An Analysis of the Canadian Military-Naval Industry in the Period 2010–2018

Uma Análise da Indústria Militar-Naval Canadense no Período 2010–2018

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INTRODUCTION

Canada has its geographical position between three oceans — the Pacific, the Atlantic and the Arctic. In addition, it has as neighbor —and main ally- the United States of America (USA). Thanks to this geographic positioning and its past as a colony of Britain, its government found no great need investing in defense. Therefore, its armed forces have been reduced, presenting smaller expenses to the contingent. Consequently, their acquisitions are also heavily influenced by these conditions, presenting large investments only in times of war and threats abroad.

It is thanks to these conditions that Canadian defense investments encounter instabilities over time. However, especially after the large cuts from the 1980s and 1990s, the military had to deal with scrapped equipment and loss of capability. Moreover, several industries that developed from investments during periods of conflict were unable to enter the international market, sometimes closing or presenting limited infrastructure.

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Having been officially established in 1910, mainly for improper fishing patrol, the Canadian Navy had little attention from Canadian government, spending several years with limited capacity by having equipment that was already in a state of obsolescence when bought by Canada. Notwithstanding, after the end of World War II the country saw the need for all force vessels to be produced in Canada to ensure that they met their demands and encouraged local industry, generating economic benefits for society (Auger 2015; Stone 2012; Wilson 2009). As a result, several cycles of shipbuilding were observed and, later, abandonment of this industry.

Following this pattern, the Harper government (2006-2015) came to power with a watchful eye on the question of the scrapping of its forces, as well as a greater concern about the Arctic situation and the need for a country to be able to defend its sovereignty in the region. Therefore, this discourse, associated with the acquisition attempts that previous governments had faced, contributed to the understanding that it was necessary to renew the naval power of the country. This gave rise to the National Shipbuilding Strategy (2010), which features the longest naval renewal in the country in the long run and an attempt to end the "boom and bust cycles" in the naval industry, giving predictability for the acquisitions and guarantee future maintenance of the equipment.

In this way, the policy brings an accurate look at Canadian military-naval industry and the market in which it operates. Ergo, it is necessary to better understand the role of the Canadian state in military naval industry. In this way, this paper aims to analyze the Canadian military naval industry, establishing a parallel between this sector before and after the introduction of the NSS, identifying the actors and norms involved in the sector, and the relevance of the State for the promotion of relations between the relevant actors and being responsible for the development of the area. It is worth noting that this article has a qualitative approach, having no pretensions to bring quantitative discussions about the indicators of the Structure-Conduct-Performance paradigm.

The study is justified because it seeks to constitute a framework for the functioning of a sector that has not been the central point of many studies in the academy to date and mainly because it takes into account the state actor in this dynamic through a purely economic theoretical basis. It is important to emphasize that this approach contributes to reduce the theoretical gap in defense, combining two different areas — Economics and Defense — to understand the naval industry as a whole. In addition, the study of Canada is important because it presents a prominent international experience in public policies to obtain social benefits allied to matters related to its Armed Forces. Thus, while preserving its peculiarities, the

study and full understanding of international experiences is important to fill gaps within the literature.

Hence, the paper will be divided into three main sections: the first section guarantees a brief presentation of the Structure-Conduct-Performance (SCP) paradigm, showing how such economic focus can be applied to several areas, including defense issues. The following section will then be divided into two parts: first, it will provide a brief historical analysis of the Canadian military-naval industry, which is necessary for understanding the constant interference of the state in this sector and its current situation; and secondly it will bring the industry analysis from the SCP model, from the National Shipbuilding Strategy (NSS) results. The last section of the paper will be devoted to shade some light established from this analysis.

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[1], since they observed markets with differentiated products and great suppliers, that is a reflection of the market power of companies (Lelissa and Kuhil 2018). In this way, this field of Economics studies the outcomes of market power (Church and Ware 2000).

The SCP Paradigm emerges from the works of Edward Mason in the 1930s, in which the author ends up unifying the reflections and approaches of important thinkers, structuring the theoretical framework of this paradigm of economics (Kupfer and Hasenclever 2013). However, despite the fact that these studies can be considered as the precursors of the model, the theory received several contributions from other authors for its better structuring — e.g. the works of Joe Bain and Frederick Scherer.

