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Evaluation of the Industrial and Regional Benefits Policy

Final Report

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Industry Canada

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Acronyms

AIAC	The Aerospace Industries Association of Canada
ACOA	Atlantic Canada Opportunities Agency
BC	British Columbia
CAF	Canadian Armed Forces
CFDS	Canada First Defence Strategy
CCV	Canadian Content Value
DND	Department of National Defence
DPS	Defence Procurement Strategy
EPTL	Enhanced Priority Technology List
FTEs	Full-Time Equivalent Employment
GATT	General Agreement Tariffs and Trade
GDP	Gross Domestic Product
GVC	Global Value Chain
GPA	Agreement on Government Procurement
HQP	Highly Qualified Persons
IC	Industry Canada
IF	New Investment Framework
I/O	Input/Output
IP	Intellectual Property
IRB	Industrial and Regional Benefits
ITB	Industrial and Technological Benefits
KIC	Key Industrial Capabilities
NAICS	North American Industrial Classification System
PWGSC	Public Works Government Services Canada
R&D	Research and Development
RDA	Regional Development Agencies
RFP	Request for proposal
SME or SMB	Small and Medium Size Businesses
SPAC	Senior Procurement Advisory Committee
TBS	Treasury Board Secretariat
TCCV	Total Canadian Content Value
WTO	World Trade Agreement

Executive Summary

Objectives, Scope and Methodology

The objective of the Industrial and Regional Benefits (IRB) Policy is to contribute to the continuing viability of Canadian companies' capabilities in high technology manufacturing and services, and to improve their ability to compete in both domestic and international markets. The policy is applied routinely to defence and security procurements over \$100M and is discretionary for procurements between \$2M and \$100M.

Under the policy, winning bidders (prime contractors) must undertake business activities in Canada equal to the value of the contract (IRB obligations). Prime contractors are encouraged through a variety of IRB policy features to undertake high quality, export-oriented activities with competitive Canadian industrial firms (IRB recipients) across Canada's regions. There are five eligibility criteria that an IRB contractor must demonstrate when they submit an IRB transaction to Industry Canada for review: causality, incrementality, the Canadian Content Value, timing and eligible party.

The new Defence Procurement Strategy (DPS), announced by the Government of Canada on February 5, 2014, marked a fundamental shift in the IRB Policy. DPS will involve a Value Proposition. Under the DPS, Industrial and Regional Benefits (IRB) will be transformed into Industrial and Technological Benefits (ITB).

There are currently 40 defence contractors meeting IRB obligations on 72 different procurement contracts, presenting opportunities for Canadian advanced technology businesses valued at almost \$25B. The earliest of these contracts dates back to 1996 and most of the contracts span 10 to 20 years, meaning that IRB activities on these contracts will also span that many years.

The objective of this evaluation was to provide program management with information on the impact of the IRB Policy to inform decision-making. The evaluation was conducted in accordance with the *Directive on the Evaluation Function*, and addressed the core issues of relevance and performance. The evaluation covered the five-year period from April 1, 2008 to March 31, 2013, and it focused on the aspects of the IRB Policy that pertain to Industry Canada. The evaluation utilized the following methodologies: a document review and administrative data analysis; a literature review; key informant interviews (n=37); case studies; and a survey (n=140 recipient firms). The evaluation also utilized an input-output (I/O) model to assess the impacts of the IRB Policy on Gross Domestic Product.

Findings

Relevance

There is a continued need for federal support for industrial development in Canada's defence and security sector. Defence procurements usually fall outside of the scope of international trade agreements, thereby allowing the use of offsets policies to: support domestic defence sectors; address security concerns; and capture economic benefits from defence and security procurements. In Canada, defence firms face a number of challenges including: the heavy dependence on foreign markets; the relative small size of the Canadian defence market; closed procurements in some countries; cyclical domestic demand; and the increased competitiveness of foreign defence markets. Accordingly, like many countries, the Government of Canada has implemented policies to leverage economic benefits from its defence and security procurements.

The IRB Policy is in line with the priorities of the federal government and the strategic outcomes of Industry Canada. The IRB Policy is also aligned with the roles and responsibilities of the federal government in international trade and defence.

Performance

Prime contractors are fulfilling their IRB obligations. Industry Canada (IC) monitors contract activities to ensure fulfillment of obligations, and there were no cases where prime contractors failed to meet their IRB obligations. For the 2008 to 2013 period, a total amount of \$11.2B in new obligations were committed to, of which \$5.1B (46%) had already been claimed and credited. All obligations are on track and are expected to be completed within established contractual timeframes, which range from 2008 and 2038.

IRB recipients have benefited from IRB transactions to a varied extent. Transactions were of varying quality in terms of long-term capacity building benefits for the IRB recipients. For example, many contracts involved the development of new technologies, the development of highly-qualified personnel, technology transfers, and increased scientific and technical know-how of IRB recipients. High impact transactions were generally associated with larger transactions. However, the definition of "quality" varied by sector, sub-sector, as well as by geographic area, according to respondents. Overall, an econometric analysis found that \$11.1B¹ in new IRB obligations will lead to a total increase in GDP of between \$12.4B and \$19.0B (including direct, indirect and induced impacts as well as the effects of spin-off sales) over the lifetime of the contracts. Prime contractors would not have as big a presence in Canada in the absence of the IRB Policy, indicating a strong causal and incremental impact of the IRB Policy.

The IRB Policy has led to the growth of IRB recipients and the development of new business relationships. IRB transactions led to significant spin-off sales for IRB recipients. Counting actual and projected spin-off sales in the next three years (excluding the IRB contract), sales are estimated to be in the range of \$3.2B and \$10.9B for the period. The mid-range scenario estimated spin-off sales to be of \$7.1B. These impacts are in addition to the IRB transactions. In some cases, the IRB Policy contributed to the development of new business relationships with

¹ Due to data entry gaps, the econometric analysis could only be conducted on \$11.1B of the \$11.2B in obligations.

the prime contractor. Some of these relationships were likely to be long term, while some were one-offs.

In several cases, IRB recipients benefited from supplemental business opportunities with other firms after the initial IRB transactions. IRB recipients have been included into the global value chains of primes in other countries; have gained an international reputation from the IRB contract; or have been introduced to new potential clients through their prime contractor.

Views about the 2009 Policy Enhancements

The latest enhancements to the policy were gradually implemented since 2009. Generally speaking, it is too soon to tell what the full impacts of 2009 enhancements will be. Prime contractors generally appreciate the banking and phase-in options although some prime contractors said a longer period for banking credits would provide additional flexibility. The consortia option is generally appreciated although the outcomes are still unknown in many cases. There was also appreciation for the improved recognition of the value of Canadian firms' participation in Global Value Chains.

Operational and Allocative Efficiency

IC delivered the IRB Policy at a low cost given that administrative costs represented less than one percent of new IRB obligations created during the period. The administration of the IRB Policy involved intensive verification processes and there is evidence that program resources were insufficient to meet internal targets (e.g. time required to verify claims). There are opportunities to improve processes, use more electronic tools to receive claims and review the level of staffing. There is also an opportunity to improve reporting given that new data systems are in place to do so. The net benefits of the program were well above the direct costs to administer the policy.

Recommendations

1. The Industrial and Technological Benefits (ITB) Branch should ensure that the ITB policy encourages high-quality outcomes (including those identified in the review of previous IRB transactions) by defining quality and success factors, establishing baselines, and monitoring performance.
2. The ITB Branch should ensure that the monitoring and reporting system currently in place tracks the impacts on recipients of IRB transactions and the new industrial and technological benefits.
3. The ITB Branch should clarify and streamline its administrative procedures.

1.0 Introduction

This report presents the findings of an evaluation of the Industrial and Regional Benefits (IRB) Policy. The overall objective of the evaluation was to assess the relevance and performance of the IRB Policy. The report is structured as follows: Sections 2.0 and 3.0 describe the context and methodology for the evaluation. The findings of the evaluation are presented in section 4.0. These are provided by evaluation issues related to relevance and performance. Conclusions and recommendations follow the findings in Section 5.0.

2.0 Profile of the IRB Policy

This section describes the IRB Policy and the administrative arrangements to implement the policy within Industry Canada (IC). Please refer to Appendix A for definitions of IRB technical terms.

2.1 Context

Federal procurement of goods and services has the potential to generate significant industrial benefits for Canadian firms. Since the mid-1970s the Government of Canada has been pursuing the use of industrial benefits as part of the federal procurement contracts that are exempt from international trade agreements. Under this approach, firms bidding on government defence and security contracts are evaluated on the basis of the economic benefits of their proposals to Canada, as well as price and quality.

In 1985, a task force study on government procurement identified some limitations with the process. Notably, procurements tended to be assessed on a case-by-case basis focused on short-term regional benefits, and emphasized the quantity, not the quality, of the industrial benefits. In response to the task force recommendations, the Government of Canada implemented a formal IRB Policy in 1986, which provides the framework for leveraging federal defence and security procurements to generate long-term industrial and regional development within Canada.

2.2 Policy Objectives

The objectives of the IRB Policy is to contribute to the continuing viability of Canadian companies' capabilities in high technology manufacturing and services, and to improve their ability to compete in both domestic and international markets. The policy is applied routinely to defence and security procurements over \$100M and is discretionary for procurements between \$2M and \$100M.

Under the policy, winning bidders (prime contractors) must undertake business activities in Canada equal to the value of the contract (IRB obligations). In order to meet their IRB obligations, prime contractors are encouraged through a variety of IRB policy features to undertake high quality, export-oriented opportunities for competitive Canadian industrial firms (IRB recipients) across Canada's regions. The optimum IRB proposal will result in the creation and exploitation of capabilities, knowledge, technologies and markets of lasting benefit to Canadian industry. It is important to note that while many prime contractors are associated or affiliated with foreign multinationals, some are non-affiliated Canadian firms.

2.3 Policy Implementation

The IRB Policy is administered and managed by officials in the IRB Directorate at Industry Canada (now known as the ITB Branch). As the IRB Policy Authority, Industry Canada is deeply involved in both the procurement process and the post-contract management of IRB obligations.

Prime contractors' IRB obligations are fulfilled through IRB transactions. A transaction is an actual business activity between the prime contractor and a Canadian business/organization that contributes to fulfilling the prime contractors' IRB obligations. Transactions can be directly linked to the item being procured, or can be indirectly linked through the prime contractor's other business lines. Transactions can involve a number of types of activities, including purchases of Canadian goods and services, investments in business development activities, investments in R&D, technology transfer, and inclusions in Global Value Chain platforms (i.e. vehicles or major sub-systems).

For procurements that fall under the scope of the IRB Policy, the procurement process usually begins with a meeting of the contracting department or agency (typically the Department of National Defence or the Canadian Coast Guard), the contracting authority (Public Works and Government Services Canada), and Industry Canada to discuss the potential project. Industry Canada, with the aid of the Regional Development Agencies (RDAs), develops IRB requirements for the procurement which is approved by the Senior Procurement Advisory Committee (SPAC) or a similar interdepartmental body. The SPAC is chaired by the procuring department or agency and is comprised of senior officials from Industry Canada, PWGSC, the RDAs, Treasury Board of Canada Secretariat, Finance Canada, and the Privy Council Office. There is a similar secretarial review process for projects valued under \$100M.

When the Government of Canada decides on a procurement strategy for a particular project to which the IRB Policy applies, a Request for Proposals (RFP) is published on the government's on-line tendering system. The RFP outlines the specific IRB requirements for the procurement. As part of their response to the RFP, bidders must submit an IRB proposal that outlines how the bidder will meet the IRB obligation, along with their technical and pricing proposals. The IRB proposal must also include specific IRB transactions, equal to at least 30% of its bid price. These plans and specific transactions form the basis of the contractual commitments by the successful bidder.

Once the proposals are submitted, the purchasing department evaluates the technical aspects of the proposal and PWGSC evaluates the financial aspects. A successful proposal must meet the technical and financial requirements specified in the RFP.

Industry Canada, along with the RDAs, conducts evaluations of the bidders' IRB proposals. The IRB evaluation is based on a set of mandatory IRB requirements, which are assessed as pass or fail. If a bidder fails the IRB component, their entire bid is eliminated from the procurement process.

The IRB evaluation team evaluates the bidder's IRB plans and specific transactions to ensure that they meet the requirements set out in the RFP and that those transactions meet the IRB

eligibility criteria as follows:

- **Causality:** The IRB transaction must be clearly and demonstrably brought about, in part, as a result of the IRB obligation to Canada (i.e. the work would likely not have taken place in Canada otherwise).
- **Timing:** The proposed IRB transaction must be completed within the IRB achievement period, which is usually the length of the contract.
- **Incrementality:** IRB transactions must involve new work in Canada. When an indirect IRB transaction is for the purchase of the same goods or services from an existing Canadian supplier to the prime contractor, only the new work over and above a baseline of previous business activity is counted for credit.
- **Eligible Party:** The IRB transaction must be undertaken by either the prime contractor, one of its Tier 1 suppliers for the defence and security procurement, or their corporate family companies. The prime contractor is fully responsible for fulfilling the IRB obligation regardless of the flow down to other eligible parties.

