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Sea Power and the Canadian Military-Naval Industry (2010-2020)

Poder Naval e a Indústria Militar-Naval Canadense (2010-2020)

Jéssica Pires Barbosa Barreto[1]

Thauan Santos[2]

[1]Cluster Tecnológico Naval do Rio de Janeiro (CTN-RJ), Rio de Janeiro, RJ, Brasil. **E-mail**: barretojessicapb@gmail.com **ORCID**: https://orcid.org/0000-0002-1176-3682

[2]Escola de Guerra Naval (EGN), Rio de Janeiro, RJ, Brasil. **E-mail:** santos.thauan@gmail.com **ORCID**: https://orcid.org/0000-0002-4001-4322.

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ABSTRACT

Due to the historical difficulty of high investments in periods of conflict and large cuts in periods of peace, the Canadian military-naval industry and the country's Navy suffered from a lack of infrastructure, low technological development in some areas and scrapped equipment. After years of instability, the Harper government launched in 2010 the National Shipbuilding Strategy in an ambitious attempt to modernize the Navy and Coast Guard. Thus, the main objective of the article is to understand the role of the State as a relationship promoter within this sector and its influence on the country's naval power. The analysis is based on the Structure-Conduct-Performance (SCD) model. The research uses academic articles, documents, and official reports, and is limited to 2010-2020, based on the launch of the strategy that was a milestone for the industry.

Keywords: Military-Naval Industry; NSS; SCP Paradigm.

RESUMO

Por uma dificuldade histórica de altos investimentos em períodos de conflitos e grandes cortes em períodos de paz, a indústria naval militar canadense e a Marinha do país sofrem com falta de infraestrutura, baixo desenvolvimento tecnológico em algumas áreas e equipamentos sucateados. Após anos de instabilidades, o governo Harper lançou, em 2010, a *National Shipbuilding Strategy* numa ambiciosa tentativa de modernizar a Marinha e a Guarda Costeira. Dessa forma, o principal objetivo do artigo é entender o papel do Estado como promotor das relações dentro desse setor e sua influência para o poder naval do país. A análise é baseada no modelo Estrutura-Conduta-Desempenho (E-C-D). A pesquisa utiliza artigos acadêmicos, documentos e relatórios oficiais, e tem como delimitação temporal 2010-2020, baseado no lançamento da estratégia que foi um marco para a indústria.

Palavras-chave: Indústria Naval-Militar; NSS; Modelo E-C-D.

1. INTRODUCTION

Historically, Canadian defense strategies are heavily influenced by their geographic position. Being located between three oceans – Arctic, Atlantic and Indian – and the United States of America (USA), the country faced instability in investments for the defense portfolio. Having land connection only with the US, this position was also seen as a difficulty for possible enemies to access its territory, influencing society's security imaginary.

In 1910, the Royal Canadian Navy (RCN) was officially established, mainly for patrolling illegal fishing, but the first effort to modernize its equipment only came during World War I (1914-1918), due to the role of its shipbuilding industry in meeting the demands of the UK in the conflict. Therefore, Canadian defense investments encounter instability over time. Especially in the post-Cold War period, massive cuts were made, and the country's armed forces had to deal

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with scrapped equipment. This condition directly affected the country's ability to act internationally.

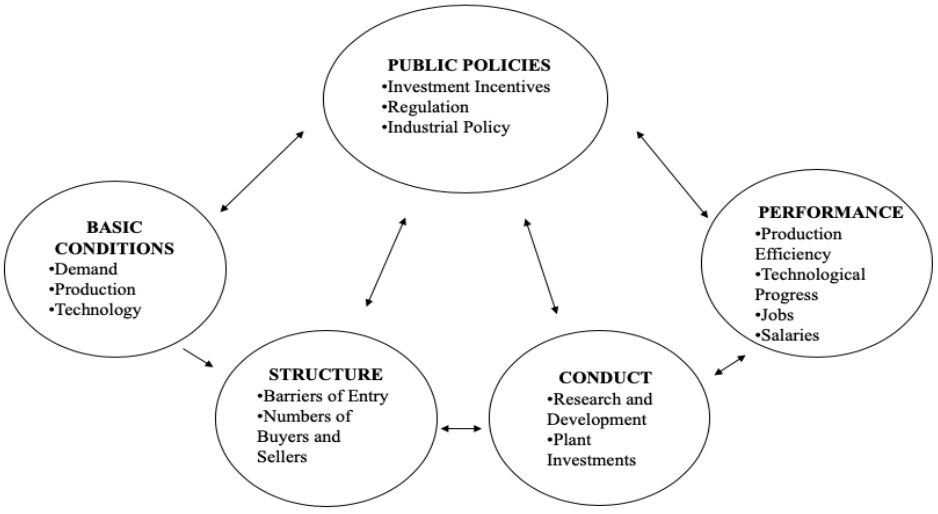
Canada's National Shipbuilding Strategy (NSS), launched in 2010, is set out in an attempt to end these "cycles of Boom and Bust" in the shipbuilding sector, providing predictability for acquisitions and ensuring future maintenance of Naval equipment. The policy provides for the construction of small and large vessels, in addition to the modernization of several assets, over the next 20 years. Thus, the article aims to analyze the Canadian military naval industry, establishing a parallel of the sector before and after the introduction of the policy, identifying the role of the State in the development of the area and the importance of this development for the performance of the RCN in the international scenario.