Bain's work is from the 1950s — a period in which the discipline is settling in the USA. Thus, the author was responsible for progressing in the formalization of this analysis framework by thoroughly developing the three components of the model. In this way, through his work "Industrial Organization" (1959), we can see the associations between the components (Lopes 2016). Therefore, Bain uses statistical data to analyze these causal relationships, stressing the correlations between the structure and performance indicators. Consequently, it establishes that the structure would have the ability to determine the market performance component, not giving importance to the conducts of the industry impacting the com-

ponents. So, his main contribution was the development of research on the conditions of entry in that market (Hasenclever and Torres 2013).

After the design of this model/paradigm, many researchers dedicated themselves to study it and improve it. One of the major contributors in this sense was Frederick Scherer and his reformulation of the model. Understanding behavior as an important component for the comprehension of the industry, Scherer (1990) shows how it is the component responsible for the link between structure and performance (Mann 1971). In partnership with Ross, the authors demonstrate that there is a multiplicity of variables that can be understood within the SCP model (Lopes 2016). In addition, their main contribution to the reformulation of the paradigm was to highlight the role of public policies in this model, showing how it can influence the components, and to stablish a multidimensional evaluation of the Performance, as shown in Figure 1 – in which we highlight the factors that will be considered in this analysis about Canadian military-naval industry (Philips Jr 1971).

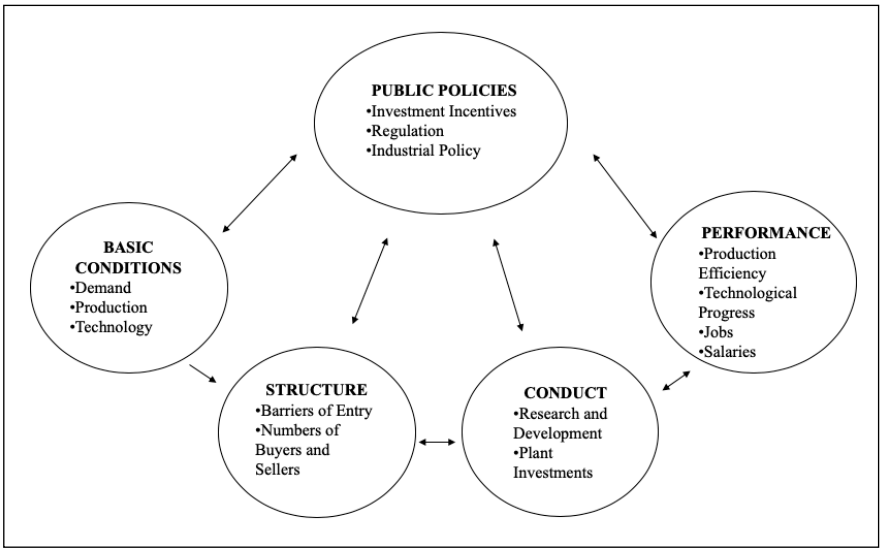

Figure 1 — SCP Paradigm adapted to Canada's Naval Industry.
Source: Own elaboration.

The SCP paradigm is then formed by the idea that it is possible to identify causal and determinant relationships between market structure,

conduct (behavior) and performance (Church and Ware 2000). 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. Therefore, while Bain believed that the determination among the three major components followed a causal line, many later scholars point out that performance may also affect conduct and structure, just as conduct alone can influence structure, leaving the model more dynamic and interdependent (Lelissa and Kuhil 2018).

In this way, 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 (Lopes 2016). Moreover, Bain (1959) shows how this structure is influenced by the concentration of supply and demand. Consequently, one can consider as characteristics that should be observed in this component the number of sellers and buyers, physical differentiation, presence of barriers to entry in the market and diversification of companies (Hasenclever and Torres 2013). Despite this list, it does not deplete the variables that can be observed within the structure and must also be careful with the peculiarities of each industry, including technological, geographic, institutional aspects (Bain 1959). The structure is actually seen as the determinant of conduct, since it is based on the idea that the behavior of industries will adapt to the conditions offered by it; however, as already shown, it is also possible for the conduct to modify the structure, breaking with its determinations.