All IRB commitments are measured in terms of Canadian Content Value (CCV), meaning that only Canadian labour and parts are counted towards obligations. In addition, IRB transactions should involve technology at the same or higher level than the procurement project. Once a contract is in place, Industry Canada is responsible for the ongoing management and monitoring of IRB obligations. Prime contractors are required to submit annual reports to Industry Canada, where officials review them to determine the progress of the IRB obligation. The report contains claims against the IRB transactions (business activities, etc.), detailing the work going to Canadian industry that year. Prime contractors only receive IRB credits toward their obligations once their report has been verified.

Verification involves an Industry Canada review of the prime contractor's relevant documentation (invoices, purchase orders and other payment information) to prove that the work has been completed as described in the IRB claims. The verification process ensures that work claimed by the prime contractor is accurate and continues to meet the IRB eligibility criteria. If the prime contractor does not complete the obligation by the end of the contract, performance guarantees in the contract are then exercised.

Canada currently has 40 defence contractors meeting IRB obligations on 72 different procurement contracts, presenting opportunities for Canadian advanced technology businesses valued at almost \$25B. The earliest of these contracts dates back to 1996 and most of the contracts span 10 to 20 years, meaning that IRB activities on these contracts will also span that many years. The vast majority of the IRB activities are either completed, in progress or identified. The IRB portfolio is comprised of approximately 2,000 transactions and more than 800 distinct recipients, including large corporations, small and medium-sized enterprises (SMEs), and publicly funded academic and research institutes.

2009 Enhancements

The launch of the Canada First Defence Strategy in 2008 had significant implications for the IRB Policy as it laid out a vision of defence procurement plans, and outlined close to \$490B in federal defence investments between 2008-09 and 2027-28. The Strategy, combined with changes in the aerospace and defence sectors and the economic crisis, were key drivers in enhancing the IRB Policy in December 2009. These enhancements were designed to maximize the benefits from future defence procurements and encourage more strategic, long term outcomes from the IRB policy, by:

- Providing more flexibility and time for contractors to develop high quality activities. The percentage of IRB obligations that had to be identified prior to the awarding of the contract was reduced from 60% to 30%, and firms were allowed to bank IRB activities towards future IRB obligations;
- Increasing innovative, public-private research and development collaboration to fuel economic growth. New incentives were provided for public-private R&D consortia, as well as a new Investment Framework for R&D and commercialization investments at Canadian small and medium sized enterprises;
- Encouraging the early and strategic involvement of Canadian suppliers in global value chains (GVCs). The Enhanced Priority Technology List was implemented.² Strategic Plans were requested from prime contractors with major IRB obligations. Incentives were also provided to improve the support the increased participation of Canadian firms in GVCs.

2.4 Program Resources

The resources available to the IRB Directorate to manage the IRB Policy are shown in the following table.

Table 1: IRB Directorate Funding Profile, 2008-09 to 2012-13

	2008-09	2009-10	2010-11	2011-12	2012-13	Total
Salaries	\$1,176,699	\$1,903,421	\$2,122,937	\$2,161,155	\$2,250,687	\$9,614,899
Operating	\$155,778	\$355,135	\$249,650	\$365,849	\$530,087	\$1,656,499
Total	\$1,332,477	\$2,258,556	\$2,372,587	\$2,527,004	\$2,780,774	\$11,271,398

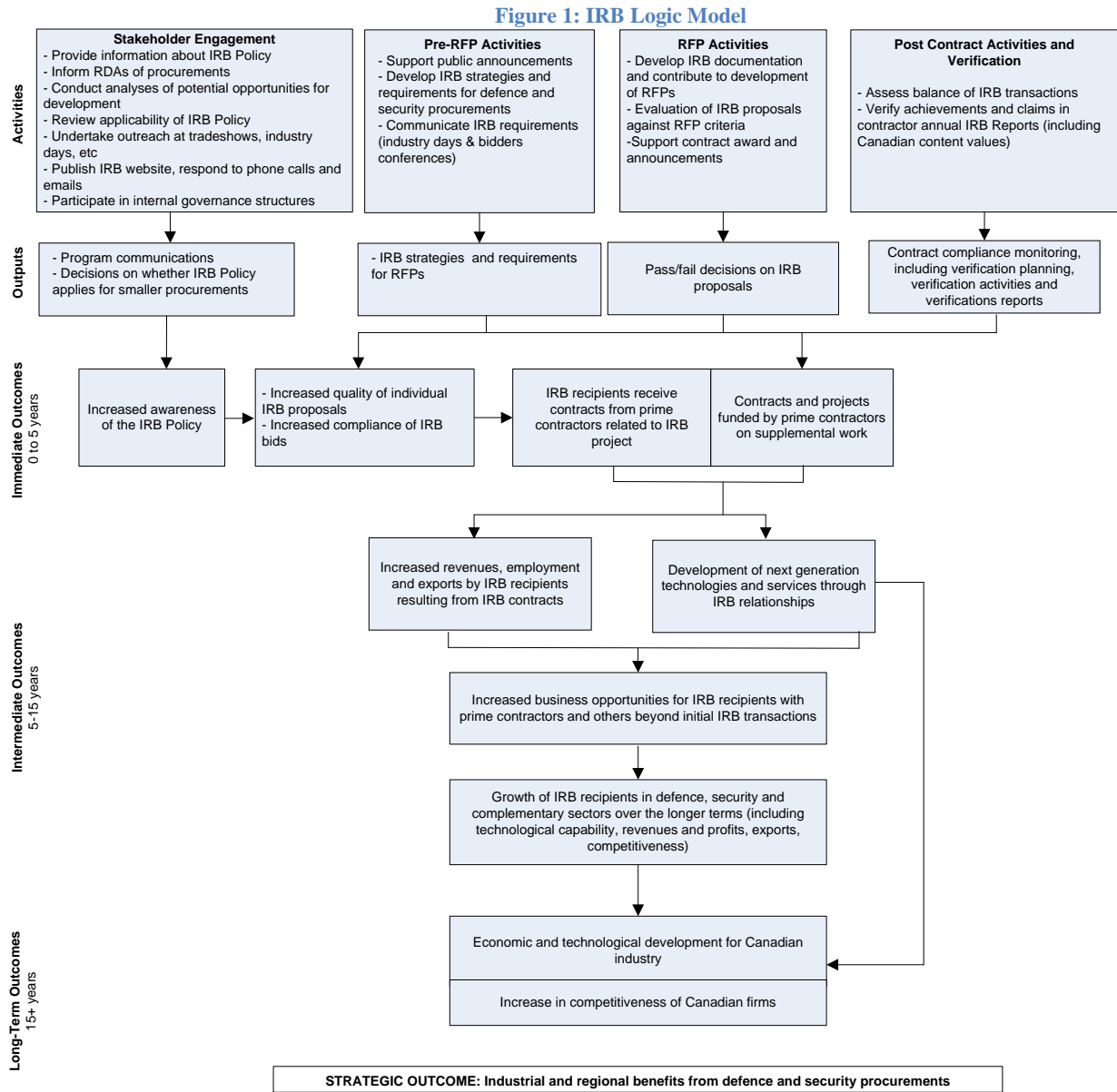
Source: IRB program data

The majority of the IRB Directorate's financial resources are dedicated towards staff salaries. The Directorate has 26 FTEs. Industry Canada does not provide funding to prime contractors or IRB recipients for the achievement of industrial and regional benefits. Instead, a successful bidder assumes an IRB obligation equal to the value of the contract on its balance sheet and the obligation diminishes with each IRB transaction achievement until the outstanding IRB obligation reaches zero.

² The Enhanced Priority Technology List (EPTL) identifies the emerging and transformational technologies needed by the Canadian military across all key platforms. The list is regularly updated by the Department of National Defence as its critical technology needs evolve.

2.5 Logic Model

A logic model is a visual representation that: links a program’s activities, outputs and outcomes; provides a systematic and visual method of illustrating the program theory; and shows the logic of how a program is expected to achieve its objectives. It also provides the basis for developing the performance measurement and evaluation strategies. The logic model for the IRB Policy is represented in Figure 1.



3.0 Objectives and Methodology

This section presents the evaluation scope, objectives, guiding issues and data collection methods.

3.1 Evaluation Scope and Objectives

The objective of this evaluation was to provide program management with information on the impact of the IRB Policy to inform decision-making. The evaluation was conducted in accordance with the *Directive on the Evaluation Function* and addressed the core issues of relevance and performance. The evaluation covered the five-year period from April 1, 2008 to March 31, 2013, and focused on the aspects of the IRB Policy that pertain to Industry Canada.

3.2 Evaluation Questions

The evaluation addressed the following questions on relevance and performance:

Relevance

1. Is there a continued need for federal support for industrial and regional development in Canada's defence and security sector? Does the IRB Policy respond to this need?
2. Does the IRB Policy align with the priorities of the federal government and the strategic outcomes of Industry Canada?
3. Does the IRB Policy align with the roles and responsibilities of the federal government?

Performance

To what extent have prime contractors fulfilled their obligations?

1. To what extent have IRB recipients benefited from IRB transactions?
 - a. Did firms benefit from IRB transactions?
 - b. What has been the quality of the IRB transactions provided by prime contractors? (e.g., transfers of intellectual property, support for additional R&D, etc.)
 - c. What have been the incremental economic impacts of the "Direct" and "Indirect" IRB transactions on IRB recipients and the economy?
2. To what extent has the IRB Policy led to the growth of IRB recipients and to the development of new business relationships between prime contractors and IRB recipients?
3. To what extent have IRB recipients benefited from supplemental business opportunities with other firms after the initial IRB transactions?

4. What has been the impact of the 2009 policy enhancements?
5. To what extent has the implementation of the IRB Policy demonstrated efficiency? Are there alternatives to improve efficiencies?

The evaluation was managed by Audit and Evaluation Branch at Industry Canada. Goss Gilroy Inc. was contracted to conduct the evaluation.

3.3 Data Collection Methods

Several research methods were employed for this evaluation to produce valid evaluation findings. The following provides an overview of these methods.

Document Review and Administrative Data Analysis

The evaluation team undertook a review of relevant government and non-government documents and secondary data sources to address the evaluation questions. Key documents included Speeches from the Throne, federal budgets, policy documents, reviews, program documentation, administrative data, and recent evaluations and studies of the IRB Policy.

Literature Review

A review of key publications was undertaken in order to address many of the evaluation questions, particularly the need for economic offsets from defence and security procurements, the benefits of this kind of industrial policy, and key criticisms. The analysis also reviewed the challenges facing Canadian defence firms and the experience in countries with similar industrial participation programs (offset programs).

Key Informant Interviews

Semi-structured, in-depth interviews were conducted to address relevance and performance. A total of 37 interviews were conducted with the following type of key informants (including case study interviews):

- IRB program management (6, including 2 group interviews);
- Public Works and Government Services Canada (1);
- Regional Development Agencies (3);
- Other departments (2);
- Industry associations (1);
- Prime contractors, including foreign multinationals and Canadian prime contractors (7);
- Other industry stakeholder (1);
- Canadian businesses who are recipient organizations (14); and
- Independent brokers for IRB transaction (2).

Case Studies

Six case studies of major procurements under the IRB Policy were completed. Each involved interviews with prime contractors and associated IRB recipients. Through the case studies, the evaluation examined the net cumulative impacts of the IRB Policy on the growth of recipients.

Survey

A mixed mode survey (web and telephone) of IRB recipients was conducted to capture views and results of the IRB Policy from the perspective of these Canadian suppliers. After the pretest, it was decided that the instrument should focus on a single IRB transaction (selected randomly) in order to ensure more valid responses.

Information from 805 recipients was contained in the IRB database system. Of these, 148 had been populated with contact information (the remaining information was in the process of being migrated to the new database). Through searches of program files, phone calls and Internet searches, coordinates were found for 393 more IRB recipients. Due to evaluation timeframes, searches were focused on those recipients that had the most significant transactions in dollars. Emails and phone calls were made to survey the 541 IRB recipients with coordinates. From these 541 potential IRB recipients, only 469 IRB recipients could be successfully contacted. For the remaining 72 IRB recipients, a voicemail was left by GGI; the available phone number was out-of-service; or the company was no longer in business. In total, 140 IRB recipients participated in the survey out of a population of 805 recipients. Additional details appear in Appendix B.

Input-Output Analysis

An input-output (I/O) model is a quantitative economic technique that depicts the mutual interdependencies among the different parts of an economy. Specifically, this kind of model describes how one industry uses the outputs of other industries as inputs and how its own outputs are used by other sectors as inputs. Input-Output models are used in evaluations to produce detailed descriptions of how government programs affect the production and consumption of goods and services in an economy.

In this evaluation, the purpose of the I/O analysis was to assess the net impacts of the IRB dollars and spin-off sales resulting from IRB contracts on the Canadian economy. Consequently, the evaluation team undertook an interprovincial I/O analysis using administrative data of IRB obligations undertaken from April 2008 to March 2013. Definitions and additional details of the I/O analysis are provided in Appendix C.

3.4 Limitations

3.4.1 Administrative Data

A number of gaps were found in the administrative data, mostly associated with descriptive information of the recipients and prime contractors. When in the evaluation was conducted, most of the recipient information was in project paper files, but not necessarily in the program's

electronic database. The IRB Directorate was in the process of implementing and populating a new IT system, which at the time of evaluation had only limited information. The evaluation team completed missing information by using phone number information and through Internet searches. The evaluation team also validated the financial information (sums) with the program representatives to ensure that the information utilized was correct. However, it was not possible to include all IRB transactions in the I/O analysis because some provincial information was not yet populated, as well as North American Industry Classification System (NAICS) code information. Due to missing provincial and NAICS classifications for \$133M of the \$5.1B in IRB transactions, some segments of the I/O analysis were based on \$11.1B of the \$11.2B in total obligations. This very small difference of less than one percent of total obligations should not affect the overall validity of the results.

