 2002.

GERRING, J. What Is a Case Study and What Is It Good for? **American Political Science Review**, Cambridge, v. 98, n. 2, p. 341-354, 2004.

GERTLER, J. **F-35 Joint Strike Fighter (JSF) Program**. Washington, DC: Congressional Research Service, Apr. 23, 2018.

HILSMAN, R. **The Politics of Policy Making In Defense And Foreign Affairs**. New York: Harper & Row, 1987.

HUDSON, V. M. **Foreign policy analysis**: classic and contemporary theory. Lanham: Rowman & Littlefield, 2014.

INSINNA, V. Bogdan: Separate Program For F-35 Block 4 Mods Would Increase Cost, Schedule Difficulties. **Defense Daily**, [*s. l.*], 23 Mar 2016. Available from: https://bit.ly/2C11tQ9. Access on: Oct. 31, 2019.

JONES, B.; BAUMGARTNER, F. **The Politics of Attention**: How government prioritizes problems. Chicago: University of Chicago Press, 2005.

KANTER, A. **Defense Politics**: A budgetary perspective. Chicago: University of Chicago Press, 1975.

KORB, L. The Budget Process in the Department of Defense: the strengths and weaknesses of three systems. **Public Administration Review**, Hoboken, v. 37, n. 4, p. 334-346, 1977.

LELOUP, L. The Myth of incrementalism: analytical choices in budgetary theory. **Polity**, Chicago, v. 10, n. 4, p. 488-509, 1978.

LEVY, J. Case Studies: types, designs, and logics of inference. **Conflict Management and Peace Science**, Thousand Oaks, v. 25, n. 1, p. 1-18, 2007.

LOCKHEED MARTIN SUMMARY. **Open Secrets**, Washington, DC, [2019]. Available from: https://bit.ly/322HZoX. Access on: Jan 1., 2019.

LOCKHEED MARTIN NET Worth 2006-2019. **Macro Trends**, [*s. l.*], 2019. Available from: https://bit.ly/323xyRV. Access on: Jan. 1, 2019.

MCCAFFERY, J.; JONES, L. **Budgeting and Financial Management for Defense**. Greenwich: Information Age, 2004.

MCCARTHY, N. The Evolution of the F-35's Unit Cost. **Statista**, New York, 17 Sept. 2018. Available from: https://bit.ly/334SwRD. Access on: Jan. 1, 2019.

MILNER, H. V. **Sailing the water's edge**: The domestic politics of American foreign policy. Princeton: Princeton University Press, 2015.

MILLS, Charles Wright. **The Power Elite**. New York: Oxford University Press, 2010.

MINTZ, A.; DEROUEN JR, K. **Understanding Foreign Policy Decision Making**. New York: Cambridge University Press, 2010.

POSEN, B. R. **The Sources of Military Doctrine**: France, Britain, and Germany between the World Wars. Ithaca: Cornell University Press, 1984.

SARKENSEN, S. C.; WILLIAMS, J. A.; CIMBALA, S. J. **US National Security**: Policymakers, Processes, and Politics. New York: Lynne Rienner Publishers, 2013.

SAPOLSKY, H.; GHOLZ, E.; TALMADGE, C. **US Defense Politics**: The origins of security policy. New York: Routledge, 2009.

SCHICK, A. Incremental budgeting in a decremental age. **Policy Sciences**, New York, v. 16, n. 1, p. 1-25, 1983.

SCHWARTZ, M.; O'CONNOR, C. V. **The Nunn-McCurdy Act**: background, analysis, and issues for congress. Washington, DC: Congressional Research Service, May 12, 2016.

SILVA, F. M. E.; CUNHA, E. S. M. Process-tracing e a produção de inferência causal. **Teoria e Sociedade**, Belo Horizonte, n. 22.2, p. 104-125, 2017.

SIMON, H. **Administrative Behavior**. New York: The Free Press, 1945.

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE. **SIPRI Military Expanditure Database**. Stockholm: SIPRI, 2018. Available from: https://bit.ly/32ZqKpE. Access on: Jan. 1, 2018.

TRIMBLE, S. Lockheed says F-35s will replace USAF F-15s. **Flight International**, Washington, DC, Feb. 4, 2010.

TSEBELIS, G. **Veto Players**: How political institutions work. Princeton: Princeton University Press, 2002.

UNITED STATES. Department Of Defense. **F-35 Lightning II Joint Strike Fighter (JSF) Program (F-35)**. Washington, DC: DoD, Mar. 19, 2018.

WANAT, J. Bases of Budgetary Incrementalism. **American Political Science Review**, Cambridge, v. 68, n. 3, p. 1221-1228, 1974.

WILDAVSKY, A. **The Politics of the Budgetary Process**. Boston: Little, Brown, 1964.

ZEGVELD, W.; ENZING, C. **SDI and Industrial Technology Policy**: Threat or opportunity? New York: St. Martin's Press, 1987.


ECEME

ARTICLE DOI 10.22491/cmm.a023

Challenges to the Brazilian Army at Amazonian borders: between *border* and *frontier*

Desafíos del Ejército Brasileño en las fronteras amazónicas: entre border y frontier

Abstract: This article discusses the challenges to the Brazilian Army at the border strip, with emphasis on the Amazon, based on an interdisciplinary theoretical-conceptual approach. Conceptually, the highlight is the distinctive nature of the two notions of border (*border* and *frontier*) and the significance of each of them in terms of defense and security. For this purpose, the paper suggests dividing national security threats into two categories: geopolitical threats and security threats. Based on this theoretical approach and considering the border territorial policies historically adopted by Brazil, the article discusses the military challenges at Amazonian borders, analyzing the main military strategies adopted for that region.

Keywords: Border. Frontier. Geopolitical threats. Security threats. Amazon.

Resumen: Este artículo discute los desafíos del Ejército Brasileño en las fronteras nacionales, centrándose en la Amazonia, en el contexto de un enfoque teórico-conceptual de carácter interdisciplinario. En términos conceptuales, se enfatiza la naturaleza distinta de las dos nociones de frontera (*border* y *frontier*) y el significado de cada una de estas nociones en términos de defensa y seguridad. Con este fin, el artículo sugiere la división de las amenazas a la seguridad nacional en dos categorías: amenazas geopolíticas y amenazas a la seguridad. Con base en este enfoque teórico y considerando las políticas fronterizas territoriales históricamente adoptadas en Brasil, el artículo discute los desafíos militares en los espacios fronterizos de la Amazonia, analizando las principales estrategias militares adoptadas para esa región.

Palabras clave: *Border*. *Frontier*. Amenazas geopolíticas. Amenazas a la seguridad. Amazonia.

Oscar Medeiros Filho
Exército Brasileiro. Estado-Maior do Exército
Brasília, DF, Brasil
oscarfilho.medeiros@eb.mil.br

Received: Oct. 24, 2019
Approved: Nov. 22, 2019

COLEÇÃO MEIRA MATTOS
ISSN on-line 2316-4891 / ISSN print 2316-4833
http://ebrevistas.eb.mil.br/index.php/RMM/index

1 Introduction

Brazilian Army's presence at the border strip played a relevant role in the process of consolidation of the National State's limits. In this sense, the creation of military colonies in the mid-nineteenth century, whose purpose was border vivification, deserves special mention, blending, in General Meira Mattos' words, "the defense weapon and the hoe of man's economic attachment to the land" (MATTOS, 2011b). In that context, the concern about threats was notably geopolitical, stemming from potential external interests. The notion of boundary had a notably political-legal, limit, *border* character; and the Army's function was basically to mark national sovereignty on the boundary territories.

The huge demographic void that characterizes the Brazilian land border strip, especially from Corumbá/MT towards the north, makes another relevant notion of boundary: the *frontier*. It refers to the notion of periphery, to distant and undeveloped regions, with little State presence, and whose main military concern refers to the guarantee of the State's sovereignty, consequently, of the legitimate violence monopoly. For the Brazilian Army, these are territorial control demands with continental dimensions, colonial heritage, which gain more relevance when combined with the perception that the National State is still in formation process. In this sense, Marques (2007) highlights as one of the main features of the Brazilian military strategic culture the importance given to the presence strategy, understood as a fundamental factor for the national integration and Brazil's territorial integrity. Thus, with regard specifically to the Amazon, "military presence is seen as an effective strategy to induce settlement, inhibit the action of non-public transnational actors, and ensure public order in the region" (MARQUES, 2007, p. 89).

The notion of *frontier* became more relevant to the Brazilian Army from the last two decades of the last century due to two reasons: the geopolitical distension in the La Plata River Basin and the expansion of goods circulation and transnational offenses observed from that period. In this regard, it is necessary to emphasize the significance of Complementary Law 97 (1999), as amended by Complementary Law 117 (2004), which assigned the Army a police role at the land border strip in the fight against cross-border and environmental offenses.

This paper aims to discuss the challenges to the Brazilian Army at the border strip, marked by a complex context in which demands from the notions of *border* and *frontier* coexist. To this end, the paper is divided into five sections, in addition to this introduction and the final considerations. The first will seek to characterize the Amazon borders from two categories: *border* and *frontier*. From a more historical perspective, the second section will describe the border territorial policies adopted by Brazil. In the third, the nature of the threats will be discussed, dividing them into two categories: geopolitical and security threats. The fourth section will analyze the Brazilian military strategies for the Amazon. Finally, the sixth section will discuss the military challenges at Amazon borders: searching for sovereign development.

2 Amazon borders: military characteristics and implications

Amazon borders are a serious Brazilian challenge, requiring adoption of exceptional territorial policies. There are a number of factors that justify such policies, related to natural factors (climate and vegetation that make the region an environment of difficult access to land

transportation), low population density, in addition to logistical difficulties resulting from these factors, which depend almost exclusively on waterways and airways. It is a peripheral region, lacking the State presence. This situation has been aggravated by the presence of cross-border offenses between neighboring countries, and the highlight is the cocaine transportation by the rivers of the region coming from the two largest producing centers in the world (Colombia and Peru) to reach the international market via Atlantic Ocean.

2.1 Border or Frontier

The complexity of boundary spaces has imposed new approaches on boundary studies that, by adopting interdisciplinary perspectives, are able to overcome the limitations of traditional approaches that were often restricted to the meaning of limit, without the analytical ability to grasp the meaning of cross-border phenomena.

Analyzing the peculiarities surrounding the formation of borders in Latin America, Vargas (2017) offers an interesting distinction between two types of borders: border as the limit of the territory, and border as the place. The first refers to the most common sense and designates "the State's territorial limits" (VARGAS, 2017, p. 36, our translation). In the second, the "border, more than just separating, also has the power to unite neighboring peoples. Beyond its characterization as a territorial limit, it can be understood as a place, a common space [...]" (VARGAS, 2017, p. 44).

Vargas presents other border concepts, as proposed by the American historian Frederick Jackson Turner, who, in his book *The Significance of the Frontier in American History* (1893), by attributing the historical development of the United States to the existence of the so-called "free lands" to the west, suggested another connotation for the term border, which, unlike the political sense in European literature (limit that separates countries, populations or civilizations), in the United States came to designate "the dividing line between populated and free land, as well as the encounter between the civilized and the primitive" (VARGAS, 2017, p. 62, our translation).

It is in this sense that Medina García (2006, p. 14), when presenting theoretical contributions to the study of international boundaries, notes that the literature has addressed the theme in two ways: or as the limit of an exclusive territory over which a nation state exercises its sovereignty (*border*), or as a diffuse and transitional space between adjacent cultures or civilizations (*frontier*). The author draws attention to the fact that, generally, borders are both things at the same time.

Considering the peculiarities of defense and security in the Amazon, the suggestion proposed by Medina García (2006) is understood as very appropriate. To this end, and considering the use of the military, this study will seek to establish the conceptual distinction between two notions of border: *border* and *frontier*.

Border, the first and most recurrent, refers to the notion of limit. It corresponds to a range of contact – thus of tension, between contiguous territories – of notably political-legal character. At the level of National States, this notion corresponds to the point of separation/contact between territories over which these States exercise their sovereignty, and which is expressed by lines, whether natural or artificial. The wall that

forms the border between the US and Mexico, for example, constitutes the visible material dimension of this limit. The border thus establishes the line by which a given State's sovereign performance is defined, with a natural and strong military connotation.

The second concept, *frontier*, refers to the notion of periphery, to distant and unexplored regions. From the political point of view, it corresponds to the national territory's portions with little State presence, poorly developed, and not yet fully vivified or controlled by the central power. In this case, the main military concern refers to guaranteeing the exercise of the State's sovereignty and, consequently, of the legitimate violence monopoly in remote territories.

The distinction between the notions of *border* (limit border) and *frontier* (periphery border) is important according as diverse military concerns arise from them. While the former suggests classic-type threats (geopolitical issues), the latter refers to insurgent threats, whose roots often lie on the State's own vulnerabilities (security issues). However, they are at the root of meaning both of the National State and of the armed forces as its military instrument.

The two notions presented here coexist at Amazon borders. In this case, beyond the meaning of boundaries that divide independent National States (*border*), these spaces constitute periphery territories (*frontier*) lacking territorial control and, therefore, effective sovereignty. Such a perspective should consider the fact that, although interstate conflict has not been eliminated in Staffs' calculations, the most imminent threats in these countries do not originate from military conflicts, but rather from the inability of States to exercise full control of their territories and adopt efficient public policies to address social vulnerabilities.

3 Border territorial policies and military challenges

This section will discuss the strategies of territorial control historically adopted by the country, seeking to understand how the notions discussed in the previous section have impacted the use of the armed forces in boundary regions.

Brazil has continental dimensions, inherited from the Portuguese colonial administration that, unlike the Spanish model adopted in its surroundings, controlled the country's territorial portions well, even those distant from its trade centers. Wanderley Messias da Costa points out that "while the Castilians, who since the beginning were involved with mining in the Andean Highlands and Mexico and concentrated the bulk of their occupation in those regions, the Portuguese, who began mining inland two centuries later, extended their domains (mainly with agriculture and livestock)" (COSTA, 2002, p. 30, our translation). According to Meira Mattos, Portugal has always been concerned about establishing a geopolitical strategy to ensure its territorial domain (MATTOS, 2011a). Examples of this modus operandi are the various forts installed upstream of the great river basins at the ends of the national territory. Such fortifications testify the ruling elites' old concern about country territorial control.

In this sense, the occupation of the Amazon is an example of applying the geopolitical foundation of territorial control. According to Bertha Becker,

> Due to territorial control strategies, Portugal managed to maintain the Amazon and expand it beyond the limits of the Treaty of Tordesillas. Although economic interests prevailed, they were unsuccessful, and geopolitics was more important than economics in securing sovereignty over the Amazon [...] (BECKER, 2005, p. 71, our translation).

In the mid-nineteenth century, already as the Brazilian Empire, the country started adopting the concept of military colonies, which represented an evolution of the old concept of military surveillance and protection through the construction of forts and sconces. Meira Mattos (2011b, p. 108, our translation) recalls that "the empire, in 1840, by creating the military colonies, intended to extend them as a process of settling population at certain points of the uninhabited land border; the fort was no longer needed, but the barracks would replace it, providing a social support spot for the surrounding population." Rodrigues and Silva (2017) note that in the 1850s alone, twenty-one military colonies were created in Brazil, distributed from Rio Grande do Sul to the province of Pará (RODRIGUES; SILVA, 2017, p. 67). By this model, the aim was to vivify the border strip[1] through settlement, providing settlers with various incentives, including donation of land to those interested in occupying that region. With this territorial strategy, the empire sought to "occupy its farthest frontier by blending the defense weapon and the hoe of the man's economic attachment to the land" (MATTOS, 2011b, p. 112-113, our translation).

