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Economic Benefits of Defence Spending

by David Perry and J. Craig Stone

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POLICY PERSPECTIVE

ECONOMIC BENEFITS OF DEFENCE SPENDING

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Neither the December 2021 economic and fiscal update nor the 2021 budget contained much new spending for defence beyond some very targeted incremental funding to deal with more recent issues not covered in the 2017 defence policy. These issues include NORAD's renewal, increased support to the NATO alliance and funding for operations and resources to address sexual misconduct and gender-based violence. This should not be surprising to those who follow defence issues. The 2021 budget emphasizes that the 2017 defence policy, *Strong Secure Engaged*, "set out a vision for a long-term, fully-funded plan to renew and re-equip the Canadian military, built around people."[1]

Perhaps more important for DND's longer term funding requirements are the projected deficits in the budget, beginning at $354 billion in FY20-21 and reducing to $30 billion in FY 2025-26. Historically, when governments in Canada face large deficits and start reducing costs, the largest discretionary spending category – defence – invariably takes a hit. Based on the government's desire to focus on getting Canadians back to work by promoting innovation and small business, it is worth discussing whether continuing defence spending at the levels planned in *Strong, Secure, Engaged* will help achieve those goals.

What benefits would large capital investments, specifically, provide to the Canadian economy? Over the summer of 2021, it appeared that at least two additional major defence investments might be in Canada's future. In July, it was revealed that the RCN has started looking at options for replacing Canada's submarine fleet.[2] Then, on the eve of the 2021 election, the minister of National Defence and the American Secretary of Defense signed a "Joint Statement on NORAD Modernization," committing to a sweeping set of investments to improve North American defence.[3] Each of those commitments alone would require spending tens of billions of dollars.

As the new, but essentially unchanged government hopes to move the economy and the nation to a post-COVID-19 recovery, what is the economic benefit of spending money on defence?

Input-Output Simulations

Defence spending information was provided to Statistics Canada to run simulations using their input-output (I-O) model. I-O models are linear and lend themselves to rapid computations that show the ripple effects through the economy of a change in demand. Statistics Canada states that "input-output tables allow the analyst to explore 'what if?' questions at a fairly detailed level, exploring the impact of exogenous changes in final demand on output while taking account of the interdependencies between different industries and regions of the economy and the leakages to

[1] Department of Finance, *Budget 2021: A Recovery Plan for Jobs, Growth and* Resilience, April 19, 2021, 288; Department of Finance, "Economic and Fiscal Update 2021," December 2021, https://www.budget.gc.ca/efu-meb/2021/report-rapport/EFU-MEB-2021-EN.pdf.
[2] Lee Berthiaume, "Royal Canadian Navy to Start Process of Replacing Aging Submarine Fleet," Canadian Press/Global News, July 14, 2021, https://globalnews.ca/news/8026392/royal-canadian-navy-replacing-submarine-fleet/.
[3] Government of Canada, "Joint Statement on NORAD Modernization," August 14, 2021, https://www.canada.ca/en/department-national-defence/news/2021/08/joint-statement-on-norad-modernization.html.

imports and taxes."[4] More simply, the I-O tables from running the simulations show "how industries provide inputs to, and use output from, each other to produce GDP."[5] For this study, the I-O simulation shows the changes that result from a specific government investment, in this case defence, in terms of the direct, indirect and induced increases or decreases to gross output, GDP and employment.

Two simulations were run: one that looked at operational expenditures and one that looked at capital expenditures.[6] The simulations provided an indication of output changes, the GDP impact at basic and market prices and the number of jobs based on the level of defence spending. The total impact of the spending includes data on direct, indirect and induced spending. Estimated defence spending levels provided by DND for FY 2019-20 were $22.8 billion for total net spending. Of this amount, $18.2 billion was used in the operational expenditure simulation and $2.2 billion was used in the capital expenditure simulation.[7]

The results of these simulations are presented in Table 1 below. Table 1 shows the impact of the $18.2 billion operational spending and the $2.2 billion of capital spending. Important for this discussion are the different types of impacts and multipliers and it is crucial to understand the difference. Table 1 shows the dollar-value impacts of defence spending in terms of output, GDP at basic prices, full-time equivalent jobs and four types of multipliers. Appendix 1 provides the Statistics Canada definitions on the types of multipliers in Table 1.

The takeaway is that for every dollar invested by defence in the economy, there is a total type 2 multiplier impact of 2.0 for operational expenditures and 2.17 for capital expenditures. This means that every dollar spent on defence eventually leads to $2 of economic activity for operational expenditures and just over $2 for capital expenditures. The important distinction in a type 2 multiplier is measuring the effect as a result of the direct impact. This highlights the longer term impact of investing in/spending money on defence. Data in Table 1 demonstrate that this is significantly different than the immediate direct impact of defence spending and it is quite possible that other sectors of the economy have a more significant immediate impact. The data on job creation are similar, with Table 1 showing multipliers of 1.71 and 1.99 respectively. Again, the multipliers for the immediate direct impact are lower.