The article will be divided into three main sections: the first provides a brief presentation of the Structure-Conduct-Performance (SCP) paradigm, showing the possibility of using this economic perspective in different themes of international relations. The following section will be divided into two parts: the first provides a historical analysis of the industry and the other brings an analysis based on the results of the National Shipbuilding Strategy (NSS). The last section shades some light establishes from this analysis.

2. SCP PARADIGM

The Structure-Conduct-Performance (SCP) paradigm is considered one of the main analytical models of the Industrial Economy. This field of study seeks to understand the behavior of the industries in markets that do not respond to the classic paradigms of pure and perfect competition theory (Lelissa and Kuhil, 2018). The SCP paradigm emerges from the works of Edward Mason in the 1930s (Kupfer and Hasenclever, 2013). However, the theory received several contributions from other authors for its better structuring - e.g. the works of Joe Bain and Frederick Scherer.

Figure I – SCP paradigm adapted to Canada's naval industry



Source: Own elaboration.

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The SCP paradigm is then formed by the idea that it is possible to identify causal and determinant relationships between market structure, behavior, and performance. In addition, the model improved by Scherer and Ross also presents an earlier component that influences the structure, which would be the basic conditions - supply and demand - and a component that could affect the others, which would be the government policies, as shown in **Figure I** – highlighting the factors considered in this analysis of the Canadian naval industry. Therefore, while Bain believed that the determination among the three major components followed a causal line, many later scholars point out other relations, leaving the model more dynamic and interdependent (Lelissa and Kuhil, 2018).

Consequently, the first component that needs understanding is the Structure, which would be the set of characteristics of the market that is being studied. The variables that compose this element are usually stable over time, and a great rupture is necessary to modify them, but the analyst must be careful with the peculiarities of each industry, including technological, geographic, institutional aspects (Lopes, 2016).

The second component is Conduct, which would be the behavior of the companies facing the market they make up. There is a need to adopt certain strategies to improve performance such as the level of advertising and investment in research and development. The third component of this model is performance, that is related to the economic results (Lelissa and Kuhil, 2018). In this way, Scherer and Ross (1990) introduced the concept of multidimensional evaluation, seeking to analyze not only the efficiency of these companies, but also aspects such as jobs and salaries (Lopes, 2016).

The last relevant component, which was established as a contribution to the original model, is Public Policies. Ergo, government intervention in the market, through regulating interactions and conditions of supply and demand, can establish changes in the structure or influence the conduct and performance of this industry (Neuberger, 1997). Nevertheless, these policies may be specific to the industry being analyzed or have an indirect influence on it (Lopes, 2016). The Public Policy component is fundamental for an analysis based on international relations. It is important to note how a measure of the State, based on internal and external incentives, can change the other variables. The role of the State is key when analyzing the relevance of the defense economy, even in developed countries (Santos, 2018; Leske and Santos, 2020).

Table I shows that SCP model is widely used in academia. Although its use is concentrated in the Administration and Economics areas, the authors identified that the model is extremely versatile and could enrich international analysis, bringing the internal economic factor to the countries' capacity and acting analysis. The comprehension of the total picture is key to the study. Still, some consolidated authors in the literature of Social Science and Defense, like Keith Hartley, have already used this, what encouraged this analysis.