For Rodrigues and Silva (2017, p. 68), the installation of these military colonies in Brazil's limits with foreign countries signals a strategy of border occupation that aimed to prevent "the undesirable advance of our neighbors over Brazilian territory." Under such a strategy, military presence alone would not be sufficient to protect Brazil's extensive borders. It was necessary "an effective colonization, in which the settlers would populate, produce and defend national borders" (RODRIGUES; SILVA, 2017, p. 68, our translation). In this sense, the establishment of military colonies can be understood in the context of promoting territorial occupation as a State purpose, as an "instrument to create conditions of productivity, in a hostile and isolated environment, a movement of settlement, security and territorial defense, which required the settlers to overcome the difficulties imposed by the space" (RODRIGUES; SILVA, 2017, p. 73, our translation).

It is noteworthy that such border strategies were part of a much broader Empire policy of maintaining its own territorial unit, in which the provinces functioned as territorial circumscriptions of the general unit. Considering the contrast with the disruptive process that fragmented Hispanic America throughout the nineteenth century, Magnoli (2003, p. 8) notes that, in Brazil, imperial power emerges as a response to the threat of republican disintegration, and as an instrument of political and territorial unity. According to Magnoli (2003, p. 9, our translation), the imperial state's border policy had as its platform the idea of an "imaginary territory" for Brazil, whose historical basis "was the border treaties signed

1 "The first time that Brazilian law recognized the legal status of the border strip was through Law No. 601 of September 18, 1850, in which Emperor Pedro II established a 10-league zone (66 km) within the empire's borders with neighboring countries, where military colonies would be established" (MATTOS, 2011b, p. 81-82, our translation).

between the Iberian crowns in the second half of the eighteenth century and, especially, the field reconnaissance and cartography works performed by the boundary commissions."

In the republican period, the Brazilian State's effort to demarcate the country's land borders deserves mention. Created in 1927, and headed by Marshal Cândido Mariano da Silva Rondon, the Border Inspection Commission had the task of carrying out, until the end of President Washington Luiz's government, a thorough inspection of the country's borders in order to study the conditions of their settlement and security (RODRIGUES, 2017, p. 130). The idea of bringing the State presence to the most peripheral corners of the country was at the heart of this mission. The following image represents this idea. It shows the flag hoisting ceremony by Marshal Rondon at the National Pavilion at the border strip during the border inspection campaign.

Figure 1 – Hoisting ceremony at Frontier National Pavilion[2]

Source: Arquivo Histórico do Exército (1929).

Analyzing the photographs produced by the Border Inspection Commission, Rodrigues (2017, p. 131-132) notes that the political thinking of that historical moment

2 The photograph was taken at the headquarters of Fazenda São Marcos (Campo Alegre indigenous community), located in the current municipality of Boa Vista (RR), on the banks of the Uraricoera River, near the confluence with the Tacutu River. It is the Flag Day celebration. Marshall Rondon stands out, performing the hoisting at the Brazilian pavilion. On the left, there were trained staff officers, and on the right, the rest of the troop armed with rifle, saluting the Flag. In the background, several natives watched the ceremony, whose purpose was to insert in the native population the national culture through the recognition of one of the nation's symbols, so that the celebration would remain in people's memory, contributing to the establishment of the State domination in the region. Celebration and symbol were united for the maintenance of territorial sovereignty (Description kindly performed by Prof. Fernando da Silva Rodrigues).

had in the Army its main instrument for maintaining established order and expanding progress, conditions understood as essential for establishing sovereignty in border areas.

It is necessary to emphasize that all these State's actions, either through the creation of Military Colonies, or by the appointment of inspection commissions, had remarkably geopolitical character of establishing the territorial domain in remote areas. So far, concerns referred essentially to external threats. This idea can be observed, for example, in the purposes described in Decree No. 45,479 of February 26, 1959, which approved the Regulation of the Border Military Colonies in the Amazon:

> Art. 2 The purposes of the Border Military Colonies are mainly:
> a) **to nationalize the country's borders**, particularly those not marked by natural obstacles;
> (b) to establish and set up nuclei of the national population at border areas, **located in front of the prosperous zones or localities of the neighboring country**, as well as in those where there are communication routes or facilities (navigable rivers, roads or fields) which give free access to the national territory;
> c) to promote the development of the population at border zones or localities where there is mining, pastoral or agricultural industry **controlled by foreigners from neighboring countries** (BRASIL, 1959, emphasis added).

In this context, the concern about threats was notably state-based, and the neighbor was an almost exclusive reference. It was a matter of maintaining the territory in the face of potential external interests. Art. 3 of the aforementioned document corroborates this idea by stating that one of the attributions of the Border Military Colonies would be to "ensure the presence of the Brazilian pavilion at extreme points of our Amazonian space, unequivocally stating land tenure and our sovereignty in those regions" (BRASIL, 1959, our translation). As clearly stated, the main function of these military colonies would be to populate (vivify) the borders, expecting that they would become settlements, as provided for in Article 88 of that document: "Border Military Colonies that reach development up to a civil community status will be emancipated" (BRASIL, 1959, our translation). The fact is that many military colonies became embryos of settlement, becoming villages and then cities (FRANCHI, 2013, p. 126). The policy of creating new military colonies remained in the Republic and lasted until 1967, the year in which the *Tabatinga* Military Colony was recreated (FRANCHI, 2013, p. 135).

In the following section, the military strategies adopted by the Brazilian Army for the Amazonian border strip will be analyzed. First, however, it is necessary to briefly discuss the main threats in that region.

4 The nature of threats and military concerns

For analysis purposes, military concerns will be divided into geopolitical and security dimensions. The first is related to Westphalian sovereignty and the primary function of any armed force: to guarantee National State's territorial integrity. In the

specific case of the Amazon, it refers to the control and sovereign management of its natural resources in the face of the great powers' potential greed. The second dimension relates to domestic sovereignty and the threat of emergence, in that space, of "gray zones" where the State would have difficulty effectively enforcing the legitimate violence monopoly, opening room for the proliferation of offenses of all kinds and, which is more serious, for the emergence of parallel powers in the social fabric. Next, the military challenges at border areas in the face of each of these dimensions will be analyzed.

4.1 Geopolitical dimension of military threats and challenges

Notwithstanding the urgency of security concerns in the region, as it will be seen later, the geopolitical dimension of the threats in the Amazon is the armed forces' main cause of existence: to maintain the States' independence and territorial integrity. In this sense, the notion of *border* as discussed in the previous section cannot be disregarded. These are a set of military concerns that refer to the classical perspective of international relations in which National States fight for resources to maximize their gains, what have historically led to wars.

In the specific case of the Amazon, however, two peculiarities should be highlighted. The first, which potentizes this type of concern, refers to the abundance of natural resources present in the region (water, diversity of flora and fauna, rare minerals, etc.), giving its territory a strategic character. The second peculiarity, for geographical (immensity) and historical reasons (these are former colonies, whose borders have been drawn in a friendly manner), relates to the fact that neighbors do not perceive themselves as mutual threat.

Consistent with the historically adopted territorial modus operandi, there is a much greater concern among the Brazilian military about international greed for the Amazon. The Brazilian military has been much more careful about maintaining independent sovereignty in the region. The recent denunciation by the Brazilian military[3] of the project to create an international ecological corridor in the region, connecting the ecosystems of the Andes, the Amazon and the Atlantic Ocean, known as the "Triple Corridor A" and which has the Colombian Government's support, illustrates well this case.

In August 2019, two events contributed to raising this debate to an issue of existential risk to Brazil. The first was the publication of Stephen Walt's article "Who Will Invade Brazil to Save the Amazon?"[4] on Foreign Policy magazine. On the occasion, Walt presents a theoretical essay on the relevance of international intervention to prevent environmental disasters, using the Brazilian Amazon as a case study. The central discussion addresses the States' ability to remain independent in the face of international

3 On September 19, 2018, then Brazilian Army Commander General Villas Boas posted to his Twitter account: "My mission as an Army Commander, concerned about national interests, is to indicate the risks of this proposal to the country. We need to discuss it deeply with society. Our society!" (VILLAS BOAS, 2018, our translation).

4 The article was published in August 5. The next day, the magazine changed the title to "Who will save the Amazon (and how)?"

environmental pressure. The author's conclusion is worrying: lacking credible deterrence, Brazil would be vulnerable to such pressures (WALT, 2019).

The second event refers to the inclusion of the theme "burning in the Amazon" at the G7 meeting, held from August 24 to 26, 2019, in the city of Biarritz, France. At the time, the President of France, Emmanuel Macron, even suggested the possibility of assigning the Amazon an *international status* if any sovereign State made decisions that opposed the interest of the entire planet.

The risk of internationalization of the Amazon has been the "flagship" of external threats for decades. Sharing management is not allowed except with the "joint owners," as proposed in the early 1980s by General Meira Mattos in "A Pan-Amazonian Geopolitics." The pan-Amazonian perspective underpins the creation of the Amazon Cooperation Treaty (ACT)[5] in 1978, uniting Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela around a common agenda for the region. This was the vision of Brazilian foreign policy, for which the creation of a regional instrument, such as the ACT, was the best antidote to curb the "internationalization maneuver," as it reserved to the Amazonian states exclusive responsibility for the fate of the region (RICUPERO, 1984, p. 186). Faced with these threats, the solution found would be cooperation between the countries of the region.

4.2 Security dimension of military threats and challenges

The security dimension in the Amazon refers to the notion of *frontier*, and it is related to the challenge of maintaining domestic sovereignty over the vast Amazon territory. It concerns the risk of territorial fragmentation, a reality historically more present in the region since the 1980s, with the aggravation of internal conflicts in Colombia. In that country, the increase in violence from different armed groups (guerrilla tactics, self-defense, drug dealers, etc.), combined with State fragility and a high degree of social corruption, led to the loss of control of territorial portions, leading to what Martín Moreno (2017), pp. 98-9) calls a kind of tacit renunciation of the Colombian state's exercise of arms monopoly in some territories of national geography.

In this context, the most urgent threats do not refer to border issues (geopolitical), but to issues at the borders (criminal). These concerns come less specifically from military threats and more from problems arising from the very fragility of the law and the high degree of social violence in the region. Such vulnerabilities have, notably, originated from the lack of State presence and/or functional (providing basic services to the population) and territorial degradation of their public function (exercising the law), combined with the very common cross-border criminality in that place. The notion of "brown areas" seems to apply very well to the border reality in the Amazon. Studying the border between Colombia and Brazil, Trejos Rosero (2015, p. 40) defines "brown areas" as spaces in which non-state actors, linked to local and international

5 In 1998, the Amazon Cooperation Treaty Organization (ACTO) was created, giving international organization legal personality to the ACT. ACTO currently has an agenda focused on the development and protection of the Amazon region, whose main means are to build rapprochement between national actors, development agencies, social movements, scientific communities, productive sectors and the societies of these countries. Although it is divided into three dimensions of action – political-diplomatic; strategic; and technical –, the organization has not having a line of action in the security area in the agenda of the last decades (ORGANIZACIÓN DEL TREATO DE AMAZÓNICA COOPERACIÓN, 2017).

illegal practices and networks, accumulate so many resources and so much influence that they supplant the fragile State institutions. According to him, these "brown areas" end up as "armed territorialities," understood as spaces in which institutional power is not sovereign and where social sectors openly express the desire not to submit to State order, resisting its control, leaving latent the possibility of facing it with weapons (TREJOS ROSERO, 2015, p. 44).

Recognizing the presence of "brown areas" in the national territory means to admit the fact that the State does not always have the logistical conditions, resources or sufficient competence to exercise monopoly of the legitimate use of violence (RUEDA, 2017, p. 48); and that, in more serious cases, the State absence has provided conditions for the appearance and consolidation of parallel powers, which, based on the use of violence, eventually establish their own social and economic orders (TREJOS ROSERO; LUQUETTA CEDIEL, 2014, p. 34).

Under these conditions, the geopolitical concept of exclusive territory is questioned, according to which the National State would exercise full sovereignty, and it is evidenced a deep tension marked by the State's challenge to maintain its precepts of sovereignty and legitimate violence monopoly; faced with territorial fragmentation dynamics in which diverse actors – in many cases supported by resources of illicit activities – establish parallel ways of territorial power and control (RUEDA, 2017, p. 50-51).

From the military perspective, the possibility of the emergence of parallel powers, constituting "armed territorialities," constitutes one of the greatest threats to State sovereignty. It is noteworthy that the idea of sovereignty here should refer less to its Westphalian sense, related to the States' autonomy capacity to make decisions without interference from third parties, and more to the idea of domestic sovereignty, which refers to the exercise of State's authority within its own territory, including effective border control (KRASNER, 1999).

The corollary resulting from this equation seems to challenge the realistic logic of John Herz's "Security Dilemma," suggesting its reversal: the threat would be the weak neighbor, unable to control its own territory, not the strong neighbor (VILLA; MEDEIROS FILHO, 2007, p. 8). That is, in this case, the threats would originate not from power policies adopted by States, but from their inability to adopt public policies to address their social vulnerabilities.

Regardless of the origin, motivations and trajectory of these armed groups (insurgents or criminals), the most damaging fact for the State is that they eventually acquire a political role in society by regulating the social order of peripheral and marginalized communities (RAMIREZ; DUNCAN, 2014, pp. 164). In practice, the political capacity of these groups is based on their imposition as *de facto* authority in state-side territories (RAMIREZ; DUNCAN, 2014, p. 189). In this context, the notions of sovereignty and "territorial integrity" are re-signified as, unlike the classical inter-state geopolitical perspective, the contenders no longer necessarily want to "appropriate" these territories but to maintain socioeconomic control of these areas.

5 Brazilian military strategy for the Amazon

Despite the historical concern about the defense of the Amazon, this region became a priority for the Brazilian military only from the last two decades of the twentieth

century. Until then, attention was focused on the southern arc of the Brazilian border, in a genuinely geopolitical dimension, where, in that context, Argentina was a potential threat.

From the point of view of regional geopolitics, it is noteworthy that, despite the intrastate challenges (consolidation of integration and national cohesion), throughout most of the twentieth century the vital challenge for Brazil was the "neutralization" of its main rival: Argentina. Writing in the early 1930s, Mario Travassos, a pioneer of geopolitics among the Brazilian military, was troubled by the advance of Argentine transport communications over a considerable part of South American territory. Given this scenario, Travassos proposed the projection of Brazil towards the west of the subcontinent, seeking mainly to control Bolivia's Andean highlands, considered by him the South American heartland, represented by the triangle Cochabamba (Andine), Sucre (Platine) and Santa Cruz (Amazonian) (TRAVASSOS, 1938, p. 142).