[4] Statistics Canada, Supply, Use and Input-Output Tables, https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=1401.
[5] Philip Cross and Ziad Ghanem, "Multipliers and Outsourcing: How Industries Interact with Each Other and Affect GDP," *Canadian Economic Observer*, January 2006, 3.1.
[6] DND provided defence expenditures for FY 2019-20 defence spending by supply use product codes (SUPC). Note that SUPCs have replaced the previous input-output commodity codes (IOCC) that some may be familiar with from past examinations of the economic impact of defence spending
[7] The simulations were run prior to the release of the FY2019-20 public accounts but the operational expenditures in the public accounts were approximately $18.4 billion versus the $18.2 billion used in the simulation. Capital expenditures are more problematic only because the public accounts capture all capital spending of approximately $4.2 billion while the simulations only use capital spending in Canada. Expenditures made to foreign companies outside of Canada are not included in the capital expenditure simulation since it is money spent outside Canada and has no impact in the Canadian economy.

Table 1: Economic Impact of Defence Spending

Output (Thousands of Dollars)	Direct	Indirect	Induced	Total
Capital Expenditures	1,255,222	762,415	512,977	2,530,613
Operational Expenditures	18,234,367	8,840,062	10,017,660	37,092,089
Simple Multiplier Capital Expenditures	0.92			
Simple Multiplier Operational Expenditures	1.48			
Total Multiplier Capital Expenditures	1.15			
Total Multiplier Operational Expenditures	2.03			
GDP at Basic Prices (Thousands of Dollars)				
Capital Expenditures	582,557	383,001	298,039	1,263,598
Operational Expenditures	10,639,146	4,812,448	5,824,291	21,275,884
Simple Multiplier Capital Expenditures	0.44			
Simple Multiplier Operational Expenditures	0.85			
Total Multiplier Capital Expenditures	0.58			
Total Multiplier Operational Expenditures	1.17			
Type 1 Multiplier Capital Expenditures	1.66			
Type 1 Multiplier Operational Expenditures	1.45			
Type 2 Multiplier Capital Expenditures	2.17			
Type 2 Multiplier Operational Expenditures	2.00			

Full-Time Equivalent Jobs				
Capital Expenditures	5,344	3,178	2,137	10,660
Operational Expenditures	115,049	40,329	41,923	197,301
Simple Multiplier Capital Expenditures	3.88			
Simple Multiplier Operational Expenditures	8.52			
Total Multiplier Capital Expenditures	4.85			
Total Multiplier Operational Expenditures	10.82			
Type 1 Multiplier Capital Expenditures	1.59			
Type 1 Multiplier Operational Expenditures	1.35			
Type 2 Multiplier Capital Expenditures	1.99			
Type 2 Multiplier Operational Expenditures	1.71			

A natural question based on this long-term versus short-term impact issue is: How does this compare to other sectors of the Canadian economy, assuming the government should be trying to get the greatest impact from spending taxpayer dollars? Unfortunately, the obvious question lacks an obvious answer. There is some uncertainty and debate around the size of fiscal multipliers and some economists note that input-output models fail to take into account the opportunity costs when the economic activity is inserted into the model. This becomes an issue when looking at the future impact of investing in defence rather than some other sector of the Canadian economy. Is the multiplier larger for another sector of the economy?[8]

Recent federal budgets discuss assumptions that can affect projections for revenues and expenses, but one has to go back to the 2016 budget to find a discussion about estimating the impacts and the issue of multipliers. The 2016 budget states:

> Multipliers are summary measures that take into account the channels from measures to economic activity, including direct, indirect and induced impacts . . . .Multipliers will vary by type of measure . . .as indirect and induced impacts take time to

[8] Cross and Ghanem provide an excellent discussion on multipliers and how industries interact with each other in the Canadian economy.

> materialize, multipliers are initially smaller but grow over time, as new spending stimulates employment growth, which in turn yields a further boost to economic output.[9]

For example, Budget 2016 indicates housing investment measures provide a multiplier of 1.0 in 2016-17 and then 1.5 in 2017-18 while infrastructure investment provides a multiplier of 0.9 in 2016-17 and 1.4 in 2017-18.[10] Defence spending in those categories would provide similar multipliers. When considered in their entirety over a longer period of time across a variety of economic sectors, the multipliers of 2.0 and 2.17 are not unrealistic but there is no indication in the budget document about what type of multiplier (simple, type 1 or type 2) is being used.