3.4.2 Sampling and Response Rates

The IRB Directorate maintains up-to-date information on prime contractors and, on a paper-basis, IRB recipients who are the key beneficiaries of the IRB Policy. The survey conducted for the evaluation focused on the IRB recipient population, for which there was data not yet populated in the IT system at the time of evaluation. As a result, one of the fundamental challenges for this evaluation stemmed from the fact that the survey only covered 17% of the recipients. Despite efforts to locate information through online searches, the survey frame did not include 33% (n=264) of the IRB recipients due to contact information not yet entered in the IRB IT system (i.e. no email or phone numbers).

To account for these sampling and response rate issues, the evaluation team extended the survey results for spin-off sales based on survey responses under three scenarios: pessimistic, mid-point (deemed likely) and optimistic based on various extensions of the obtained sample.

- Scenario 1 (lower) contains the credited, uncredited claims and the outstanding IRB obligations as well as spin-off sales estimated and projected by survey respondents (n=140).³ No extrapolations were made of spin-off sales to firms that did not respond to the survey.
- Scenario 2 (mid-point) contains the credited, uncredited claims and the outstanding IRB obligations, as well as spin-off sales estimated and projected by survey respondents, plus estimated spin-off sales of half of the IRB recipients who did not answer the survey but were deemed to be still in business (1/2 of 329 = 164)⁴.
- Scenario 3 (higher) contains the credited, uncredited claims and the outstanding IRB obligations, as well as spin-off sales estimated and projected by respondents to the survey (n=140), plus estimated spin-off sales of all IRB recipients who did not answer the survey but were deemed to be still in business (n = 329).

All three scenarios are considered to be very conservative approaches for estimating the spin-off

³ Which corresponds to 17% of the recipient population. See Appendix B for details.

⁴ In other words, excluded were firms for which the survey could not confirm their existence (no contact was made through the survey) on the assumption that they were out of business. Spin-off sales of non-respondents were basically extrapolated from answers of those who answered the survey.

sales as the survey only covered part of the IRB transactions. The survey measured the spin-off sales of only one randomly selected transaction while on average, each IRB recipient was actually involved in about 10 transactions during the evaluation timeframe (2008-2013). This meant that the survey and the I/O analysis likely underestimated the full impacts of the IRB Policy.

Limitations and assumptions associated with the I/O analysis are described in Appendix C.

4.0 Findings

4.1 Relevance

4.1.1 Is there a continued need for federal support for industrial and regional development in Canada's defence and security sector? Does the IRB Policy respond to this need?

Summary of Findings

There is a continued need for federal support for industrial development in Canada's defence and security sector. Offset policies for defence procurements fall outside of the scope of international trade agreements and exist to: support domestic defence sectors; address security concerns; and capture economic benefits from defence and security procurements. Challenges faced by Canadian defence firms include: the heavy dependence on foreign markets; the relatively small size of the Canadian defence market; cyclical domestic demand; and increased competitiveness of foreign defence markets. Accordingly, like most countries, the Government of Canada has implemented an offset policy to capture economic benefits from its defence and security procurements.

Defence offsets refer to the entire range of industrial and commercial benefits provided to foreign governments as an inducement or condition to purchase military goods or services, including benefits such as co-production, licensed production, subcontracting, technology transfer, in-country procurement, marketing and financial assistance, and joint ventures.⁵

Offset policies, such as the IRB policy, are a common part of global defence and security procurements and are practiced in one form or another in many countries around the world.⁶ In addition, more emerging economies are beginning to introduce offsets as they begin to undertake higher levels of defence spending. Most defence procurements fall outside of the scope of international trade agreements. For example, the Agreement on Government Procurement (GPA) of the World Trade Organization (WTO) contains exceptions for the defence industry to its general prohibition on offset arrangements in international trade. As a result, offsets have been considered a policy strategy targeted at both securing national security interests and advancing the competitiveness of defence firms.⁷

From this perspective, Canada's need for an IRB Policy also stems from the competitive need to ensure that the benefits of major defence and security sector procurements accrue to Canada to the greatest extent possible. There is evidence in the literature that offset policies contribute to industrial growth in countries that impose offset obligations on foreign vendors.⁸ Offset policies particularly benefit industries that involve a number of complementary products and services. The defence industry is a good case in point as "procurement of large-scale, advanced technology products such as weapons systems, aerospace, and information technology typically

⁵ Definition used by the US Department of Defense (http://www.acq.osd.mil/dpap/cpic/ic/offsets_of_foreign_military_sales.html#q1)

⁶ https://www.ic.gc.ca/eic/site/042.nsf/eng/h_00020.html

⁷ Castellacci, F., & Fevolden, A. (2012). Capable companies or changing markets? Explaining the export performance of firms in the defence industry.

⁸ Bovis, C. (2008). Public-Private Partnerships in the Defence Sector: How Offset Agreements Interface between the Private and Public Stakeholders. *Eur. Pub. Private Partnership L. Rev.*, 200.

involve thousands of complementary products”.⁹

While some countries implement offsets primarily for national security reasons, economic impacts have been the main rationale for Canadian offset policies. Expected benefits include Canadian content in procurement; technology transfer; joint ventures and strategic alliances; product mandates, licenses, marketing agreements; regional and small business development; licensing arrangements; and access to new international markets. The needs that a policy like the IRB Policy addresses was illustrated in the Jenkins Report 2013, entitled *Canada First: Leveraging Defence Procurement through Key Industrial Capabilities*. The report recognized government procurement policies as a significant means to achieve industrial development objectives. The report notes that the majority of all successful Canadian-based defence suppliers of scale—several of which also have large commercial businesses—got their start with a Department of National Defence (DND) contract.

Continued Need For Federal Support

The evaluation confirmed that there are several interrelated challenges that the Canadian defence and security sector faces. These include:

- **A heavy dependence on foreign markets:** The international defence market is an important avenue for the growth and viability of the Canadian defence industry. Indeed, according to the 2013 Jenkins Report, half of the \$12.6B annual revenues of Canada’s defence and security industry are derived from exports.¹⁰
- **Relatively small size of the Canadian defence market:** The defence market in Canada is small in size from a demand perspective. For example, in 2009-2013, Canada spent the equivalent of 1% of its GDP in military expenditures, compared to 1.6% in Australia, and 3.8% in the US.
- **Cyclical domestic demand:** Domestic demand for products and services related to defence has been cyclical. Over the past 30 years, expenditures by sector have not been constant. For example, the last defence shipbuilding project (the Maritime Coastal Defence Vessel) was completed in 1998. Prior to 2013, the last Coast Guard vessel was delivered in 1983.
- **The increased competitiveness of foreign defence markets:** Accessing foreign defence markets is a continual challenge. They are highly competitive and protected by government policies. This challenge has increased of late; defence budgets in the Western world have declined on average since the Cold War era¹¹ and manufacturers in emerging markets in Asia, Latin America and Africa are developing into cost-competitive suppliers.

⁹ Taylor, T. K. (2012). Countertrade Offsets in International Procurement: Theory and Evidence. In M. A. Yülek & T. K. Taylor (Eds.), *Designing Public Procurement Policy in Developing Countries* (pp. 15–34). P.18.

¹⁰ Jenkins, T. (2013). *Canada First: Leveraging Defence Procurement Through Key Industrial Capabilities*, Report of the Special Adviser to the Minister of Public Works and Government Services.

¹¹ Bovis, C. (2008). *Public-Private Partnerships in the Defence Sector: How Offset Agreements Interface between the Private and Public Stakeholders*. Eur. Pub. Private Partnership L. Rev.

Interview respondents confirmed that the IRB Policy responds to a need for federal support for industrial and regional development in Canada's defence and security sector because it addresses the above mentioned challenges by: leveraging procurement to build a domestic industrial base; helping Canadian companies establish and grow; and in so doing, generating further tax revenue and creating jobs in Canada. As well, the IRB Policy helps meet national defence requirements by building and maintaining in-country capacity to produce and service military products.

4.1.2 Does the IRB Policy align with the priorities of the federal government and the strategic outcomes of Industry Canada?

Summary of Findings

The IRB Policy is in line with the priorities of the federal government and the strategic outcomes of Industry Canada.

The IRB Policy remains relevant at the government-wide and departmental levels. The Government of Canada budgets since 2006 have recognized that creating a favorable atmosphere for economic growth is a priority of the federal government. For instance, the Economic Action Plans of 2009, 2010 (and Budget), 2011, 2012 and 2013 highlighted economic and employment growth as the main priorities of the government. To that end, the IRB Policy is a means to achieve economic growth in Canada. Budget 2014 re-affirmed the Government of Canada's continued commitment to the Economic Action Plan.

The Canada First Defence Strategy (CFDS), published in 2008, provides a detailed road map for the modernization of the Canadian Forces over a 20-year period and refers to the important role that the IRB Policy plays in supporting it.

The new Defence Procurement Strategy (DPS), announced by the Government of Canada on February 5, 2014, marked a fundamental shift in the IRB Policy. The DPS fulfills the Government's commitment to better ensure that purchases of defence equipment create economic opportunities for Canadians and that defence procurement outcomes improve. The DPS has three key objectives:

- Delivering the right equipment to the Canadian Armed Forces (CAF) and the Canadian Coast Guard in a timely manner;
- Leveraging purchases of defence equipment to create jobs and economic growth in Canada; and
- Streamlining defence procurement processes.

Job creation and economic growth will be achieved through:

- Using a weighted and rated Value Proposition, to assess bids for defence and major Canadian Coast Guard procurements;

- Implementing an Export Strategy to support international sales opportunities and participation in global value chains;

Under the DPS, Industrial and Regional Benefits (IRBs) will be transformed into Industrial and Technological Benefits (ITBs).

At the departmental level, the IRB Policy is aligned with Industry Canada's strategic outcomes (2013-14). These include specifically: advancements in science and technology, knowledge, and innovation; and competitive Canadian businesses and communities. In addition, three of five key priorities of Industry Canada for fiscal year 2013-2014 are directly associated with the IRB Policy objectives:

- Strengthening the manufacturing sector to foster globally competitive industries, increase economic growth and attract jobs to Canada;
- Responding to the Aerospace Review with proposals to build more competitive aerospace and space industries in Canada; and
- Implementing initiatives to attract and retain business research and manufacturing mandates in Canada, including those for large scale investments, using government procurement and other incentives.

4.1.3 Does the IRB Policy align with the roles and responsibilities of the federal government?

Summary of Findings:

The IRB Policy is aligned with the roles and responsibilities of the federal government in international trade and defence as described in *The Constitution Act* of 1867, Article 91.

The IRB Policy clearly falls under the purview of the federal government as defined by *The Constitution Act* of 1867, Article 91, which states that the exclusive Legislative Authority of the Parliament of Canada extends to the regulation of trade and commerce and the raising of money by any mode or system of taxation. Pursuant to the federal mandate, three departments are engaged in defence procurement. They are Industry Canada (IC); Public Works and Government Services (PWGSC); and the Department of National Defence (DND).

4.2 Performance

4.2.1 To what extent have prime contractors fulfilled their obligations?

Summary of Findings:

Prime contractors are fulfilling their IRB obligations. IC monitors contract activities to ensure fulfillment of obligations, and there were no cases where prime contractors are failing to meet their IRB obligations. For the 2008 to 2013 period, a total amount of \$11.2B in new obligations were committed of which \$5.1B (46%) had already been claimed and credited. These defence contracts and associated IRB obligations span many years and the remaining obligations are on track to be successfully completed between 2008 and 2038.

Once a contract with IRB obligations is awarded, Industry Canada (IC) is responsible for the ongoing monitoring of IRB obligations. Prime contractors are required to submit annual reports to IC, where officials review them to determine the progress of the IRB obligation.

Based on the evidence reviewed, IC has a system to actively monitor whether prime contractors meet their obligations under the IRB Policy. IRB program data records the extent to which contracts signed within the period (2008-2013) were expended, claimed and credited (including banked activities). Based on the data, for the 2008 to 2013 period, a total amount of \$11.2B in new obligations were committed of which about half (\$5.1B or 46%) has already been claimed and credited. It should be noted that some legitimate claimed transactions have not yet been credited by the program, as time is required to verify and process them.

Most procurement contracts that were reviewed for the evaluation span many years, with some continuing until 2038. The remaining obligations and associated impacts of the IRB policy for contracts signed between 2008 and 2013 will therefore materialize over many years.

According to federal government key informants and prime contractors, individual prime contractors may sometimes lag behind schedule in meeting their obligations for a variety of reasons. A common reason is the market ebb and flow of business activities. In addition, developing business activities takes time, longer than estimated during the proposal phase. IC also does not always approve certain activities for credit. Examples of activities that do not get approved include ones that do not meet the eligibility criteria, transfers of relatively old technology, or low technology indirect activities. When this happens, prime contractors need to submit new transactions for credit. According to government officials, should prime contractors encounter challenges as they are fulfilling their obligations, IC and the regional development agencies continually follow-up with them to offer assistance in identifying possible partners.