With regard to extra-regional threats, Travassos was concerned about the "Yankee" influence, as he referred to the US, especially given the vulnerabilities in the northwest corner of the subcontinent (Venezuela, Colombia and Ecuador). For him, "The geographical instability of the northwest corner of the continent, however, precisely because it is at one end of the continental mass, is easy prey for extra-continental influences" (TRAVASSOS, 1938, p. 52, our translation). In his view, "The Panama Canal and the Antilles Sea – the incubator of the Yankee influence – expresses well the character of the pressures they exert on this end of the continent" (TRAVASSOS, 1938, p. 52, our translation).

Using the division of the Border Strip into three major Arcs (North, Central and South), proposed by the Ministry of National Integration (Figure 2), it is possible to say that until the 1980s the strategic border priority in Brazil corresponded to the Southern Arc, especially due to geopolitical disputes with Argentina. From that decade, the Amazon gradually gained relevance.

Figure 2 – Border strip arcs

Source: Adapted from Brasil (2005b, p. 53).

In this context, Paulo Kuhlmann (2007) notes that in the mid-1980s, under the administration of the Army Minister General Leônidas Pires Gonçalves (1985-1990), the Army underwent a major restructuring process, which included the creation of the Army Strategic Planning System (*Sistema de Planejamento Estratégico do Exército* – SIPLEx), in 1985; a new military operations management body, the Ground Operations Command (*Comando de Operações Terrestres* – COTER) in 1990; in addition, the ground force started being reorganized, which would lead, throughout the 1990s, to the change of brigades from south central region to the Amazon, such as the transfer, in 1993, of the 16th Motorized Infantry Brigade from Santo Ângelo- RS to Tefé-AM (currently 16th Jungle Infantry Brigade) and, in 1998, of the 2nd Motorized Infantry Brigade, from Niterói-RJ to São Gabriel da Cachoeira-AM (current 2nd Jungle Infantry Brigade). Kuhlmann describes the process of shifting attention from south to north as follows:

> If the idea of sovereignty is that of State presence, border vivification and provision of basic services, it has been established in the Amazon region, together with the *Calha Norte* Project, which began as a government project in the 1980s. In this region, the missions cover the fullest possible range for the military forces: nation building, through the vivification of borders, with the idea of colonization and nationalization of the indigenous people, police-type actions to contain offenses of all kinds (smuggling, drug dealing, among others), border policing, conventional combat against a similar enemy, and irregular combat (resistance strategy) against a far superior enemy. Since the 1990s this region has definitively assumed the status of priority strategic area for foreign defense (KUHLMANN, 2007, p. 159-158, our translation).

The reasons why the Amazon region became a strategic priority, therefore, came from two main issues – each related to a notion of *border* (*border*; *frontier*), described in the previous section. With regard to the notion of *border*, concerns were related to the increasing international pressure on the Amazonian countries – covered by an ecological (environmental) narrative, but perceived by the military as a form of greed for the natural resources of that region.

Regarding the notion of *frontier*, the concern arose from the presence of armed groups near the border, especially with Colombia, and the possibility of their coming to Brazil. For the Brazilian military, concern about the security dimension at border areas is relatively recent. One of the inflection points in the change of military perception of the threat complexion in the region was the 1991 attack to the Brazilian Army Detachment on the Traíra River, allegedly performed by Colombian guerrillas. This concern became even more relevant from signs of guerrilla groups approaching drug dealers.

In this context, the first major strategy was the *Calha Norte* Project (*Projeto Calha Norte* – PCN), launched in 1985, which, divided into a civilian and a military dimension, aimed at enhancing bilateral relations, intensifying the military presence, improving the definition of landmarks and road and energy infrastructures, besides offering more basic

social resources in the area (DINIZ, 1994, p. 5). This initiative led to an increased military presence in the Amazon. The transfer of military units from south-central Brazil to this region demonstrates this strategic change.

More recently, the importance of this region has been made explicit in the National Defense Policy as follows:

> The Brazilian Amazon, with its great potential for mineral wealth and biodiversity, **is the focus of international attention.** Ensuring the State presence and the vivification of the border strip are hindered by the low population density and long distances associated with the precariousness of the land transportation system, which conditions the use of waterways and air transportation as the main access alternatives. These characteristics facilitate the practice of **transnational offenses and related crimes**, as well as the presence of groups with objectives contrary to national interests (BRASIL, 2005a, p. 4, emphasis added, our translation).

It is interesting to note that in the above excerpt, the two notions of border are present: *border* and *frontier*. In this context, the National Defense Strategy (NDE) suggests the use of the presence strategy[6] through the "increase of the participation of governmental, military and civilian bodies, in the plan of vivification and development of the Amazonian border strip, by using the presence strategy" (BRASIL, 2008, p. 4, our translation 9). In the specific case of the Amazon, "the presence strategy implies, besides becoming present (mobility), being present (vivification), with the involvement of governmental bodies, both civil and military" (BRASIL, 2015, p. 4, our translation).

In the next section, the presence strategy will be addressed to discuss the idea of a "sovereign developing country" and how it impacts the strategic culture of the Brazilian military.

6 Military challenges at Amazon borders: searching for sovereign development

According to Mohamed Ayoob (1995), in addition to specific defense issues, developing countries include in their security agenda a set of challenges related to their state-building process. Ayoob (1995, p. 9) states that, unlike the classic model of international security, security/insecurity issues in developing countries are defined in relation to vulnerabilities that threaten or have the potential to threaten the very State structures. Thus, the ruling elites' main concerns refer to issues related to State structures and the government's regime, involving challenges related to the legitimacy of institutions and regimes, and the lack of social cohesion (AYOOB, 1995, p. 28).

6 The presence strategy has been contemplated in the different defense documents. According to the 2007 Military Defense Doctrine, this strategy "is characterized by the military presence in the national territory and its extensions, in order to fulfill the constitutional destination and subsidiary attributions. It is enabled not only by the careful articulation of the military organizations in the territory, but also by the ability to move quickly to any region of the country, when necessary" (BRASIL, 2007, p. 36, our translation). It "supposes both the physical presence and the ability to be present in any part of the national territory by the rapid deployment of troops, characterizing the so-called strategic mobility" (BRASIL, 2015, p. 4, our translation).

State weaknesses[7] observed in countries in the region would be related to the serious challenges they face to enforce the law in portions of their own territories, and they would stem from the slow historical process of development, marked by the socioeconomic and institutional shortcomings typical of States in formation process. These are therefore challenges related to National State building processes.[8]

Faced with such challenges to national armies, the military is imbued with the "republican" mission of contributing to national development that involves the consolidation of State's internal sovereignty and territorial integrity. It is an ideational element organic to its institutional culture, shared by the military of both countries, and based on the feeling of incompleteness of the National State – still in the process of consolidation.

Army's *Manual de Campanha: Estratégia* (Campaign Manual: Strategy) defines the "presence strategy" as "military presence throughout the national territory, in order to guarantee the constituted powers, law and order, ensure national sovereignty and integration, and contribute effectively to the national development" (BRASIL, 2001, p. 3-8, our translation). The expression "national development" in the Army document reveals, once again, an ideational element that is organic to its institutional culture and expressed through a kind of "republican mission" arising from the processes of National State building.

The Army's own Staff recognizes presence strategy as a kind of "geopolitical task," suggesting that:

> Regarding the national territory, the Presence Strategy should be maintained, as it is a fundamental vector of support for the Brazilian State in the historical task of occupying, integrating, protecting and developing the Brazilian territory. We are aware that the Army, in addition to being often the only state presence in remote areas, is an important support tool for other sectors of society. Moreover, the Presence enables identification with local populations, influencing national will and helping constitute the national relevance sentiment of the Brazilian State [...] (BRASIL, 2010, p. 26, our translation).

7 The discussion of the subject inevitably leads to the idea of "failed states," which is very much in vogue in post-Cold War international literature, and which refers to States that are not able to perform key functions such as the provision of basic services, linked to security, a monopoly of the legitimate use of force, border control and maintenance of the rule of law (BLANCO, 2014, p. 293-294). Such a view has been applied to countries that face or have faced strong civil wars capable of shaking state structures. In this sense, applying the concept of "failed state" to the case studied here is not appropriate.

8 Here it is necessary a brief justification for the use of the expression. It has been common in the literature to use separately the expressions 'State Building' and 'Nation Building,' with distinct connotations. In addition, these expressions have been commonly used in post-conflict context. According to Blanco (2014, p. 301-303), while the idea of State Building refers to (re) construction/ strengthening of State institutions, the idea of Nation Building refers to (re) creation or (re) construction processes of a cultural or political identity. These expressions have been used in the center-periphery sense to refer to countries that have undergone relatively recent processes of decolonization or serious conflict and that have compromised the ability of the state to perform its functions autonomously, suggesting external intervention and, consequently, the idea of State reconstruction. It is considered that, with such a connotation, these concepts do not apply to the case studied here.

6.1 Presence strategy and National State building

The presence strategy is directly related to the need for territorial control related to National State building processes. The use of the military in development and security-related activities reveals how much the frontier notion impacts the defense policies of countries in the region. In this context, armies are seen not only as an instrument of the State in remote areas, but as the State itself, often permanently responsible for conducting regional development public policies (health, education, engineering works, etc.), and, in many cases, for public safety.

Being present is not the only challenge, but also being an element of consolidation of a National State still in formation. In this regard, the words of the head of the Joint Chief of Staff of the Colombian Military Forces, General Juan Carlos Salazer, published in the prologue to the book *El control territorial en el siglo XXI*: *fundamentos teóricos* (MARTÍN MORENO, 2017), illustrate this challenge well:

> [...] The Colombian State is a historical instance in the process of consolidation, and also the Colombian territory, because, given its characteristics, it is not yet fully contained by the benefactor presence of State institutions. Great challenge to the first decades of the 21st century, where, for this reason, the role of the Military Forces is of considerable importance, since their presence and performance are an essential element for both Territorial Control and institutional presence. (SALAZER, 2017 apud MARTÍN MORENO, 2017, p. 13, our translation)

Also in this regard, it is worth mentioning the words of General Eduardo Dias da Costa Villas Bôas, Commander of the Brazilian Army, during the Public Hearing held by the Committee on Foreign Relations and National Defense of the Chamber of Deputies on 07/05/2017. According to him,

> [...] while we have to be an Army with those characteristics I referred to, a modern Army with external projection capabilities, we have to remain a colonizing Army. This is reality! (VILLAS BOAS, 2017, n.p., our translation)

Once again, in the statements above, the feeling of incompleteness of State effectiveness – mentioned earlier – and the military central concern about the presence and territorial control are made evident. Such a sentiment is a military culture striking feature of the countries of the region.

6.2 Neighborhood and cross-border cooperation

Shared concerns about the presence of illegal armed groups near the border between countries in the region ultimately contribute to stimulating, among the military

of the region, the shared perception that territorial control at the *frontier* would be threatened by "common enemies."

In this process, the contacts between the military of both armies and the mutual perception adopted gain relevance. Contrary to what the classic literature of International Relations suggests, in the *frontier* studied here, the military tends to see in their counterpart not a threat (although, speaking of sovereign States, the stock of distrust will always be a reality), but rather a security factor, as they adopt the perception that neighbors share similar (transnational offenses) issues.

Indeed, the channels of dialogue established between the military of the region are fundamental to building a sense of neighborhood,[9] and they are made real through the numerous initiatives of agreements signed at bilateral conferences, exchange of military personnel, and operations performed in that region.

In such a context, it seems feasible to expand military cooperation between countries, especially in relation to territorial control elements from a frontier perspective. In this sense, the expansion of the Integrated Border Monitoring System (*Sistema Integrado de Monitoramento de Fronteiras* – SISFRON) can be an excellent opportunity for cross-border cooperation. However, it may be more difficult to establish cooperative outcomes with respect to geopolitical threats, since it involves the participation of extra-regional powers.

7 Final considerations

This study aimed to analyze the military challenges at the border strip, with emphasis on the Amazon. To this end, the threats present in the region were divided into two categories: geopolitical and security threats. In the end, it is observed that the coexistence of these two types of threats makes the analysis of security and defense complex in the sense that both threaten national sovereignty, although one – *geopolitical* – endangers external sovereignty; while the other – security – endangers domestic sovereignty.

The military presence in this border space has special significance, going far beyond classical geopolitical concerns. In this sense, it is not just a State's spearhead in remote areas, but it assumes, often permanently – and this becomes more evident in the Brazilian case – State responsibilities, such as the management of regional development in different areas: health, education, engineering works, etc. In the midst of a historic process of National State building, the armed forces of the region still maintain missions beyond what is generally understood as the scope of defense.

Therefore, it is concluded that a trace of the strategic culture is expressed in the perception of these countries' military that the most urgent threats in that area are related to the notion of *frontier*. They refer to the risk of territorial fragmentation and the emergence of parallel powers that threaten domestic sovereignty. Thus, one notices that the notion of *frontier* supplants that of *border*.

9 According to Galvão (2017, p. 120-121, our translation), "the neighborhood manifests itself in the continuity of the political-diplomatic consolidation through the conclusion of agreements; conducting official visits; in the attribution of mutual relevance; identifying opportunities and possibilities for local partnerships."

The mutual perception of sharing common threats contributes to generating among the military, on both sides of the border, an identity element based on the feeling of neighborhood. Under this perception, the neighboring country's military presence is not seen as a threat – which would suggest a realistic analysis of International Relations, but as a security factor.

On the other hand, one cannot neglect the meaning of the notion of *border* for these same military. One of the traits of Brazilian strategic culture reveals how much the Brazilian military cares about the idea of strategic autonomy in relation to the Amazon, incisively rejecting any proposal for sharing international management of that region that goes beyond the presence of the "joint owners."

Finally, it is possible to expand military cooperation between the Amazonian countries, especially in relation to territorial control elements from a *frontier* perspective. However, it may be more difficult to establish cooperative outcomes with regard to the *border* dimension, simply because it involves the participation of extra-regional powers.

References

ARQUIVO HISTÓRICO DO EXÉRCITO (Brasil). **Campanhas de 1928/1929 (3ª Parte)**. Panoramas fotográficos do Topo do Pico Ricardo Franco, para documentar a conformação do Arco formado pela Serra Tumucumaque, na Cabeceira do Rio Parú do Cuminá: índios, Tiriôs, Rangús e Uianas; e Marco de identificação e tomada de posse da fronteira no Estado do Pará e Guiana Holandesa, no Divisor Mani-Pacheu. Rio de Janeiro, [1929?]. Álbum (34 fotografias em preto e branco).

AYOOB, M. **The third world security predicament**: State-making, regional conflict, and the international system. London: Lynne Rienner, 1995.

BECKER, B. K. Geopolítica da Amazônia. **Estudos Avançados**, São Paulo, v. 19, n. 53, p. 71-86, 2005.

BLANCO, R. Del mantenimiento de la paz al proceso de formación del Estado: un esbozo de los esfuerzos de la ONU para la paz internacional. **Foro Internacional**, México, DF, v. 54, n. 2, p. 266-318, 2014.

BRASIL. Presidência da República. **Decreto nº 45.479, de 26 de fevereiro de 1959**. Aprova o Regulamento das Colônias militares de Fronteiras da Amazônia. Brasília, DF: Presidência da República, 5 mar. 1959. Disponível em: https://bit.ly/2rjxz7p. Acesso em: 9 out. 2018.

BRASIL. Exército. **Manual de Campanha**: estratégia. Brasília, DF: Estado-Maior do Exército, 2001. C 124-1.