The important issue when looking at defence is the notion of longer term growth and impact rather than the immediate impact from spending. For example, it is clear from the data in Table 1 that the indirect and induced impacts together are larger than the direct impact, which supports the notion of starting slowly and growing over time. This means that just as defence investments, especially those directed towards capital purchases, contribute to Canada's defence over multiple years, defence spending creates an economic impact that spans multiple years as well.

Economic Impact Issues

It is also important to note that there are some limitations and/or differences from past simulations that have been completed using I-O model simulations. The current set of simulations has been implemented (or run) using operational expenditures as inputs rather than as a consumption shock. This means that the I-O simulation assumes, or treats the expenditure in such a way, that DND purchases inputs – equivalent to operational expenditures – and hires labour to produce output in the defence services industry. For example, if DND buys vegetables for a base kitchen, the model will show the resulting direct impact, i.e., output, GDP and jobs, in the defence services industry, rather than showing them in an industry related to agriculture. As a result, direct impacts of the defence services industry would be higher than what we expect and what was produced by StatsCan historically using the previous approach.[11] The other more

[9] Department of Finance, "Growing the Middle Class," March 22, 2016, 254. Annex 2 of the budget (pages 253-258) deals with economic impacts of the budget measures, with pages 254 to 256 dealing more specifically with the issues around multipliers. The document makes the point that in times of weak economic growth, government investment is likely to have a larger impact, as it does not simply displace private investment or push up interest rates. More recent budgets (2017 to 2021) do not have this type of discussion. Details on national and provincial multipliers can be found at Statistics Canada, https://www150.statcan.gc.ca/n1/daily-quotidien/201123/dq201123g-eng.htm.
[10] Ibid., 255.
[11] These differences with the new model and the use of supply and use product classification (SUPC) codes rather than input-output commodity codes (IOCC) make past comparisons over time difficult because the shocks and the SUPC codes are different. In the discussion with staff at Statistics Canada, they observed that prior to the 2009 model, all shocks on expenditures were treated as a shock on final expenditures. Now, they differentiate among industry inputs, household consumption, goods, fixed capital formation and exports. If they were to do a shock on household expenditure, some commodities would be rejected as they are not purchased by households; margins would be inflated as well. The only shock they can do to reflect defence spending is on intermediate inputs and a shock on gross capital formation (for the commodities that fall into that category). This makes it problematic to compare results from past simulations. As well, the reader should be aware that in the 1980s and 1990s, the Centre for Studies in Defence Resource Management published annual reports on the impact of defence expenditures. The reductions under program review in the 1990s saw this organization closed in Kingston and re-established with a more restricted mandate in Ottawa under the VCDS. Original work on this issue was done by Prof. Jack Treddenick at the Royal Military College. See J. M. Treddenick, "The Economic

significant issue when comparing previous studies is the provision of results for different types of multipliers. Models' results from simulations run today provide information on four types of multipliers discussed in Appendix 1. Previous simulations provided different multiplier definitions and data.

The other challenge when trying to look at the impact of defence spending over time is that most examinations have looked at the impact of defence spending on the defence industry specifically, rather than the impact across all sectors of the economy. In recent years, Statistics Canada has been conducting regular surveys and running I-O simulations to provide updates on the state of Canada's defence and aerospace industries and most recently, Canada's cyber-security industry.[12] These studies have a different focus but provide a valuable snapshot about the importance of the defence industrial base to Canada's economic activity.

The results of the simulations conducted for this report do provide a framework to look more directly at the two largest capital investments (shipbuilding and fighter replacement) in the defence policy and what economic benefits are possible. Both of these investments have been examined in the past by outside organizations and reports have been issued on the economic benefits to Canada and/or a specific community. Before dealing specifically with these two investments, some additional general comments on the economic impact of defence spending are appropriate.

DND regularly conducts socioeconomic impact studies of CAF installations on their host communities. The most recent study, completed in 2017, used spending data from 2014-15 and census data from the 2011 census. These studies look at operating expenditures and the impact of those expenditures across the broad categories of GDP, share of population, share of the workforce, municipal taxes and housing. The presence of CAF bases and wings in a community can have a significant impact, depending on the size of the CAF facility and the size of the host community. For example, a large base like CFB Petawawa provides a 75 per cent GDP impact for the small host community of Petawawa.[13] In contrast, military facilities in Toronto and Montreal provide an impact of less than one per cent. The issue of importance for the reader is that defence spending is actually a small amount of money on a national level but can be a very important issue at the local and regional level. The socioeconomic studies conducted by Defence provide data for governments at all levels to understand that impact.