According to the program, there were no cases where the Government of Canada sought liquidated damages from prime contractors failing to meet their IRB obligations. Government of Canada officials confirmed that all prime contractors were in good standing.

4.2.2 To what extent have IRB recipients benefited from IRB transactions?

a) Did firms benefit from IRB transactions?

b) What has been the quality of the IRB transactions provided by prime contractors?

c) What have been the incremental economic impacts of the direct and indirect transactions on IRB recipients and the economy?

Summary of Findings:

About \$5.1B in business activity in Canada was completed as a result of procurements covered by the IRB Policy (2008-2013). IRB recipients have benefited from IRB transactions to a varied extent. Transactions were of varying quality in terms of long-term capacity building benefits for the IRB recipients. For example, many transactions involved the development of new technologies, the development of highly-qualified personnel, technology transfers, and increased scientific and technical know-how of IRB recipients. High impact transactions were generally associated with larger transactions. However, the definition of “quality” varies by sector, sub-sector, as well as by geographic area, according to respondents. Overall, an econometric analysis found that \$11.1B in new IRB obligations will lead to a total increase in Gross Domestic Product of between \$12.4 and \$19.0B (including direct, indirect and induced impacts as well as the effects of spin-off sales) over the lifetime of the contracts. Finally, prime contractors would not have as big a presence in Canada in the absence of the IRB Policy, indicating a strong incremental impact of the IRB Policy.

One of the key areas reviewed by this evaluation was the extent to which recipient firms benefited from the transactions through IRB transactions, and the extent to which these IRB transactions led to direct and indirect economic outcomes.

Direct Benefits for IRB Recipients

According to program administrative data, extensive amounts were expended by prime contractors in Canada through contracts with recipients. As mentioned earlier, for the 2008 to 2013 period, a total amount of \$11.2B in new obligations were committed of which about half (\$5.1B) was claimed and credited.

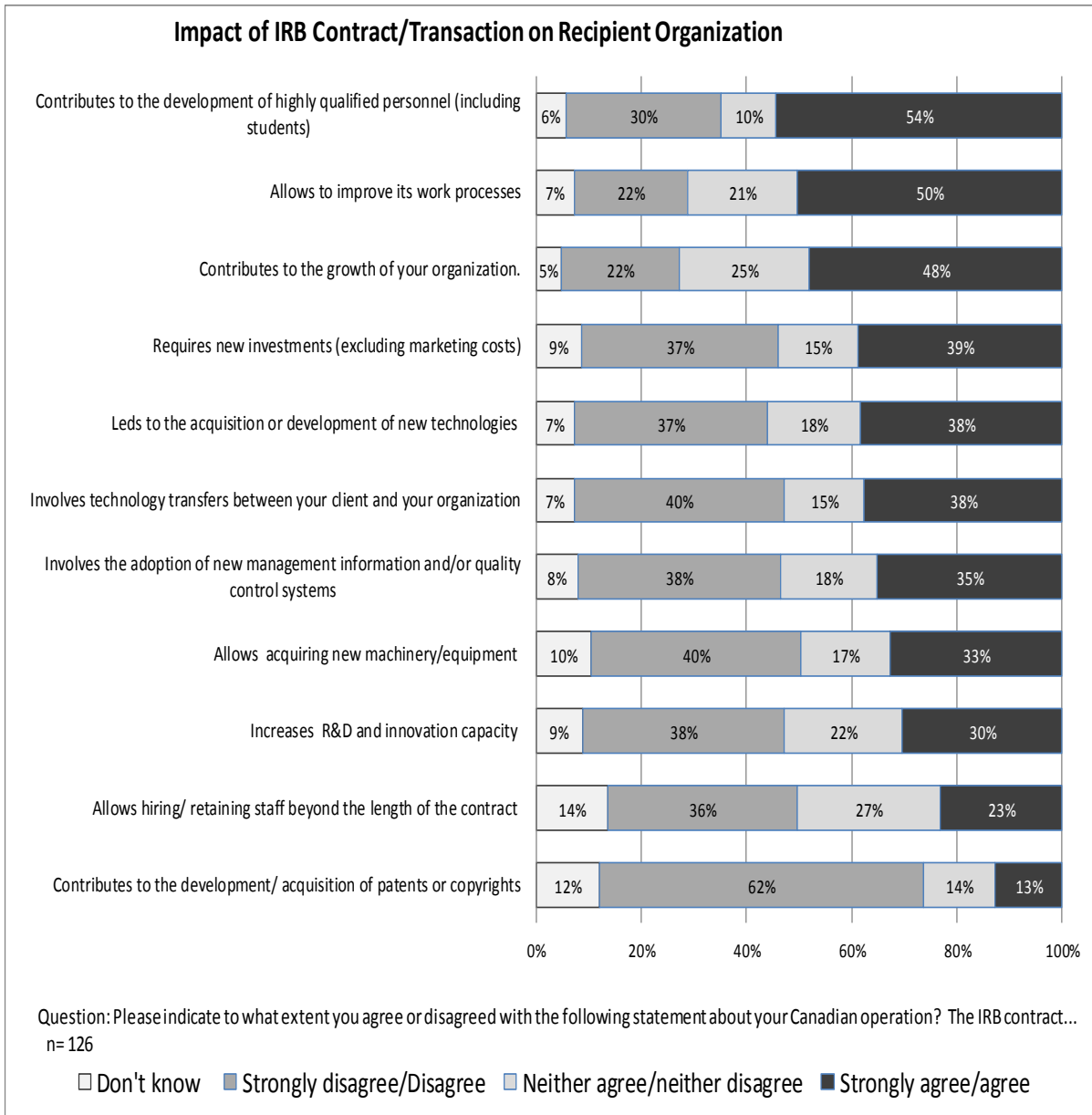
Quality of IRB Transactions

There is no documented source that could be used for this evaluation to define what would constitute a quality transaction. Based on the responses of the key informant interviews, while some transactions had few long-term development implications for recipients, many contracts led to benefits for the recipients beyond the short-term profits, including the development of highly-qualified personnel, the transfer of technology, and an increase in the scientific and technical know-how of recipient companies. The survey of recipient firms conducted as part of this evaluation confirmed these views (see Figure 2). IRB transactions directly contributed to the increased capacity of the firms’ performance by supporting the development of highly qualified personnel, work processes and R&D among others. More than half of the respondents

(54%) agreed that IRB contracts contributed to the development of highly qualified personnel. Half (50%) agreed that IRB contract allowed them to improve their organization's work processes; slightly less than half (48%) agreed that these contracts contributed to the organization's growth. About 40% said that the transaction involved a new investment by the IRB recipient.

Along the same lines, the data indicated about 38% of IRB recipients reported that IRB transactions led to technology transfer between prime contractors and their sub-contractors, new investments by the recipient, or the acquisition or development of new technologies. As well, 30% to 35% agreed that their IRB transactions led to the adoption of new management information systems and quality control improvements, increased R&D and innovation capacity, and the acquisition of new machinery and equipment. Some respondents agreed that their IRB transactions lead to the hiring and retention of personnel beyond the length of the IRB contract (23%), and the development of patents and copyrights (13%).

Figure 2: IRB Contract/Transactions Contribution to IRB Recipients



Source: Survey of IRB Recipients

In addition, the survey findings related to the quality of the IRB transactions were further analyzed by developing a summative index to measure the impact of the specific transactions on internal operations (based on the survey questions shown in Figure 2), and sales and marketing (survey questions shown in Section 4.2.3).¹²

The values of the index scores were calculated by adding the individual responses on the agree-disagree scales for 19 survey questions. For example, if a respondent “strongly agreed” that there had been a positive impact for the survey question, then their index score increased by five points. If a respondent only “agreed” that there had been a positive impact, then their

¹² In addition to the 17 questions that appear in Figure 2 and Figure 3, the index included survey responses on whether the IRB transaction had allowed the organization to sell to new clients and whether the IRB transaction led the organization's participation in a prime contractor's global supply chain. See Appendix D for more details.

index score increased by only four points. Overall, it was assumed that an IRB transaction that led to the growth and strengthening of an IRB recipient (i.e. generated a high index score for impacts) could be considered to be a high quality IRB transaction. The general approach and the detailed findings appear in Appendix D.

The analysis found that the index scores were distributed along a continuum. The 126 scores were then divided in three groups (low, medium and high impact transactions) that were roughly equal in terms of size. These results were then cross-tabulated with IRB transaction size (in dollars), industry sector, obligation type (direct or indirect), procurement sector (Air, Land or Marine), region, and size of firm in terms of the number of employees.

Further examination found that the high impact transactions were not evenly distributed within the various variables. For instance, the proportion of high impact transactions increased with the size of the IRB transaction. Among the largest IRB transactions (\$10M or more), 41% were in the high impact group and only 26% fell in the low impact group. Conversely, 42% of the smaller IRB transactions (\$500k or less) were in the low impact group and only 13% were in the high impact group. Although the relatively low number of large IRB recipients (i.e. 500 or more employees) in the survey makes it difficult to draw firm conclusions, 44% of their transactions fell into the high impact group compared to 33% for all survey respondents.

At a higher level, the analysis showed that higher level impacts were more likely to be realized within specific sectors and contract types.

- At the sector level, manufacturing was slightly overrepresented with 69% of the high impact transactions, but only 63% of the IRB transactions in the survey analysis group. Professional, scientific and technical services had 23% of the high impact transactions but only 19% of the IRB recipients in the survey analysis group.
- In contrast, there were no clear differences in the prevalence of high impact transactions for transaction type, procurement sector, and region. Direct procurements made up 25% of the IRB transactions analyzed and 23% of the high impact transactions. IRB transactions for indirect procurements were 44% of all transactions and 46% of the high impact transactions. Similarly, there were no clear differences by procurement sector for high impact transactions. Air procurement transactions were 58% of the IRB transactions in the survey analysis group and 59% of the high impact transactions. Land procurements were 21% of all transactions and 23% of the high impact transactions. Marine procurements were 21% of the IRB transactions in the survey analysis group and 18% of the high impact transactions.
- Finally, the location of the high impact transactions matched the geographic distribution of IRB transactions. The Atlantic region had 12% of all transactions and 10% of the high impact transactions. Quebec had 18% of all IRB transactions analyzed and 18% of the high impact transactions. Ontario made up 48% of the IRB transactions and 49% of the high impact transactions. The West had 21% of the transactions and 23% of the high impact transactions.

Status of Recipients vis-à-vis the Primes

While production by the IRB recipients is located in Canada (as per the policy), contracts may be delivered by the prime contractors directly through their Canadian subsidiaries, or by independent companies. The administrative data was analyzed to assess the extent to which project work was done internally by prime contractors and those by separate companies. Results are shown in Table 2. As indicated, while only about a third of the number of recipient companies was affiliated with the prime contractor, the value of these transactions represented close to two-thirds of all transaction values.

Table 2: Status of IRB Recipient Organization and Affiliation with Prime Contractor

Organization Status	Number of Organizations	Volume of Transactions Claimed
Recipients also Prime Contractor	296 (30%)	\$3.2B (63%)
Recipients not same as Prime	702 (70%)	\$1.9B (37%)
Total	998	\$5.1B

Source: Administrative data

Note: Analysis based on matching of business name in database. It is possible that affiliations exist in situations where the company names of prime contractors and recipients are different. As a result, it may overestimate the level of independence among organizations.

Evidence from case studies and interviews also indicate some of the more intangible benefits for Canadian recipients that often arise from IRB activities, such as:

- Prime contractors transferring knowledge and technologies to IRB recipients associated with processes;
- Prime contractor providing the opportunity for younger companies to gain contract experience;
- Prime contractors providing information to recipients about requirements to compete on international markets;
- Prime contractors providing global supply chain information to IRB recipients to help them become more competitive; and
- Prime contractors helping IRB recipients expand to other regions in Canada.

In most instances, these knowledge transfer and capacity building activities benefitted both the IRB recipients and prime contractors in a win-win situation. However, case study and interview evidence indicate that the definition of “quality” itself varies by sector, sub-sector, as well as by geographic area, according to respondents. While the policy encourages activities in advanced technology where possible, in the view of some respondents, the IRB transactions do not need to grow a high tech industry in order to create a good quality benefit for Canada. One example given was the case of the land vehicles sector, where the technologies involved are not highly complex. In that case, the IRB Policy provides opportunities for Canadian

companies in areas not associated with the level of technology but in other quality areas, such as capacity growth, employment and entry into global supply chains.

Industry representatives had a variety of suggestions for how the quality of IRB transactions could be improved. Some mentioned that the policy could be more specific in some respects, such as better defining Canadian industrial objectives and specifying what kinds of technology to invest in and how to interact with domestic industry. Procurements at the request for proposal stage could also include other conditions leading to regional development and the development of Canadian firms.

All in all, the analysis of the quality of transactions shows that this is highly complex, with varying levels across sectors, regions and firm characteristics. Further research (with larger samples) would be required to identify/confirm the factors that distinguish the transactions that are most likely to lead to growth and success for IRB recipients.