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Table I – Examples of studies using the SCP model

Publication Year	Author(s)	Theme / Research Area	Scope
1988	Hartley	Defense industry	Defense
1996	Davies and Downward	Hotel industry	Economics
1997	Neuberger	Banking industry	Economics
2006	Thille	Competitiveness in Canadian Industries	Economics
2006	Panagiotou	Strategic management	Administration
2007	Hartley	Armaments industry	Defense
2010	Markowski *et al.*	Defense acquisitions	Defense
2011	Hartley	Industrial Defense Base	Defense
2014	Anh *et al.*	Vietnamese firms	Economics
2015	Chidoko *et al.*	Beer industry	Economics and trade
2016	Xu	Film industry	Social Sciences
2016	Bastos and Souza	Tissue paper market	Production engineering
2017	Stanciulescu and Molnar	Turism agencies	Economics
2017	Lorizola	Energy sector	Administration
2018	Li *et al.*	Men's clothing industry	Fashion Technology

Source: Own elaboration.

3. CANADIAN MILITARY NAVAL INDUSTRY

3.1. Brief history

The Canadian shipbuilding industry began in the nineteenth century, when the country was still a colony of the United Kingdom (UK) (Shoute, 2015). When the Canadian Navy was officially launched (1910), there was already limited capacity and infrastructure for shipbuilding. The government of the time planned a newly sequenced force, leading to the idea that all

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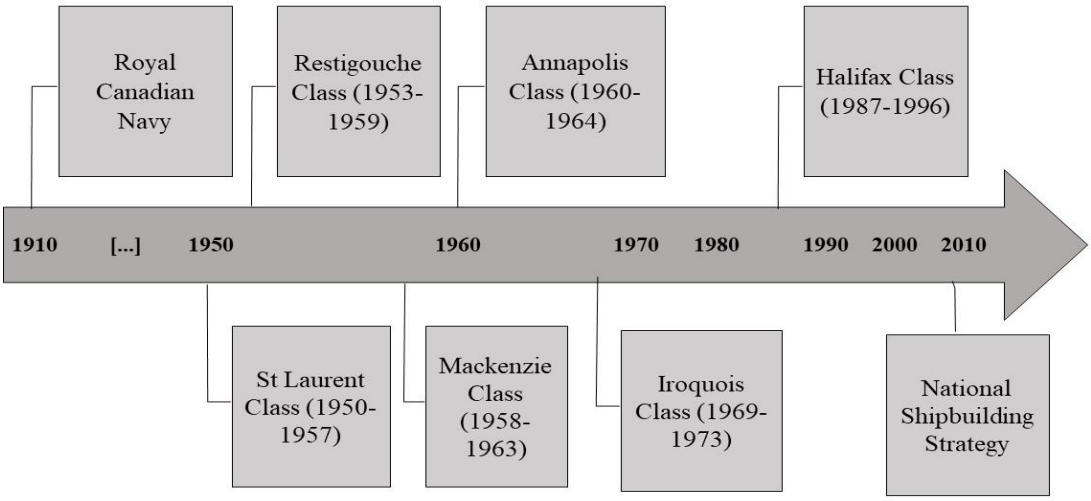
vessels should be built in Canada (Young, 2012). However, the government lost the 1911 elections, leaving a Navy with obsolete vessels bought from the British.

During World War I (1914-1918), the Canadian shipbuilding industry had great demands, serving as the basis for much of the industrial base that the country had at the end of the 20th century. With the end of the conflict, there was an idea that the industry should be used in the same amount (Young, 2012), but, by 1925, the movement in the shipyards had greatly diminished. The government was not favorable to promote incentives to the sector until the beginning of the World War II (1939-1945) (Hennessy, 1991).

The Canadian shipbuilding industry is then marked by instabilities regarding its demand and production capacity. The last major Canadian vessel project took place during the 1980s and 1990s with the Canadian Patrol Frigate Project, which was the first time the industry was put in charge of project management as prime contractor[3] (Gimblett, 2015). Thus, the process of acquiring these frigates, which resulted in the Halifax-class, had as its main objective to enable the industry to manage large projects (Haydon, 2008).

As exemplified in the **Figure II**, the demands for construction of new vessels were higher during the years 1950-1960, although most of the projects were escorts, and after this moment there was only the frigates project. Thereafter, a number of capable facilities with high industrial development closed because they had no possibility of new construction in the near future or adapted capabilities to more general activities (Young, 2012).