Impact of Canadian Defence Expenditures (NDHQ Study Directive S2/80)," *Centre for Studies in Defence Resource Management Report No. 2* (Kingston: Royal Military College of Canada, Summer 1983). The last annual report was done in 1997. More recent examinations have been published by Brent Lemon, "The Economic Impact of Defence Expenditures on the Canadian Defence Industrial Base," MA thesis, Royal Military College, 2001, and Craig Stone, "The Economic Impact of Defence Expenditures in Canada: Early Results of Increased Defence Budgets," in *201: Canadian Defence Industry at a Crossroads?* Claxton Paper 12, Craig Stone, ed., 21-40 (Kingston: School of Policy Studies, Queen's University, 2010).

[12] See Innovation, Science and Economic Development Canada, "State of Canada's Defence Industry 2018 Report," https://www.ic.gc.ca/eic/site/ad-ad.nsf/eng/h_ad03978.html and "State of Canada's Aerospace Industry 2019 Report," https://www.ic.gc.ca/eic/site/ad-ad.nsf/vwapj/State_of_Canada_Aerospace_report2019.pdf/$file/State_of_Canada_Aerospace_report2019.pdf; and "Statistical Overview of Canada's Cybersecurity Industry in 2018," https://www.defenceandsecurity.ca/UserFiles/Uploads/publications/reports/files/document-35.pdf.

[13] PRISM Economics and Analysis, "Socio-Economic Impact of Canadian Armed Forces (CAF) Installations on Host Communities Study," April 28, 2017, 11.

The same analogy applies to looking at defence spending beyond the socioeconomic studies. While the studies look at operational expenditures and the impact of a base or wing on a local community, all defence spending in Canada includes industries which may or may not be tied to a local base or wing. However, the impact can also be economically significant to a municipality or region. The most obvious example is shipbuilding and the impact of the government's national shipbuilding strategy in Nova Scotia, Quebec and British Columbia and the light armoured vehicle produced by General Dynamics Land Systems (GDLS) in London, Ontario. Once selected, the next-generation fighter will also be a significant economic boost to a community or region.

Returning to the data in Table 1, it is clear that operational expenditures have a larger immediate impact on economic activity than capital investment. The $18.2 million of operational expenditures has a direct impact of $18.2 million and operational expenditures at the base/wing and regional level. The recent socioeconomic study referred to above looked at 28 Canadian Armed Forces bases, wings and stations in Canada and the data indicate that 11 of those locations have a 10 per cent or larger GDP impact on their host community, with five of them over 20 per cent. In the context of the multiplier discussion in this study, five of the facilities have GDP multipliers larger than 1.5 and all but four have multipliers larger than 1.25.[14]

A related issue is the connection between defence facilities, defence industries and the electoral districts (ridings) for Canada's federal elections. A number of areas in Canada have two or more contiguous ridings with CAF facilities and defence industry firms, which is referred to as a cluster. For example, the ridings of Fredericton and New Brunswick Southwest have 1,688 DND buildings (predominantly CFB Gagetown) and 69 defence firms. CFB Gagetown has an economic impact on GDP of 22.6 per cent for the town of Gagetown and the 69 defence firms will add to that impact in the two ridings. This cluster of defence firms, CAF facilities and electoral districts is small when compared to some others in Canada. Eastern Ontario has a cluster of 15 ridings with 2,251 DND buildings and 4,653 defence firms while Nova Scotia has a cluster of five ridings with 1,218 DND buildings and 387 defence firms. This grouping of defence firms around CAF locations provides economic activity that supports the data in Table 1, but also provides evidence for why the government should consider defence spending and investment when trying to grow the economy.

Innovation, Science and Economic Development Canada conducts regular assessments on the economic impact of Canada's defence industry, its aerospace industry and most recently, its cyber-security industry. The most recent study of the defence industry, released in 2020 and looking at 2018 data, indicated that the direct impact of Canada's defence industry was $3.45 billion to GDP and 29,000 jobs.[15] It is important to note that Canada's defence spending is not the only contributor to these values since exports are more than 50 per cent of Canadian defence industry activity. However, almost all significant Canadian defence firms started with a Canadian defence purchase and industry reminds government regularly that if the item is not sold to the Canadian military, it is very difficult to sell to another nation. The narrative of "why would I buy this from you when your own military does not use it?" is a common refrain.

[14] PRISM Economics and Analysis,11.
[15] ISED, "Statistical Overview of Canada's Defence Industry in 2018," 5.

More important for this discussion is the quality of the jobs in Canada's defence, aerospace and cyber-security industries. They are more research and development-intensive, have more people employed in science, technology, engineering and math (STEM) and have higher salaries when compared to the overall manufacturing sector in Canada. These are the types of jobs that fall into the government's Budget 2021 desires of promoting innovation and leading-edge technology opportunities to grow the economy. The connection of CAF bases and wings, defence firms and electoral districts is important when looking at why defence spending supports economic growth and employment.

