



Aerospace Small and Medium Sized Enterprises Financing

Management Consulting Project

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Aerospace Small and Medium Sized Enterprises (SME) Financing Management Consulting Report

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1. EXECUTIVE SUMMARY

In February 2012, the Minister of Industry, the Honourable Christian Paradis, announced the launch of the Aerospace Review. A working group on Small Business and Supply Chain Development was established with the mandate that included understanding the issues for small aerospace firms in Canada, including the financing needs of small aerospace firms.

This management consulting report has the mandate to look into the following questions:

- What are the financing needs of aerospace small and medium sized enterprises (SMEs)?
- Is this readily available in Canada?
- Where are the gaps?
- What are the public policy implications?

The report provides research of the aerospace industry, government policies, analysis of data from sources, such as Statistics Canada, as well as through discussions and interviews with SMEs throughout Canada, to assess the financing needs of SMEs.

There are approximately 635 small aerospace businesses in Canada, and 34 medium sized firms. SMEs account for 21% or \$4.6 billion in total revenues (this includes the maintenance repair and overhaul sector). Small firms accounted for 13% or 5340 full-time employees in the aerospace manufacturing sector and 9% of total Canadian aerospace R&D. Aerospace SMEs produce aircraft parts, electronic components, software and many others products. Their customers are the Tier 2 and Tier 1 firms, though some SMEs have relationships with OEMs. This customer relationship reflects the broad technology levels of SMEs, with some having high technical capabilities and other limited to only certain processes or products. Aerospace SMEs are vulnerable to a high level of global and domestic competition. Unlike other manufacturing industries, the aerospace industry's production focus is on low-volume but high quality output.

The financing needs of aerospace SMEs vary by each individual company, and according to their business strategies. In general, SMEs have access to good financing to undertake a number of their activities, through either their own commercial bank lending facilities or through a management of their own cash flows from operations. As a sub-group of the aerospace industry, there were three major SME financing needs identified that were not well covered:

1. Working Capital and Inventory Financing in the short-term to offset delays in major aircraft programs
2. Long-term financing for developing new products/technologies for participating on major global aircraft platforms
3. Funding of new technologies to improve business processes and increase productivity

The availability of sources of financing to fill these needs varies. There is a lack of commercial financing from the private sector banks for new product/technology development and new market opportunities. Equally, SMEs have found that financing terms offered by BDC are not available to those offered by commercial banks. Government financing for developing new technologies is available through existing

government programs, in particular the Strategic Aerospace and Defence Initiative (SADI); however, that program has a lengthy approval process and is a poor fit for the needs of SMEs.

There is a long-term economic benefit to supporting SMEs, in particular for those firms looking to grow and succeed internationally from a Canadian base. SMEs generate significant economic activities and their investments, especially for R&D, are more likely to be retained in Canada (from a production and development perspective). As most SMEs currently have a domestic or North American focus, many SMEs will be vulnerable to low-cost competition, especially as emerging countries increasingly target advanced technology and product market segments.

The federal government has a number of programs that support aerospace SMEs, including financing requirements. **From a broad perspective, these programs cover the spectrum of business activities from basic research, to pre-competitive development, to commercialization and sales. Therefore a financing “gap” does not exist.**

However, the appropriateness and effectiveness of these existing programs is an issue for the aerospace SME group. For instance, SADI funds R&D by SMEs but the program could be made to be more user-friendly. With less financing options than larger firms (such as the inability to raise funds through bonds in the capital markets), it can be challenging for SMEs to raise funds due to high financing costs and the concerns of overleveraging, which impacts the financial health of SMEs.

Supporting aerospace SMEs in a variety of business activities can generate positive externalities for Canada. A number of recommendations to address the financing needs of aerospace SMEs were prepared for the consideration by the Aerospace Review. These recommendations are:

Recommendation 1: Make SADI easier for SMEs to use by adopting a risk sharing (possibly royalty) based repayment approach and identifying ways to reduce the complexity and length of the application approval process (e.g. by having a simplified competitive process). Royalty-based repayment increases the risk of non-repayment significantly if the company is unsuccessful or the technology is a failure.

Recommendation 2: Identify ways for BDC to extend subordinate financing for aerospace SMEs on favourable terms, particularly with a lower risk premium.

Recommendation 3: Allocate any new aerospace SME funding from other programs such as SADI or the NRC, or establish dedicated funding allocations for SMEs, to ensure support for aerospace SMEs remains fiscally neutral. For SADI, for example, the dedicated funding for aerospace SMEs should be approximately equal to their share of total aerospace R&D, which is 9%.

Recommendation 4: Work with OEMs and Tier 1 to ensure Canadian SMEs have the real opportunity to compete for work on major platforms, allowing for further benefit in investments in Canadian OEMs and Tier 1 suppliers.

The government should be aware that financing of aerospace SMEs will likely generate calls for similar financing support for other industries across the country, many of which are likely more numerous.

2. INTRODUCTION

In February 2012, Federal Minister of Industry, the Honourable Christian Paradis, announced the launch of the Aerospace Review, a comprehensive, fiscally neutral review of all policies and programs related to the aerospace/space industry. The Honourable David Emerson was asked to Chair the Review, and would be assisted by four panel review members.

As part of the Aerospace Review, a working group on Small Business and Supply Chain Development was established. The Small Business working group is tasked with looking into the issues of small aerospace firms in Canada. One area of research is the financing needs of small aerospace firms.

Mandate of this Management Consulting Paper

As part of the Aerospace Review's research agenda, the following questions regarding Aerospace SME financing are being addressed in this report:

- o What are the financing needs of aerospace SMEs?
- o Is this readily available in Canada?
- o Where are the gaps?
- o What are the public policy implications?

The project scope includes researching and profiling the aerospace SME sub-sectors in Canada through the use of data from sources, such as Statistics Canada, as well as through discussions and interviews with SMEs throughout Canada, to assess the financing needs of SMEs.

This management consulting report is being submitted to the Aerospace Review to provide analysis of the financing situation for aerospace.

This report will provide a breakdown of aerospace SMEs, their role in the industry and identify current business challenges and issues facing this segment of the industry. An assessment of current government policies and programs available to aerospace SMEs and recommendations to fill gaps (if appropriate) will be provided.