BRASIL. Presidência da República. **Decreto nº 5.484, de 30 de junho de 2005**. Aprova a Política de Defesa Nacional, e dá outras providências. Brasília, DF: Presidência da República, 1 jul. 2005a. Disponível em: https://bit.ly/37DiMFh. Acesso em: 25 nov. 2019.

BRASIL. Ministério da Integração Nacional. **Proposta de reestruturação do Programa de Desenvolvimento da Faixa de Fronteira**. Brasília, DF: Secretaria de Programas Regionais, 2005b.

BRASIL. Exército. **Doutrina Militar de Defesa**. 2. ed. Brasília, DF: Estado-Maior do Exército, 2007. MD51-M-04.

BRASIL. Presidência da República. **Decreto nº 6.703, de 18 de dezembro de 2008**. Aprova a Estratégia Nacional de Defesa, e dá outras providências. Brasília, DF: Presidência da República, 19 dez. 2008. Disponível em: https://bit.ly/35BQRE9. Acesso em: 25 nov. 2019.

BRASIL. Exército. **O processo de transformação do Exército**. 2. ed. Brasília, DF: Estado-Maior do Exército, 2010.

BRASIL. Exército. **Estratégia da presença**: antigos conceitos, novas ideias. Brasília, DF: Centro de Estudos Estratégicos do Exército, 2015.

COSTA, W. M. **O Estado e as políticas territoriais no Brasil**. São Paulo: Contexto: Edusp, 2002.

DINIZ, E. **O Projeto Calha Norte**: antecedentes políticos. 1994. Dissertação (Mestrado em Ciência Política) – Universidade de São Paulo, São Paulo, 1994.

FRANCHI, T. **Da conquista do inferno verde à proteção do paraíso tropical**: o discurso militar brasileiro sobre a Amazônia no século XX. 2013. Tese (Doutorado em Desenvolvimento Sustentável) – Universidade de Brasília, Brasília, DF, 2013.

GALVÃO, T. G. Por uma vizinhança amazônica de segurança e defesa. *In*: OLIVEIRA, M. A. G.; PAGLIARI, G. C. (org.). **Pensando defesa e integração nas fronteiras**. Recife: Editora da UFPE, 2017. p. 97-126.

KRASNER, S. D. **Sovereignty**: organized hypocrisy. Princeton: Princeton University Press, 1999.

KUHLMANN, P. R. L. **Exército Brasileiro**: estrutura militar e ordenamento político (1985-2007). 2007. Tese (Doutorado em Ciência Política) – Universidade de São Paulo, São Paulo, 2007.

MAGNOLI, D. O Estado em busca do seu território. **Terra Brasilis**, Niterói, n. 4-5, p. 1-10, 2003.

MARQUES, A. A. **Amazônia**: pensamento e presença militar. 2007. Tese (Doutorado em Ciência Política) – Universidade de São Paulo, São Paulo, 2007.

MARTÍN MORENO, L. A. (ed.). **El control territorial en el siglo XXI**: fundamentos teóricos. Bogotá: Departamento Ejército, 2017.

MATTOS, C. M. Uma Geopolítica Pan-Amazônica. *In*: MATTOS, C. M. **Geopolítica**. Rio de Janeiro: Ed. FGV: Biblioteca do Exército, 2011a. v. 2, p. 13-207.

MATTOS, C. M. Geopolítica e Teoria de Fronteiras. *In*: MATTOS, C. M. **Geopolítica**. Rio de Janeiro: Ed. FGV: Biblioteca do Exército, 2011b. v. 3, p. 13-101.

MEDINA GARCÍA, E. M. Aportaciones para una epistemología de los estudios sobre fronteras internacionales. **Estudios Fronterizos**, Mexicali, v. 7, n. 13, p. 9-27, 2006.

ORGANIZACIÓN DEL TRATADO DE COOPERACIÓN AMAZÓNICA. Temas. **OTCA**, Brasília, DF, 19 jun. 2017. Disponível em: https://bit.ly/2s715xN. Acesso em: 8 maio 2018.

RAMIREZ, J. G.; DUNCAN, G. Criminales y rebeldes: las hibridaciones del crimen organizado en el caso colombiano. *In*: MÍGUEZ, D.; MISSE, M.; ISLA, A. (comp.). **Estado y crimen organizado en América Latina**. Buenos Aires: Libros de la Araucaria, 2014. p. 163-192.

RICUPERO, R. O tratado de cooperação amazônica. **Revista de Informação Legislativa**, Brasília, DF, v. 21, n. 81, p. 177-196, 1984.

RODRIGUES, F. S. Marechal Rondon e a trajetória de um militar sertanista na Primeira República Brasileira: investigação sobre a intervenção do Estado e o processo civilizador da população indígena. **Estudos Ibero-Americanos**, Porto Alegre, v. 43, n. 1, p. 122-134, 2017.

RODRIGUES, F. S.; SILVA, É. S. Estudos sobre colonização e imigração no norte do Brasil (1840-1930). **Revista de História Regional**, Ponta Grossa, v. 22, n. 1, p. 53-73, 2017. Disponível em: https://bit.ly/2KDhb8P. Acesso em: 20 nov. 2019.

RUEDA, L. A. A. Evolución de las teorías sobre Control Territorial en el mundo y en Colombia: un estado del arte. *In*: MARTÍN MORENO, L. A. (ed.). **El control territorial en el siglo XXI**: fundamentos teóricos. Bogotá: Departamento Ejército, 2017. p. 23-68.

TRAVASSOS, M. **Projeção continental do Brasil**. 3. ed. Rio de Janeiro: Companhia Editora Nacional, 1938.

TREJOS ROSERO, L. F. T. El lado colombiano de la frontera colombo-brasilera: una aproximación desde la categoría de área sin ley. **Estudios Fronterizos**, Mexicali, v. 16, n. 31, p. 39-64, 2015.

TREJOS ROSERO, L. F. T.; LUQUETTA CEDIEL, D. J. Una aproximación a la ilegalidad, el crimen organizado y ausencia estatal en la frontera colombo-venezolana. El caso del departamento de La Guajira en Colombia. **Memorias**, Barranquilla, n. 24, p. 125-148, 2014.

VARGAS, F. A. **Formação das fronteiras latino-americanas**. Brasília, DF: Funag, 2017.

VILLA, R. A. D.; MEDEIROS FILHO, O. Agências de Segurança e Defesa na América do Sul: percepções sobre o complexo regional de segurança. *In*: ENCONTRO NACIONAL DA ASSOCIAÇÃO BRASILEIRA DE RELAÇÕES INTERNACIONAIS, 1., 2007, Brasília, DF. **Anais** [...]. Brasília, DF: Abri, 2007.

VILLAS BOAS, E. D. da C. **Você sabe o que é "Corredor Triplo A"?** [...]. Brasília, DF, 19 set. 2018. Twitter: . Disponível em: https://bit.ly/35jFCzO. Acesso em: 17 dez. 2018.

VILLAS BOAS, E. D. da C. [Debater sobre a situação dos projetos estratégicos das Forças Armadas]. *In:* COMISSÃO DE RELAÇÕES EXTERIORES E DE DEFESA NACIONAL. **Audiência Pública reunião Nº: 0868/17.** Brasília: Câmara dos Deputados, 2017. Disponível em: https://bit.ly/2RgSVxc. Acesso em: 02 dez. 2019.

WALT, S. M. Who Will Save the Amazon (and How)?: It's only a matter of time until major powers try to stop climate change by any means necessary. **Foreign Policy**, Washington, D.C., Aug. 5, 2019. Disponível em: https://bit.ly/347bsjm. Acesso em: 3 set. 2019.


ECEME

ARTICLE DOI 10.22491/cmm.a024

Chile and the search for modernization of its Army during the transition to democracy

Chile y las Demandas de Modernización del Ejército Durante la Transición Democrática

Abstract: This study aims to analyze the demands for military modernization and restructuring that led to the transformation of the Chilean Army at the beginning of the 21st century. We briefly discuss changes in military institutions, trying to identify factors or conditions that drive these change processes, and to assess to what extent political authorities exercise control over these changes. We also analyze the case of the Chilean Army in the 1990s, according to the following aspects: international political conjuncture, domestic political conjuncture, disputes and military tensions in the Chilean environment, perception of adverse military capabilities, perception of the very Chilean military capabilities, and the Chilean strategic culture. Finally, we outline the 1994 plan to modernize the Chilean Army. Our conclusion is that the process of modernization of the Chilean Army in the transition to democracy emerged within the armed institution, coming from the very top level, and it was mainly motivated by international and domestic prestige.

Keywords: Military Modernization. Military Innovation. Military Transformation. Chilean Army. Redemocratization in Chile.

Resumen: El propósito de este trabajo es analizar las demandas por modernización y reestructuración militar que condujeron al proceso de transformación del Ejército de Chile desencadenado a principios del siglo XXI. Presenta una breve discusión acerca de los cambios en instituciones militares, buscando identificar los factores o condiciones que impulsan estos procesos de cambios, y evaluar en qué medida las autoridades políticas ejercen el control sobre estos cambios. A continuación, analiza el caso del Ejército de Chile en la década de 1990, según los aspectos: coyuntura política internacional, coyuntura política nacional, contenciosos y tensiones militares en el entorno chileno, percepción de las capacidades militares adversas, percepción de las capacidades militares propias y cultura estratégica chilena. Por fin, presenta las líneas generales del plan de modernización del Ejército de Chile de 1994. Concluye que el proceso de modernización del Ejército de Chile durante la transición democrática surgió en el interior de la propia institución armada desde su cumbre, y fue motivado, sobre todo, por razones de prestigio interno e internacional.

Palabras clave: Modernización Militar. Innovación Militar. Transformación Militar. Ejército Chileno. Redemocratización en Chile.

Fernando Velôzo Gomes Pedrosa
Exército Brasileiro. Escola de Comando e Estado-Maior do Exército.
Rio de Janeiro, RJ, Brasil.
velozopedrosa@yahoo.com.br

Received: Mar. 19, 2019
Approved: Nov. 7, 2019

COLEÇÃO MEIRA MATTOS
ISSN on-line 2316-4891 / ISSN print 2316-4833
http://ebrevistas.eb.mil.br/index.php/RMM/index

1 Introduction[1]

The 1990s was a transition period in the history of Chile. After 17 years of a rigorous military dictatorship, the country began its transition to the democratic normality. On March 11, 1990, General Augusto Pinochet transfered the Presidency power to Patricio Aylwin. However, taking advantage of the attribute of irremovability of commanders-in-chief of the Armed Forces, which had been established in the 1980 Constitution (CHILE, 1980, art. 93),[2] the former dictator remained in the post of Commander-in-Chief of the Army for eight years after giving up the power (CAVALLO, 1998). During this transition period, Pinochet retained considerable political power (IZURIETA FERRER, 2015) and challenged the government's initiatives to punish excesses committed during the military regime as well as protected military personnel and civil servants involved in cases of violations against Human Rights. Despite the constant political confrontations, President Patricio Aylwin and his successor, Eduardo Frei, were able to deal with the old general, thus avoiding legal ruptures (CAVALLO, 1998).

Pinochet finally relinquished the command of the Chilean Army on March 10, 1998, at the end of President Eduardo Frei's fourth year in office. Thus, the cycle of transition to democracy in Chile has ended. Despite wounds left by the military dictatorship, the political class had been able to conduct a compromised transition, maintaining the stability and economic foundation that would ensure the future of the country (CAVALLO, 1998).

However, after 25 years under the command of General Pinochet, the Army felt that it had fallen behind in relation to the other armed forces in the country, which, for not being truly politically committed to supporting the military government, could modernize themselves, acquiring new equipment and achieving high professional standards (IZURIETA FERRER, 2015; LE DANTEC GALLARDO, 2015).

This study aims to analyze the demands for the military modernization and restructuring that led to the transformation of the Chilean Army at the beginning of the 21st century. The first section presents a brief theoretical discussion on changes in military institutions, trying to identify the factors or conditions driving these processes of change, and to assess to what extent political authorities can exercise control over these changes. The second section analyzes the concrete case of the Chilean Army, seeking to identify demands

1 This article is a partial result of the research conducted by the author in the scope of the Graduate Program in Comparative History of Universidade Federal do Rio de Janeiro (PPGHC/UFRJ), under the guidance of Prof. PhD. Alexander Zhebit, between March 2014 and March 2018. The author would like to express his gratitude to Lieutenant General Roberto Arancibia Clavel for his support and guidance during the research conducted in Chile. As a researcher holding a PhD degree in History, former Chief of General Staff of the Chilean Army, and professor at Academia de Guerra del Ejército de Chile, General Arancibia gave the author a broad insight into the peculiarities of the Chilean military regime and the transition process to democracy, recommending bibliography on these topics and on the modernization of the Chilean Army, and facilitated the contact and interviews with several former Chilean military authorities, as well as the access to the Archives of the Department of Culture, History and Extension of the Army and to the Central Library of the Army. The author would also like to thank those retired and active dutty officers of the Chilean Army who granted him interviews during his research: in Santiago, Chile, General (R) Óscar Izurieta Ferrer; Lieutenant General (R) Christian Le Dantec Gallardo; and Brigadier General (R) Jaime García Covarrubias; in Rio de Janeiro, Brazil, Lieutenant Colonel Álvaro Enrique Salazar Jara, Chilean instructor at the Escola de Comando e Estado-Maior do Exército (2017).

2 The Constitution drafted by the military government was approved in a plebiscite held in 1980 (TAGLE D., 1995, p. 8).

for modernization in the institution in the 1990s, during the process of redemocratization that followed at the end of Pinochet's government. The third section outlines the ideas of the Chilean Army modernization project published in 1994, called the Alcázar Plan. Finally, we present the conclusions of the research that originated this study.

2 Changes in military institutions

Military institutions tend to be conservative. This mostly occurs due to the conservative nature of the military personnel (HUNTINGTON, 1996), and results from the exercise of the military profession and education. War is the riskiest of human activities. Therefore, the conduct of war and the preparation of military forces are not activities that allow hasty decisions and frivolous experiments. Extreme risks involved in the military activity shape and reinforce the military's conservative posture, because although war is an eventual experience for most armed forces, the military education and the troop's training permanently emphasize the frightening reality of armed conflict. As a result, education of military officialdom and troop training encourage the reproduction of consecrated military behaviors and practices (PEDROSA, 2012).

Conservatism of armed institutions also comes from its bureaucratic character and the fact that bureaucratic organizations are averse to changes. As Stephen Rosen notes, large bureaucratic organizations are not only difficult to change, but they are also "designed not to change." And military bureaucracies are particularly resistant to change (ROSEN, 1991, p. 2).

In fact, despite its conservative character, military institutions do change. These military changes and innovations are inevitable, depending not only on the technological development occurring in the civil sector and affecting the military activity (MURRAY, 1998, p. 301), but also on political and cultural changes in societies (FARRELL; TERRIFF, 2002).