Despite all of the above, many Canadians might argue that in the current COVID-19 environment and identified health-care deficiencies across the country, fiscal restraint should be applied to a defence budget that is too large when compared to other challenges Ottawa faces. This is not a new or unique issue. The arguments for and against defence spending have been part of Canada's political debate for decades (and perhaps since Confederation) and depending on where you sit, you either agree or disagree with this premise. The most recent budget in the spring of 2021 did not reduce the planned spending announced in *Strong, Secure, Engaged* and added some funding for specific issues such as NORAD renewal, NATO activity, sexual misconduct in the CAF and sustaining health services in the CAF. Therefore, this report assumes that the funding levels in the defence policy will continue. An examination of the economic impacts of the two large capital investments will be presented to demonstrate the economic significance of the investment and government's ability to use this investment to promote growth.

The National Shipbuilding Strategy and the Next-Generation Fighter

To introduce these two significant investments for Canada's defence capability and the expected expenditure for these investments articulated in *Strong, Secure, Engaged*, it would be useful to have a sense of what the impact is of defence spending for the shipbuilding and aircraft sectors. Tables 2 and 3 below provide the output data for economic impact and employment from the simulations using the 2019 defence spending data. The results support the notion that there is benefit to spending money in Canada on defence in the longer term versus the immediate short term when looking at the data in Tables 1, 2 and 3 and comparing the initial direct impact and the subsequent indirect and induced impacts.

The one issue worth commenting on when looking at the data in Table 1 versus the data in Tables 2 and 3 is the direct impact category for operational expenditures. Because the data in Tables 2 and 3 deal with the specific supply codes associated with shipbuilding and aerospace, the reader should note that the $10.7 billion for operational expenditures provided in Table 1 under direct impact are captured entirely in the defence services category supply code rather than the other supply codes. Returning to the earlier discussion on the changes in the I-O simulations from previous years, this is one obvious difference from past simulations that used input-output commodity codes and treated operational expenditures as a consumption shock. Operational expenditures only show up in other supply codes in the indirect and induced impacts.

Table 2: Economic Impact on GDP at Market Prices for Shipbuilding and Aircraft Spending

ECONOMIC IMPACT (thousands of dollars)	Direct	Indirect	Induced
Capital Expenditures			
Shipbuilding	235,843	236,045	236,112
Aerospace products and parts	29,306	32,398	32,491
Total Impact Capital Expenditures: Shipbuilding and aerospace products and parts	265,149	268,443	268,603
Operational Expenditures			
Shipbuilding	0	505	1,806
Aerospace products and parts	0	91,374	93,154
Total Impact Operational Expenditures: Shipbuilding and aerospace products and parts	0	91879	94960
Total Impact Capital and Operational Expenditures: Shipbuilding	235,843	236,550	236,292
Total Impact Capital and Operational Expenditures: Aerospace products and parts	29,306	123,772	125,645

Table 3: Economic Impact on Employment for Shipbuilding and Aircraft Spending

JOBS			
Capital Expenditures	Dir	Ind	Induced
Shipbuilding	2,411	2,413	2,413
Aerospace products and parts	179	198	199
Total Jobs Capital Expenditures: Shipbuilding and aerospace products and parts	2,590	2,611	2,612

Operational Expenditures			
Shipbuilding	0	5	18
Aerospace products and parts	0	559	570
Total Jobs Operational Expenditures: Shipbuilding and aerospace products and parts	0	564	588
Total Jobs Capital and Operational Expenditures: Shipbuilding	2,411	2,418	2,431
Total Jobs Capital and Operational Expenditures: Aerospace products and parts	179	752	769

When looking at the data in Tables 2 and 3, it is important to note that they cover just the supply codes for shipbuilding and aerospace products and parts. There will be other supply code values, such as fabricated metal product manufacturing or communications equipment, that may very well contribute to the final product of a ship or an airplane. The impacts of these supply codes are captured in total impact data contained in Table 1.[16] The data in Tables 2 and 3 are provided for context in the discussion below on the two specific projects and what needs to be considered in terms of the impact from one year of expenditures with the expected benefits from implementing the NSS and selecting a next-generation fighter.

National Shipbuilding Strategy (NSS)

The National Shipbuilding Strategy was developed in 2010 with a view to creating a sustainable, long-term shipbuilding plan that avoided past boom-and-bust cycles in order to meet the needs of the Coast Guard and Royal Canadian Navy.