3. METHODOLOGY

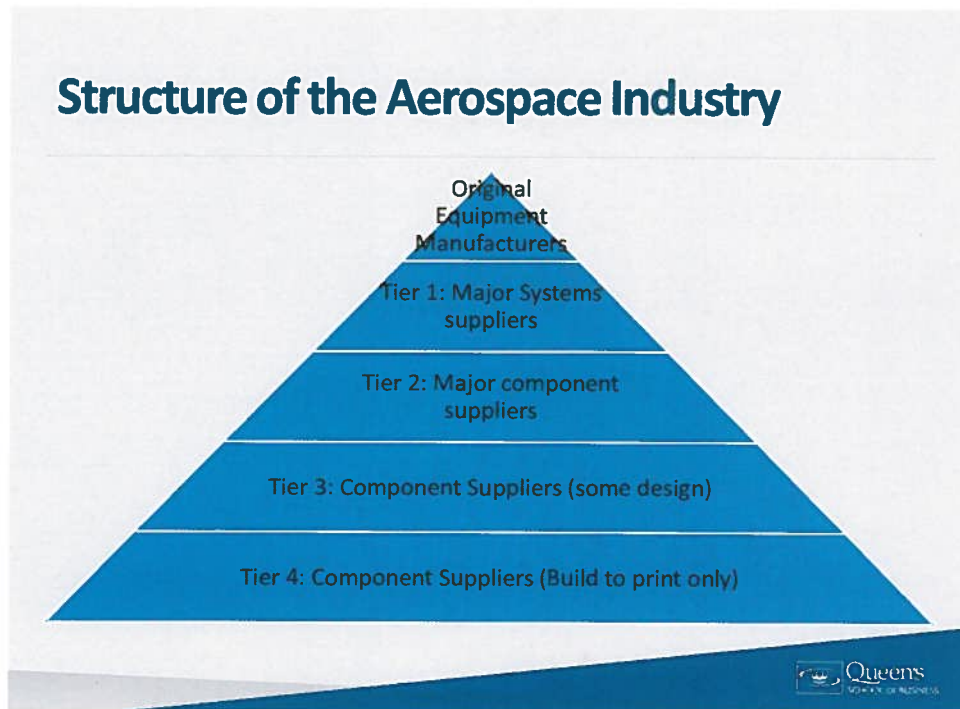
The analysis and recommendations in this paper are developed through a dual approach of research and data analysis. The 2010 data from Statistics Canada's Survey of Innovation and Business Strategies (SIBS) provides a wealth of information on the views of aerospace firms (by firm size) in regards to innovation and their issues. Additional analysis of current research papers on SME issues was also used as a basis for developing analysis of SME business issues.

The project also relies on discussions undertaken with industry associations from across Canada and with Canadian aerospace SMEs. While it would have been useful to undertake a full survey of Canadian aerospace SMEs, the interview process allows for more qualitative understanding of the business challenges and financing issues of this important part of the aerospace supply chain.

4. BACKGROUND AND PROFILE

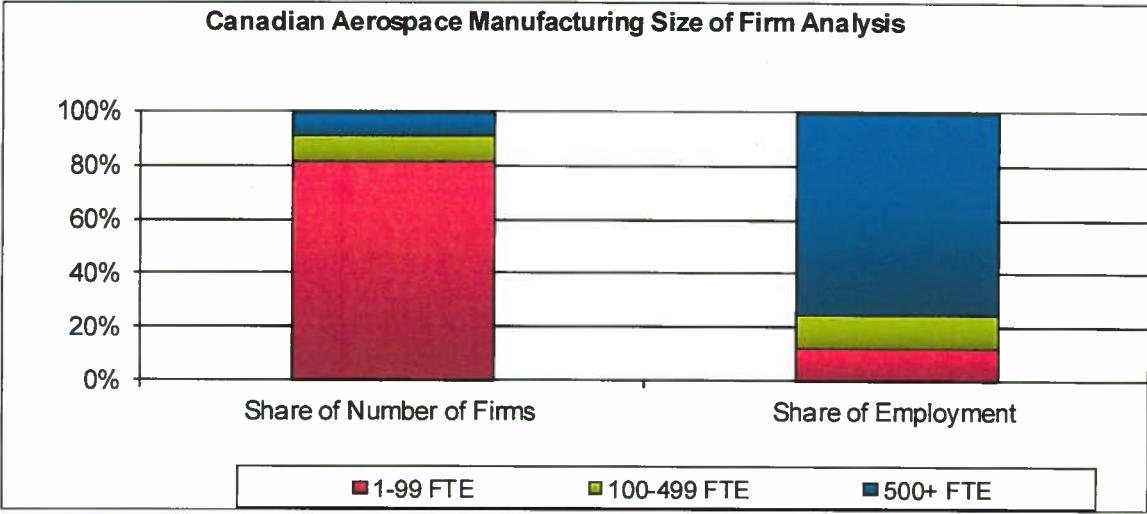
- SME role in the aerospace industry and in the global aerospace supply chain

The aerospace industry is structured based on a hierarchy, with Original Equipment Manufacturers (OEMs) such as Bombardier at the top of the industry. Tier 1 firms provide major completed sub-assemblies such as engines or completed landing gear systems. Tier 2 firms design and supply parts to the Tier 1 firms, while Tier 3 and 4 firms primarily provide build to print parts and components to the upper tiered firms.



In general, SMEs are located in the Tier 3 and 4 categories. Aerospace SMEs have the following characteristics:

- They are small firms with less than 500 employees,
- Have some R&D and design capabilities (Tier 3 Component Suppliers)
- Often owners operated
- Have limited number of product lines and clients. Rely on a few large clients for the bulk of their business.



Source: Industry Canada

According to Industry Canada¹, there are some 635 Small aerospace businesses in Canada, and 34 medium sized firms. SMEs account for \$21 or 4.6 billion in total revenues (this includes the maintenance repair and overhaul sector). Within aerospace manufacturing, there are 178 small firms, and 21 medium sized companies. Small firms accounted for 13% or 5340 full-time employees in the aerospace manufacturing sector. SMEs account for only a small portion of total Canadian aerospace R&D (9% of \$1.5 billion).