Figure II – Important Events in Canada's Naval Industry



Source: Barreto, 2020, p. 46.

[3] Prime Contractors have to deal with the management and integration of all necessary skills and contributors within the given time frame. For years, the Canadian government had the responsibility for integrating the system developed by different entities. The Navy also acted in this way in projects, especially in the 1970s, but from the 1980s and 1990s, the responsibility passed to the private sector, that is, the shipyard that won the competition for the construction project.

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These production cycles caused shipyards to invest in the expansion of their capacity, and then decrease due to lack of production. Hence, the capability of the industry has to be rebuilt with every program the government launched (Auger, 2015). The government announced in June 2010 the NSS, which would be a long-term plan for the renewal of the RCN and the Canadian Coast Guard fleet, and giving security to the investments in the naval industry (Canada, 2019a).

The NSS is made up of three components: the construction of large ships, the construction of small ships, and the maintenance and repair program - the first of these components being the largest and most expensive of the entire program, and implemented in phases (Auger, 2015). The large ships component consists of two packages – combatant and non-combatant - and six projects in different construction phases, as shown in Table II. The first phase of the implementation of large vessels program (2010) was related to the development of the strategy itself, which was carried out based on extensive consultations with key industry bodies (Canada, 2019b).

The second phase (2010-2012) was the selection of the shipyards (Shoute, 2015). Notwithstanding, this selection did not guarantee that the yards would be responsible for the constructions, but aimed at establishing a strategic relationship between them and the government. This selection established a new form of procurement within government (Auger, 2015). The third phase (2012) consisted in establishing the relationship between the government and the two yards selected materialized by the signing of umbrella agreements in January 2012 (Canada, 2019b). These agreements, although they are not exactly contracts, established principles and intentions about this relationship, as well as the conditions for the shipyards to have the contracts (Auger, 2015).

The penultimate phase concerned the design part of the vessels and modernization of the facilities responsible for the constructions. The modernization requirements were established in the umbrella agreements and are being overlook by an impartial third party - First Marine International. Assessments will be made on a regular basis to ensure the capacity of the shipyards and the improvement of their productivity (Canada, 2019b). Therefore, there was great engagement in revitalization, with Irving Shipyard investing $ 350 million between 2012-2015 and Seaspan Shipyard investing $ 170 million over the same period (Canada, 2016a). The last phase, which is in progress, is the construction of vessels (Canada, 2019b). As it is a period with few economic advances, the period 2012-2015 will be presented jointly by the following figures.

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Table II – Status of the Large Vessels Projects

	AOPS	Canadian surface combatant	Offshore fisheries science vessel	Offshore oceanographic science vessel	Joint support ship	Polar icebreaker
Expected number of vessels	6	15	3	1	2	1
Shipyard	Irving	Irving	Seaspan	Seaspan	Seaspan	Seaspan
2012-2015	Construction Contract Awarded in Jan/2015	Definition Phase	Construction Contract Awarded in Jun/2015	Definition Phase	Definition Phase	Definition Phase
2016	Construction Contract Awarded in Jan/2015	Definition Phase	Construction in Progress	Definition Phase	Definition Phase	Contract design stage
2017	Construction in Progress	Bid evaluation phase	Construction in Progress	Definition Phase	Design and production engineering phase	Design is complete
2018	Construction in Progress	Design phase	Construction in Progress	Definition Phase	Design and production engineering phase	Design is complete
2019	Construction in Progress	Design phase	Construction in Progress	Definition Phase	Design and production engineering phase	Design is complete
2020	Construction in Progress	Design phase	Completed	Construction expected to begin in 2021	Construction expected to begin in 2021	Construction engineering

Source: Own elaboration.

Irving Shipyard and Seaspan Shipyard cannot bid for contracts of others NSS projects because of the search to favor as many companies as possible, especially those of small and medium size (Canada, 2016b). Therefore, NSS has been responsible for establishing a new structure for the management and supervision of large projects, including several new governance bodies under the leadership of public services and procurement (Auger, 2015).

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Besides, the strategy strengthens the industry, maintaining the capacity of shipyard operations and presenting several economic benefits for this market.

3.2. Analysis from SCP model

The Canadian government seeks to provide a domestic industry with production capacity, not only aiming economic benefits, but also to ensure its safety and the prevalence of its interests on the international scenario. In addition to its presence in the Arctic, Canada is responsible for its participation in different military exercises with allied countries and NATO to ensure its interoperability in a situation of conflict. Notwithstanding, as previously discussed, this area is extremely dependent on government demand. In this way, like the Navy and the Coast Guard, the industry took the NSS with enthusiasm, as a new wave of renewal and possibilities of improvement (Auger, 2015).