The second component that needs to be understood 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 within a specific market, such as the level of advertising and investment in research and development (Lelissa and Kuhil 2018). Despite the idea that the conduct of the companies adapts to the structure of the market, they can also adopt strategies that modify the size of the market, for example, changing this component (Lopes 2016).

The third component of this model is performance, which is related to the economic results that can be observed (Lelissa and Kuhil 2018). As previously discussed, although Bain shows it only as a consequence of structure and conduct, more recent research demonstrates the ability of performance to establish changes in the other two elements. Scherer and Ross (1990), for example, 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 used in the industrial economy, 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).

Table 1 shows that SCP model is widely used in academia, but its use basically focuses on areas such as Administration and Economics. However, some consolidated authors in the literature of Defense, like Keith Hartley, have already used this, what encouraged this analysis and ratifies that this model is extremely versatile and can be used in the scope of defense studies.

Table 1
Examples of Studies Using the SCP Model

Publication Year	Author(s)	Theme / Research Area	Scope
1988	Hartley	Defense industry	Defense
1991	Hannan	Banking industry	Economics
1996	Davies and Downward	Hotel industry	Economics
1997	Neuberger	Banking industry	Economics
2006	Thille	Competitiveness in Canadian Industries	Economics
2006	Resende	Manufacturing industry	Economics
2006	Panagiotou	Strategic management	Administration
2007	Hartley	Armaments industry	Defense
2008	Grigorova et al.	Mobile telecommunications industry	Economics
2009	Teixeira et al.	Petrochemical industry	Economics
2010	Markowski et al.	Defense acquisitions	Defense
2011	Hartley	Industrial Defense Base	Defense
2012	Ribeiro	Automobile industry	Economics
2012	Silva et al.	Software industry	Management and technology
2013	Araújo et al.	Automotive industry	Management and technology

2013	Landivar et al.	Intermodal terminals	Administration
2014	Anh et al.	Vietnamese firms	Economics
2015	Chidoko et al.	Beer industry	Economics and trade
2016	Xu	Film industry	Social Sciences
2016	Talpur et al.	Banking industry	Economics and Trade
2016	Bastos and Souza	Tissue paper market	Production engineering
2017	Stanciulescu and Molnar	Turism agencies	Economics
2017	Lorizola	Energy sector	Administration
2018	Khan and Hanif	Banking industry	Economics
2018	Li et al.	Men's clothing industry	Fashion Technology

Source: Own elaboration.

SCP model allows a broad view of the sector being analyzed, enabling the understanding of the dynamics of this industry and the identification of its important or determinant variables. Indeed, the successful use of this model in this analysis can contribute to strengthen its use in the area of defense, increasing the possibilities of theoretical basis for analyzes related to this scope of study.

CANADIAN MILITARY NAVAL INDUSTRY

This section is responsible for deepening the study on the Canadian military-naval industry through the framework of the SCP model. For the full understanding of the industry in the 2010-2018 time period, it is necessary to consider a brief analysis about the history of this sector stressing with its main events and influences in its development. Hence, the shipbuilding projects from the 1950s established by the government for the Canadian Navy play a key role in this analysis, because they were built in the domestic industry to sustain and invest the sector.

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 in 1910, there was already limited capacity and infrastructure for shipbuilding. Therefore, the government of the time, headed by Prime Minister Sir Wilfrid Laurier,

planned a newly sequenced force of four cruisers and six destroyers for use by the Royal Canadian Navy (RCN), leading to the idea that all vessels should be built in Canada (Young 2012).

With a six-year proposal for the delivery of the fleet, the deadline for offering it was 1911, and there were six Canadian proposals. However, this plan has never been able to materialize it since the current government lost the 1911 elections, before all contractions of countries were finalized. Consequently, Sir Robert Borden, who took over the government after Sir Wilfrid Laurier, did not continue with the program, leaving a Navy with obsolete vessels bought from the British.

During World War I (1914-1918), the Canadian shipbuilding industry again had great demands, serving as the basis for much of the industrial base that the country had at the end of the 20th century. Ergo, although Canadian surpluses may be limited in terms of steel construction, requests have been increasing with the progress of the war (Shoute 2015). As a consequence, with the end of the conflict in Europe, there was an idea that the industry should be used in the same amount that was during the war, and the Canadian government placed an order for a merchant shipping fleet (Young 2012).