- Technology and Markets

SMEs operate in nearly all market segments of the industry, producing aircraft parts, electronic components, software and many others products. In general, their customers are the Tier 2 and Tier 1 firms, though some SMEs have relationships with OEMs. The level of technology at SMEs varies. Some firms have extremely high technical levels and their work is focussed on a niche technology or process. In contrast, there are other SMEs whose technical level is quite basic (limited to certain processes or products). SME business strategies are very much dependent on their business model that is appropriate for their operations. For instance, they may be focussed on selling to global markets by targeting international aerospace suppliers, or domestically to local Tier 1 and 2 firms. Often the SMEs are vulnerable to a high level of competition, both from a domestic market and new technologies. Unlike other manufacturing industries, the aerospace industry has low-volume production that is focussed on high quality output.

- Business structures

Most aerospace SMEs are incorporated but are privately held companies. Incorporation limits the liability for individual entrepreneur owners. For the most part, aerospace SMEs are of sufficient size that incorporation, which can be more expensive, is worthwhile. There are some SMEs which fall into the definition of SMEs but are actually Canadian operations of large foreign companies (such as the case of SonacaNMF, whose parent is Sonaca of Belgium). Another example would be Composites Atlantic, a medium sized enterprise headquartered in Lunenburg, Nova Scotia, and a subsidiary of Sogerma, a wholly owned subsidiary of Airbus' parent, EADS.

Most SMEs are run by entrepreneurs. A study by the Institute for Competitiveness and Prosperityⁱⁱ profiled SMEs in Canada indicates most owners of SMEs are business men with mostly technical backgrounds.

5. INTERVIEW WITH SMES AND INDUSTRY ASSOCIATIONS

As part of the management consulting report, interviews with SMEs were conducted to better understand their financing needs. Phone interviews were held with self-identified or recommended aerospace firms (from various sub-sectors, and regions). While there was insufficient time to interview a wider number of firms, and across a number of technology areas, there were a few consistent messages brought out through the interviews.

Major financing issues raised include:

- Provide support to firms looking to grow: Firms believe aerospace SMEs that want to succeed should be supported and need financing to encourage their growth. The view was expressed in the context of the common image of firms seeking financial support as the companies in financial trouble or in poor competitive positions.
- Working capital and inventory financing: There was generally no common point shared by firms on the financing of working capital and inventory. Some firms expressed viewed that these were part of their day-to-day management activities and they had lines of credits or other financial instruments available to use should the need arise. Other firms indicated inventory financing, especially as it related to work on delayed programs such as the Boeing 787 (some models as much as four years behind scheduleⁱⁱⁱ) and Airbus A380 were particularly problematic, since it tied up capital that could otherwise be employed elsewhere or created cascading cash management issues (mainly due to servicing loan payments without offsetting revenues).

Financing Need 1: Working Capital and Inventory Financing in the short-term to offset delays in major aircraft programs

- Patient Financing: Firms expressed the need for long-term, patient investor financing. This was sought to support firms looking to win work on major platforms or to develop new technologies/products that took time to mature and gain market acceptance. This was particularly a concern from the aspect of 1) raising sufficient funds to support new business development efforts (especially in a pay to play situation) and 2) sharing in the risk of new ventures that had yet to prove themselves.

Financing Need 2: Long-term financing for developing new products/technologies for participating on major global aircraft platforms

- Type of funding: Most firms choose to use debt as the financing mechanism, rather than equity. This is consistent with small business owners who would be averse to giving up control of their company to raise capital. The majority of firms did not ask for grants, instead they expressed the need for loans on more favourable terms. Some of those interviewed express the need for

non-repayable contributions that were similar to government funding available in other countries.

- BDC: Firms generally view BDC as a poor vehicle for supporting aerospace SMEs. Nearly all firms had indicated having financing discussions with BDC but that term of financing were deemed expensive, and non-advantageous versus their commercial bank. The rate, term and amount of funding available were considered particularly problematic. One firm indicated that an opportunity to work with BDC turned negative as the bank tried to extract itself from a financing arrangement, at a time when flexibility from the bank would have been appropriate. Few firms were aware of the subordinate financing offered by BDC or the more flexible lending terms available.

Financing Issue: Poor financing terms from BDC

- Commercial Bank financing: While BDC was not a good source for financing, the SMEs indicated commercial banks were not well suited for lending to develop new technologies and products. The commercial banks could finance tangible items, such as buildings and machines, but SMEs indicated difficulty in accessing financing to support growth opportunities associated with riskier technology development or to go after new market opportunities.

Financing Issue: Lack of commercial financing for new product/technology development and new market opportunities.

- Sales financing: The SMEs interviewed all had experience in working with Export Development Canada either now or in the past. Firms expressed universal support for the work and service provided by EDC, mentioning that the type (insurance or loan financing) and amount of support provided fit their needs. Most were unaware of the financing support for expansion of business to other countries (through establishment of new manufacturing facilities).
- The National Research Council - Industrial Research and Assistance Program (IRAP): IRAP was mentioned by a few companies; who expressed concern that the type of assistance they received (either technical advice or financing) was useful but that the amount of funding and the time required to seek approvals was high. As a result, these particular firms (3) indicated they would not seek IRAP assistance in the future. One firm currently engaged with IRAP in a project expressed satisfaction with the project, and the amount of assistance.
- SADI: The R&D program run by the Industrial Technologies Office was generally not regarded as a useful program for supporting their R&D projects. SADI was viewed as a program for large aerospace companies and not suitable as a financing mechanism due to its high cost of applying from both a cost and time perspective. The SMEs expressed concerns that the long application period and the uncertainty regarding project approval made the program unusable to SMEs. The Gross Business Revenue Model for repayments terms was raised as another major concern, with several firms noting there was a lack of risk sharing.

Financing Issue: Lengthy approval process, poor fit for needs of SMEs

- **Previous Programs:** While not all firms raised this issue, many suggested programs such as the former Technology Partnerships Canada (1996-2006) and the Defence Industries Productivity Program (1959-2006) were better programs to support their R&D activities. The firms indicated these programs had a true risk sharing model (e.g. royalty based repayment, non-repayable contributions, etc) that addressed their patient funding needs.
- **Provincial Program:** Some firms noted that financing from provincial programs were extremely useful to support expansion, acquisitions and product/process development. Firms in Quebec highlighted the advantage of Investissement Quebec financing as both forward looking and timely in supporting aerospace growth. Ontario firms had accessed provincial funding (e.g. the Advanced Manufacturing Investment Strategy (AMIS) but there was concern the review of current Ontario government programs would further delay accessibility.