2.1 Origins of changes in military institutions

Since the mid-20th century, English and American historians have published studies on changes in military institutions. These researchers have pointed out different sources or motivations for such changes. Theo Farrell and Terry Terriff have identified three basic sources of military changes: cultural norms, political and strategic panorama, and technological changes (FARRELL; TERRIFF, 2002, p. 6). Cultural norms produce persistent behavior patterns, becoming institutionalized in community rules and routines, and imposed by strong sanctions. Although cultural norms are naturally conservative, they can produce changes in armed institutions, whether when changes in the political and strategic framework seems no longer to adjust to the current cultural norms, requiring changes that allow the institution to adapt to the new reality, or as a result of cultural changes that have occurred over time. Farrell and Terrif identify two types of cultural changes: the planned change and that resulting from an external shock. Planned cultural changes occur due to the emergence of new beliefs regarding identity and appropriate behavior. Deep

external shocks in the local cultural system, however, can undermine the current legitimacy norms and patterns of behavior associated with them (FARRELL; TERRIFF, 2002).

The most obvious cause of changes in military institutions consists in changes in the political-strategic framework, particularly the emergence of new military threats or changes in the strategic posture of the existing threats (FARRELL; TERRIFF, 2002). New technologies created by defense equipment industries or resulting from the military use of technological developments of civilian origin may also produce profound changes in military institutions, as demonstrated by the impact of rail, motorized, and air transportation on the conduct of wars and on the armed forces.

Emily O. Goldman (2002), in turn, understands that a primary path towards changes in military organizations is the dissemination of innovations originated in one State to the others, and identifies two main sources of motivations to disseminate military innovations: competition, arising from the perception of threats in the international environment, and the search for legitimacy within a social system. In her analysis, the author suggests competitive pressures in the field of international security influence the awareness of the need for changes in military institutions, but the normative considerations—such as obtaining internal and external legitimacy—are those that determine the extent of and the adherence to change, particularly when it comes to emulating foreign models. Goldman also notes that States tend to promote military changes based on the imitation of innovations implemented in countries with greater military capacity and ingenuity, what is characterized as a form of "institutional isomorphism." Armed institutions imitate each other as it is the easiest way to adopt the best military practices demonstrated in the great wars of the period, but also searching for the legitimacy that can be conferred to them by the emulation of practices and formal aspects of successful military forces.

According to this perspective, organizations change to gain legitimacy, and isomorphism guarantees legitimacy to organizations. The success and survival of organizations partly depend on their ability to conform to and being legitimized by the institutions of their environment. Emulating consecrated practices is a demonstration of responsibility, and prevents the organization from being deemed as negligent. The success of institutionalized bureaucratic organizations depends on the confidence and stability provided by isomorphism (MEYER; ROWAN, 1977). Noteworthily, this is precisely the case of changes in armed forces in peacetime, when their success can only be assessed from the compliance with institutional and doctrinal norms.

2.2 Political control of change processes in military institutions

Regarding the level of control exercised by political authorities over the processes of change in military institutions, we may identify three models of interpretation. According to the first, proposed by Barry Posen (1984), military institutions are among the most difficult to be controlled by political authorities due to their characteristics of large bureaucratic organizations. "They are parochial, closed, large, endowed with all sorts of resources, and masters of a particularly arcane technology" (POSEN, 1984, p. 39). Due to these characteristics, the armed forces would be averse to doctrinal innovations and

are likely to preserve a certain degree of autonomy over civilian authorities. According to Posen's model, military innovation would depend on an intervention by civilian authorities to overcome the inertia of professional military. This model became known as the "external model of military innovation" (NAGL, 2005, p. 3-4).

Stephen Rosen (1991) proposed the second model of interpretation regarding the innovation of military institutions. According to Rosen, institutions would not need to suffer military defeats or be subjected to the intervention of civilian authorities in order to produce military innovations. According to this understanding, which became known as the "internal model of military innovation" (NAGL, 2005, p. 3-4), it is very difficult for the civilian command to impose a process of military innovation, due to the specialization and complexity of the military activity. Civilians would impact more if they could create a strategy to reinforce the action of the most senior officers who already held "legitimate" power in the armed forces.

Later, based on the concepts proposed by Posen and Rosen, other scholars developed an integrated model of doctrinal change. Barry Watts and Williamson Murray (1998), supporters of this integrated perspective, understand that military innovations in peacetime would inevitably be nonlinear, contingent, and marked by casualness. Hence, they preferred to avoid theoretical generalizations about explanations for the processes of military innovation. Instead, they chose to focus on a more modest and feasible objective, that is, to identify the specific actions adopted by high-level officers and civil servants to facilitate innovation in their military institutions. Regarding the scope of civilian authorities' intervention to induce innovation in military institutions, both authors understand that it would be very unlikely for a "handful of visionaries," though very dedicated and loquacious, to have any chance of forcing the institution to accept new doctrines without the acquiescence or collaboration of its bureaucracy (WATTS; MURRAY, 1998, p. 409).

3 Demands for modernization in the Chilean Army in the 1990s

The origins of the demands for modernization of the Chilean Army in the 1990s will be analyzed according to aspects deemed conditioning for the modernization of military institutions: international political conjuncture, national political conjuncture, litigation and military tensions around Chile, perception of adverse military capabilities, perception of the Chilean military capabilities, and Chilean strategic culture.

3.1 International political conjuncture

Internationally, Chilean redemocratization coincided with the end of the Cold War and the wave of redemocratization that terminated military governments dominating the South American political scenario in the 1970s. The end of military governments has defused tensions in the Southern Cone. In 1984, the Treaty of Peace and Friendship between Chile and Argentina (CHILE, 1985) was signed, which defused geopolitical tensions between both countries, preventing a war in 1978. In the mid-1980s, Brazil and Argentina began the

rapprochement process that would result in the creation of the Southern Common Market (MERCOSUR) in 1991, including Paraguay and Uruguay (CERVO; BUENO, 2010).

Redemocratization disrupted the international isolation to which Chile had been subjected during the military dictatorship, as a reaction of the international community to violations against Human Rights, which were perpetrated in the country. The end of the isolation would allow the *Concertación*[3] governments to put into practice, in terms of international trade, the liberal economic model implemented by the military regime inspired by the Chicago Boys—a group of Chilean scholars formed according to the principles of the Chicago School (SOTO; SÁNCHEZ, 2015). During the *Concertación* governments, Chile signed a series of free trade treaties with countries in the Americas and other regions, becoming one of the freest economy countries worldwide (ECONOMIC..., 2019).

At the regional level, the 1990s and 2000s brought better relationships with neighboring countries to Chile, particularly Argentina, with which all border litigation was resolved. Concerning Peru and Bolivia, both countries still had demands emerging from Chilean territorial conquests in the Pacific War (1879-1883). Peru maintained demands regarding the maritime boundary with Chile and called on the International Court of Justice for a solution in 2008. In January 2014, this Court provided a judgment in favor of Peru in relation to the maritime boundary (INTERNATIONAL COURT OF JUSTICE, 2014). However, both countries are still engaged in a dispute over a tiny triangle of land at the coastline, whose dimension accounts for about 300 meters or less, but its possession causes tensions in the relationships between both countries, and has little difference in the line of the maritime boundary established by the 2014 judgment. Bolivia, in its turn, broke off diplomatic relationships with Chile in 1978, and since then both countries have maintained only consular relations.

3.2 National political conjuncture

The Chilean political transition was a very politically delicate period. Defeated in the popular inquiry of 1988, Pinochet, following the Constitution decreed by himself in 1980, called elections in 1989. In such election, the candidate of *Consertación,* Patricio Aylwin, was elected. One of the first steps taken by President Aylwin after taking office in March 1990 was the creation of a National Commission for Truth and Reconciliation. The purpose of the Commission was "to contribute to the global clarification of truth about the most serious violations against Human Rights" committed during the years of dictatorship, "in order to collaborate with the reconciliation of all Chileans and without harm to judicial procedures that such facts may produce" (CHILE, 1990b, our translation). The issue was extremely delicate and sensitive to the military personnel and especially to General Pinochet, but President Aylwin was very cautious in choosing the commission members. One of the careful measures was not to compose the Commission of politicians opposed to the military regime or people linked to the left-wing armed resistance. For the Comission's presidency, the lawyer Raúl

3 Coalition of left-wing, center-left, and center political parties that opposed the military government in Chile and came together to defeat the proposal for enduring military government in the 1988 plebiscite. *Concertación* won the first four Chilean presidential elections after the end of the military dictatorship, ruling the country for 20 years.

Rettig was chosen, an old jurist and former parliamentarian, who had opposed to the military government, but whose conduct was blameless (CAVALLO, 1998, p. 22-23).

Pinochet protested against the Commission, and the Armed Forces did not comply with the progress of its work. However, in February 1991, the Commission presented its final report, which would be known as the Rettig Report (CHILE, 1996). This Report pointed out a total of 2,298 cases of violations against Human Rights, accounting for 1,151 deaths by State action, 979 missing prisoners, and 168 dead victims of political violence committed by individuals, without connection with the State. The Report also proposed the creation of an agency to continue investigations into hundreds of other cases without conviction. The final report on the work of this agency, the National Corporation for Reparations and Reconciliation, was presented in December 1996, adding 899 more victims of violations against Human Rights, 776 dead, and 123 missing (CAVALLO, 1998, p. 90-91).[4]

The legislation imposed by dictatorship for the transition included a broad authoritarian apparatus, aimed at protecting the civilian government and members of the repressive instrument of the military regime. The "authoritarian enclaves" (ESCALONA MEDINA, 2012, p. 255) included the following military tutelage tools: nine senators appointed by Pinochet, all with a conservative profile, four former commanders of the Armed Forces, and the *Carabineros*;[5] military super-representation in the National Security Council, which was composed of commanders-in-chief of the three Armed Forces and the general director of the *Carabineros*; the irremovability of commanders-in-chief of the Armed Forces and the general director of the *Carabineros*; article 7 of the new Organic Law of the Armed Forces (CHILE, 1990a), approved a few days before the government's disclosure to civilians, which was ambiguous regarding the authority of the President of the Republic to appoint, promote, and transfer officers to the reserve force, since it subordinated the President's decision to the proposals presented by commanders-in-chief of the military forces (CAVALLO, 1998).

Since the beginning of his administration, President Aylwin has been determined to promote amnesty for political prisoners in the military regime. The issue was complex, since many convicted of murders and acts of terrorism were among the prisoners. There was even a personal matter involving the Commander-in-Chief of the Army. Among the political prisoners, several of them had participated in an attack on Pinochet's life on September 7, 1986. The dictator was unscathed, but five of his security guards had been killed. Throughout the transition, however, amnesty for political prisoners was eventually used by the military as an exchange to obtain amnesty for the military who had violated Human Rights (CAVALLO, 1998).

Nevertheless, delaying maneuvers did not prevent legal measures from being taken in the most alarming cases of violence committed by the military regime. The main responsible people for the murder of the former Minister Orlando Letelier in a bombing by DINA[6] agents in Washington, in 1976, were convicted in 1995, under President Eduardo Frei's government:

4 Here I mention the summary presented by Ascanio Cavallo, but you can find the complete data in the three volumes of the Rettig Report.

5 Militarized police force, which acts as a security force across the country and performs ostentatious policing in cities and highways. The *Carabineros* are deemed a fourth armed force in Chile.

6 *Dirección de Inteligencia Nacional*. Chilean government agency responsible for the repression of left-wing armed movements after the 1973 military coup.

General Manuel Contreras, former head of DINA, and his main advisor, Brigadier General Pedro Espinoza (CAVALLO, 1998). These convictions represented the onset of the end of impunity in cases of violations against Human Rights in Chile (ESCALONA MEDINA, 2012).

The tendency of accountability for violations against Human Rights in Chile reached its peak when General Pinochet was arrested in October 1998 by the British government in London, England, where he had gone for a surgery. Pinochet's arrest had been requested by a judge of the Spanish National Court, attributing to the former dictator the crimes of genocide, terrorism, and torture, all indefeasible, according to the Spanish law and the international jurisprudence (AUTO..., 2013). The former dictator was, after all, allowed by the British government to return to Chile in March 2000, due to his precarious health condition. On his return, Pinochet had revoked his jurisdiction prerogative, and was forced to resign his term as senator, being submitted to court by the Chilean judicial authorities (ESCALONA MEDINA, 2012). Although he was never convicted, Augusto Pinochet had his reputation seriously tarnished during investigations, in which millionaire deposits were discovered on his behalf in bank accounts in tax havens (CASO RIGGS..., 2015).

In the purely administrative sphere, since the beginning of the Aylwin government, General Pinochet has obstructed his subordination to the Minister of Defense Patricio Rojas. Pinochet avoided discussing Army affairs with the Minister, seeking to directly deal with the President. Meetings between the Commander-in-Chief and the Minister were always tense, and often ended in heated discussions (CAVALLO, 1998, p. 14, 23, 25, 77, 127, 163, 166).

Military challenges to civilian government during the democratic transition period were not limited to issues related to politics and Human Rights, but also involved General Pinochet's family life. In August 1990, the new Aylwin's government authorities found in archives of the Banco de Chile copies of three checks involving General Pinochet's second son, Augusto Pinochet Hiriart, in cases of advantage in the sale of a small and semi-bankrupted metallurgical industry to the Chilean Army for the value of three million dollars. The case was published in newspapers in Santiago, leaving the old general in a very delicate situation, considering the benefits granted by the Army to his son (CAVALLO, 1998). Before the financial scandal involving the Army and the former dictator's son, the Congress appointed a committee of inquiry to clarify the case and assign accountability for the losses caused to public funds.

The ongoing investigation in the Congress to inquire the case of *pinocheques*, as it became known, caused enormous tension between the Army and the government. At first, Pinochet internally manifested the possibility of resigning from the post of Commander-in-Chief; but, considering the continuation of the investigations and the lack of government support, he determined that Army troops should be on standby in their barracks on the night of December 19, 1990, as an imminent threat to the government and the Congress. The Army's spokesman claimed that everything was nothing more than an "exercise of security, readiness, and bonding," but the threat was posed, and the final report of the committee of inquiry disregarded the existence of criminal offences (CAVALLO, 1998, p. 80).

The *pinocheques* case would return to the headlines in May 1993, when the State Defense Council decided to refer the case to the criminal justice. Once again, Pinochet reacted by using the Army. On May 28, military troops moved within the country and in the capital, wearing combat uniforms, in an event that would become known as the *boinazo*, because of the black berets worn by the soldiers ostensibly placed on standby in front of the Armed Forces Building, a few steps from La Moneda Palace, the government headquarters. In June, the judge responsible for the *pinocheques* case declared himself unable to judge it and transferred it to another instance in a delaying maneuver. The case of the *pinocheques* ended in 1995, when the State Defense Council definitively archived it at the request of President Frei in order to avoid setbacks and to preserve the rule of law (CAVALLO, 1998).

Despite challenges posed by General Pinochet to the governments of the transitional period, corresponding to the years he remained as Commander-in-Chief of the Army after transferring the presidency of the republic, Presidents Aylwin and Frei were very skillful for not giving in so much, in such a way they would be demoralized in their civil authority, and for neither bringing confrontations to a breaking point, which could mean a setback unacceptable by Chile and by the international community (ESCALONA MEDINA, 2012).