By 1925, the movement in the shipyards had greatly diminished, making the industry to request for help in the Parliament; however, the government was not favorable to promote incentives to them until the beginning of the World War II (1939-1945). Therefore, especially since the 1950s, all Canadian ships have been produced and maintained by the country's industry (Hennessy 1991). In the late 1960s, the project was the construction of four class-Iroquois destroyers, having as its main responsibility for the management of the project the Navy itself.

The Canadian shipbuilding industry is then marked by instabilities regarding its demand and production capacity. The last major Canadian vessel acquisition project took place during the 1980s and 1990s with the Canadian Patrol Frigate Project, which involved the construction of 12 frigates for the RCN (Gimblett 2015). Thus, the process of acquiring these frigates, which resulted in the Halifax-class, had as its main objective to enable the Canadian industry to manage large projects since this industry had not dealt with such a demand since the 1960s with the construction of Iroquois-class destroyers (Haydon 2008).

As a consequence, the project underwent a differentiated procurement strategy in which an industrial team led by the Canadian government received a contract for the construction of the frigates after the establishment of requirements and a competition. Although the first contract signed in 1983 foresees the construction of only six frigates, it was changed in 1987

to cover twice the originally planned. In this way, the government faced an unprepared industry with no capacity to fulfill this task (CADSI 2009).

The prime contractor[2] shipyard was Saint John Shipbuilding Limited, now known as Irving Shipbuilding Inc. This was the first time the industry was put in charge of project management. The yard sought to invest in its capacity throughout the project to ensure the success of this work. However, since there was no other construction program that could maintain its production, Irving Shipbuilding had to close its facility in Saint John (CADSI 2009).

In that same period, the four class-Iroquois destroyers were completely reformed seeking extension of its useful life. This update of the vessels was done at Davie Shipyards (Shoute 2015). As exemplified in the Figure 2, the demands for construction of new vessels by the government were higher during the years 1950-1960, although most of the projects were escorts, and after this moment there was only the frigates project in the years 1980-1990. Thereafter, a number of extremely capable facilities with high industrial development eventually closed because they had no possibility of new construction in the near future or adapted capabilities to more general activities (CADSI 2009).

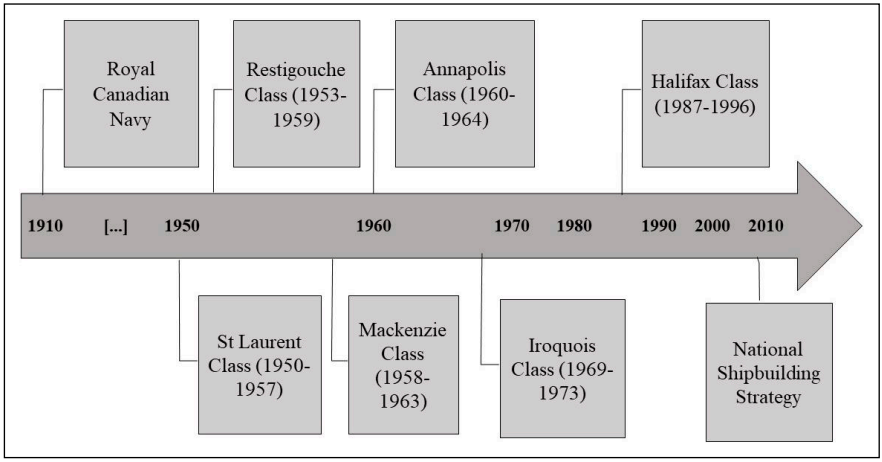

Figure 2 – Important Events in Canada's Naval Industry.
Source: Barreto 2020, 46.

Thanks to irregular shipbuilding demands, Canadian shipyards were in a precarious situation, requiring a high investment in personnel training

and upgrades at their facilities. 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 National Shipbuilding Strategy (NSS), which would be a long-term plan for the renewal of the RCN and the Canadian Coast Guard fleet. The strategy arises from a review commissioned by the government to solve problems with attempts to acquire auxiliary oil refueling vessels. The result was a recommendation from the analysis office that consisted of a plan to restructure the country's shipbuilding capacity and the Navy through a national procurement strategy (Collins 2019). In this way, it brings predictability to the acquisitions, giving security to the investments in the naval industry (Canada 2019a). Such predictability is necessary to ensure that companies will invest in their industrial development and engineering improvement (CADSI 2009).