A number of studies have looked at the impact of the NSS nationally and more specifically for Nova Scotia and British Columbia.[17] Some of these studies were conducted shortly after the release of the NSS and were based on the initial planned investment of $25 billion. The value for the NSS is now more than $60 billion, so the economic impact from these earlier studies would need to be adjusted upward from their initial projections. The February 2021 Conference Board of Canada study, *Value for Money: Economic Impact of the Halifax Shipyard Under the National Shipbuilding Strategy,* noted that the project's spending in Canada from 2013 to 2024 was

[16] For the purposes of this study, DND provided spending data categorized in accordance with supply codes in order to facilitate the input-output model simulation.
[17] Note that the original National Shipbuilding and Procurement Strategy released by the Conservative government in 2010 awarded the major work to Irving Shipyards in Halifax and Seaspan Shipyards in Vancouver. The Liberal government renamed the strategy to just NSS in 2016 and added Davie Shipyard in Lévis, Quebec in December 2019.

expected to add over $9.8 billion to Canada's GDP, over $2.9 billion to revenues across all levels of government and boost employment between 2016 and 2024 by an average of 8,200 jobs annually across Canada.[18] This is for the building of the Arctic offshore patrol ships (AOPS) and the design of the new surface combatants. This does not include construction of the Canadian surface combatants, the work being done on the joint support ship in British Columbia or the more recent inclusion of the Davie shipyard in Quebec. The actual benefits from the construction of the surface combatants will be significantly more than the impact from the AOPS. Seaspan has said it has already awarded more than $1 billion in contracts to 140 Canadian companies and expects the JSS program to sustain 3,900 jobs in the Canadian marine industry between 2021 and 2025.[19]

The government's own 2019 report on the entire NSS states:

The NSS continued to help stimulate the Canadian economy, with approximately $3.3 billion in new contracts having been awarded to Canadian companies in 6 different provinces in 2019. Of note, NSS contracts issued between 2012 and December 2019 are estimated to contribute over $17.04 billion ($1.54 billion annually) to gross domestic product, and create or maintain more than 15,500 jobs annually, through the marine industry and its Canadian suppliers from 2012 to 2022.[20]

More specific to the simulations looking at the impact of DND spending in 2019-20, DND spending data provided for the simulation showed that just over $921 million was spent for the supply code associated with the category of shipbuilding. The impact of that investment as shown in Tables 2 and 3 is an additional $236.3 million to GDP and an additional 2,431 jobs for one year of spending. These impacts facilitate the larger impacts identified throughout the supply chain in related industries that are captured in the reports by the government and the Conference Board. Without this initial DND investment in ships, the rest of the economic activity will not happen.

Next-Generation Fighter Aircraft (NGFA)[21]

The second large investment in the defence policy is the replacement of Canada's fighter aircraft. Three companies have submitted bids to the government and an announcement on the winning bid is expected in 2022. Although there has been significant controversy around this procurement, the intention here is to demonstrate that regardless of which aircraft is selected, there will be significant economic benefit to Canada. Similar to shipbuilding, DND spending data indicate $89.8 million was spent against the aerospace products and part supply code. This initial

[18] Gregory Hermus, Nair Swapna and Zhenzhen Ye, "Value for Money: Economic Impact of the Halifax Shipyard Under the National Shipbuilding Strategy," The Conference Board of Canada, 2021, 3.
[19] Cision Canada, "Seaspan Shipyards Surpasses $1 Billion in Contracts to Canadian Companies on Joint Support Ship Program for Royal Canadian Navy," March 9, 2021, https://www.newswire.ca/news-releases/seaspan-shipyards-surpasses-1-billion-in-contracts-to-canadian-companies-on-joint-support-ship-program-for-royal-canadian-navy-810732747.html.
[20] Canada, Public Services and Procurement Canada, "Canada's National Shipbuilding Strategy 2019 Annual Report," July 2020, 3.
[21] Note that just as this study was being finalized, the government announced that Boeing and the F-18 Super Hornet did not meet the requirements for the NGFA. The data for Boeing have been left in the study deliberately to support the underlying premise that the defence investment for the NGFA, regardless of which aircraft is selected, will generate economic activity.

spending resulted in an economic impact of $125.6 million being added to GDP and 769 jobs; that is, without the inclusion of the next-generation fighter.

Each of the three leading companies has indicated what the economic benefit is for their particular airplane proposal. An April 2018 study by PricewaterhouseCoopers discusses the overall economic impact of Lockheed Martin activities in Canada. The study indicates Lockheed's economic impact between 2008 and 2017 was $3.8 billion to GDP, 36,521 jobs, $1.9 billion in exports to the U.S. and $1.5 billion in tax impact. In a typical year, Lockheed states it contributes $379 million to GDP and creates 1,000 direct jobs, with over 2,600 additional jobs.[22] Lockheed Martin activities in Canada include Canadian defence industry firms providing support to the F-35.