Such projects involve several areas of high technological development and specific technical knowledge, like Platform Systems and Ship Design. In addition to investments in infrastructure modernization, the shipyards also invested in hiring employees and in specialized training to the staff. They also established relationships with companies from the first nations to modernization and supplies, showing the possibilities of diversifying the benefits of NSS (Canada, 2016a). This conduct of the shipyards was necessary to deal with the increase of demand the NSS made.

However, this need of having the physical capacity to house the projects, besides the specific technical and technological knowledge of the area, ends up forming a barrier to the entry of new companies in this market. In addition, the largest buyer of vessels within the Canadian market is the government itself, but there has not been a constant demand during these years, mainly because they are products with a long useful life. The structure of the Canadian military shipbuilding market is set to be relatively small, although we can see the beginning of some changes in this structure influenced by the increasing of the basic conditions.

The government also had to face challenges, since many who worked on the latest shipbuilding projects were no longer in the administration and took this expertise with them. Therefore, the initial budget for the projects presented by NSS varied considerably, as we can see in **Table III**. The values identified in Canadian dollar have been made available by the government in different project reviews over the past few years and were not adjusted for inflation.

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Table III - Budget for NSS large vessel component projects (C$)

Projects	2010	2013	2014	2015	2017	2018	2019	2020
Combat Package	**28.5 b**	**29.3 b**	**29.7 b**	**29.7 b**	**59.5 b - 63.5 b**	**60.3 b - 64.3 b**	**60.3 b - 64.3 b**	**60.3 b – 64.3 b**
AOPS	2.3 b	3.1 b	3.5 b	3.5 b	3.5 b	4.3 b	4.3 b	4.3 b
CSC	26.2 b	26.2 b	26.2 b	26.2 b	56 b – 60 b	56 b – 60 b	56 b –60 b	56 b - 60 b
Non-combat Package	**3.78 b**	**4.3 b**	**4.64 b**	**4.73 b**	**5.9 b**	**5.9 b**	**8.8 b**	**5.8 b**
JSS	2.6 b	2.6 b	2.6 b	2.6 b	3.4 b	3.4 b	6.4 b	4.1 b
OFSV	244 m	244 m	594 m	687 m	687 m	687 m	788.5 m	788.5 m
OOSV	144.4 m	144.4 m	144.4 m	144.4 m	331 m	331 m	331 m	966.5 m
Icebreaker	0.8 b	1.3 b	1.3 b	1.3 b	1.3 b	1.3 b	$ 1.3 b	To be determined

Source: Own elaboration, based on Barreto, 2020, p. 77.

Due to the lack of support from society regarding investments for the defense portfolio, the Canadian government traditionally justifies the discourse of modernization project of its fleet, in addition to the need of maintain the ability of its armed forces, with concerns to the economic benefits to the society, using variables like contribution to GDP and jobs. Although the NSS was officially launched in 2010, the choice of shipyards for large vessels constructions only took place in 2012, and the contracts were negotiated and signed after this period. Therefore, the data used in this work will be from that period.

It is important to note that the GDP impact data presented correspond to the impact that the whole strategy will have during its period of operation, defined in principle as between 2012 and 2022. Some reports present the idea of annual impact; however, the values were only divided by the number of years in the project, which makes them inaccurate for the analysis developed here.

The report for the period between 2012-2015 shows a total project impact of $ 4.4 billion on GDP and maintenance of 5,500 jobs by 2022 (Canada, 2016a) while the 2016 report shows a projection of $ 7.7 billion on GDP and maintenance of 7,350 jobs by 2022 (Canada,