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 that would be responsible for the construction of this great government acquisition This second phase also had several moments of consultation with industry. On September 20, 2010, the government issued a request for interest and qualifications, in which stakeholders should send their responses to the government. This period lasted three weeks with five yards being chosen to compete for the construction of the large vessels. After this phase, the five had about three months to be consulted on the request for proposals (RFP) and, from February 2011, they could present their proposals for the construction packages (Shoute 2015).

Thus, after the closure of the RFP in July 2011, three of the five qualified shipyards submitted proposals. Ended the period of considerations, the government announced in October the selection of Irving Shipbuilding's Halifax Shipyard and Seaspan's Vancouver Shipyards (Canada 2019b). Notwithstanding, this selection did not guarantee that the two yards

would be responsible for the construction of the vessels, but aimed at establishing a strategic relationship between them and the Canadian government and designating them as sources of supply. This form of selection established a new form of acquisition within government (Auger 2015).

The third phase (2012) consisted in establishing the relationship between the government and the two yards selected in the previous phase 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, such as the obligation of them to have specialized infrastructure and workforce for these constructions (Auger 2015).

The penultimate phase related concerned the design part of the vessels and modernization of the facilities of the shipyards responsible for their construction. The modernization requirements were established in the umbrella agreements and are being overlook by an impartial third party — First Marine International — formed by specialists in the field. Capacity 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 revitalizing its infrastructure, with Irving Shipyard investing $ 350 million between 2012-2015 in its modernization and Seaspan Shipyard invested $ 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.

As previously discussed, the NSS also covers the construction of small ships, and maintenance and repair program, but the Irving Shipyard and Seaspan Shipyard cannot participate in the process to win contracts of this projects because there is a search to favor as many companies as possible, especially those of small and medium size (Canada 2016b). The NSS has then 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). In addition, the strategy has had positive industry reviews in order to strengthen the industry, maintaining the capacity of shipyard operations and presenting several economic benefits for this market, as will be explained in the next session of the work

Table 2
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 Shipbuilding's Halifax Shipyard	Irving Shipbuilding's Halifax Shipyard	Seaspan's Vancouver Shipyards	Seaspan's Vancouver Shipyards	Seaspan's Vancouver Shipyards	Seaspan's Vancouver Shipyards
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

Source: Own elaboration.

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. Notwithstanding, as previously discussed, although some companies have managed to enter the international market, this area is extremely dependent on government demand. In this way, the Canadian industry took the NSS with enthusiasm, as a new wave of renewal and possibilities of improvement for companies in this area (CADSI 2009).

Such project of high complexity of shipbuilding involves several areas of high technological development and specific technical knowledge, like Platform Systems and Ship Design. Due to this need for capacity assurance, the shipyards heavily invested in their revitalizations to compete in the construction projects launched by the NSS. In addition to investments in infrastructure modernization, especially in the context of the umbrella agreements, the shipyards also invested in hiring new employees and in the specialized training of all their staff to ensure a better capacity to respond to possible problems of construction projects. In addition, 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, as previously stated, 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, which generates moments of increase and drop production in the area. The structure of the Canadian military shipbuilding market is set to be relatively small, but it changes when the governments projects are launched, with some enterprises adapting their capacities to participate of this market. In this way, we see the NSS increasing the basic conditions of this market, increasing the demand for ships, and this affects the structure of it.

The government also had to face challenges and adapt within this relationship, 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 3.

Table 3
Budget for NSS large vessel component projects

Projects	2010	2013	2014	2015	2017	2018
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
AOPS	$ 2,3 b	$ 3,1 b	$ 3,5 b	$ 3,5 b	$ 3,5 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
Non-combat Package	$ 3,78 b	$ 4,3 b	$ 4,64 b	$ 4,73 b	$ 5,9 b	$ 5,9 b
JSS	$ 2,6 b	$ 2,6 b	$ 2,6 b	$ 2,6 b	$ 3,4 b	$ 3,4 b
OFSV	$ 244 m	$ 244 m	$ 594 m	$ 687 m	$ 687 m	$ 687 m
OOSV	$ 144,4 m	$ 144,4 m	$ 144,4 m	$ 144,4 m	$ 331 m	$ 331 m
Icebreaker	$0,8 b	$ 1,3 b	$ 1,3 b	$ 1,3 b	$ 1,3 b	$ 1,3 b

Source: Barreto 2020, 77.