Despite past abuses during the military government, the *Concertación* governments preferred not to adopt a confrontational posture towards the Armed Forces, either by subjecting military chiefs to trial, or by drastically reducing manpower and budgets, as it happened in Argentina. The way Chilean civil authorities chose to remove the military from politics was the professionalization of the Armed Forces (IZURIETA FERRER, 2015), adopting an approach similar to what Samuel Huntington (1996, p. 113) called objective civilian control. To do so, they provided political and economic support to a program for the Army modernization, proposed by General Pinochet himself during the transition years. Political authorities were willing to support any initiative to professionalize the Armed Forces (LE DANTEC GALLARDO, 2015).

According to General Óscar Izurieta Ferrer[7] (2015), initially, the political authorities of the *Concertación* envisioned to develop the model of military modernization adopted in Spain after redemocratization. This proposal was supported by many former opponents of the military regime who had been exiled in Europe and who, during the transition period, held political positions in the new government and chairs at the main universities of the country. The military, however, knew that the existing model needed to be replaced, and recognized the qualities of the new Spanish military model. But they also considered that, if on the one hand the Spanish Armed Forces had adjusted and submitted to political control of civilian authorities, on the other hand, they had benefited from Spain's entry into the North Atlantic Treaty Organization (NATO), which implied the international commitment to its military training. In the absence of similar conditions, the officialdom of the Chilean Army feared that the emulation of the Spanish model would not be an easy task, and that the simple adoption of a foreign model would be inappropriate for the Chilean reality and its defense needs. Therefore, it was necessary to

7 Commander-in-Chief of the Chilean Army during the first term of President Michelle Bachelet (2006-2010).

adjust the preference of civil authorities for the Spanish model and the military's proposal regarding a new military model developed in Chile (IZURIETA FERRER, 2015).

To negotiate this adjustment, a new generation of young senior officers—majors and lieutenant colonels—played a key role. In the final years of Pinochet's government, these officers had gone, by their own choice, to universities in search of greater academic training. According to Izurieta Ferrer (2015), from about 15 to 20 officers attended graduate programs at Chilean universities, in the middle of the military government, and in an environment of strong opposition to the regime. According to the same author, although these officers were misunderstood by the generals and their own comrades, who saw them as "enemies of the military government", they were warmly welcomed in the universities, despite ideological differences, and they had the support of Pinochet, who ordered the Army to finance their studies. The good academic performance of this group of officers and the contacts established with the academic environment have favored the search for the very Chilean model of military modernization.

3.3 Litigation and military tensions around Chile

Throughout its history, Chile has had serious litigation with all its neighbors. The incorporation of large territorial extensions rich in saltpeter, guano, and copper, as a consequence of the Pacific War (1879-1883), originated a permanent hostility from the countries that were defeated and lost territories. The loss of the Antofagasta Province had traumatic consequences for Bolivia, which was transformed into a Mediterranean country. In addition to the issues arising from the Pacific War, Chile has engaged in prolonged border disputes with Argentina. These litigations extended from the border of both countries with Bolivia to the Andes Mountains, the Patagonian Region, and the Beagle Channel zone (BURR, 1974).

Since the end of the Pacific War, Chile has faced frequent states of tension with Peru and Bolivia. The dispute with Peru initially revolved around the possession of territories of Tacna and Arica, which had been incorporated into Chile during the War. According to the Treaty of Ancón (1883), the definitive possession of these territories would be established by a plebiscite to be held within ten years (PERU..., 1883). This plebiscite, however, has never been held. The issue was resolved by the Treaty of Lima (1929), and as a consequence Chile returned to Peru most of the Tacna territory, but preserved its Southern region and the territory of Arica (PERU, 1929). Bolivia, in turn, maintains against Chile a permanent demand for a sovereign exit to the Pacific Ocean.

Concerning Argentina, Chile has maintained a series of territorial disputes that, on some occasions, were about to start a war. These tensions were due to the blur of the borders of the two countries at the time of independence. The Treaty of 1881 defined the possession of the territories along the Andes Mountains, Patagonia, and Tierra del Fuego, and a commission with representatives of both States was responsible for the precise definition of the border line, based on criteria defined in the treaty (RODRÍGUEZ S., 1985, p. 51-53).

However, the process of demarcation of the border gave rise to heated disputes, resulting from the different interpretations of the demarcation criteria. The Chilean historian Enrique Brahm García (2003, p. 83, our translation) reports the "situation of constant tension

that was experienced with Argentina between 1896 and 1902." In this interregnum, "the war between both countries (considering the consistently possibility of intervention on the part of Peru and Bolivia) has reached the point of being declared several times" (BRAHM GARCÍA, 2003, p. 15, our translation). The relenting of relationships between Chile and Argentina would occur with the 1902 British arbitration award, nulling the differences found by the border demarcation commission in the Southern Region (BRAHM GARCÍA, 2003).

Relationships between Chile and Peru were deteriorated once again during the Peruvian government of General Juan Velasco Alvarado in the mid-1970s. Between 1973 and 1975, the Peruvian government made major acquisitions of modern war material in the Soviet Union, in the largest rearmament program in its history (EL DÍA..., 2014), which made the Peruvian Armed Forces one of the best equipped in the Subcontinent. In the most tense moments of relationships between the two countries, many Peruvian military troops and their equipment were sent to the South of the country, to the alarm of the Chilean government and the armed forces (IZURIETA FERRER, 2015). Velasco Alvarado's aggressive movements were not accomplished, due to his deposition by a military coup led by General Francisco Morales Bermúdez in August 1975. Having to deal with a huge economic and social crisis, Morales Bermúdez's government has decreased the pressure on Chile.

In 1978, Chile once again was faced with the threat of a war against Argentina, due to the dispute over the possession of some islands and islets in the Beagle Channel, which marked the Southern maritime border between both countries. The issue began in the late 19th century and had been submitted to British arbitration in 1970 by agreement between the governments of Chile and Argentina. The 1977 arbitration award was favorable to the Chilean position, but Argentina refused to accept it (INFANTE, 1979). At the time, considering itself in military advantage, the Argentine military government decided to seek the solution with the army, beginning the preparation of Operation Sovereignty. When this operation started, the Argentine Armed Forces should invade Chile and secure the possession of the disputed islands (MADRID MURÚA, 2003). Chile understood that Peru and Bolivia would not miss the opportunity to attack the North of the Country, in the event of a war with Argentina. The situation was aggravated by the international isolation of Pinochet's government, which greatly hindered the acquisition of military resources and political support from the international community (IZURIETA FERRER, 2015). Argentina was within a few hours of invading Chilean territory, but the Vatican intervention prevented the disaster of a war. The mediation of the Pope resulted in the signing of a Treaty of Peace and Friendship between Argentina and Chile in 1984. This treaty would be a milestone for relenting the relationships between both countries (IZURIETA FERRER, 2015), putting an end to the crises that had almost brought them to war on two occasions in less than a hundred years.

The problem with Peru remained latent, but the rebellion of the *Sendero Luminoso* diverted all Peruvian military efforts towards the internal war in the early 1980s. The issue with Peru was resumed during the government of President Ricardo Lagos (2000-2006), when the Peruvian government enacted a straight baseline law for the maritime boundary. Peru also questioned the aforementioned possession of the triangle of land (LE DANTEC GALLARDO, 2015). The issue of the maritime boundary was resolved by the International Court of Justice in 2014, but the issue of the triangle of land remains unsolved. As for Bolivia, its political instability was so great that it gave Chile some "time off" (IZURIETA FERRER, 2015).

3.4 Perception of adverse military capabilities

In the 1970s Chile felt seriously threatened by its neighbors. To the North, Peru's government has begun a long process of strengthening its armed forces, acquiring modern Soviet military equipment costing approximately U$ 1.2 billion, according to an estimate by the United States of America government. In the early 1980s, the Peruvian Army accounted for over 450 combat vehicles in its inventory, including 300 T-55 "battle tanks,"[8] as well as dozens of modern aircraft of Soviet origin such as Sukhoi SU-22 fighter aircrafts and helicopters, anti-aircraft artillery, and anti-tank missiles (CENTRAL INTELLIGENCE AGENCY, 1982).

The Peruvian rearmament effort was apprehensively perceived by the Chilean government and armed forces, considering the great disparity of resources between both countries (IZURIETA FERRER, 2015). In order to counterbalance the military disadvantage, the Chilean government has made several emergency acquisitions, but without any planning, having to bear high costs in the international market. As a result, the Chilean military spending increased from 3.3%, in 1973, to 5.3% in 1974, and to 5.7% in 1975 regarding the GDP (ARANCIBIA, 2007, p. 1).

To the East, Argentina was also deemed by Chile as a serious military threat. The almost incoming war of 1978 once again forced Chile to make emergency acquisitions in a disorganized manner. At that time, violations against Human Rights committed by Pinochet's government had put Chile in a situation of international isolation. In 1974, the U.S. Congress had approved the Kennedy Amendment, which prohibited military assistance and sales of arms to Chile (KENNEDY..., 2009). President Carter's election in the USA in 1977 would further aggravate the Chilean situation, forcing Pinochet's government to resort to intermediaries or countries that had also been accused of violations against Human Rights, such as South Africa, Israel, and Brazil, always paying exorbitant prices due to the lack of planning and the urgency of purchases (IZURIETA FERRER, 2015).

Argentina's defeat against England in the Falklands War (1982) has radically changed this picture. The Argentine Armed Forces came out of the war demoralized, and suffered severe political retaliation from civilian governments that took power after the dictatorship has collapsed due to the military failure. The consequence for the Argentine Armed Forces consisted in reductions in staff, budget cuts, obsolescence of war material, and the demoralization of the military before the Argentinean society. For Chile, Argentina's defeat in the Falklands War was a milestone for relenting military tensions between the two countries. Since then, Argentina no longer poses a war threat for Chile (IZURIETA FERRER, 2015). Bolivia, in its turn, was perceived by Chile as a minor threat, considering its political instability and its weak economy (IZURIETA FERRER, 2015).

3.5 Perception of Chile's own military capabilities

Throughout the 1970s, Chile had the perception of being at major military disadvantage compared with its larger and most threatening neighbors—Peru and

8 "Battle tank" was the designation of the new generation of tanks, which emerged during the Cold War, with high technology and capable of great firepower, armored protection, and speed.

Argentina. In 1973, the Chilean Army had fewer than 100 combat vehicles in operating conditions in its inventory, all of U.S. origin. Of these, the most modern were 60 M-41 lightweight tanks. Regarding aviation, it had very few helicopters, and depended on the Air Force for air transport missions (GAZMURI, 1985, p. 1).

Faced with Peruvian and Argentine threats in the 1970s, Chile made a major military reequipment effort, although it has failed to purchase first-line military resources, due to budgetary constraints and the precarious financial situation in which the country was inserted after the economic chaos experienced during the government of the *Unidad Popular* (1970-1973). Among the main acquisitions during that decade and in the early 1980s, there were 47 AMX-13 lightweight tanks and 21 AMX-30 tanks—the only ones that could be classified as "battle tanks"—, all French-made, in addition to 30 wheeled reconnaissance armored vehicles EE-9 Cascavel, and 70 armored personnel carrier of the EE-11 Urutu and Cardoen-Mowag Piranha types (GAZMURI, 1985, p. 4-5).

However, the Army's endeavor to contain opposition movements at the end of the military government, with huge street protests and conflicts, forced the institution to slow its modernization and restructuring. Moreover, it made a significant part of its units be transformed to acquire anti-subversive and control-related capabilities of the internal order, which was fatal from a professional point of view. This also had a very negative effect on the image of the Force, since it transformed the Army into a repressive body against the population (IZURIETA FERRER, 2015).

The Army's commitment to the military government was not limited to the field of homeland security, but also included the Country's political administration. During Pinochet's regime, officers from operational units directly performed administration and government functions, at the expense of the military training of their units. Overall, the divisions commanding generals held the positions of intendants of the administrative regions of the Country, while regimental commanding colonels held the positions of governors of the Provinces (SALAZAR JARA, 2017).

When transition to democracy started in the early 1990s, the Chilean military's perception was that the Army had fallen behind the Navy and the Air Force. These forces had moved away from the core of the military government and, after its end, they were not trapped in the past, as it happened with the Army, which remained eight years under Pinochet's command in the first two governments of *Concertación* (IZURIETA FERRER, 2015). The democratic transition found an Army that did not correspond to a country that intended to be modern and democratic. According to General Óscar Izurieta Ferrer (2015), Pinochet was aware of the Army's inadequacy as the military force Chile needed in the democratic era being established. It was at this point that Pinochet launched a project of modernization and reorganization of the Army.

The poor organizational functionality of the Chilean Army at the end of the military regime can be evaluated based on its operational structure of 2001, when the Institution effectively began its reorganization. At that time, the Chilean Army had as its great basic combat unit the army division (AD) (CHILE, 2001). A functional doctrinal concept would recommend for all divisions to have a uniform organization, consisting

of a balanced set of combat units, combat support units, and a logistics unit,[9] in such a way to constitute real combat systems, favoring their training and employment in combat. Likewise, it would be recommended for army divisions to be composed of only operational units and without peacetime administrative burdens. However, each of the seven ADs in the Chilean Army had a distinct organization (Chart 1). Some ADs lacked combat support units or logistics. Other ADs were simultaneously organized with armored and mountain divisions, in an arrangement that would have many difficulties in operating together. Three ADs had fixed administrative units in their organizational structures (two arsenals and a horse breeding site) without any relation to the combat activity (CHILE, 2001).

Chart 1 – Organization of the great operational units of the Chilean Army in 2001.*

I AD	II AD	III AD	IV AD	V AD	VI AD	VII AD
IR No 7 Esmeralda	IR No 1 Buin	IR No 6 Chacabuco	IR No 12 Sangras	IR No 10 Pudeto	Bde Ex No 5 Carampangue	IR No 14 Aisén
IR No 15 Calama	IR No 2 Maipo	IR No 9 Chillán	MIR No 8 Tucapel	IR No 11 Caupolicán	TR No 6 Tarapacá	IR No 26 Bulnes
IR No 23 Copiapó	IR No 3 Yungay	IR No 16 Talca	AR No 2 Maturana	AR No 7 Chorrillos	LB No 6 Pisagua	AR No 8 San Carlos de Ancud
AR No 5 Antofagasta	MIR No 18 Guardia Vieja	IR No 17 Los Ángeles	ACR No 2 Cazadores	ACR No 5 Lanceros	IR No 24 Huamachuco	ER No 8 Chiloé
ACR No 8 Exploradores	IR No 19 Colchagua	AR No 3 Silva Renard	ACR No 3 Húsares	ACR No 6 Dragones	RA No 6 Dolores	Las Bandurias Military Breeding Site
ER No 1 Atacama	IR No 21 Arica	LB No 3 Concepción	ACR No 4 Coraceros	ER No 5 Punta Arenas	ACR No 9 Vencedores	
TR No 1 El Loa	IR No 22 Lautaro	EC Independente – Los Ángeles	ER No 4 Arauco	TR No 5 Patagonia	ER No 6 Azapa	
LB No 1 Tocopilla	AR No 1 Tacna		TR No 4 Membrillar	LB No 5 Magallanes	Arsenal MWM No 1 Arica	
	ACR No 10 Libertadores		LB No 4 Victoria	Arsenal MWM No 2 Punta Arenas		
	ER No 2 Puente Alto					

* In addition to the large units described in this chart, the Chilean Army also had an Aviation Brigade. Caption: AD (Army Division); IR (Infantry Regiment); MIR (Mountain Infantry Regiment); AR (Artillery Regiment); ACR (Armored Cavalry Regiment); ER (Engineers Regiment); TR (Telecommunications Regiment); LB (Logistics Battalion); Bde (Brigade); C (Company); EC (Engineers Company); MWM (Maintenance of War Material).