In addition to interviews with companies, discussions took place with the three largest aerospace associations in Canada, the Aerospace Industries Association of Canada (AIAC), l'Association québécois d'aérospatiale (AQA) and Ontario Aerospace Council (OAC). The highlights of these discussions include:

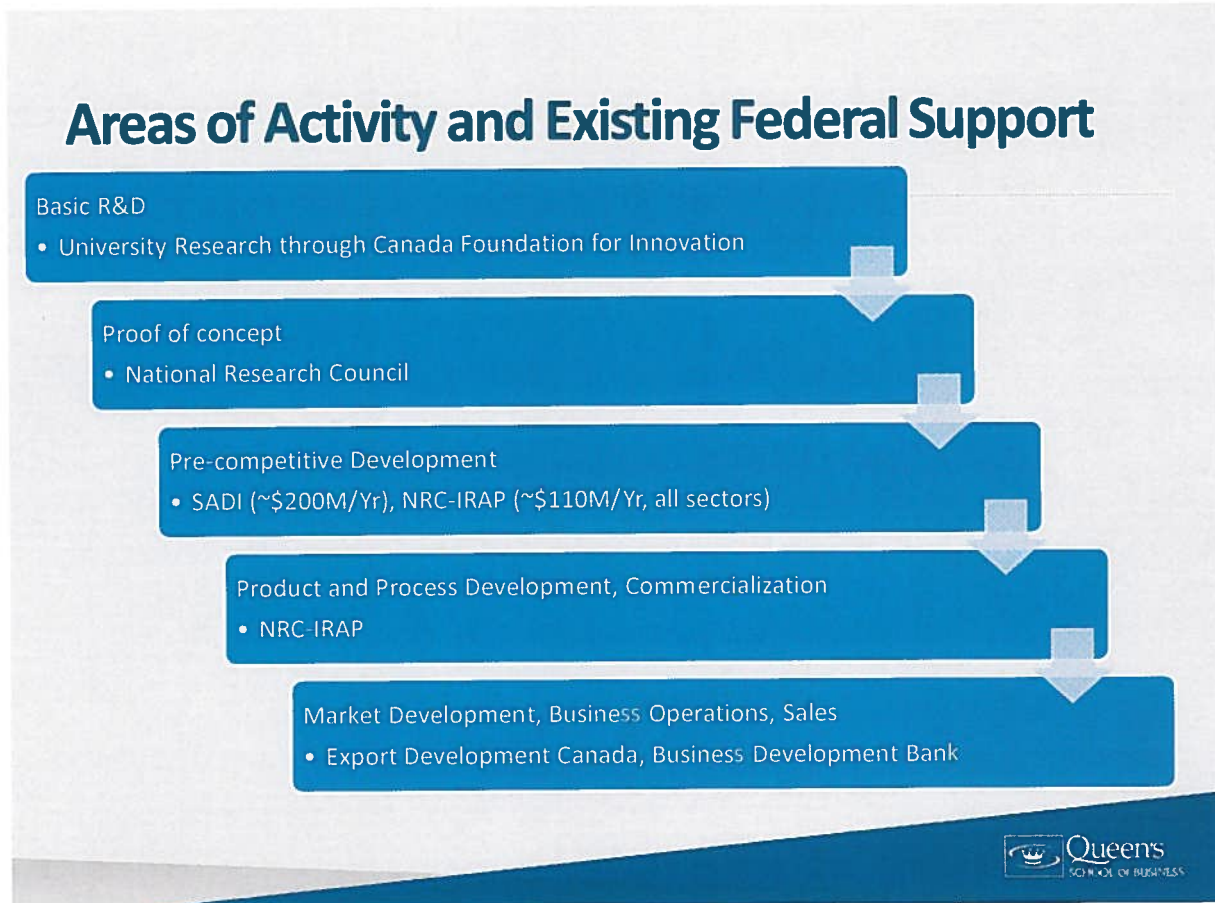
- **Need to support financing of firms looking to grow:** Many SMEs also do not want to grow and therefore there is little requirement to support these companies. Instead, financing should target those firms that are looking to grow their business, that truly need it and that are demonstrating their own commitment with making a financial commitment themselves.
- **Management skills:** Many aerospace SMEs are run by engineers or entrepreneurs who lack the proper business and management skill to execute on their projects. It is important that firms have this experience to ensure the proper projects are being put through, applications prepared properly and that they have the capacity to carry out the work.
- **New Technologies:** The changing ways of manufacturing and the future technologies required by firms to produce and compete were raised a business issue for SMEs. The remark was made in the context of the need to adapt to new manufacturing technologies (such as 3D printing) to stay ahead of the competition. These new technologies and their use in the aerospace industry represented a significant opportunity to reduce costs, better address customer needs and reduce the labour cost disadvantage with emerging markets. However, these new manufacturing technologies required a new set of skills, worker training and were quite expensive to acquire.

Financing Need 3: Funding of new technologies to improve business processes and increase productivity

- **Winning Canadian participation on major platforms:** Associations were unanimous in calling for ways to revitalize the aerospace industry by getting more Canadian firms on the new major platforms and ensuring this work comes to Canada. This was especially important in the context of most major platforms being Airbus, Boeing and even Embraer programs and the work not being done with OEMs.

6. UNDERSTANDING CURRENT GOVERNMENT POLICIES AND EVALUATION OF FEDERAL FINANCING PROGRAMS

There are numerous federal and provincial programs to support the aerospace industry. These programs provide support for various functions, that cover the entire business range and across the innovation continuum. It would be difficult to provide a complete assessment of all programs. Instead this report will instead focus on the primary federal programs available to the aerospace industry.



Strategic Aerospace and Defence Initiative

SADI was created in 2007 as a replacement for the Technology Partnerships Canada program. Its focus is to provide support for research and development activities being carried out in the aerospace and defence industry, primarily in the **pre-competitive development phase**. The program has a nominal budget envelope of approximately \$200 million per year. Operated by the Industrial Technologies Office of Industry Canada, SADI has provided support to 22 projects since its launch in April 2007. It is currently in its fifth year of operation. According to the SADI website its mandate is as follows:

“The Strategic Aerospace and Defence Initiative (SADI) has three main objectives:

1. to encourage strategic research and development (R&D) that will result in innovation and excellence in new products and services;
2. to enhance the competitiveness of Canadian A&D companies;
3. to foster collaboration between research institutes, universities, colleges and the private sector. Strategic R&D projects under SADI will use technologies that either:
 - support the development of next-generation A&D-related products and/or services;
 - build on existing Canadian strengths in A&D technology development;
 - enable Canadian companies to participate in major platforms and supply chains; or
 - assist the A&D industries in achieving Canada's international obligations (e.g. development programs supported by Canada)^{iv}.”