The Canadian Government's main discourse on the modernization project of its fleet, in addition to the need to maintain the ability of its armed forces to act against unforeseen events on the international scene, concerns the economic benefits to the country's society, using variables like contribution to GDP and jobs as we can see in Table 4. However, although the NSS was officially launched by the government in 2010, the choice of shipyards for large vessels constructions only took place in 2012 with the signing of umbrella agreements, and the contracts were negotiated and signed after this period. Therefore, the data used in this work, provided by the government, will be from that period.

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 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).

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.

Table 4
NSS Economics Benefits

Report	Job creation and maintenance (estimate)	Total Impact in the GDP ($ billion)
2012-2015	5.500	4,4
2016	7.350	7,7
2017	8.788	8,9
2018	10.190	10,1

Source: Own elaboration.

In order to have a better understanding of the value of the awarded contracts each year, it is necessary to remember that, as previously explained, the NSS is divided into three components. Therefore, the first component is being built at the Irving and Seaspan Shipyard, while the other two components have the presence of other companies, such as the Davie Shipyard, because if the objective of favoring the largest possible number of companies with the resources of the strategy.

Thus, as exemplified in Figure 3, 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). The high values of the third component in relation to the other two are due to the fact that 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.

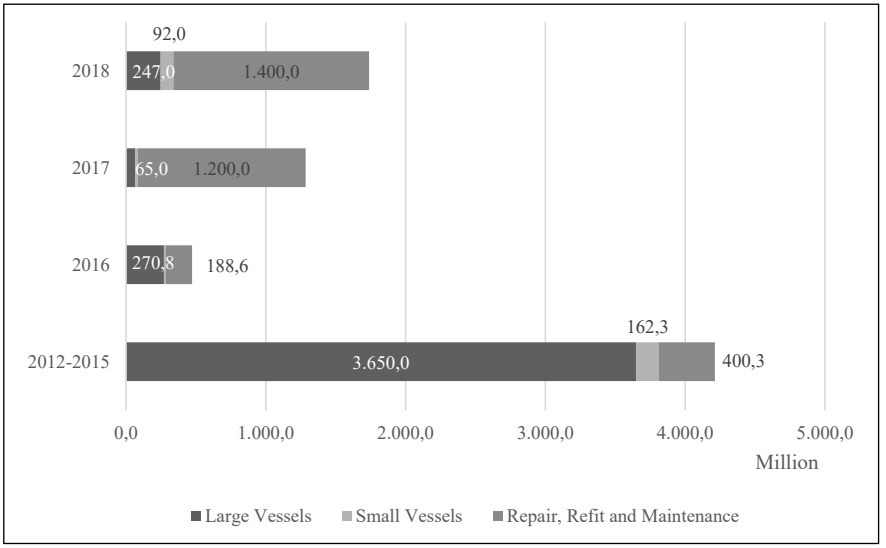

Figure 3 — Awarded contracts by NSS components.
Source: Barreto 2020, 80.

The idea is that many Canadian suppliers are favored by these projects, especially small and medium-sized enterprises (SME), as shown in the 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).