Source: Chile (2001, p. 153-173).

9 Combat units are those that perform the close combat—infantry and cavalry units; combat support units provide fire support, movement support, and support for coordination and control capability—artillery, engineering, and communications—, in order to increase the combat power of combat units.

In addition to organizational issues, the Chilean Army had also been professionally fallen behind, since it had been more focused on homeland security than on technological advances that had occurred in the military field. It had also suffered professional losses for the training of its officers abroad, due to the international political isolation to which Chile had been subjected. Few countries have accepted Chilean military in their military schools. Only countries such as South Africa, Brazil, and Israel continued welcoming Chilean officers. In those circumstances, it was hard to keep up on military issues (LE DANTEC GALLARDO, 2015). The Army was also exhausted after facing three major challenges simultaneously and successively (the military coup and the fight against internal armed groups, the Peruvian threat in 1974-75, and the almost incoming war with Argentina in 1978). It was also heavily indebted to the government due to emergency acquisitions made at exorbitant prices during the crises with Peru and Argentina. In 1976, the Military Board had modified the old "Copper Law"[10] and allocated 10% of the state company Codelco's[11] sales to the Armed Forces (PATTILLO, 2003, p. 93), but the emergency purchases had been far superior to what was provided for by the Copper Law, and the Army had been left with a huge debt that would only be paid in 2001 (IZURIETA FERRER, 2015).

Pinochet was sure of the Army's inadequacy as the military force Chile needed in the democratic era that was being established. But he understood that, if that was not the Army Chile needed, it was the one he needed to maintain political control over the country in the transition phase. It was at this point that Pinochet launched a project of modernization and reorganization of the Army (IZURIETA FERRER, 2015).

3.6 Chilean Strategic Culture

Since the end of the 19th century and throughout the 20th century, the main feature of the Chilean strategic culture has been the perception that Chile is "a country under siege" by all its neighbors (VIAL, 1981 apud BRAHM GARCÍA, 2003, p. 47), and that sense of threat has concrete motivations. To the North, Bolivia and Peru had many reasons to seek revenge for their defeat and territorial losses in the Pacific War. To the East, Argentina was economically stronger each day and gathered a military apparatus corresponding to the new status of emerging regional power. The possession of the Subcontinent Southern region caused dispute between both countries and almost led them to war in 1898-1900 and in 1978, with the risk that the Northern neighbors would take advantage of a war in the South to attack Chile and recapture territories lost between 1879 and 1883. Referring to the turn of the 20th century period and the growing tensions between Chile and its North and Eastern neighbors, Robert Burr (1974, p. 244) estimates that Chile was *in danger of moral and military siege*.

The sense of being under siege has, thus, shaped the perception that the Chilean society and its leaders have about the existence of plausible opponents, about the threats they

10 Reserved Law No. 13,196 of 1958, with which a tax on the operations of copper mining companies for the exclusive financing of acquisitions of military equipment was created. Unlike resources allocated to the armed forces in the State budget, funds from the "Copper Law" are automatically directed to the armed forces, without undergoing the regular process of budget debate and approval of the Congress (PATTILLO, 2003).

11 *Corporación Nacional del Cobre de Chile*.

pose as well as the importance and appreciation of their military institutions. The experiences of its main wars in the 19th century—War of the Confederation (1836-1839); Pacific War (1879-1883), and the Civil War of 1891—also provide Chileans with a positive perspective of the effectiveness of the use of force for resolving serious political disputes (JOHNSTON, 1995).

The siege perception makes Chile perceive the offensive action of a preventive war as a form of defensive war. In this sense, the Pacific War, in which Chile undertook initiative and which resulted in the conquest of large Peruvian and Bolivian territories, is deemed as, in the words of a Chilean historian from the 21st century, "a defensive reflection on the part of Chile before the union of Peru and Bolivia, which has seriously threatened the balance of power and Chilean interests" (RUBILAR LUENGO, 2016, p. 220, our translation).

The very existence of the "Copper Law" reflects the feeling that Chile is a country under siege. Its origins date back to a 1938 law according to which part of the profits obtained from the leasing of the State's rural areas was assigned to the acquisition of war material and to meet the most urgent needs of the Armed Forces. The "Copper Law" was finally passed in the Congress in November 1958,[12] partly motivated by an incident with Argentina about the possession of an islet of the Beagle Channel (PATTILLO, 2003, p. 106-107). This allocation of financial resources to military forces without the need for approval of the legislative power demonstrates the priority attributed by Chileans to the national defense.

The second defining feature of the Chilean strategic culture is the people's self-image in relation to the war activity. Chileans tend to see themselves as a warrior people, whose martial proclivity emerged from the mixture between the blood of the Spanish colonizer and that of the strong and untamed Mapuche native people,[13] with whom they lived and fought a secular war on the distant frontiers of Auracania to the South of the Country (BLANCPAIN, 1991). General Emil Körner, a German official hired by the Chilean government to begin the process of professionalizing the Chilean Army after the Pacific War, praised "the mixture of blood between Spanish men and Indigenous women," conferring to their descendants an irresistible war capability (KÖRNER, 1988, p. 189, our translation). Furthermore, the struggle for survival against the rough nature and the peoples originated from those remote borders would have generated "powerful influences on the image and mentality of the emerging nation and on the way of life of the Chilean" (ARANCIBIA CLAVEL, 2002, p. 102, our translation). That experience resulted in the idea of an "warlike epic", which, although somehow based on the reality, greatly derives from the patriotic fiction. Nevertheless, the myth of the warrior race had the virtue of all myths: "it is a truth that does not need to be demonstrated and neither admits contrary proofs" (ARANCIBIA CLAVEL, 2002, p. 103, our translation).

4 The Chilean Army Modernization Project

The project for the modernization of the Chilean Army started being designed with a series of conferences, or *Clases Magistrales*, held by Pinochet between 1992 and

12 The "Copper Law" was reformed during the Military Regime in six occasions: 1973, 1975, 1976, 1981, 1985, and 1987.

13 They are also known as *araucanos*, a name given to them by the Spanish.

1994, aiming at presenting his vision about the Army for the future, and at establishing the basis of a modernization process (IZURIETA FERRER, 2015). In 1992, the theme of the conference was ***Ejército de Chile: Trayectoria y Futuro*** (CHILE, 1992); in 1993, the theme was ***Ejército de Chile: Posibles Elementos a Considerar en su Proyección Futura*** (CHILE, 1993); and on August 19, 1994, Pinochet effectively launched his modernization plan—the ***Alcázar Plan***—, with the conference ***Modernización del Ejército: Realidad y Futuros Alcances*** (CHILE, 1994b).

At the 1992 *Clase Magistral*, Pinochet analyzed the changes the world had been undergoing after the end of the Cold War and their impact on the Army. He also established that moment as the milestone of the beginning of a new planning process for the future, and presented his vision of what the Army should be in the coming decades, synthesizing his guidelines for the modernization process to which the Army was committed in order to form a military force adjusted to the times that would come (CHILE, 1992, p. 5). Pinochet also warned that the military modernization would be a long process that, to be conceived, planned, and developed, would require an effort as great as that to execute it (CHILE, 1992, p. 15).

In the following year, *Clase Magistral* proposed to deepen the theme of modernization of the Army, developing new guidelines to expedite the internal process of studies initiated in 1992 (CHILE, 1993, p. 3). Among other aspects, Pinochet highlighted, in the field of teaching, the increase in the professional training of senior officers, obtained from the completion of the Master's degree program in Military Sciences at the Academia de Guerra del Ejército de Chile. He also mentioned the Master's degree program in Military Engineering Sciences, taught at the Academia Politécnica Militar, the engineering college of the Chilean Army, and programs aimed at Army officers to obtain academic master's degree and PhD titles in universities within the country and abroad, in the areas of Sociology, Political Science, International Relations, Economics, Business, and Engineering. In the field of military instruction and training, he highlighted the onset of a program for the improvement of tactical unit commanders, using computer simulation tools, and the installation of the Centro de Entrenamiento Operativo Táctico, based on a computer simulation system, entirely designed and created with national technology (CHILE, 1993, p. 5-6). The core of the conference was focused on presenting a dual perspective of the Army of the future—one within the scope of national defense, and another within the scope of development (CHILE, 1993).

The Chilean Army modernization project was finally consolidated in the **Alcázar Plan**, launched on August 19, 1994 (CHILE, 1994a), and publicly presented at the *Clase Magistral* of the same year. Alcázar Plan was presented as an integral megaproject for the whole process of modernization of the Army, comprising a period from 1994 to 2010. Due to this long period, its execution was planned to be performed in two major stages: the first until 1997, and the second from 1998 to 2010. Noteworthly, 1998 was the year Pinochet was supposed to relinquish his command of the Army, permanently retiring from institutional life. That is, there was a step to be followed by his successors in the Force Command. And, considering that Pinochet would remain Commander-in-Chief of the Army for 25 years, these successors would be officers of a generation much younger than the old general, who would be 82 years old when he retired from the Army.

Considering the long duration of the plan, the objectives of only its first stage were defined: 1st) To materialize concrete achievements for modernization, which were necessary and feasible to implement within the available budget and which would be the basis for the plan to be established; 2nd) To develop, with the necessary time and coordination, the major projects and studies that will shape the main transformations required by the institutional modernization; and 3rd) To create the best conditions to continue the process in the second stage [...] (CHILE, 1994a, p. 2-3).

Based on its initial provisions, evidently, the Alcázar Plan was less of an action plan than the enunciation of a set of long-term intentions, involving only a few immediate actions, which were possible to carry out in the short-term and within the limited available budgets. The main result of its first stage would be developing plans and projects for the modernization process to be performed in the second stage, after Pinochet's retirement.

As stated by General Óscar Izurieta Ferrer (2015, n.p.), who was the officer in charge of writing it "from the first letter to the last one," the Alcázar Plan was "more symbolic than real." Some aspects of the plan have been effectively implemented since its creation, such as changes in military education and the inclusion of women in the Institution, but, due to his personal political convenience, Pinochet did not wish the central part of the plan, that is, the restructuring of the Force, to start while he was Commander-in-Chief. The effective reorganization of the Chilean Army would only begin in 2001, in the administration of General Ricardo Izurieta,[14] who succeeded General Pinochet as Commander-in-Chief of the Chilean Army from March 11, 1998 to March 11, 2002. The Army's reorganization process was delayed not only by Pinochet's decision not to fully deploy the Alcázar Plan before his retreat from the Army, but also by the heavy debts that marked the Army's budget—resulting from emergency purchases of the 1970s—and which were only paid in 2001 (IZURIETA FERRER, 2015).

Considering that the object of this study is the demand for modernization of the Chilean Army, it is not necessary to analyze the effective execution of the transformation process of the Chilean Army, but only its general ideas.

5 Conclusions

The process of modernization of the Chilean Army was conceived in the 1990s, during the democratic transition, still under the command of General Pinochet. The effective implementation of its key aspects of administrative reorganization and force restructuring would only start at the beginning of the following decade. In the international scope, this period corresponds to the post-Cold War and a global wave of democratic optimism. In Latin America, it coincides with the end of authoritarian military governments that had dominated the Region in previous decades. The new regional democratic panorama has allowed the relenting of military tensions in South America, although Peru and Bolivia still maintained border demands against Chile, but now calling on the International Court of Justice to achieve peaceful solutions.

14 General Ricardo Izurieta Caffarena must not be mistaken for his cousin Óscar Iizurieta Ferrer, who was also Commander-in-Chief of the Chilean Army later in time, between March 2006 and March 2010, and whom was interviewed by me in October 2015.

Internally, Chile has participated in a tense process of transition to democracy, conducted in an agreeable manner, but haunted by the former dictator's permanence as Commander-in-Chief of the Army. Resorting to this political position and the considerable power and prestige he enjoyed along with a significant part of the Chilean society, Pinochet used repeated armed threats to the government as a way to avoid or delay the measures of accountability of those involved in violations against Human Rights during dictatorship.

During these transition years, Pinochet was able to glimpse the changes Chile would undergo in the democratic future being established, and the new demands that would fall on the Armed Forces. Thus, despite using the Army as an instrument of support for his remaining personal power, Pinochet devised a plan to modernize the Force, which would initially be implemented in its superficial aspects, but which should be deepened after his replacement in the command of the Institution.

Therefore, we observed that the impulse of modernization of the Chilean Army emerged within the institution, and it was proposed on the initiative of the Commander-in-Chief of the Force himself. Moreover, we perceived that the political-strategic framework of regional relenting character did not require innovative changes to the Chilean Army. The main motivation for these changes was the aspiration to transform the land force into a modern and efficient institution, respected within the country, and on par with a country that sought a new insertion at the international level. This case demonstrates that armed institutions, despite their conservative disposition, are able to identify their weaknesses and promote changes and innovations.

It should be noted that the design of the Chilean Army modernization project was not subjected to the control of civilian authorities, since the moment was of complete dissociation between the military high command, represented by General Pinochet, and the political authority, represented by the Minister of Defense Patricio Rojas. During the effective implementation of modernization, after Pinochet's replacement, political authorities of *Concertación* governments chose to provide freedom of action to the military, because they understood professionalization as a way to remove military from politics, according to the objective civilian control model.

In short, the Chilean case of modernization of its Army, which began in the 1990s, refutes the theoretical model proposed by Barry Posen (1984), according to which the armed forces would be averse to doctrinal innovations and would depend on interventions on the part of authorities in order to rupture the peculiar inertia of conservatism of the military and to impose the achievement of changes and innovations. Conversely, we observed that this case corresponds to a large extent to the model described by Stephen Rosen (1991), in which the Chilean civil political leadership of the *Concertación* was based on the modernization initiative emerging within the officialdom of the Army as well as on the legitimacy enjoyed by the military leadership in the institution to conduct the process. From a political point of view, the elevation of the Army military performance standards would allow political leadership to exercise civilian control over the armed forces using military professionalism.

References

ARANCIBIA, P. Chile-Perú: una década en tensión 1970-1979. Capítulo Final: Velasco Alvarado fija el "Día D" y Morales Bermúdez lo desactiva. **La Segunda**, Santiago, 24 agosto 2007. Serie Histórica. Disponível em: https://bit.ly/32uIkB1. Acesso em: 8 nov. 2019.

ARANCIBIA CLAVEL, R. **La influencia del Ejército Chileno en América Latina 1900-1950**. Santiago: Centro de Estudios e Investigaciones Militares, 2002.

AUTO de detención dictado a Augusto Pinochet. Juez Baltazar Garzón Real. **Analítica.com**, Caracas, 25 sept. 2013. Disponível em: https://bit.ly/34O1naN. Acesso em: 19 abr. 2017.

BLANCPAIN, J. P. L'armee chilienne et les instructeurs allemands en Amerique Latine (1885-1914). **Revue Historique**, Paris, t. 285, fasc. 2 (578), p. 347-394, 1991.

BRAHM GARCÍA, E. **Preparados para la guerra**: pensamiento militar chileno bajo influencia alemana 1885-1930. Santiago: Ediciones UC, 2003.