Impacts on Canadian Economy

As mentioned earlier, the contracts covered by IRB and signed between 2008 and 2013 total approximately \$11.2B in obligations. These contracts will be executed over many years, some until 2038, and will generate significant business activity in Canada. To date, about half (\$5.1B) of the value of the IRB obligations have been fully met by contractors. The remaining obligations are in progress and are expected to be achieved over the remaining years of the contracts. Based on interviews with prime contractors representing large companies, in the absence of the IRB Policy, it is likely that this business activity would not have occurred in Canada, and would not have benefitted Canadian recipient firms and organizations. Instead, prime contractors would have sought out or continued to use international suppliers. Pressures from other offset policies would have encouraged contractors to manufacture their products abroad if there were no obligation to invest in Canada.

An input-output model was used to assess the net impacts (value-added) on the Canadian GDP.¹³ Results of the open and closed model appear in Appendix C.¹⁴ Table 3 below summarizes the key impacts from \$11.1B in selected IRB obligations where industry sector and provincial location information was available (closed model). The estimates provided are for incremental GDP impacts in Canada. Because the future impacts of the IRB obligations on firms are subject to uncertainty, three scenarios were developed as described in Section 3.4.2.

¹³ Gross domestic product (GDP) is defined by OECD as an aggregate measure of production equal to the sum of the gross values added of all resident institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs).

¹⁴ Sums of the direct and indirect expenditures were calculated for the amounts recognized as IRB transactions undertaken in 2008-2013. In addition, expenditures were also calculated on the spin-off sales reported by the recipients in the survey.

Table 3: I/O Analysis of the IRB Obligations 2008-2019 (Closed Model)

Segment and Extension	Contribution to GDP
IRB Transactions:	
1. Credited Claims	\$4.4B
2. Uncredited Claims	\$0.3B
3. IRB Obligations (unclaimed)	\$4.9B
4. SUB-TOTAL (1+2+3)	\$9.6B
Spin-Off Sales:	
5. Scenario 1	\$2.8B
6. Scenario 2	\$6.1B
7. Scenario 3	\$9.4B
Totals (IRB and Spin-Off sales):	
8. Scenario 1 (4+5)	\$12.4B
9. Scenario 2 (4+6)	\$15.7B
10. Scenario 3 (4+7)	\$19.0B

Source: I/O Model

Note: The closed model includes induced impacts arising from consumer expenditures

The I/O analysis showed that the \$11.1B in selected IRB obligations (not shown in table) incurred during the evaluation period will likely lead to a total increase in GDP of between \$12.4B and \$19.0B (including direct, indirect and induced impacts as well as the effects of spin-off sales) over the lifetime of the contracts (see Table 3).

The evaluation team also used the I/O model to assess the employment impacts of the IRB obligations and the Full-Time Equivalent Employment (FTEs) created or maintained as a result of IRB policy were estimated to be between 137,204 and 206,496 FTEs for the period from April 2008 to March 2019.¹⁵ On an annual basis, it would represent an average of about 17,185 FTEs per year over a period of ten years.¹⁶ These are considered net impacts based on interview findings with industry representatives that indicated that, in the absence of the IRB Policy, the bulk of the production would likely have been produced elsewhere.

¹⁵ The number of hours worked by part time workers is aggregated to obtain an equivalent to full-time employment.

¹⁶ Some contracts actually span over a period of 30 years. However, the bulk of the contracts are expected to be completed within a period of 10 years.

4.2.3 To what extent has the IRB Policy led to the growth of IRB recipients and to the development of new business relationships between prime contractors and IRB recipients?

Summary of Findings:

The IRB Policy has led to the growth of IRB recipients and the development of new business relationships. IRB transactions led to significant spin-off sales for IRB recipients. Counting actual and projected spin-off sales in the next three years (excluding the IRB contract), sales are estimated to be in the range of \$3.2B and \$10.9B for the period. The mid-range scenario estimated spin-off sales to be of \$7.1B. These impacts are in addition to the IRB transactions. In some cases, the IRB Policy contributed to the development of new business relationships with the prime contractor. Some of these relationships were likely to be long term, while some were one-offs.

The evaluation assessed the extent to which IRB contracts allowed recipients to develop capacity to find other contracts. These spin-off sales were measured through the survey. The tables below show the results reported for sales of products derived from IRB transactions. As discussed earlier, GGI used three scenarios to extrapolate results from the obtained survey sample to a more representative group of IRB recipients. As shown, spin-off sales are estimated to be between \$3.2B and \$10.9B. The evaluation team considers the mid-point scenario as highly likely and scenario 3 as likely given the conservative assumptions used in all scenarios. While 140 firms provided estimates of spin-off sales in the survey, many of the remaining 605 IRB recipients also generated spin-off sales as a result of their IRB transactions. In addition, the survey questionnaire focused on a single, randomly-chosen IRB transaction, but survey respondents could have generated spin-off sales from other IRB transactions.

Table 4: Spin-Off Sales from IRB Contracts Projected (2008-2019) (in Dollars)

Canadian Sales of Products and Services of IRB recipients derived from but not under IRB Contracts	Scenario 1 (n=140)	Scenario 2 (n=305)	Scenario 3 (n=471)
Domestic Sales (2008-2013)	337,838,501	736,005,306	1,131,758,978
Export Sales (2008-2013)	1,439,293,439	3,135,603,564	4,821,633,020
Total (2008-2013)	1,777,131,940	3,871,608,870	5,953,391,998
Projected (2014 to 2019)	1,495,983,005	3,259,105,832	5,011,543,067
Total Spinoff sales (2008-2019)	3,273,114,945	7,130,714,702	10,964,935,065

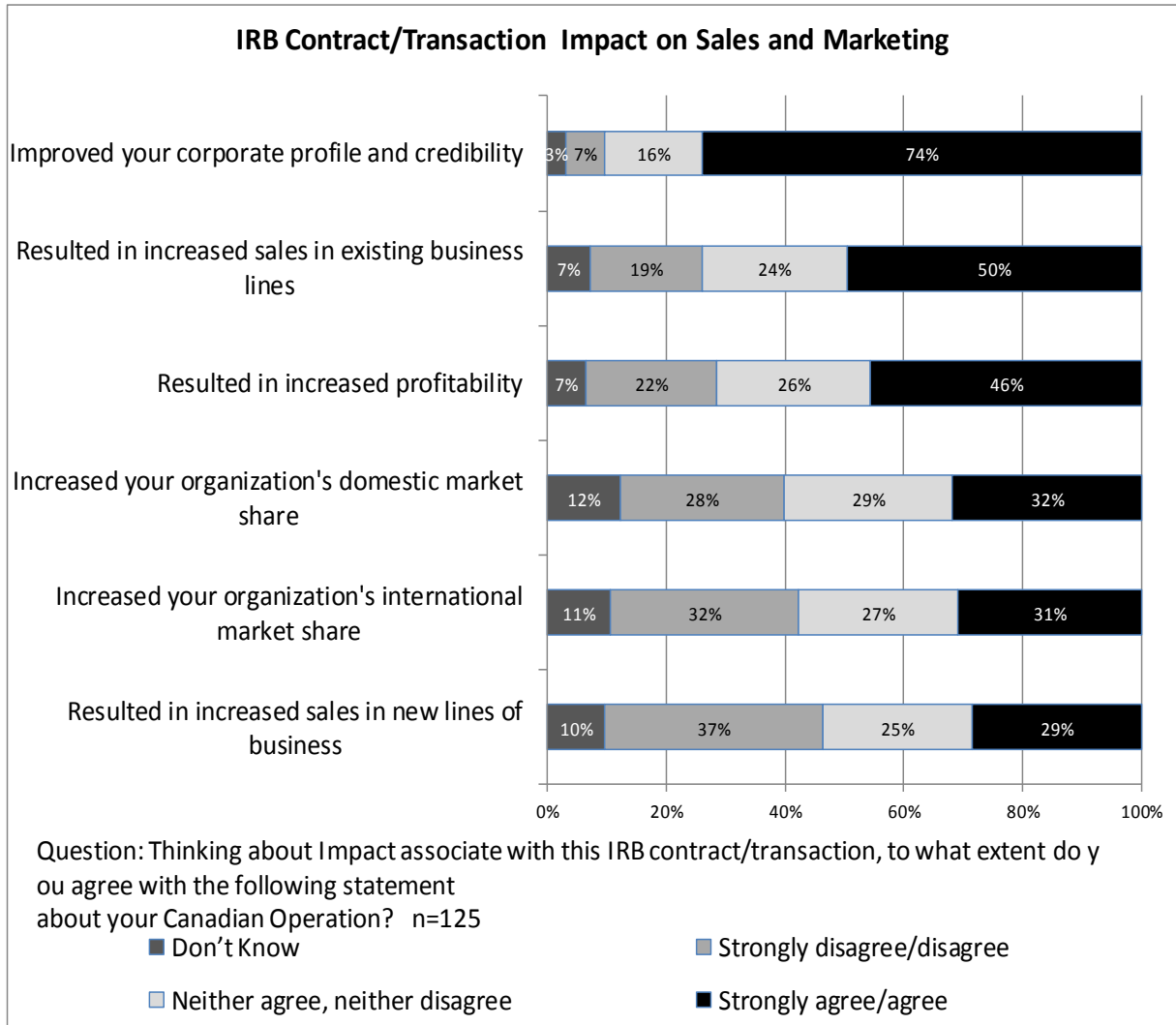
Source: Calculations based on IRB evaluation online survey. See Section 3.4.2 for an explanation of how the three scenarios were developed.

Evidence from the key informant interviews indicates that IRB contracts have allowed many recipients to better position themselves in the supply chain and to access other contracts. It was explained that by communicating and working with large prime contractors, Canadian companies have gained knowledge and market intelligence that has helped Canadian SMEs understand the level of their technical capacities, business models and certifications needed in order to work with large prime contractors and be competitive internationally. Case studies and key informant interviews identified a number of examples where the IRB Policy played a key role in recipient growth. These included:

- One company specializing in training simulation was a \$2M firm with 20 employees and no involvement in the defence sector. Through an indirect transaction secured through the IRB Policy, they developed a solid relationship with a prime contractor and grew by over ten times in market capitalization and staff numbers in five years and continue to grow. The company believes that without the IRB Policy this firm would not have had the opportunity to enter the defence market.
- Another firm in the aerospace industry reported that its participation in an IRB project increased its corporate profile and visibility in the international defence market. The firm was then added to the prime contractor's global supply chain and this is anticipated to lead to \$20M in sales for the firm over the next decade.

Survey findings supported the views about benefits for many of the IRB recipients. As shown in Figure 3, almost three quarters (74%) of respondents agreed that IRB contracts had improved their organization's profile. Along the same lines, the survey results indicate that half of respondents (50%) agreed that as a result of the IRB transactions, sales in the existing businesses lines increased. The IRB transaction also resulted in increased profitability (46%). Almost a third (32%) agreed that the IRB work increased their organizations' domestic market share; and 31% said that it contributed to an increase in their organization's international market share. More than a quarter (29%) said that it increased their organization's sales in new lines of business.

Figure 3: IRB Contract/Transaction Impact on Sales and Marketing



Source: IRB Online survey

The survey was also used to assess the extent to which the obligations signed in 2008-2013 were new business relationships between the recipients and the prime contractors. In total (all recipients), 28% of survey respondents did not have any contracts with the prime contractor prior to their IRB transaction. Key informant interviews also indicated that some of the relationships established between the IRB recipients and the prime contractors were likely to be long term, while some were one-offs.

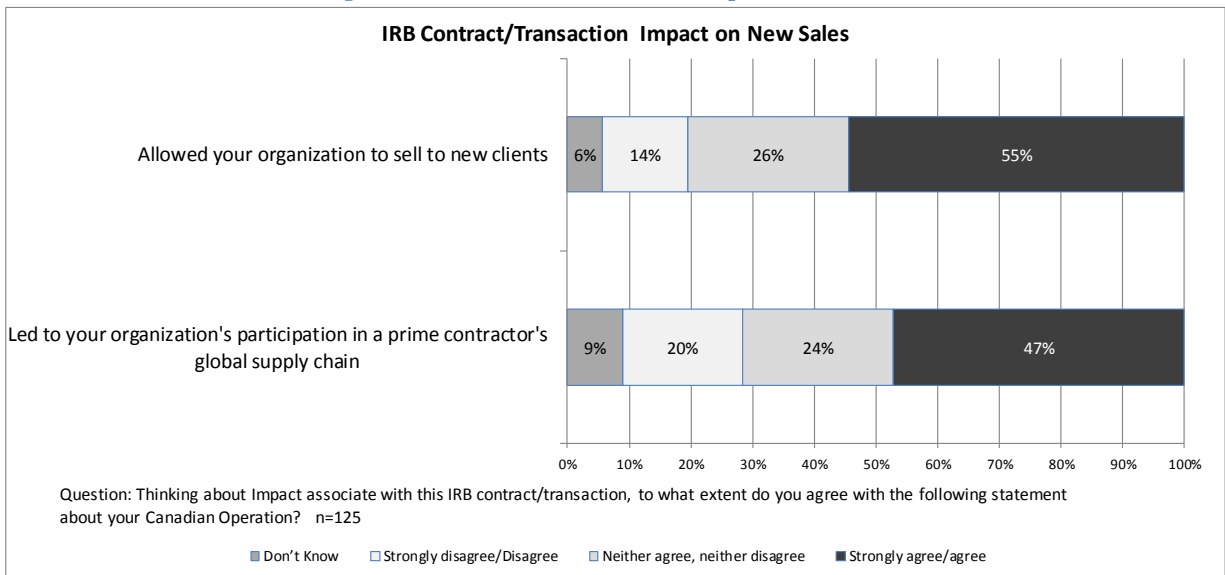
4.2.4 To what extent have IRB recipients benefited from supplemental business opportunities with other firms after the initial IRB transactions?