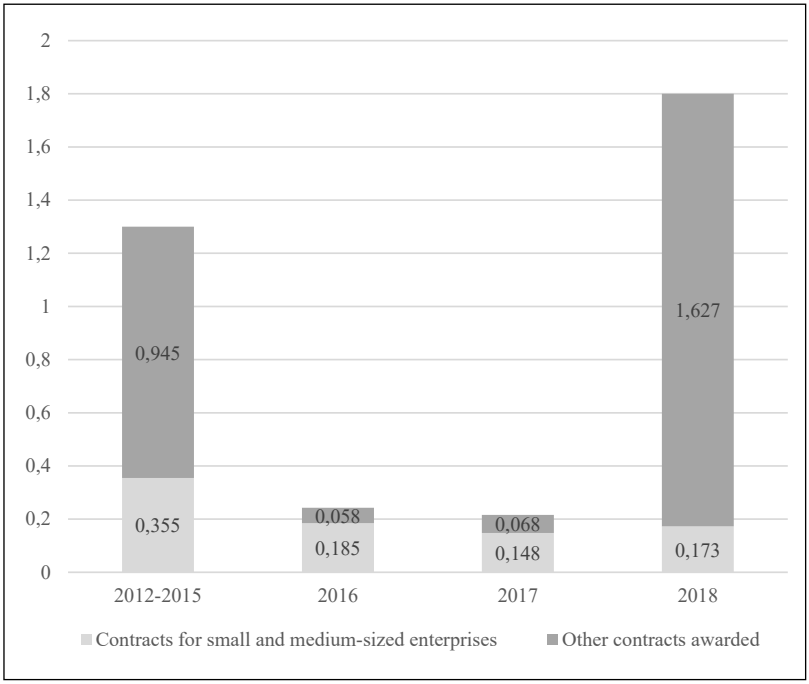

Figure 4 — Contracts awarded to suppliers
Source: Barreto 2020, 79.

A final point that should have its data evaluated on the NSS is the obligation of the the Industrial and Technological Benefits (ITB) policy, which is a Canadian government compensation policy for defense procurement exemplified in Table 5. 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. Being the responsibility of the Innovation, Science and Economic Development Canada (ISED), the policy presents the requirement of a 100% investment of the value of the contract in offset that can be divided in different projects and portions (Canada 2017d).

The most up-to-date version of this document was drafted in 2018 by the Trudeau government and features the essential industrial capabilities mapping (KIC), which shows 16 areas where there is a greater need for investments such as artificial intelligence and shipbuilding. In addition, this policy also incorporates value proposition (VP), which 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 5
ITB Obligations

	Irving Shipbuilding Halifax Shipyard	Seapan's Vancouver Shipyard
ITB commitments ($ Billion)	3,96	1,05
Completed ($ Billion)	2,04	0,77
Value proposition ($ Million)	19,8	5,5

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, because of the award-winning construction contracts, the 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). Finally, 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).

In addition to the ITB obligations as a whole, it is interesting to look at the investments made by the shipyards under the VP. The report for the year 2016 shows that the Irving Shipyard invested $ 4 million and the Seaspan Shipyard, $ 1.1 million in 2016. One of the investments of the first shipyard was the creation of a $ 2 million fund in partnership with Nunavut Arctic College for research focused on areas of importance to the naval industry and the Arctic region (Canada 2017). As early as 2017, these figures totaled $ 2.6 million and $ 1.3 million respectively (Canada 2018a). In the latest report released, with data for the year 2018, these

obligations already amount more than $ 20 million and the shipyards have already made about $ 17 million (Canada 2019c).

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 of this sector. 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, we realized that this increase in demand and the promise of stability in acquisitions made by the NSS encouraged several companies to turn to the services required by the government. 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 (Barreto 2020).

CONCLUSIONS

This paper has showed that the history of Canada's naval industry is full of great instabilities in demand, affecting its production capacity and technological development. Although the naval component is important for the country, its alliance with the UK and the USA ensured its protection, making hard for the Canadian society to a real threat to its territory. Therefore, its population hardly approves large budgets for acquisitions in the defense portfolio. To change this scenario, 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, especially projects for the Navy, in times of economic crisis as a generator of jobs. In the case of the NSS, there was an increase of formal jobs, mainly in shipyards, but most of these jobs do not require skilled labor. Some companies have labor qualification projects as part of their VP. Government data shows that the average salary in the 2018 shipbuilding sector was 30% above other manufacturing sectors (Canada 2019c).

Consequently, the new strategy launched in 2010 is set as a new government procurement cycle and encourages the shipbuilding industry to develop. Besides, it presents the differential of trying to end these instabilities in the market, establishing a long-term plan to guarantee the

continuity of demand. It also requires a better regulation of the State through industrial policies. Although ITB is a great instrument for the country's industrial and technological development, it is not specific to the naval sector. The last policy parameter of this sector was in 2001, with the launch of "A New Policy Framework for the Canadian Shipbuilding and Industrial Marine Industry", but given the new parameters, the government still needs to update its policy.