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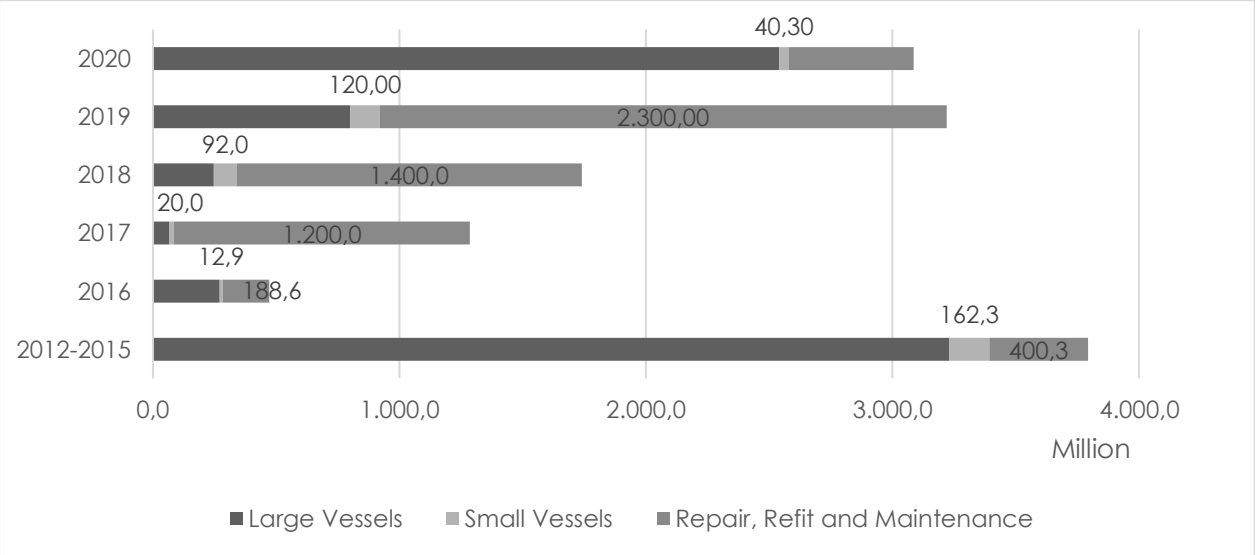
2017). The third report, covering the year 2017, shows a total impact of $ 8.9 billion and 8788 jobs (Canada, 2018a), and the latest available report, related to 2018, shows a projection of $ 10.9 billion on GDP and 10.190 jobs throughout the NSS period (Canada, 2019c). In the 2019 report, the projection is a contribution of $1 billion annually to the GDP and 15.500 jobs between 2012-2022 (Canada, 2020). In the last report available, the data shows that contracts awarded only in 2020 will contribute additional $2.7 billion to the GDP until 2022 and 8.400 jobs annually between 2020-2022 (Canada, 2021).

Thus, as exemplified in **Figure III**, from 2012 to 2015 contracts in Large vessels totaled $ 3.2 billion (85,1%), Small Vessels totaled $ 162.3 million (4,3%) and Repair, Refit and Maintenance contracts totaled $ 400.2 million (10,6%) (Canada, 2016a). In 2016, contracts in large vessels totaled $ 270.8 million (57,3%), Small Vessels totaled $ 12.9 million (2,7%) and Repair, Refit and Maintenance Projects totaled $ 188.6 million (40%) (Canada, 2017).

By 2017, contracts in large vessels totaled $ 65 million (5,1%), Small Vessels totaled $ 20 million (1,6%) and Repair, Refit and Maintenance Projects totaled $ 1.2 billion (93,3%) (Canada, 2018a). In 2018, contracts in large vessels totaled $ 247 million (14,2%), Small Vessels totaled $ 92 million (5,3%) and Repair, Refit and Maintenance Projects totaled $ 1.4 billion (80,5%) (Canada, 2019c). In 2019, contracts in large vessels component totaled $ 800 million (24,8%), Small Vessels totaled $ 120 million (3,8%%) and Repair, Refit and Maintenance Projects totaled $ 2,3 billion (71,4%%) (Canada, 2020). In the last report available, the contracts awarded or amended in 2020 totaled $ 2,54 billion (82,3%) in the large component, $ 40,3 million (1,4%) in the small component and $ 504,7 million (16,3%) in the Repair, Refit and Maintenance component (Canada, 2021). The high values of the third component in relation to the other two are since the government has invested in large programs to extend the useful life of most of its existing vessels to ensure their use until the delivery of new vessels provided from the NSS.

Figure III – Awarded contracts by NSS components



Source: Own elaboration, based on Barreto, 2020, p. 80.