Summary of Findings:

In several cases, IRB recipients benefited from supplemental business opportunities with other firms after the initial IRB transactions. Several IRB recipients have been included into the global value chains of prime contractors in other countries; have gained an international reputation from the IRB contract; or have been introduced to new potential clients through their prime contractor.

There are many instances where the IRB Policy led to the development of new business relationships. According to the survey, 55% of the IRB recipients reported that their IRB contract allowed them to sell products and/or services to new clients (Figure 4). Also, 47% of IRB recipients' contracts with prime contractors led to their participation in the prime contractor's global value chain. Many interview respondents, particularly in the aerospace and land sectors, indicated that they have become part of the global value chains of the prime contractor. These companies have gained a reputation as high performers and their prime contractors have introduced them to other firms outside of Canada.

Figure 4: IRB Contract/Transaction Impact on New Sales



Source: IRB Online survey

Despite the successes of many recipients, some prime contractors indicated that the challenge that many IRB recipients face in enhancing their position in prime contractor supply chains is the ability to offer something new, of higher quality, or at a lower cost that prime contractors can access elsewhere. Prime contractors look to develop relationships with IRB recipients that are already high performing and that fit with their business needs.

4.2.5 What has been the impact of the 2009 Policy Enhancements?

Summary of Findings:

The latest enhancements to the policy were gradually implemented since 2009. Generally speaking, it is too soon to tell what the full impacts of 2009 enhancements will be. Most prime contractors were well aware of the policy changes. A small sample of prime contractors that commented on the changes appreciate the banking and phase-in options, although some said a longer period for banking credits would provide additional flexibility. The consortia option is generally appreciated although the outcomes are still unknown in many cases. There was also appreciation for the improved recognition of the value of Canadian firms’ participation in Global Value Chains.

In 2009, a number of enhancements were made to improve the policy from the perspective of industry and the federal government. According to interviews with IRB officials and industry representatives, the less complex changes were the ones that were implemented first. The 2009 Policy Enhancements were introduced after many procurements had been initiated but not completed. It was therefore not possible to introduce the policy enhancements for these procurements. The policy has been applied on new defence procurements going forward. Table 5 provides an overview of the implementation dates of the various policy enhancements.

Table 5: Implementation Dates of Policy Enhancements

Implementation Date	Policy Enhancement
December 2009	Phase in of 60% Upfront Identification
December 2009	Public-Private Consortia
June 2010	Global Value Chains
June 2010	Strategic Plans
September 2010	Banking of IRB Transactions
December 2011	Enhanced Priority Technology List
February 2013	New Investment Framework

The prime contractors interviewed were all very well aware of the policy enhancements and many said that it was still early to tell whether most of these enhancements will reach their objectives. The following points summarize the views about the enhancements.

Phase-in 60% up-front requirement. Previously, bidders were required to identify eligible IRB activities valued at 60% of bid price at bid closing. The winning contractor identified the remaining 40% over the remainder of the IRB achievement period (usually the length of the contract, but, in some cases, a specific time limit existed). Effective December 2009, bidders are only required to submit an IRB proposal specifically identifying at least 30% of their proposed IRB activities at bid closing. Another 30% is to be identified one year after the contract is concluded. Overall, prime contractors appreciate this enhancement as it provides more time to

develop a strategy and value-added partnerships. It also allows for flexibility, as the business plan sometimes changes after the procurement goes through.

Incentive for the creation of Public-Private Consortia. This option encourages Industry-Academia-Public Research Consortia to develop next-generation technologies and services in aerospace, defence and related sectors. According to IC staff, since its introduction in December 2009, this option has generated interest among industry stakeholders; they have been enquiring with IC regarding the option on a regular basis. At the time of writing, six consortia transactions had been accepted by IC as eligible and one was in the IRB bank.

Improved recognition of the value of Canadian firms' participation in Global Value Chains (GVC). First implemented in June 2010, this option encourages equipment manufacturers to add Canadian suppliers to their GVC by crediting Canadian work done on eligible international platforms against direct IRB requirements. Based on the evaluation findings, this option has been especially useful for the land and aerospace projects that have moved forward since its introduction.

Strategic plans from prime contractors with major IRB obligations. According to this change, prime contractors with major corporate obligations to Canada (i.e. over \$1B in IRB obligations) are requested to submit a strategic plan to IC. Other prime contractors are also invited to submit a strategic plan if they wish. This option was implemented in June 2010. At the time of writing, all three of the concerned prime contractors had submitted their strategic plans to IC and had them accepted.

Banking of Industrial and Regional Benefit transactions. This option was implemented in September 2010. Prime contractors were also generally satisfied with the possibility of limited banking of IRB transactions both in advance of awarding the contract, and in the event of over-commitment of IRB transactions (credits expended above those planned). This practice is generally consistent with international practice. Many prime contractors would appreciate more flexibility with respect to timing: banked transactions depreciate over time and are only valued in the bank for a period of five years. A longer period would be a greater incentive to use the bank more for strategic high quality work in Canada. According to prime contractors, other countries have more flexibility with respect to banking. It was noted by IC staff that banking considerably increased the administrative workload for the program.

Enhanced Priority Technology List (EPTL). An Enhanced Priority Technology List was established and since December 2011, prime contractors have been encouraged to develop advanced technologies that are in-line with this list. Views about EPTL were mixed. The list is viewed either as too generic or too focused on some sectors. There is no evidence yet as to the effectiveness of this mechanism.

New Investment Framework (IF)—R&D and Commercialization. Implemented in February 2013, the intent of this framework was to encourage prime contractors to invest in long term, innovation-focused activities in Canadian SMEs, through strategic relationships leading to increased market-driven R&D activities and more robust business development approaches. There was limited up-take of this framework at the time of the evaluation in 2014.

4.2.6 To what extent has the implementation of the IRB Policy demonstrated efficiency? Are there alternatives to improve efficiencies?

Summary of Findings:

IC delivered the IRB Policy at a low cost given that administrative costs represented less than one percent of new IRB obligations created during the period. The administration of the IRB Policy involved intensive verification processes and there is evidence that program resources were insufficient to meet internal targets (e.g., time required to verify claims). There are opportunities to improve processes, use more electronic tools to receive claims and review the level of staffing. There is also an opportunity to improve reporting given that new data systems are in place to do so. Based on the evidence gathered, it is highly likely that the net benefits of the program (for the Canadian economy), significantly exceeded the direct costs to administer the policy.

For the purposes of analyzing efficiency, the Government of Canada distinguishes operational efficiency, allocative efficiency and economy.¹⁷ The following paragraphs summarize the analyses of each aspect of efficiency and economy.

Findings and Analysis of Operational Efficiency

Operational efficiency relates to the program’s capacity to produce outputs with a reasonable amount of resources. As an indicator of efficiency, a percentage of the IRB administrative costs was calculated by dividing the costs of the IRB program by the procurement dollars. The following table provides the details of the calculation. It should be noted that the numbers involve a number of assumptions, including that obligation dollars reflect the volume of work produced.¹⁸

Table 6: Program Costs as a Percentage of IRB Dollars (Obligations)

1. Total IRB program costs (2008-2013)	\$11,271,398
2. Total IRB obligations (2008-2013)	\$11,227,693,614
Percentage of program costs over IRB Obligations (Line 1 divided by Line 2)	0.10%

As shown, the costs associated with the IRB Policy represent a fraction of one percent of the contracting costs.¹⁹ Thus, from a procurement perspective, the costs associated with the IRB Policy are very low.

In terms of the operations themselves, there are two major IC activities related to compliance

¹⁷ TBS, Assessing Program Resource Utilization When Evaluating Federal Programs (<http://www.tbs-sct.gc.ca/cee/pubs/ci5-qi5/ci5-qi5tb-eng.asp>)

¹⁸ The assumption is that the procurements signed is an appropriate indicator of IRB program activities. In reality, IRB program activities cover procurement activities signed before the period (ongoing procurement activities), as well as banking of activities for procurements to come. While this may seem to go beyond the actual numbers, it should be mentioned that some of the procurements signed have timeframes covering up to 20 years, which means that only part of the procurements would have been processed between 2008 and 2013. On the other hand, IRB programs will continue processing ongoing procurements signed earlier. Thus, the assumption is that both more or less cancel for each other.

¹⁹ Other administrative costs incurred by by PWGSSC, DND and the private sector were excluded from the calculation but are not considered material given the size of the denominator.

monitoring: first, assessing proposed transactions against the eligibility criteria; and second, verifying the contractors annual IRB reports to ensure that claims are correct, that is, that the Canadian companies benefited as intended. Reviews were also undertaken to ensure that transactions related to the procurement covered by the IRB Policy could be recognized as direct credits. There were guidelines and standard questions asked to prime contractors to recognize such transactions. According to the literature, best practices in administering offset policies include the importance of having a well-established administrative and monitoring framework to manage the IRB policy, as well as the existence of review mechanisms leading to accurate assessments of incrementality and causality. On this second point, all respondents agreed that the IRB verification process was generally above average in terms of time and effort when compared with other countries in terms of extent of verifications. In fact, some countries do not conduct any verifications of the credits claimed.

According to interviewees, it would have been very difficult to conduct these compliance monitoring activities at lower cost without affecting the effectiveness of the IRB Policy (in ensuring benefits for Canada). Due diligence was necessary to prevent the approval of transactions that are not truly causal, incremental or sourced from Canada. A few respondents mentioned that there was a lack of resources within IC to properly deliver the policy. There was evidence to support this view. The IRB Directorate has internal delivery targets which are to complete verifications of contractor annual report claims within a six month timeframe. According to a partial review of files, this is achieved in only 19% of the cases. When the evaluation was conducted, the backlog represented 6% of the claims (2008-2013 period).

These delays can have a direct impact on the prime contractors who need to make decisions on an ongoing basis about global bidding opportunities. Delays in approving transactions or credits can cause a burden on prime contractors that are required to make bidding and production decisions at an international level. For example, delayed decisions about eligibility or credits claimed in Canada could prevent a prime contractor from deciding to produce in Canada or abroad for contracts in various countries.

As well, there was evidence that the IRB staff participation in the interdepartmental procurement committees could be more timely and value-added. There was a perception among committee members that the IRB Directorate could participate more fully in committee meetings. This also supports the view that IRB resources are extended and may be affecting the performance of the IRB program. The department should consider its resource requirements, particularly as the IRB Policy transforms into more labour-intensive ITB policy.

To summarize, the analysis of the financial costs of the program supports the view that, in the grand scheme of things, IRB staff resources could be augmented or balanced to achieve better performance, without a major impact on the total procurement costs.

Government programs are expected to seek and achieve efficiency gains on a continuous basis. Given this evaluation's finding that Canada is robust in its compliance monitoring process relative to other countries, the processes could be reviewed to ensure the highest level of efficiency. Many of the prime contractors interviewed complained about the IRB procedures in terms of lack of clarity of guidelines, a perceived lack of consistency of approaches to interpretation of the guidelines among officers, and excessive compliance verification. IC

should consider how best to clarify its procedures, apply them consistently and reduce administrative burden where possible. One senior IC respondent said that allowing the prime contractors to submit information electronically would also allow for some efficiencies as everything is done via hardcopies.

Analysis of Allocative Efficiency

Allocative efficiency refers to the costs of producing outcomes. Findings reported in earlier (Section 4.2.2) indicate that the benefits associated with IRB range from approximately \$12B to \$19B. On the costing side, it was indicated earlier that the administrative costs associated with IRB during the same reference period (2008-2013) totalled \$11M. Based on these findings, it is highly likely that the benefits of IRB significantly exceed the costs associated with the administration of IRB.

5.0 Conclusions and Recommendations

Overall, the evaluation evidence indicates that there is an ongoing need and rationale for the IRB Policy, that the IRB Policy produces extensive impacts for the Canadian economy, and that there are opportunities to improve the delivery of the IRB Policy. These conclusions are supported by the following findings.

Relevance

There is a continued need for federal support for industrial development in Canada's defence and security sector and the IRB Policy responds to this need. Offset policies for defence procurements fall outside of the scope of international trade agreements and exist to: support a domestic defence sector; address security concerns; and capture economic benefits from defence and security procurements. Canadian defence firms face a number of challenges, including a dependence on foreign markets, a small-size Canadian defence market; cyclical domestic demand; and increased competition in foreign defence markets Accordingly, like most countries, the Government of Canada has implemented an offset policy to capture economic benefits from its defence and security procurements.

The IRB Policy is in line with the priorities of the federal government and the strategic outcomes of Industry Canada. The IRB Policy is aligned with the roles and responsibilities of the federal government in international trade and defence.

Performance

Prime contractors are fulfilling their IRB obligations. There were no cases where the prime contractors failed to meet their IRB obligations. For the 2008 to 2013 period, a total amount of \$11.2B in new obligations were committed of which \$5.1B (46%) had already been claimed and credited. These defence contracts and associated IRB obligations are expected to be completed between 2008 and 2038.