SADI has come under criticism from the aerospace industry for a number of issues. These points will be expanded upon in the analysis section of the report.

National Research Council – Industrial Research Assistance Program

The NRC's IRAP program provides technical and business advisory services related to research and development. IRAP also provides financial assistance to firms for R&D activities, particularly qualifying SMEs looking to develop new technologies. The financial support is provided to SMEs for eligible projects for salary and contractor costs that is associated with the project. Projects need to be focussed on technology-driven new and improved products, services or processes. IRAP Industry Technology advisors are available for firms to help guide the development of project proposals. The funding requires that the company have both financial and management resources to undertake the project, as well as the project being within the technical ability. These factors are all considered during the due diligence phase of evaluation^v. The NRC has developed service standards for IRAP, such that projects receive a funding decision to within a maximum of 45 days (for projects seeking funding over \$500K), based on the acceptance of a completed proposal and other requested documentation.

Export Development Canada (EDC)

The Government's decision to expand the powers of (Export Development Canada) has made financing more readily available for Canadian SMEs. EDC is primarily known for providing loans or insurance guarantees for the export sales of Canadian firm. EDC has a large transportation portfolio, which includes \$11.7 billion of loans to the aerospace sector^{vi}. However, its role in supporting other aerospace is less well known but quite practical. For instance, it can assist in the financing of foreign transactions and the development of off shore production sites that support a company's main operation. Each transaction with EDC is quite unique but provides a powerful tool for Canadian companies. Its powers exceed those of some its competitors, especially with the recent addition of permanent domestic financing powers^{vii}. However, EDC's support is very limited in one area of the innovation spectrum and is limited to product and sales ready goods. Its financing operations do not support innovation related activities, nor does it provide support for marketing or business development initiatives.

Business Development Bank of Canada (BDC)

BDC provides lending on a commercial basis to companies across Canada. BDC can provide normal commercial financing (mostly loans) to companies. As its function is not to crowd out the private sector, BDC rates are often higher than those available with commercial rates; which is considered to be charging for the risk being undertaken by BDC. Commercial lending at BDC can be used for a variety of purposes, including capital, buildings and machinery. Terms of the financing (rate, period, security) all vary from project to project. The terms can include those amounts deemed within the risk envelope of BDC. In addition to normal commercial lending, BDC can provide subordinate financing, an often unsecured financing vehicle that provides for more flexible payment terms. For instance, there can be delays for repayment of principal, interest only payment, and extended terms (push for 8-10 years, versus a normal commercial 5 year loan). The BDC, as a government owned entity, also has less emphasis on financing return and thus can undertake financing initiatives that more closely align with government priorities. For instance, during the 2008-09 recession, BDC was used as a response to the financial crisis to make additional lending capacity available to existing clients. BDC indicates that aerospace financing in general has not represented a large portion of its financing portfolio.

Other Programs

It is worth noting that the federal regional development agencies also provide funding for various types of projects

- ACOA: The Atlantic Canada Opportunities Agency's Atlantic Innovation Fund^{viii} supports the development and commercialization of new technologies, product and services. Funding is allocated on a competitive basis and is vetted through the AIF advisory board, which is composed of business leaders and academia. The funding is conditionally repayable and needs to meet a set of eligibility criteria, such as being technically sound, have appropriate management in place and demonstrate economic benefits for Atlantic Canada.
<http://www.acoa-apeca.gc.ca/eng/ImLookingFor/ProgramInformation/AtlanticInnovationFund/Pages/AtlanticInnovationFund.aspx>
- CEDQ: The Quebec Economic Development^x program provides financial assistance to SMEs working to develop new or improve existing products and services, purchase new equipment, computers tools or other technologies, and in prototyping, proof of concept or demonstration activities. A complete list can be found on CEDQ's website. Funding can be both repayable and non-repayable and SMEs are eligible for assistance of up to 50% of project costs.
<http://www.dec-ced.gc.ca/eng/programs/qedp/innovation.html>
- Feddev: There are two programs that are especially applicable to SMEs, these include the Technology Development Program which supports research and development, engineering design, and pre-commercialization activities (among others).
http://www.feddevontario.gc.ca/eic/site/723.nsf/eng/h_00332.html Funding is also provided through the Prosperity Initiative, which supports broad projects that increase productivity, regional diversification and help build a competitive advantage for southern Ontario.
http://www.feddevontario.gc.ca/eic/site/723.nsf/eng/h_00398.html^x

- WD: Western Economic Diversification does not provide support that is equivalent to ACOA's or CEDQ funding programs. WD does have the Communities futures program which provides small loans (up to \$150K) for SMEs in rural areas of the western provinces^{xi}.
<http://www.wd.gc.ca/eng/272.asp>

7. BRIEF RESEARCH OF FOREIGN PROGRAMS

- UK, US, European Union

Most countries have special carve outs for SMEs and or increased percentage of eligible costs.

Aerospace and defence support programs in other countries varies from one country to another. The type, level, quantity and even the nature of the support varies. The crucial elements of concern are the type of programs (grants, contributions or loans), the repayment terms, and the level of technology support provided.

Support for SMEs is nearly universal across most major countries.

In the United States, the government has two major funding programs to support aerospace and defence research, both offshoots of larger programs. Funding is done through carve out of larger programs or specialized sector focuses. Most of the aerospace R&D funding is delivered through the National Aeronautical and Space Administration (NASA). The Small Business Innovation Research program provides early-stage technology financing by supporting firms engagement in federal R&D. NASA's SBIR program funding was \$124 million in 2010.

The US also offers the Small Business Technology Transfer program that funds cooperative R&D projects. The program will support a SMEs participation in a formal R&D project with universities, R&D centres or a non-profit institution. Funding for the aerospace portion of the STTR was only \$14 million in 2010.

8. ANALYSIS IDENTIFYING THE FUNDING GAP AND ISSUES AFFECTING SMES

Analysis of the funding needs of SMEs necessarily requires understanding the role they play and the context within the larger aerospace industry.