Bain's traditional ECD model was limited by the impossibility of conduct and performance influencing the structure of the industry. For the analysis of the Canadian case, there was a need to use more recent perspectives from the ECD, which consider the possibilities of feedbacks and causalities among all variables, in addition to including the "Public Policies", that can affect and be affected by all other elements. This inclusion was essential for the research that has been developed.

Besides the limitations, the SCP model was essential to facilitate the comprehension of the Canadian case, contributing to understand how the NSS changed parameters in the operation of the military-naval industry. The model allowed us to analyze the NSS as a public policy developed to retrofit the country's naval force and restructure the shipbuilding industry. Combined with long-term construction projects and industrial compensation policies, the guarantee of predictable government investments encouraged the country's main shipyards to invest in their infrastructure.

Despite the objective of NSS being the restructuring of the naval industry and the possibility of building its ships domestically, part of the technology used by its vessels is developed in partnership with allies or acquired through industrial compensation agreements. Thus, although domestic acquisition[3] is usual within the naval sector, is still not possible to argue that Canada has technological autonomy.

In this way, it is possible to realize that the State assumes the role of the main promoter and facilitator of the relationship between the actors and the norms within the naval sector, being the main responsible for its development — both economic and technological —, but not always during history it corresponded to what the industry expected him as this agent, contributing to the instability of the sector. As a side effect of this interference, it may also make it even more dependent on government procurement.

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NOTAS

1. The pure and perfect competition theory is defined as the mainstream model of economics, identifying a system in which the many actors do not have the power to influence the price of the products of that market (Mankiw 2012).
2. Prime Contractors are responsible for the success of the project, having 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.
3. Acquisitions can commonly be divided into four types: Domestic, Offshore, Licensed and Joint Venture. For more information, see: Hartley, Keith. 2011. *The Economics of Defence Policy*: A new perspective. London: Routledge.

AN ANALYSIS OF THE CANADIAN MILITARY-NAVAL INDUSTRY IN THE PERIOD 2010-2018

ABSTRACT:

Canadian military naval industry has historically suffered from cycles of high investment during periods of conflict and cuts in peacetime. After years of scrapping, the government turned to the sector through the initiative of the National Shipbuilding Strategy (2010), which is an ambitious attempt to modernize the navy. Taking this scenario into account, the main purpose of this paper is to understand the role of the State as a promoter of the interactions between the relevant actors and the rules of this industry. To do so, the analysis will be based on the Structure-Conduct-Performance (SCP) paradigm, allowing a better understanding of the dynamics of the industry and a clearer identification of its important variables. We identify and analyze the following variables: demand increase, structure of the Canadian military shipbuilding market, job offers, GDP, contracts awarded within the strategy, investments in infrastructure and industrial compensation policy. Setting up a case study, this research uses official data, documents, reports and academic papers. the time frame covers the period 2010-2018, due to the launch of the Canadian shipbuilding strategy, which is a milestone for the revitalization and operation of the Canadian military-naval industry. This policy changed the components of the country's military naval industry.

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

RESUMO:

Historicamente, a indústria naval militar canadense sofre com ciclos de altos investimentos em períodos de conflito e cortes em tempos de paz. Após anos de sucateamento, o governo voltou-se para o setor através da iniciativa da *National Shipbuilding Strategy* (2010), que é uma tentativa ambiciosa de modernizar a marinha. Tomando este cenário em consideração, o objetivo principal deste trabalho é compreender o papel do Estado como promotor das interações entre os atores relevantes e as normas dessa indústria. A análise será baseada no modelo Estrutura-Conduta-Desempenho (E-C-D) que, ao estabelecer a relação causal entre os três componentes observados, nos permite ter uma melhor compreensão da dinâmica da indústria e identificar variáveis importantes. Nós identificamos e analisamos as seguintes variáveis: aumento da demanda, estrutura do mercado de construção naval-militar canadense, oferta de empregos, PIB, contratos celebrados dentro da estratégia, investimentos em infraestrutura e política de compensação industrial. Estabelecendo um estudo de caso, esta pesquisa utilizará documentos e relatórios oficiais, bem como artigos acadêmicos, e terá como delimitação temporal 2010-2018. Este período é baseado no lançamento da estratégia de construção naval, que é um marco para a revitalização e operação da indústria naval canadense. Essa política mudou os componentes da indústria naval militar do país.

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

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