Recipients have benefited from IRB transactions to a varied extent. Transactions were of varying quality in terms of long-term capacity building benefits for the IRB recipients. For example, many contracts involved the development of new technologies, the development of highly-qualified personnel, technology transfers, and increased scientific and technical know-how of recipients. High quality transactions were generally associated with larger transactions (in dollars). However, the definition of "quality" varies by sector, sub-sector, as well as by geographic area, according to respondents.

The IRB Policy has led to the growth of IRB recipients and the development of new business relationships. IRB transactions led to significant spin-off sales for IRB recipients. Counting actual and projected spin-off sales in the next three years (excluding the IRB contract), sales are estimated to be in the range of \$3.2B and \$10.9B for the period. The mid-range scenario estimated spin-off sales to be of \$7.1B for the period. These impacts are in addition to the IRB transactions. In some cases, the IRB Policy also contributed to the development of new business relationships with the prime contractor. Some of these relationships were likely to be long term,

while some were one-offs.

In several cases, IRB recipients benefited from supplemental business opportunities with other firms after the initial IRB transactions. Several IRB recipients have been included into the global value chains of prime contractors in other countries; have gained an international reputation from the IRB contract; or have been introduced to new potential clients through their prime contractor.

Views about the 2009 Policy Enhancements

The latest enhancements to the policy were gradually implemented since 2009, and it is too soon to tell what the full impacts of 2009 enhancements will be. Prime contractors appreciate the banking and phase-in options although some prime contractors said a longer period for banking credits would provide additional flexibility. The consortia option is generally appreciated although the outcomes are still unknown in many cases. There was also appreciation for the improved recognition of the value of Canadian firms' participation in Global Value Chains.

Operational and Allocative Efficiency

IC delivered the IRB Policy at a low cost given that administrative costs represented less than one percent of the IRB obligations signed during the period. The administration of the IRB Policy involved intensive verification processes and there is evidence that program resources were insufficient to meet internal targets (e.g. time required to verify claims). There were opportunities to improve processes, use more electronic tools to receive claims and review the level of staffing. There was also an opportunity to improve reporting given that new data systems are in place to do so. The net benefits of the program were well above the direct costs to administer the policy.

Recommendations

Based on the evaluation findings, the following recommendations are proposed.

1. The Industrial and Technological Benefits (ITB) Branch should ensure that the ITB policy encourages high-quality outcomes (including those identified in the review of previous IRB transactions) by defining quality and success factors, establishing baselines, and monitoring performance.
2. The ITB Branch should ensure that the monitoring and reporting system currently in place tracks the impacts on recipients of IRB transactions and the new industrial and technological benefits.
3. The ITB Branch should clarify and streamline its administrative procedures.

Appendix A: Definitions

1. The IRB Policy

The IRB Policy ensures that Government of Canada defence and security procurements generate high value-added business activity for Canadian industry. The IRB Policy requires companies undertake business activities in Canada valued at 100 percent of the value of the defence or security contract they have been awarded by the Government of Canada. The IRB obligation is a contractual commitment and part of the overall government procurement contract²⁰.

2. IRB Transactions

A transaction is the business activity between the Prime contractor and a Canadian recipient.

3. Direct IRB Transaction

Direct IRB Transactions are those achieved through the provision of the goods and services required to deliver the equipment being procured through the project.

4. Indirect IRB Transactions

Indirect IRB Transactions are those achieved through business activities not related to the equipment being procured on the project. Indirect IRB Transactions shall involve a level of technology that is generally the same or higher than that of the project, with applications in Canadian advanced technology industries. Indirect IRB Transactions must have a Canadian Content Value (CCV) of no less than 30 percent of the total value of the IRB Transaction.

5. Canadian Content Value (CCV)

CCV is the portion of the selling price of a product or service that includes Canadian labour and materials.

CCV does not include product components that were imported into Canada. For the purposes of the evaluation, only the CCV of a particular work package is counted toward the completion of an IRB obligation.

6. Purchase

Purchases are the act or an instance of buying something. In the case of IRB transactions, purchases included buying goods or services from Canadian advanced-technology companies.

²⁰ Industry Canada IRB Policy http://www.ic.gc.ca/eic/site/042.nsf/eng/h_00016.html

7. Consortium

Consortium is a public-private partnership established by the IRB contractor with the intent of undertaking activities in Canada related to research and development.

8. Postsecondary Research/Research Investment (PSR)

PSR involved: cash contribution input to Canadian universities for university research or the establishment of university chairs; investments in advanced technology skill development through publicly operated Post-Secondary Institutions; and, collaborative research undertaken with Public Research Institutions.

9. General investment

General investment in the IRB Transactions can involve activities such as investment in Canada. These investments shall meet the IRB Eligibility Criteria and shall be made by the Contractor or its Eligible Party and placed directly with a Canadian recipient.

10. Technology Transfer

Technology transfer shall meet the following criteria: technology shall be in a form that is sufficiently complete to allow the Canadian recipient to apply the knowledge to existing or new products or processes; technology shall be proprietary, current and at a level of technology equivalent to or higher than that used on the Project.

11. Investment Framework

A new IRB crediting tool to encourage IRB Obligors to make long-term investments in Canadian small or medium-sized businesses (SMB), in innovation-related areas involving R&D and commercialization activities. Their goal is to increase the number and value of business expenditures in R&D at SMB recipient companies.

Appendix B: Sample Profile

Of the 805 recipients, a total of 140 responded to the survey (in total or in part). There were 72 IRB recipients that could not be contacted and it could not be confirmed that the business was still in operation. The following table summarizes the population size, sampling frame and obtained sample:

Table B1: Sampling Profile by Survey Outcome

	Sample Size
A. Population of IRB recipients	N=805
B. IRB recipients with no easily accessible contact information	- 264
C. Survey sample frame	n=541
D. Non respondents (Recipients who chose to not respond)	-329
E. Additional non respondents (Recipients GGI was unable to contact using best available contact information)	-72
F. Obtained sample (responded to at least one survey question)	n=140

Source: Survey of IRB Recipients

Note: Due to absence of contact information

About the non-respondents with no contact made whatsoever (n=72), the results of the actual efforts to contact them were the following:

Table B2: Outcome of email and phone contact attempt

Outcome of Email and Phone Contact Attempt	Frequency	Percentage
Number out of service	25	34.7%
Messages left, but person not reached	35	48.6%
Company closed / bankrupt / sold	12	16.7%
Total	72	100.0%

Source: Survey of IRB Recipients

The following table compares the regional profile of those who answered the survey against those who did not:

Table B3: Profile of Respondents by Province

	Survey Respondents	Total Recipient Population
Alberta	2%	2%
British Columbia	14%	13%
Manitoba	4%	2%
New Brunswick	3%	1%
Newfoundland and Labrador	1%	3%
Nova Scotia	6%	5%
Ontario	51%	44%
Prince Edward Island	1%	3%
Quebec	17%	22%
Saskatchewan	1%	3%
Total n	136 (1)	401 (1)

Source: Administrative data

Note: The size is lower than the population due to missing information in the database.

In terms of type of organizations with business activities with the IRB Policy, a majority of respondents (87%) indicated that their organizations were for-profit organizations, and just a few (13%) were non-profit organizations, such as post-secondary institutes.

In terms of industry sector, the following table provides the NAICS of the transactions covered by the survey (each survey respondent was asked to provide answers about one transaction), and those of the population.

Table B4: Profile of Transactions Sample

Industry Sector	Total Transactions Survey	Total Transactions Population
23.00 Construction	1%	0%
31.00 31-33 Manufacturing	62%	69%
41.00 Wholesale Trade	4%	4%
48.00 48-49 Transportation and Warehousing	1%	2%
51.00 Information	1%	4%
54.00 Professional, Scientific, and Technical Services	19%	13%
55.00 Management of Companies and Enterprises	0%	0.1%
56.00 Administrative and Support and Waste Management and Remediation Services	1%	1%
61.00 Educational Services	11 %	5%
62.00 Health Care and Social Assistance	1%	0%
72.00 Accommodation and Food Services	0%	0.2%
81.00 Other Services (except Public Administration)	0%	1.1%
91.00 Public Administration	0%	0.6%
	100% Total (n=140)	100% Total (n=1703)

Source: Administrative data

Table B5: Sampling Profile by TCCV covered

	Sample Size (n) (% of Population on File)	Value and % of IRB TCCVs covered¹
Obtained sample (responded to at least one survey question)	n= 140 (17%)	\$2.9B (24%)
Survey sample frame ²	n=541 (67%)	\$ 9.0B (74%)
Recipients that survey was unable to contact using best available contact information ³	n=72 (9%)	\$ 1.8B (15%)
IRB recipients with no easily accessible contact information	n= 264 (33%)	\$ 3.1B (26%)
Total (population of IRB recipients)	n=805 (100%)	\$12.1B (100%)

Source: Survey of IRB recipients and administrative data

1. Total Canadian Content Value (TCCV) dollar amount are expressed in Canadian dollars from IRB database for April 1, 2008 onward.
2. Respondents reached but who did not complete the survey.
3. Respondents that could not be reached. It could not be determined if these businesses were still active. As per Table B2, the number was out of service, messages were left but the contact person could not be reached, or it was assumed that the company was closed, bankrupt or sold.

By focusing the searches for contact information on those with higher transactions, the sample was slightly over-represented in terms of size of transaction. Overall, the 17% of the population of IRB recipients actually represented 24% of IRB transactions by dollar value. On the other hand, it should be noted that the respondents were only asked to respond to questions about one of their IRB transactions, which means that the survey responses underestimated the full impact of the policy on the survey respondents.

Appendix C: Input/Output Analysis

This appendix provides an overview of Input/Output (I/O) analysis and the approach used for this evaluation.

According to Grady and Muller²¹, Input-output models are designed to trace the impact of changes in final demand, such as consumer expenditures, investment and government spending on the structure of output, and employment by industry, sector, or province. An input-output model can be used to estimate the impact on output and employment by industry of government expenditures on particular programs or projects. For example, the impact on the economy of a construction project such as building a road could be estimated. The input-output model would show the direct impact of initial spending on the project on the final demand category of government expenditures on non-residential construction. The input-output model would then transform this spending into spending on intermediate material inputs such as concrete, steel rods, gravel, and fuel, and into spending on the primary inputs of labor, capital, and indirect taxes.

Spending on inputs would in turn be transformed into industry outputs, producing estimates of the indirect impact of the initial increase in spending. Employment/output coefficients are used to transform industry output impacts into employment impacts. The end result would be an estimate of the total (direct plus indirect) impact of the initial increase in spending on output and employment by industry. If the inter-provincial model is used, a regional dimension could be added to the estimates of output and employment by industry.

There are two versions of the output determination model. One is the open model, in which all final demand categories, including consumption, are treated as exogenous. In this model, income generated in the process of production is not assumed to be re-spent. The second version is the closed model, in which income generated by the production process that accrues to the household sector is assumed to be either spent on goods and services or taxes, or to be saved in accordance with average past proportions. These effects are called induced. The closed model exhibits a traditional textbook Keynesian multiplier when subjected to exogenous expenditure shocks. The magnitude of the multiplier varies inversely with the magnitude of leakages from expenditure stream for non-wage income, taxes, savings, and imports.

The impact multipliers derived from open and closed versions of the output determination model are significantly different. For instance, when subjected to a shock of a \$1M exogenous increase in spending on residential construction, the closed model yields a multiplier of 1.66 (the ratio of the impact on GDP at market prices to the initial expenditure increase), whereas the open version of the model yields only a multiplier of .89 (the difference from unity reflecting import leakages).

²¹ Grady, Patrick, Muller, Andrew. "On The Use And Misuse Of Input-Output Based Impact Analysis In Evaluation" in *Canadian Journal of Program Evaluation*, vol 3, no 2, Fall 1988, pages 49-61

Approach Used for This Evaluation

The economic impacts comprise **direct, indirect, and induced impacts**²². Direct impacts arise when a prime is awarded a defence procurement contract (as a prime). The direct procurement impacts with prime contractors include both domestic firms and imports whereas the direct impacts on demand for Canadian goods and services include only domestic purchases. The indirect impacts are linked to Canadian suppliers of the prime contractors via the supply chain. Because IRB operations include sales by initial suppliers to prime contractors which might not have occurred without IRB, the evaluation team used IRB's database to specify the initial suppliers of prime contractors. It is left to the open Inter-Regional I/O model to delineate industrial linkages that call forth sales of inputs into inputs *ad infinitum* back up the supply chain in order to delineate total direct and indirect impacts of IRB assisted procurements.

The induced impacts emanate from incremental increased incomes due to the direct and indirect impacts, and sequential increases in income from additional rounds of induced expenditures emanating from derived incomes. Using its 2010 Inter-Regional I/O Model, GGI with Statistics Canada²³ has estimated direct and indirect impacts (Open Model) and induced impacts arising from new consumer spending (Closed Model). This process yields a partial analysis because it excludes impacts from spending induced government revenues and all induced investments.

In addition, throughout the supply chains, contractors may gain both knowledge in producing sophisticated equipment and intellectual property (IP) that allows them to expand their offerings in both civilian and non-civilian markets, possibly through the utilization of the prime contractors' marketing channels for spin-off sales. IRB contracts also benefit Canadian suppliers by allowing them to attain international credentials that qualify them to bid on additional international contracts: tangential evidence of the acquisition of IP linked to the IRB. Based on a survey, this analysis also attaches values to such sales and estimates parallel impacts for those expected sales.