The Global Aerospace Industry: The aerospace industry is a global, with multiple products and sub-segments. It is dominated by a few large original equipment manufacturers, which assemble commercial aircraft, business aircraft, helicopters, military aircraft (jet fighters, cargo aircraft) and engines. Development of aircraft programs is expensive, requires billions in investment. For instance Bombardier's CSeries program is expected to cost approximately \$3.5 billion to develop, while Boeing's 787 final development cost is expected to reach US\$32 billion^{xii}. While Canada is home to Bombardier, the global nature of the aerospace industry requires aerospace firms to have a global perspective, supplying to programs (through the Tier 1 and 2 firms primarily) developed around the world. Aircraft programs have a long life and winning work on these programs can secure supply contracts over a large number of units, providing for long-term business for firms.

The concern for Canadian aerospace SMEs is thus how to participate in these large, and lucrative supply chains? There are numerous factors that need to be considered, including economies of scale, cost, existing supplier relationships, distance from customers and availability of financing. SMEs will need to invest in the technologies and products that are in demand by the larger firms, as well as supplying the market at the right price.

Public Policy Implication: Securing work on aircraft programs provides for long-term economic activity for the SMEs.

Market Orientation and Competition Drivers: The SIBS data indicates that most Canadian SMEs are inward looking, but have linkages to firms in other countries through either a customer or supplier relationship. Most SMEs, relative to their competitors, are also competing on costs, as indicated by the SIBS survey which showed 28% of small business indicating meeting customer cost requirements was of high importance, versus 23.1. More significantly, 15.4 % of large firms found cost was not an obstacle, versus only 4% of small businesses^{xiii}. This would indicate SMEs are more vulnerable to cost competition than larger firms. Given global supply chains and the emergence of low-cost production centers in emerging markets, Canadian SMEs are particularly vulnerable.

Willingness to Risk Share: Data further indicates that SMEs do take the initiative and risk in working with customers. SIBS data indicates 47.2 % of large businesses, and 41.7 % of small businesses incurred upfront or non-recurring costs to satisfy specific customer requirements^{xiv}. Proportionally, small companies are also less inclined to accept greater risk sharing versus larger aerospace firms (30.6% versus 46.2% for larger firms). There could be multiple reasons to explain this gap, including lack of financing, expertise and the financial health of the SMEs being unable to support such activities.

Public Policy Implication: Small businesses are more risk averse; less likely to go after new work.

Investment Decision Making: The other aspect to understand is that the majority of Canadian aerospace SMEs are primarily Canadian owned, which contrasts significantly from the larger aerospace industry where, with the exception of Bombardier and CAE, the Canadian aerospace industry is largely foreign controlled (mostly wholly-owned subsidiaries). Canadian ownership and control of SMEs is important since it is a determinant for where value added activities such as production, product development, marketing and sales takes place. More importantly, it is also a consideration for where decisions are made for the company, including the question of what financing arrangements are required.

As an example, according to the SIBS data, 77.8% of SMEs engage in R&D, this compared with 92.3% of larger firms. However, only 2.8% of small firms contracted out R&D to enterprises outside of Canada, as compared to 46.2% for large firms.

Public Policy Implication: Investments, especially for R&D, by SMEs are more likely to be retained in Canada.

Lower level of technology use by SMEs: Small business is also less likely to adopt new technologies relative to the larger firms. Only 55% of small businesses reported using advanced computerized processing or fabrication and assembly technologies, versus 76.9 % for large firms. Investment in new machinery and equipment is important for increasing productivity and reducing costs. Lower adoption

and use of new technologies could signal lower productivity for SMEs. Recent federal budget measures, such as the Accelerated Capital Cost Allowance, make the purchase of new manufacturing and processing equipment more affordable to acquire, and ease cash flow in the early years for firms. Lower spending on new equipment could also be a further indication of the shortage of available financing.

Public Policy Implication: Lower level of investment in new machines and technology will hurt overall Canadian productivity.

Can Canadian SMEs compete and win internationally?: The answer, is both yes and no. Canadian SMEs that are focussed on competition based on low cost are likely to be under pressure since the Canadian manufacturing cost structure is high, relative to many jurisdictions. Bombardier's decision to build a plant in Queretaro Mexico is an example of how Canadian aerospace firms are looking to reduce costs by sourcing from low cost countries. China's manufacturing industry, which is growing increasingly more sophisticated, would be an example of another low-cost competitor.

Public Policy Implication: SMEs will be vulnerable to low-cost competition in increasingly advanced technology and product market segments.

Production Orientation: According to the SIBS survey, small aerospace firms are primarily focussed on maintaining or expanding the sale of existing products (52.8 % of small firms, 50 % of medium firms), while product improvements and new product improvements were the priority for 38.9 % of aerospace small companies.

Access to financing: The SIBS data for SMEs indicates that there are few internal financing hurdles for innovation. Only 33.3 % of aerospace small identified problems in identifying internal obstacles for financing. This compares with 53.8 % of large firms. This is likely due in part to the lower complexity of small firms, who have less internal approvals to deal with.

Responses of firms to the obstacles of external government support for financing: In the SIBS, 36.4% of small business highlight internal obstacles to financing were resolved through government support, versus 42.9% of large firms. For external financing, the percentages were 42.9% for small firms and 50% of large firms. This would indicate use of government funding tools as a way to address financing issues and strong reliance of large firms to access government funding. This could be as a result larger firms having dedicated staff with advanced knowledge of government programs, or more aggressive strategies by large firms to resolve their financing issues through government financing. The data for small businesses could also indicate that the appropriate government support mechanisms are not in place to properly support SMEs.

Public Policy Implication: Proportionally for aerospace, SMEs are less likely to use government financing support.

Data from Statistics Canada indicate small and medium sized firms do use government programs to fund innovation related activities. The SIBS data indicates 35% of small companies and 9.1% of medium sized firms accessed government grants between 2007 and 2009. The data further indicates 35% of small and

54.5% of medium sized firms used government tax credit programs for the same type of activities. In contrast, 15.4 % of large firms used government grants and 38.5% of firms used tax credits.

For example, two issues regarding SADI that directly affect SME are:

- SADI’s project review and funding delivery timelines are long. Delivery standards had been developed but it is unlikely that these standards have not always been met. This has been a source of frustration for the aerospace industry that has waited for funding.
- Aerospace firms have expressed concern that the program does not actually share technology risk; instead it is focussed on repayment. The Gross Business Revenue repayment model is designed such that companies repay SADI funding as soon as a year after project completion, despite the need for continued development of the project by the firm to finalize and complete the technology. Firms have also expressed concern that SADI funding needs to be repaid, even if the technology project is a failure.