An OMX study of the F-35 impact to Canada provides a similar comparison to the Conference Board study on shipbuilding. Although Canada has not purchased the F-35 fighter, it has been a member of the F-35 consortium since 1997. Canadian industry is participating in the supply chain for the aircraft, having demonstrated the ability to supply parts and systems for the aircraft at a competitive price. Released in October 2020, the OMX study looks at the overall impact of Canada's participation in the F-35 consortium since its inception in 1997 and at future economic benefits out to 2046 should Canada remain in the consortium.

Table 4: OMX Economic Impact data

F-35 CANADIAN CONTRACTS	Amount	Impact on GDP	Jobs Sustained/year
Current production impact (2007-2019)	2,415,976,538	2,110,232,641	1,418
Total production impact (2007-2046)	13,264,417,816	11,742,653,135	2,525
Future total sustainment impact	5,065,407,695	5,149,265,425	1,674

Source: OMX Data Analytics, F-35 program in Canada: Economic Impact Report (Toronto; OMX, February 2020), 3-5.

Table 4 details the total impact on gross domestic product (GDP), economic output and job creation resulting from the F-35 program activities in Canada. The table also provides the expected longer term benefits should Canada remain in the consortium.[23] The important issue from this data is that this economic activity is occurring without Canada purchasing the F-35.

[22] PricewaterhouseCoopers, "Lockheed Martin: Study of Economic Impact in Canada," April 2018, 17, https://www.lockheedmartin.com/content/dam/lockheed-martin/canada/documents/PwC_Economic_Impact_Study_of_Canada.pdf.
[23] The OMX report notes that Lockheed Martin had delivered approximately 250 aircraft globally at the time of the analysis and had a program of record with a current cumulative total of more than 3,100 deliveries. OMX used the total current value of opportunities provided by F-35 production and used the ratio of deliveries to estimate the total economic impact to Canada over the program's lifespan.

Canada has contributed money annually to be part of the F-35 consortium, which allows Canadian industries to bid on contracts for the production. Canadian industry has competed successfully for this business but may not be allowed to compete for future business if Canada does not purchase the F-35.

The Memorandum of Understanding for being in the consortium indicates offsets are not allowed but rather, industry gets to compete for being part of the supply chain. This issue was highlighted in a letter from the F-35 program executive office to the senior director of the Canadian Future Fighter Capability Project in PSPC which states: "Canada's requirement for Industrial and Technical Benefits (ITBs), as documented in the DRFP, is prohibited per the Industrial Participation (IP) provisions of the Joint Strike Fighter Production, Sustainment, and Follow-on Development Memorandum of Understanding (JSF PSFD MOU)."[24]

Should Canada not select the F-35, a loss of $10.8 billion of economic activity (not including the $5 billion in sustainment activity) is possible based on the OMX full production numbers. This could be considered an opportunity cost because Canada would receive industrial benefits with a value equivalent to the NGFA contract value from whichever firm is selected. The current value of the NGFA contract is $15 billion to $19 billion. This is perhaps a comparable value, but it's difficult for the public to know for sure since economic benefits proposals from companies are not made available.

Boeing also did a study that indicates its total economic footprint in Canada is $3.988 billion annually, with 9,492 direct jobs and 17,518 total jobs.[25] More specific to the future fighter project, the most recent indication from Boeing is that choosing the Super Hornet will generate $61 billion in economic activity and nearly 250,000 jobs for the Canadian economy over the program's 40-year life.[26]

Although no specific study has been completed for the Saab proposal and the Grippen E fighter, Saab has indicated a commitment to "transfer the building of its fighter solution for Canada's FFCP (Future Fighter Capability Project) – the multi-role Grippen E – to Canada."[27] A commitment like this will also contribute economic activity to Canada and the value will be at least $15 billion to $19 billion, which is the value of the contract. But it is possible that having such a capability in Canada will allow it to contribute to other global purchasers of the Grippen E and thereby add additional economic benefits to Canada. This would be somewhat comparable to the circumstances that exist for the Canadian industry's participation in the F-35 consortium –

[24]Mathias W. Winter, VADM, USN DOD, F-35 Program Office letter to Paula Fokes-Dallaire, senior director of the Canadian Future Fighter Capability Project, Public Services and Procurement Canada, dated December 18, 2018, quoted in Joseph Trevithick, "Canada's CF-18 Replacement Competition Structure Seems to Have Already Disqualified the F-35," The Drive, May 8, 2019, https://www.thedrive.com/the-war-zone/27895/canada-wont-be-able-to-buy-the-f-35-because-they-are-already-a-f-35-program-partner-huh.