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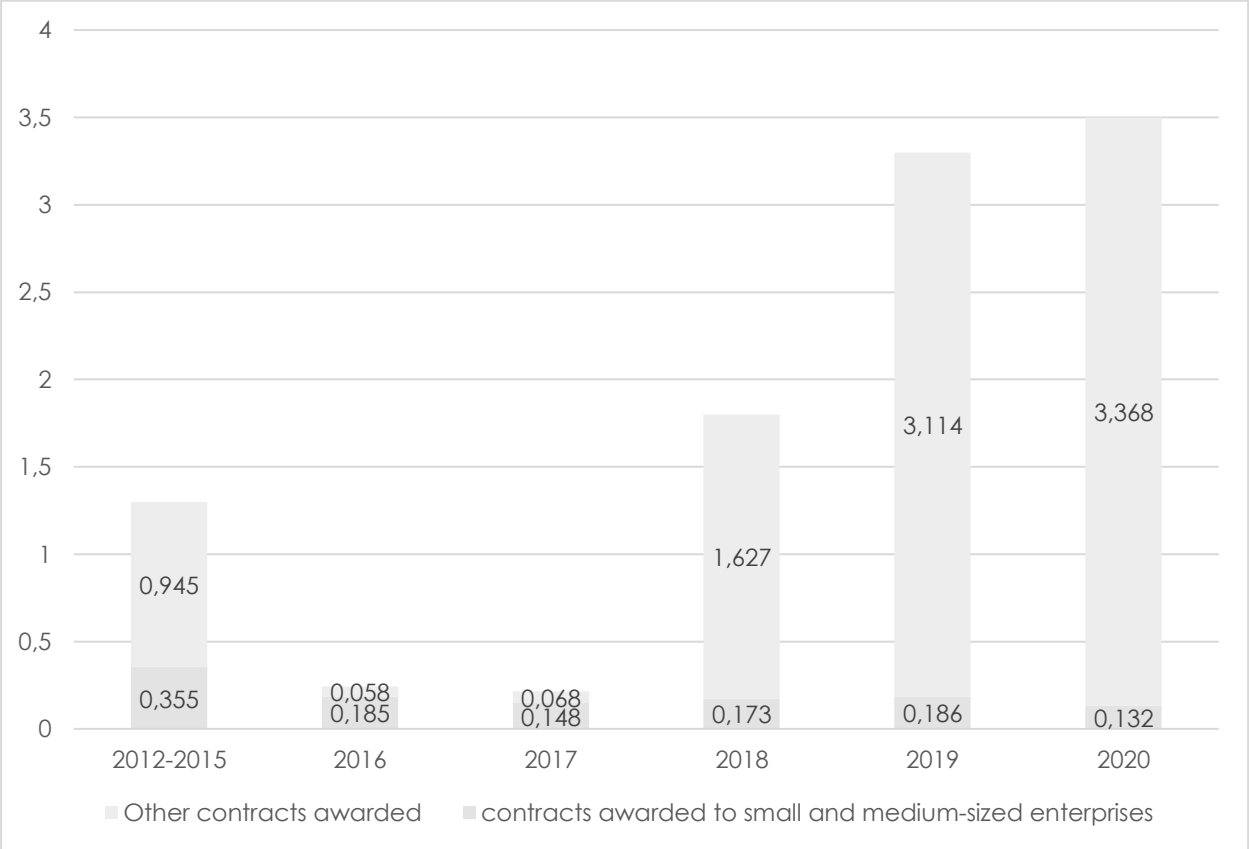
The idea is that many Canadian suppliers are favored by these projects, especially small and medium-sized enterprises (SME), as shown in **Figure IV**. Thus, between 2012 and 2015, $ 1.3 billion in contracts were awarded to suppliers in the country, of which $ 355 million was for small and medium-sized companies and $ 21 million for indigenous people (Canada, 2016a). In 2016, $ 243.8 million was granted, of which $ 185.5 went to small and medium-sized companies (Canada, 2017). In 2017, it was $ 216 million, of which $ 148 was for small and medium-sized companies (Canada, 2018a), while in 2018 it was $ 1.8 billion in contracts for suppliers, of which $ 173.6 million for small and medium-sized companies. (Canada, 2019c). In 2019, It was $ 3.3 billion of new contracts to six different provinces, in which $ 186.7 million was for small companies (Canada, 2020). In 2020, the new contracts totaled $ 3.7 billion to companies in seven provinces and on territory and $ 132.1 million was for small and medium companies (Canada, 2021).

Figure IV - Contracts awarded to suppliers, in $ bi



Source: Own elaboration, based on Barreto, 2020, p. 79.