SMEs in particular expressed views that SADI was an inappropriate vehicle for funding SME R&D. their concerns were similar to the above, but were particularly under the impression that the terms were disadvantageous for them. They were further concerned that repayment terms were not consistent with their financing needs for longer term patient capital. The other issue concerning SADI financing is the type of activities being financed. Most SMEs do not actually engage in R&D, and there was concern that the activities they do require financing for are not covered by SMEs.

While SADI is often mentioned as a program that does not work, the data for SADI funding since its creation in 2007 indicates SADI has been used by SMEs. Of the total SADI portfolio, SMEs made up 60% of the projects funded but only 8% of the funding provided. This ratio is not inconsistent with the 9% of total aerospace R&D conducted by SMEs.

Public Policy Implications: SADI’s is funding R&D by SMEs but the program could be made to be more user-friendly for these firms.

SADI Project Portfolio (As of July 1, 2012)

	Recipient	Amount	SME
1	AeroMechanical	\$ 1,967,507	1
2	Axys	\$ 1,836,900	1
3	Belair Networks	\$ 9,690,700	1
4	Da-Ta Systems	\$ 1,790,140	1
5	GMA	\$ 8,646,000	1
6	Integran	\$ 4,596,000	1
7	Integran	\$ 276,284	1
8	Integran	\$ 807,399	1
9	Integran	\$ 399,386	1
10	Kongsberg	\$ 4,968,000	1
11	Mechtronix	\$ 18,570,000	1

12	Norsat	\$	5,975,200	1
13	PCI Geomatics	\$	7,665,000	1
14	Sputtek	\$	360,285	1
15	Transcore	\$	3,127,000	1
16	Asco	\$	7,688,288	
17	Bristol	\$	43,391,600	
18	CAE	\$	250,000,000	
19	diamond	\$	19,600,000	
20	EMS	\$	8,718,634	
21	Esterline	\$	52,287,784	
22	Heroux-Devtek	\$	26,964,430	
23	PWC	\$	300,000,000	
24	Thales	\$	12,988,800	
25	Ultra	\$	32,447,400	
	Total Funding	\$	824,762,737.00	
	Total Funding to SMEs	\$	70,675,801.00	15
	% of total to SMEs		8.57%	0.60

Taxation: SMEs have a more favourable tax rate. The government provides incentives for SMEs to encourage more R&D by having a more generous SR&ED tax credit for small companies (20%) versus larger companies (15% as proposed by the Government in Budget 2012). The more favourable taxation environment for small companies makes it easier for firms to turn a profit but to also reinvest in their business to create new jobs. The lower taxation rate also contributes to a lower cost of capital for firms, especially when raising financing on open markets.

Financing Structures (Debt and Equity): Financing for firms can be done through either equity or debt. With small business being mostly privately held businesses, it is less likely that equity works as a financing method. The disadvantage of giving up further control of the company and the complications of identifying such investors creates further problems. Debt raises other issues, not the least of which are concerns over the financing costs (interest payments), terms of any loans, and whether there is sufficient cashflow to support the debt. Overleveraging can be disastrous for a company and this is particularly true for SMEs. On the other hand, few firms have the financial strength to fund growth, R&D and expansion through cashflow from operations.

Public Policy Implication: SMEs have less financing options than larger firms. Borrowing can be difficult in light of high financing costs and possibility of overleveraging.

Conclusion

- Many SMEs are continuing to compete on price, making them vulnerable to low cost competition. They need to invest in new products/technologies to compete.
- The government has programs available to support Canada's aerospace industry and SMEs across the spectrum of activities. Not all programs are well suited for serving SMEs.
- SMEs have a fiscal advantage through lower tax rates (and thus lower cost of capital).
- Generally, SMEs need to borrow to fund growth and R&D.

9. POLICY IMPLICATIONS AND PROGRAM RECOMMENDATIONS

The role of the government in funding the gap should be considered two ways: 1) Does funding SMEs in the context of the filling a gap bring positive externalities that would not otherwise occur? and 2) If so, can the government's support be effective? Further, if the government decides to support aerospace SMEs, how should it do so in an efficient manner that protects the public interest and bring value for taxpayer dollars.

Externalities: The externalities benefits of support to SMEs are not guaranteed, but the government's funding support can act as a facilitator for activities that would not otherwise occur, or would not otherwise occur in Canada. Market studies from aerospace industry analysts such as the Teal Group and Forecast International, and likely other reports being prepared for the Aerospace Review, indicate that there is a large opportunity in the global aerospace market. The value of sales in the total aerospace industry is in the hundreds of billions each year. Canadian SME participation in these opportunities can reap externalities or benefits to Canada such as:

- Increased spending on R&D, which promotes innovation;
- Creation of new business opportunities, which can increase jobs;
- Attract new investment, which supports capital influx;
- Generates spending through the economy (through supply chain impacts); and
- Lead to new export opportunities, which improves the trade balance.

There is a high pay to play aspect for firms to join on programs; however, if getting SMEs on to these programs is important to achieving these externalities, then there is a strong policy rationale for supporting the financing of SMEs activities.

Public Policy Implication: Supporting aerospace SMEs in a variety of business activities can generate positive externalities for Canada.

Gap in and Effectiveness of Federal Funding: If we consider the business activities that aerospace firms are engaged in, then the ability to identify a true financing gap not filled by the federal government is difficult. **Multiple programs serve various functions, but there exists sufficient program coverage to**

support nearly all activities requiring financing for aerospace SMEs (from basic university research to commercialization and sales financing). Therefore a federal program financing “gap” does not exist.

One area of concern may be in fact that too many programs exist, especially at the federal level. This point is especially apparent when assessing national programs (such as SADI), and including regional development agency funding (e.g. ACOA, CEDQ, Feddev). From a practical operations point of view, there are many programs providing financial support to aerospace SMEs. It could be argued strongly that financing support is spread out among too many departments and agencies; and as such, consolidation could be considered.

However, the other aspect is effectiveness and deciding which business activities should be supported by the government. Possible criteria for assessing whether an activity should be supported are: the level of involvement by aerospace SMEs, public policy goals to encourage a certain activity/behaviour, and whether it can be done responsibly (for consideration of taxpayer’s dollars).