[25] Rick Clayton, Glenn McDougall, Jeffrey Doyle and Denzil Doyle, "The Total Economic Footprint of Boeing in Canada: An Economic Impact Study Final Report – Executive Summary Extract," Doyletech Corporation, October 12, 2016, 4.

[26] Staff, "Boeing, Partners Commit to Boost Canadian Economy by $61 Billion," News Release, Boeing, October 27, 2020. MediaRoom - News Releases/Statements.

[27] Joetey Attariwala, "Saab Offers a Made-in-Canada Fighter Jet Solution," *Canadian Defence Review* 26, No.3, June 2020, 42.

Canadian industry is part of the global supply chain for all F-35s, not just the ones Canada might purchase.

It is clear that regardless of which aircraft is selected, there will be economic activity in Canada at least to the value of the contract and perhaps more, depending on the value propositions the companies present.

What remains a relevant question is whether or not the investment in ships and airplanes in Canada is the best use of taxpayer money. Can the government get better value by investing elsewhere? Maybe or maybe not, but that is not a useful question when money still needs to be spent on defence, assuming we do not want to leave our defence and national security to the U.S. or another nation. A more realistic discussion is: How do we get the most economic benefit from the spending on defence without compromising military capability in what will likely be a constrained future budget environment? Here, we think the answer is whatever money is spent on these large procurement projects in defence will provide economic benefit to Canada.

Investing in Defence is a Positive Impact on Economic Activity

Multiple studies, both specific to a particular piece of equipment and more generally across the defence industry, indicate that there is economic benefit from investing in defence in Canada. More importantly, the nature of the jobs in defence is increasingly STEM-focused and the jobs are in sectors that help the government grow the middle class. This notion will be at odds with those who believe military spending negatively influences economic growth, but the research remains inconsistent and dependent on models and variables that are selected. More importantly, it is irrelevant at this stage of the spending-on-defence process.

As indicated earlier, nations need to spend some money on defence unless they want another nation to decide to do it for them. The place for the discussion about the economic impact of defence spending restricting growth is before a government is elected and a defence policy is written. The government has decided how much to spend on defence and spending that money in Canada will provide economic benefits to Canadian industry, help grow the middle class and hopefully, ensure strategic military capabilities can be maintained in Canada. The alternative is to perhaps obtain the equipment from abroad for less money but that would provide no economic benefit to Canada, something taxpayers would find unacceptable.

Appendix

Multipliers in the Statistics Canada Input-Output Simulations

Multipliers in the Statistics Canada input-output simulations provide an estimate of the impact per dollar of output delivered to final demand. Information on economic impact is estimated for output, GDP and jobs categories provided in the table below. For the simulations conducted for this study, Statistics Canada's results are provided below for the two defence expenditure categories of operational expenditures and capital expenditures. The multiplier definitions provided in the results are:

- Simple multipliers capture the sum of direct and indirect impacts. Simple multipliers are based on the assumption that households are exogenous and that there is no feedback between wages and production. Mathematically, a simple multiplier is equal to (direct + indirect impacts) divided by $1 of exogenous demand;

- Total multipliers capture the sum of direct, indirect and induced impacts. Households are treated as endogenous and the payments for labour services, i.e., wages, are redirected in the economy through consumer expenditures. Mathematically, a total multiplier is equal to (direct + indirect + induced impacts) divided by $1 of exogenous demand;

- Type 1and type 2 multipliers express respectively the simple and total multipliers as a multiple of the direct impacts. Mathematically, a type 1 multiplier equals the simple multiplier (direct + indirect) divided by the direct impacts, while a type 2 multiplier equals the total multiplier (direct + indirect + induced) divided by the direct impact.

For example, the simple jobs multipliers show the direct and indirect impacts on jobs of $1 worth of output of a given industry, while the type 1 jobs multipliers show the direct and indirect impact on jobs of one job in a given industry. In including the induced impacts, the same idea holds for the total and type 2 multipliers

Type of Multiplier	Operational Expenditures	Capital Expenditures
Output		
Simple Multiplier	1.48	0.92
Total Multiplier	2.03	1.15
GDP at Basic Prices		
Simple Multiplier	0.85	0.44
Total Multiplier	1.17	0.58
Type 1 Multiplier	1.45	1.66
Type 2 Multiplier	2.00	2.17

Jobs – full-time equivalent (FTE)		
Simple Multiplier (per million dollars)	8.52	3.88
Total Multiplier (per million dollars)	10.82	4.85
Type 1 Multiplier	1.35	1.59
Type 2 Multiplier	1.71	1.99
Jobs – self-employed and employee jobs (non-FTE)		
Simple Multiplier (per million dollars)	9.59	4.34
Total Multiplier (per million dollars)	12.70	5.66
Type 1 Multiplier	1.42	1.66
Type 2 Multiplier	1.88	2.16

About the Author

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