A final point that should have its data evaluated is the obligation of the ITB policy, which is a Canadian government compensation policy for defense procurement exemplified in **Table IV,** and responsibility of the Innovation, Science and Economic Development Canada (ISED). The values identified in the table exclude the obligations of the Seaspan shipyard in relation to the modernization program for the Halifax-class frigates, since the work started before the start of the NSS (Canada, 2017d). In addition, this policy also incorporates value proposition (VP), which

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involves proposed commitments in the offer and negotiation of the contract. In the case of the NSS, it requires shipyards to invest 0.5% of the value of the negotiated contract in three priority areas, such as human resource development, technology and industrial development (Canada, 2018b).

Table IV – ITB Obligations

	Irving Shipbuilding Halifax Shipyard	Seapan's Vancouver Shipyard
ITB commitments ($ Billion)	4,49	1,8
Completed ($ Billion)	2,6	1
Value proposition ($ Million)	22,4	9

Source: Own elaboration.

The 2016 report showed that in the period between 2012 and 2016, more than $ 791 million in commitments under ITB had been completed, of which $ 410 million in 2016 alone. As an example of this commitments, Seaspan Shipyard has committed to an investment ($ 2 million) grant to the Dennis and Phyllis Washington Foundation for training programs and a $ 2 million investment in the Faculty of Applied Sciences at the University of British Columbia for naval architecture research and innovative programs in naval engineering (Canada, 2017).

The 2017 report makes it clear that Irving Shipyard has an investment obligation of $ 2.5 billion, having already completed $ 966 million to date, and Seaspan Shipyard has a $ 794 million, having already completed $ 398 million (Canada, 2018a). The report for the year 2018 shows how the Irving Shipyard's investment obligation as $ 4 billion, with $ 2 billion already completed, while Seaspan Shipyard's obligation is $ 1.1 billion, with $ 777 million already completed (Canada, 2019c). The 2019 report showed that Irving Shipyard has an investment obligation of $ 4.3 billion in which $ 2.6 billion have been already completed, and Seaspan Shipyard has $ 1.7 billion with $ 1 billion completed (Canada, 2020). Finally, in the 2020 Report, Irving Shipyard's investment obligation is shown as nearly $ 4.5 billion and $ 2.6 billion completed, and Seaspan Shipyard has an obligation of $ 1.8 billion with $ 1 billion completed (Canada, 2021).

Hence, through the data presented here, we can see how the NSS – public initiative – promoted changes in this sector, especially, in the basic conditions and performance of the Canadian military naval industry. The launch of the NSS has increased the demand for vessels in the Canadian shipbuilding industry, changing the basic conditions. This change has led to an increase in the number of specialized companies, especially in the supply area, although it was not fast or very large. In addition, the NSS also influenced the conduct of companies, leading them to increase investments in their infrastructure and human resources, being one of the conditions to be able to compete for the contracts. Finally, this whole scenario influenced changes in the performance of this sector, which has increased the efficiency in its production, not having great delays in the projects or failures, and more job offers.

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4. CONCLUSIONS

The article illustrated how the Canadian shipbuilding industry suffered from various instabilities in demand and investment over the years, interfering with its production capacity and technological development. Much of this situation was developed by the difficulty for Canadian society to identify a real threat to its territory, feeling there was no need to build a large military apparatus. This condition of acquisitions, associated with the continuous decrease in military personnel, directly affected Canada's ability to act on the international scene, including its commitments to allies, with emphasis on its performance in the Arctic.

The Arctic was first mentioned in Canadian defense policy in 1971, highlighting the region's importance to national identity and the possibility of threats arising. Thus, the document pointed out at the time the need to guarantee the replacement of submarines for better performance in the region, which challenging because of the ice. In the NSS, the development of the six vessels Artic Offshore Patrol Ship opens the possibility of a greater presence in the Arctic Sea, even though it is not possible to operate throughout all year.

In an attempt to change this scenario of lack of investments and scrapped equipment, the government started to associate investments in this area with the generation of economic benefits for society. Some governments used this aspect to invest in the defense portfolio in times of economic crisis as a job generator. Therefore, the strategy launched in 2010 uses a long-term plan to ensure continued demand and a Navy updated. Through the application of the SCP model, the State clearly assumed the role of main facilitator of the relationship between actors in the naval sector, ensuring the economic and technological development of the area, but also making it even more dependent on government purchases.

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