Under basic research, the government has existing programs such as the Canada Foundation for Innovation which provides funding to universities. As most SMEs do not engage in this business activity, basic research funding would be ineffective. This would be similar to the proof of concept stage of business activity, where the industry has called for technology demonstrator type project funding from the federal government. While it would be useful to have SMEs collaborate on such projects to build their technical abilities, it was not an activity where many SMEs currently participate and it was not raised as an area of financing concern for SMEs during interviews.

Despite its use by many SMEs in the aerospace industry, SADI as it is currently delivered is not an effective tool for SMEs. However, its focus on pre-competitive technology development is an appropriate business activity to support. Encouraging more R&D by SMEs would increase their technical abilities, could lead to the development of new technologies and products. Repayment terms for the current program (as previously mentioned) would not address the issue of patient long-term capital and would need to be changed to more accurately reflect the risk-sharing nature of developing new, innovative products. One possibility would be to return to a royalty-based repayment model used under previous R&D support programs.

Another issue is the lengthy approval and application process that serves to dissuade SMEs from using the program to support R&D development. One option to force SADI to develop a more simplified application process and speed up decision making that could be considered is establishing a competitive process. SMEs raise the issue of long, difficult processes for project approval. A competitive process would naturally force application for funding to be uniform and simplified. Current SADI processes are equivalent to full business case preparations, which could be considered excessive. Therefore competitive processes could reduce the paper burden on firms and ensure a more timely approval of funding. As a competitive process, it would also ensure that only the best projects put forward would receive funding. This model differs significantly from the first past the post method.

Recommendation 1: Make SADI easier for SMEs to use by adopting a risk sharing (possibly royalty) based repayment approach and identifying ways to reduce the complexity and length of the application approval process (e.g. by having a simplified competitive process). Royalty-based

repayment increases the risk of non-repayment significantly if the company is unsuccessful or the technology is a failure.

Are other programs effective and appropriate?: The key question is whether the terms of support are appropriate for the aerospace SMEs. BDC for instance, has the tools necessary to provide long-term funding to satisfy the gaps through their subordinate financing initiative. Subordinate financing allows for flexible terms of repayment that are being called for by aerospace SME, though it falls short when assessed against the rate of interest. Given the cost of capital for most firms, it is not difficult to understand firms will reject BDC financing of any type. The primary concern for the government is whether the risk premiums associated with the BDC subordinate loans could be made more attractive for an SME to consider. This could be difficult given the autonomy of the BDC. Absence other changes, subordinate financing could be acknowledged as bridging the financing gap of patient long-term capital; however, without a better interest rate, BDC would not be able to satisfy the financing needs of aerospace SMEs. The advantages of BDC based financing is their knowledge of financing tools, their experience in the subordinate loan space and an existing administrative/lending group that could easily assess and support subordinate lending to aerospace SMEs.

Recommendation 2: Identify way for BDC to extend subordinate financing for aerospace SMEs on favourable terms, particularly with a lower risk premium.

Cost to the federal government: The government's fiscal situation remains solid, despite the current deficit. As the mandate of the Aerospace Review is to remain fiscally neutral, then the issue of additional funding becomes more problematic. As an example, SADI's support for SMEs through the past 5 years was \$70.66 million, for 15 projects. This represented 8% of total announced SME funding, and consistent with SME's share of total aerospace R&D funding. Data on SME financing provided to SMEs through other programs such as BDC and NRC-IRAP are unknown, though the interviews with SMEs would indicated any funding from these programs is small. As the Aerospace Review's mandate is to remain fiscally neutral, any funding to address SME funding issues should be allocated through existing program funding or establishment of carve outs dedicated to SMEs.

Recommendation 3: Allocate any new aerospace SME funding from other programs such as SADI or the NRC, or establish dedicated funding allocations for SMEs, to ensure support for aerospace SMEs remains fiscally neutral. For SADI, for example, the dedicated funding for aerospace SMEs should be approximately equal to their share of total aerospace R&D, which his 9%.

The Government has invested billions in Canada's OEMs and Tier 1 firms over the past two decades. These investments have given Canada a strong base of technologically advance, industry leading firms that are globally competitive. Both Bombardier and Pratt & Whitney Canada, are world leaders in market segments that drive the aerospace industry. While the government's investment has contributed to the successful development of leading-edge technologies, the SME base should also benefit. The realities of global supply chains means large companies have to source from other countries to reduce costs, hedge supplier risk and currency costs, as well as to access new markets. However, with major investments being made in these large firms, the government should expect Canadian SMEs to also benefit from those investments. Businesses need to make their own supplier decisions, but government financing support could strengthen the Canadian aerospace SMEs technical abilities to compete and win as suppliers with Canadian OEMs, either directly or indirectly through other

Tier 1 and 2 companies. It would further strengthen the availability of a strong aerospace SME supplier base that could be further leveraged through other policies, such as the Industrial and Regional Benefits Policies. In particular, foreign OEMs with IRB obligations would have stronger Canadian SMEs to select and integrate into their global supply chains.

Recommendation 4: Work with OEMs and Tier 1 to ensure Canadian SMEs have the real opportunity to compete for work on major platforms, allowing for further benefit in investments in Canadian OEMs and Tier 1 suppliers.

Bias towards SMEs: Are aerospace SME's financing needs so different from other SMEs across the Canadian economy? No. SMEs across the Canadian economy likely have similar financing needs or concerns. Different industry groups likely have different but perhaps no less important SME financing needs. Automotive SMEs are similar to aerospace SMEs due to their focus on producing for major OEMs or Tier 1 suppliers and yet there are no programs designed specifically for automotive industry SMEs. The level of global competition and vulnerability to global competition is a similar trait shared by all SMEs across the manufacturing sector. Similarly, they are likely to have the same concerns about government support mechanisms, such as the higher risk premiums from BDC.

Policy Implication: The government should be aware that financing of aerospace SMEs will likely generate calls for similar financing support for other industries across the country, many of which are likely more numerous.

10. ANNEX A: LIST OF INTERVIEWS AND PARTICIPANTS

Sonaca NMF
Centra
Aerospace Industries Association of Canada
Ontario Aerospace Council
Association Quebecois d'aérospatiale
FTG Group
Apex Industries
BDC
Industry Canada

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