BURR, R. N. **By Reason or Force**: Chile and the balancing of power in South America 1830-1905. Berkeley: University of California Press, 1974.

CASO RIGGS: Condenan a 6 militares (r) por malversar fondos para Augusto Pinochet. **El Mercurio**, Santiago, 8 mayo 2015. Disponível em: https://bit.ly/2Cswsoh. Acesso em: 19 abr. 2017.

CAVALLO, A. **La historia oculta de la transición**. Santiago: Grijalbo, 1998.

CENTRAL INTELLIGENCE AGENCY. Directorate of Operations. **Peru-USSR**: Implications of the Military Relationship. Washington, DC: CIA, Dec. 1982. Research Paper. Disponível em: https://bit.ly/2rqSHc9. Acesso em: 24 abr. 2017.

CERVO, A. L.; BUENO, C. **História da política exterior do Brasil**. 3. ed. Brasília, DF: UnB, 2010.

CHILE. Ministerio del Interior. Decreto supremo num. 1150 por el que se aprueba la Constitución política de la República de Chile de 1980. **Diario Oficial de la República de Chile**, Santiago, 21 oct. 1980.

CHILE. Ministerio de Relaciones Exteriores. Tratado de Paz y Amistad. **Diario Oficial de la República de Chile**, Santiago, p. 3-6, 14 mayo 1985. Disponível em: https://bit.ly/2NtKYCv. Acesso em: 8 nov. 2019.

CHILE. Ministerio de Defensa Nacional. Ley Orgánica Constitucional de las Fuerzas Armadas. **Diario Oficial de la República de Chile**, Santiago, 28 feb. 1990a. Disponível em: https://bit.ly/2Q2uvXB. Acesso em: 18 abr. 2017.

CHILE. Ministerio de Justicia. Subsecretaria del Interior. Decreto Supremo nº 355. Crea Comisión de Verdad y Reconciliación. **Diario Oficial de la República de Chile**, Santiago, 25 abr. 1990b. Disponível em: https://bit.ly/2Q6getj. Acesso em: 17 abr. 2017.

CHILE. Ejército de Chile. **Ejército de Chile**: trayectoria y futuro. Santiago: Ejército de Chile, 21 ago. 1992. Arquivo do Departamento Cultural, Histórico e de Extensão do Exército. Documento D-132.

CHILE. Ejército de Chile. **Conferencia "Ejército de Chile: posibles elementos a considerar en su proyección futura"**. Santiago: Ejército de Chile, 19 ago. 1993. Arquivo do Departamento Cultural, Histórico e de Extensão do Exército. Documento D-131.

CHILE. Ejército de Chile. Estado Mayor General. Dirección de Racionalización y Desarrollo. **Exposición Sobre el Plan de Modernización del Ejército "Alcázar"**. Santiago: Ejército de Chile, 27 sept. 1994a. Arquivo do Departamento Cultural, Histórico e de Extensão do Exército. Coleção CAE, ano 1994, v. 161.

CHILE. Ejército de Chile. **Modernización del Ejército**: realidad y futuros alcances. Santiago: Ejército de Chile, ago. 1994b. Arquivo do Departamento Cultural, Histórico e de Extensão do Exército.

CHILE. Comisión Nacional de Verdad y Reconciliación. Corporación Nacional de Reparación y Reconciliación. **Informe de la Comisión Nacional de Verdad y Reconciliación**. Santiago: Comisión Nacional de Verdad y Reconciliación, 1996. 3 tomos. Disponível em: https://bit.ly/32sSemG. Acesso em: 17 abr. 2017.

CHILE. Ejército de Chile. **Memoria del Ejército de Chile 2001**. Santiago: Ejército de Chile, 2001.

ECONOMIC Freedom, overall index – Country rankings. **The Global Economy.com**, [*s. l.*], 2019. Disponível em: https://bit.ly/2qzOjqV. Acesso em: 1 mar. 2019.

-EL DÍA que Velasco quiso invadir Chile. **El Poder.com**, Lima, 3 sept. 2014. Disponível em: https://bit.ly/2CrxbGq. Acesso em: 22 abr. 2017.

ESCALONA MEDINA, C. **De Allende a Bachelet**: una vida política. Santiago: Agilar, 2012.

FARRELL, T.; TERRIFF, T. The Sources of Military Change. *In*: FARRELL, T.; TERRIFF, T. (ed.). **The Sources of Military Change**: Culture, politics, technology. Boulder: Lynne Rienner Publishers, 2002. p. 3-20.

GAZMURI, C. Las armas chilenas 1975-1982. **Defensa y Desarme**: América Latina y Caribe, Santiago, v. I, n. 1, sept./dic. 1985. Disponível em: https://bit.ly/2K2biSk. Acesso em: 8 nov. 2019.

GOLDMAN, E. O. The Spread of Western Military Models to Ottoman Turkey and Meiji Japan. *In*: FARRELL, T.; TERRIFF, T. (ed.). **The Sources of Military Change**: Culture, politics, technology. Boulder: Lynne Rienner Publishers, 2002. p. 41-67.

HUNTINGTON, S. P. **O soldado e o Estado**: teoria e política das relações entre civis e militares. Rio de Janeiro: Biblioteca do Exército, 1996.

INFANTE, M. T. Controversia chileno-argentina en la región del Canal Beagle: laudo arbitral de 18 de abril de 1977. **Revista Chilena de Derecho**, Santiago, v. 6, p. 423-447, 1979. Disponível em: https://bit.ly/2p4sbo8. Acesso em: 8 nov. 2019.

INTERNATIONAL COURT OF JUSTICE. **Maritime Dispute (Peru v. Chile)**. Summary of the Judgment of 27 January 2014. The Hague: ICJ, 2014. Disponível em: https://bit.ly/36NozIf. Acesso em: 17 abr. 2017.

IZURIETA FERRER, Óscar. [Entrevista cedida a] Fernando Velôzo Gomes Pedrosa. Santiago: Academia de Guerra do Exército do Chile, 13 out. 2015.

JOHNSTON, A. I. Thinking About Strategic Culture. **International Security**, Cambridge, v. 19, n. 4, p. 32-64, 1995.

KENNEDY y la enmienda con la que le puso límites a la dictadura argentina. **Clarín**, Buenos Aires, 31 ago. 2009. Disponível em: https://bit.ly/32x633g. Acesso em: 23 abr. 2017.

KÖRNER, E. El Desarrollo Histórico del Ejército Chileno por Emil Körner, General de División Chileno (1910). *In*: QUIROGA, P.; MALDONADO, C. **El prusianismo en las Fuerzas Armadas Chilenas**: un estudio histórico 1885-1945. Santiago: Ediciones Documentas, 1988. p. 181-224.

LE DANTEC GALLARDO, Cristián. [Entrevista cedida a] Fernando Velôzo Gomes Pedrosa. Santiago: Academia de Guerra do Exército do Chile, 27 out. 2015.

MADRID MURÚA, R. La Estrategia Nacional y Militar Que Planificó Argentina, en el Marco de una Estrategia Total, Para Enfrentar el Conflicto con Chile el Año 1978. **Memorial del Ejército de Chile**. No. 471, Año 2003. p. 50-70.

MEYER, J. W.; ROWAN, B. Institutionalized Organizations: Formal structure as myth and ceremony. **The American Journal of Sociology**, Chicago, v. 83, n. 2, p. 340-363, 1977.

MURRAY, W. Innovation: Past and future. *In*: MURRAY, W.; MILLETT, A. R. **Military Innovation in the Interwar Period**. Cambridge: Cambridge University Press, 1998. p. 300-328.

NAGL, J. A. **Learning to Eat Soup with a Knife**: Counterinsurgency lessons from Malaya and Vietnam. Chicago: The University of Chicago Press, 2005.

PATTILLO, G. Asignación de recursos a las fuerzas armadas en Chile: situación actual y propuesta. **Estudios Públicos**, Santiago, v. 89, p. 91-128, 2013. Disponível em: https://bit.ly/2CpTvQT. Acesso em: 8 out. 2019.

PEDROSA, F. V. G. Ideologia e ética militar no Brasil. **Coleção Meira Mattos**: revista das ciências militares, Rio de Janeiro, v. 3, n. 27, dez. 2012. Disponível em: https://bit.ly/2pKvotv. Acesso em: 8 nov. 2019.

PERU. Congreso de la República. **Tratado de paz de ANCON**. Lima: Congreso de la República, 20 oct. 1883. Disponível em: https://bit.ly/2X2PCL3. Acesso em: 22 abr. 2017.

PERU. Tratado de Lima y su protocolo complementario (Lima, 03 de Junio de 1929). **Diario Oficial de Chile**, Lima, 6 agosto 1929. Disponível em: https://bit.ly/34Gckey. Acesso em: 22 abr. 2017.

POSEN, B. R. **The Sources of Military Doctrine**: France, Britain, and Germany between the World Wars. Ithaca: Cornell University Press, 1984.

RODRÍGUEZ S., J. A. **Chile en el Canal Beagle y mares australes**: tratado de paz entre Chile y Argentina. Santiago: Gráfica Progresión, 1985.

ROSEN, S. P. **Winning the Next War**: Innovation and the modern military. Ithaca: Cornell University Press, 1991.

RUBILAR LUENGO, M. La "Prusia americana": prensa argentina e imagen internacional de Chile durante la Guerra del Pacífico (1879-1881). *In*: CHILE. Ejército de Chile. Departamento Cultural, Histórico y de Extensión. **Jornada de Historia Militar IX y X (regiones)**. Santiago: Departamento de Historia Militar del Ejército, 2016. p. 219-254.

SALAZAR JARA, Álvaro. [Entrevista cedida a] Fernando Velôzo Gomes Pedrosa. Rio de Janeiro: Escola de Comando e Estado-Maior do Exército, 6 nov. 2017.

SOTO, Á.; SÁNCHEZ, F. La "Revolución de las Libertades". A 40 años de la puesta en marcha del Plan de Recuperación Económica Chileno. *In*: SOTO, Á.; SÁNCHEZ, F. (comp.). **El "Padre" de los Chicago Boys**: Arnold Harberger. Santiago: Centro de Estudios Bicentenario, 2015. p. 21-29.

TAGLE D., M. Introducción. *In*: TAGLE D., M. (ed.). **El Plebiscito del 5 de octubre de 1988**. Santiago: Corporación Justicia y Democracia, 1995. p. 7-10.

WATTS, B.; MURRAY, W. Military Innovation in Peacetime. *In*: MURRAY, W.; MILLETT, A. R. **Military Innovation in the Interwar Period**. Cambridge: Cambridge University Press, 1998. p. 369-415.


ECEME

AUTHOR GUIDELINES AND ADDITIONAL INFORMATION

The entire submission process should be performed through our editorial management system, available at:

http://ebrevistas.eb.mil.br/index.php/RMM/index (Short URL: bit.ly/cmmbr)

In case of doubts or technical difficulties, please contact us by email: info.cmm@eceme.eb.mil.br

The manuscript:

1. It must be original and unpublished;
2. It must not have been published or be in assessment process by another journal, and an eventual submission to another journal will only occur after the assessment return;
3. A substantially similar version must not have been published in annals of events.

Guidelines for Authors

The following guidelines are essential to good editorial flow. Please, read the instructions carefully to be sure that your article meets all requirements. Complete regulatory requirements must be accessed directly in our system.

Article submissions are open in a continuous flow. Other publications such as interviews or technical reports will be selected directly by the editorial team.

Focus and Scope

The *Coleção Meira Mattos* is an interdisciplinary journal that publishes scientific articles related to Security, Defense and Military Sciences, promoting a dialogue between academics and professionals and integrating questions about Armed Forces and Society. It publishes peer-reviewed articles and, occasionally, interviews and selected technical reports on current issues of interest to the area.

Formatting

The papers should be submitted in Word or RTF format.

Structure

Language: articles may be submitted in Portuguese, English or Spanish.

Title: The title should be brief, limited to 22 words (including, if any, the subtitle).

Abstract: with a maximum of 150 words in the language of the text and in English (when submitted in Portuguese or Spanish). It must describe the objectives, methodology and results.

Keywords: at least three and at most five.

Tables, graphics and images: Use editable formats whenever possible so that translations can occur directly in the image. The quality of the images should be 300dpi when they are not from Word/Excel (tables and graphics). The graphic content should be included only if they provide indispensable information for the article's understanding.

Word limit: The article should have between 6000 and 8000 words, including pre-text and references. However, major or minor articles may be published as long as justified by the content of the contribution.

Footnotes: Notes should be included as little as possible and only for essential information. They should be included on the same page as the note, do not use endnote. Avoid using notes to reference, privilege the use of author-date citations directly in the text. For notes of informative texts available on the Internet that are of interest to the reader and which are not direct or indirect citations, such as news, institutional or corporate websites, electronic documents, tables or statistical data, the link and access date must be indicated, as following example:

[Explanatory text]. Available at: [website]. Access on: [month abbr. Day, year].

More information available on the Brazilian Army website. Available at: www.eb.mil.br. Access on: Jul. 2, 2019.

Other Recommendations

Indication of financing: it should be indicated as a footnote of the title if the research is financed and who financed it. Also indicate, when available, the process number. According to the following structure:

Study/Research project financed by the [funding body], through [project/program], [notice/process].

Example:

Study funded by the Brazilian Ministry of Defense and the *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (CAPES), through the Program of Support for Teaching and Scientific and Technological Research in National Defense (*Pró-Defesa*), notice 27/2018.

Data about the author(s): they must be informed only in the metadata filled in the system when submitting the article. Only the full name, institutional association and e-mail address will be published.

Example:

Tássio Franchi

Exército Brasileiro, Escola de Comando e Estado-Maior do Exército, Instituto Meira Mattos. Rio de Janeiro, RJ, Brasil.

editor.cmm@eceme.eb.mil.br

We will not accept articles with more than 4 (four) authors/co-authors.

The authors should have at least a masters or similar degree and, preferably, one of them should have a doctorate degree.

Additional documents: Other documents may be inserted during submission to assist reviewers in the article assessment process. However, only the article will be published and made available in the journal.

Citations and References

CMM adopts the Brazilian standards for references and citations, respectively ABNT 6023:2018 and 10520:2002.

For authors not familiar with the ABNT standard, we ask that you adapt your citations and references as much as possible according to the following examples. All references and citations will be reviewed by experts, ensuring their uniformity. However, articles standardized in other presentation standards will not be accepted.

See the full standard requirements and examples of references and citations on our website.

Copyright Statement

Acknowledgements

Our acknowledgment for the the financial and administrative support from the following institutions and their related agencies. As well as all staff who get involved directly and indirectly with the Coleção Meira Mattos in 2020.

Ministério da Defesa

Departamento de Educação e Cultura do Exército

Diretoria de Educação Superior Militar

Diretoria do Patrimônio Histórico e Cultural do Exército

EB Conhecer

Escola de Comando e Estado-Maior do Exército

Coleção Meira Mattos

revista das ciências militares

Publication

EXÉRCITO BRASILEIRO
Braço Forte - Mão Amiga

ECEME

Edition

INSTITUTO MEIRA MATTOS
ESCOLA DE COMANDO E ESTADO-MAIOR DO EXÉRCITO

PPGCM