Direct and Indirect Impacts

The first step in the economic analysis was to identify the contract and follow-on sales revenues generated at the establishment and industry level, as a result of the IRB contracts. The North American Industrial Classification (NAICS) codes, available at the firm level on Industry Canada's Corporate Profiles, or failing that, contractors' websites were used to link IRB establishment data to Statistics Canada's I/O tables.

Where a firm listed more than one NAICS code, the one most applicable was applied based on the description of each IRB transaction by establishment. Therefore, a firm with several establishments could have multiple NAICS codes. This process allowed GGI to define the economic shock (expenditure), or IRB stimulus, as incremental revenues by NAICS at purchaser prices by province. Subsidiaries were treated as different firms and therefore had NAICS codes specific to each subsidiary's activities.

Impacts on national income at the national level were captured by estimating incremental Gross

²² These terms are meant in an economic sense and do not directly correlate to the use of the term in the IRB Policy

²³ This model is the latest available from Statistics Canada

Domestic Product (GDP). GDP over and above the based case is a gross measure of what is produced incrementally domestically in Canada prior to taking depreciation into account. This figure relates not only to the firms recognized in IRB obligations but also to all suppliers in each contractor's supply chain. Some of these contract recipients and suppliers are likely to have imported materials and supplies, upon which duties would have been paid. These and other taxes have also been estimated via the Statistics Canada I/O tables. When they are subtracted from the stimulus, the I/O results from the open model yield the direct and indirect GDP impacts at market prices.

Because GDP is the sum of the value added by each impacted supplier as long as there are imports and taxes, the direct and indirect GDP multiplier relative to direct expenditures will be small. The multiplier approaching or exceeding unity in the analysis comes from induced impacts as incomes earned from the project are partially or wholly spent and spin-off sales are achieved.

The GDP at market price is calculated by subtracting indirect taxes and imports on products and adding in any subsidies to the products over and above IRB expenditures. This metric is important because its elements identify various income streams.

Direct employment from the I/O analysis includes both new FTEs and employees who retain their positions due to the defence procurement contracting. In this sense they are incremental to the counterfactual of, "What would have been the relative level of employment without the funding and follow-on sales, had companies failed to find any other markets?". They may not all be incremental relative to the outset of the program because supply chain firms may have found other work or hoarded Highly-Quality Persons (HQP) and other staff in the hope of retaining intellectual capital.

The direct and indirect impact on GDP and employment by industry indicates the reach of defence procurements (with IRB requirements) in Canada. Since I/O analysis traces supplies back up the supply chain by NAICS code, the analysis identifies GDP and employment by industry.

Limitations

- The analysis assumes causality and incrementality of the outcomes derived from the IRB obligations and spin-offs. This is based on a detailed analysis of these two eligibility criteria completed by Industry Canada prior to approving claims. Although we did not evaluate the reasonableness of the assumptions, interviews with the prime contractors confirmed the causality and incrementality of the transactions in comparison with what would have been without the IRB Policy;
- The analysis is reliant on NAICS codes for the application of the I/O models. In most cases the NAICS codes were available from Industry Canada's Canadian Company Capabilities List, in other cases NAICS codes were inferred from contract information;
- Follow-on sales are based on estimates supplied by the IRB recipients. These estimates were verified by the respondents in a follow-up conversation.

- The response to the survey approximated 25%. Therefore the estimates of spin-off sales from IRB procurements could only be estimated for firms that responded to the survey. This may lead to an underestimation of the ultimate impact of the IRB Policy.
- Some firms have operations in more than one province. In a few cases, it is possible that the province where the work was actually performed was different from the establishment making the sale.
- There are no targets for the economic impact of the IRB Policy or comparison benchmarks to facilitate the analysis of the results generated through the input-output model.
- For the two scenarios where results from the survey are extrapolated to the larger population of IRB recipients, it is assumed that the firms that completed the survey are typical and resemble the IRB recipients who chose not to participate in the survey.
- Like all input-output models, the Statistic Canada's model presents equilibrium results and does not include a time dimension. As a result, the time when the full economic impacts will be achieved is not defined and results are specific to given timeframes, not years.
- The extent to which impacts are directly incremental depends on one's view of the counterfactual of what would occur without the IRB. At a minimum assuming that the prime contractors would be located in Canada so that IRB driven sales are incremental to their normal operations and any potential sales to others by those firms are displaced to other Canadian firms. Then the direct impacts are the sales in which the IRB is active. Alternatively, without the IRB Policy but with other countries aggressively pursuing Canadian contracts, firms might not even have a Canadian presence, in which case, the impacts would be much larger than measured herein.

Results

The IRB Policy is expected to provide Canadian companies with opportunities to develop and competitively sell innovative products and services to companies with IRB obligations. This translates into various economic impacts for Canada. This sub section utilizes the latest Canada Input/Output Tables (I/O) from Statistics Canada to trace impacts throughout the Canadian economy; both in terms of direct and indirect impacts.

The sum of the direct and indirect expenditures was established using results from the "Open" I/O model with direct and indirect Gross Domestic Product (GDP) being the sum of the Canadian value added, i.e. net of any imported inputs and capital payments to foreigners. This was calculated for the amounts recognized as direct IRB obligations procured in 2008-2013. In addition, expenditures were also calculated on the spin-off sales reported by the recipients in the survey. As such, data was segmented into four parts:

- Credited Claims - (2008-2013);
- Uncredited Claims - (2008-2013);
- IRB Obligations - (to be claimed in next five years); and
- Spin-off sales - to date and 5 years out.

The first two segments are based on IRB administrative data covering 459 obligations for which 428 were provincially specified²⁴ and on the North America Industrial Classification System (NAICS) codes. No extrapolations were made for any of the obligations if provincial and NAICS classifications were unknown²⁵. Total obligations in the IRB Directorate's administrative files are for \$11.2B. At the time the administrative files were made available to the evaluation team (March 2014), \$5.1B had been credited by the IRB staff to prime contractors with IRB obligations and \$310M had been claimed but not credited. This left \$5.8B that was not as yet credited. Of this amount \$2.6B was sufficiently advanced in the planning and contracting process to be assigned NAICS codes and provincial designations. The remaining \$3.2B was modeled by extrapolating the results for the \$2.6B. Due to missing provincial and NAICS classifications for \$133M of the \$5.1B, the I/O analysis of the first three segments was based on \$11.1B of the \$11.2B in total obligations.

The table below summarizes the key impacts from \$11.1B in selected IRB obligations where industry sector and provincial location information was available. The estimates provided are for incremental GDP impacts in Canada. Because the future impacts of the IRB obligations on firms are subject to uncertainty, three scenarios were developed:

- The first scenario contains the credited, uncredited claims and the outstanding IRB obligations as well as spin-off sales projected by respondents to the survey.²⁶ No extrapolations were made of spin-off sales to firms that did not respond to the survey.
- The second scenario was an arbitrary mid-point scenario that extrapolated the spin-off sale estimates to half of the contacted IRB recipients.
- The third scenario extrapolated the forecasted spin-off sales reported by survey respondents to all contacted firms/organizations.

²⁴ A few small IRB transactions that were set-up regionally in the data could not be specified by province.

²⁵ In a small number of cases NAICS codes were not available due to the lack of detail in any of three sources - IRB files; Industry Canada's Corporations database and the corporation's own webpage.

²⁶ In over half the cases a validation of the survey responses was done through interviews to confirm their initial responses.

I/O Analysis: Monetary Impacts of the IRB Obligations (\$ Billions) 2008-2019

Segment and Extension	Open Model Results				Closed Model Results			
	GDP	Labour Income	Value Shipped	Tax Revenues	GDP	Labour Income	Value Shipped	Tax Revenues
Credited Claims	3.2	2.3	6.5	0.102	4.4	2.8	8.5	0.360
Uncredited Claims	0.2	0.1	0.5	0.006	0.3	0.2	0.7	0.020
Current and Future								
A) IRB Obligations	3.6	2.6	6.7	0.133	4.9	3.2	9.0	0.421
B) Spinoff Sales								
5. Scenario 1	2.1	1.4	4.8	0.060	2.8	1.7	5.9	0.200
6. Scenario 2	4.6	3.0	10.4	0.131	6.1	3.7	12.8	0.435
7. Scenario 3	7.0	4.7	16.1	0.201	9.4	5.7	19.8	0.670
Totals (IRB and spinoff sales)								
a) Scenario 1	9.2	6.4	18.5	0.301	12.4	7.9	24.1	1.001
b) Scenario 2	11.6	8.0	24.1	0.372	15.7	9.9	31.0	1.236
c) Scenario 3	14.0	9.7	29.8	0.442	19.0	11.9	38.0	1.471

Source: I/O Model

Overall, the I/O analysis showed that the \$11.1B in IRB obligations during the evaluation period will likely lead to a total increase in GDP of between \$12.4B and \$19.0B (including direct, indirect and induced impacts as well as the effects of spin-off sales) over the lifetime of the contracts.

Care needs to be taken in using the value shipped series. It represents the total value shipped throughout the supply chain so that some inputs are counted multiple times. For example, the same raw materials may be counted several times at each stage of production in which they are embedded in materials, parts, and final assembly. Inherently, independent of IRB activities, value shipped can be reduced over time by greater vertical integration in the supply chain with little impact on GDP. The GDP series accumulates only the value added at each step in the production chain and therefore avoids double counting. In discussing the impacts on the Canadian economy, the GDP series is usually the clearer measure.

Appendix D: Additional Survey Breakdowns

Regional distributions of respondents to the survey and IRB recipients are shown in Table D1. The survey samples of regional distribution is similar to the distribution of recipients based on the administrative data.

Table D1: Geographical Distribution of GGI’s Sample and IRB Recipients Based on Administrative Data

	Sample	IRB Recipients
Atlantic	12%	12%
Quebec	17%	20%
Ontario	51%	49%
West	20%	18%

Source: Online survey and administrative data

Notes:

1. May not add up to 100% due to rounding.
2. IRB recipients include multiple transactions involving the same firm from April 1, 2008.
3. The program now tracks Southern Ontario and Northern Ontario.

Table D2: Description of Recipient Sample by Relationship with Prime Contractors

	IRB Recipients Associated with Prime Contractors (e.g., Subsidiaries)	IRB Recipients Not Associated with Prime Contractors	Total
Survey Respondents	12.1%	87.9%	100%
Non-respondents	2.4%	97.6%	100%
Total	4.1%	95.9%	100%

Source: Administrative data

Note: Based on the names of the organizations in the IRB data files

Analysis of Quality of IRB Transactions

The survey findings related to the quality of the IRB transactions were analyzed by developing a summative index of the impact of the specific transactions on internal operations, sales and marketing. The specific indicators based on survey statements that comprised this index were:

- The IRB contract/transaction ...
 - Required new investments by the recipient (excluding marketing costs)
 - Led to the acquisition or development of new technologies for the recipient
 - Allowed the recipient to acquire new machinery and equipment
 - Contributed to the development of highly qualified personnel (including students)
 - Allowed the recipient to hire and retain staff beyond the length of the contract
 - Allowed the recipient to improve its work processes
 - Involved the adoption of new management information and/or quality control systems
 - Contributed to the development/ acquisition of patents or copyrights

- Involved technology transfers between client and the recipient
 - Increased the recipient's R&D and innovation capacity
 - Improved corporate profile and credibility
 - Allowed the recipient to sell to new clients
 - Led to the recipient's participation in a prime contractor's global supply chain
 - Resulted in increased sales in existing business lines
 - Resulted in increased sales in new lines of business
 - Increased recipient's domestic market share
 - Increased recipient's international market share
 - Resulted in increased profitability
- Overall, operational improvements resulting from the IRB transaction have contributed to the growth of the recipient

The values of the index scores were calculated by coding responses by IRB recipients to the survey questions. Specifically, individual respondent scores on the agree-disagree scales were added for each of the 19 survey questions. For example, if a respondent "strongly agreed" that there had been a positive impact for a survey question, then the index score increased by five points. If a respondent only "agreed" that there had been a positive impact, then the index score increased by only four points. Similarly, "neither agree nor disagree" responses were worth three points; "disagree" responses were worth two points; and "strongly disagree" responses increased the index score by one point. Non-response and "don't know" were given a score of 1 (the lowest point in the scale). Based on this coding system, respondents could obtain a minimum possible score of 19 and a maximum possible score of 95.

Overall, it was assumed that an IRB transaction that led to the growth and strengthening of an IRB recipient (i.e. generated a high index score for impacts) could be considered to be a high quality IRB transaction.

The results from the calculation of index scores were distributed along a continuum. The following table describes the distribution of the scores.

Table D3: Distribution of Impact Scores

Index Scores for Impact of IRB Transaction	Number of Respondents (IRB Recipients)
19	7
20-29	4
30-39	6
40-49	25
50-59	29
60-69	31
70-79	16
80-91	8

If respondents were to neither agree nor disagree for all survey questions (i.e. receive the middle score for each question), then they would have received an index score of 57. The average index score was 55.45 and the median was 56.

The 126 scores were then divided in three groups (low, medium and high quality transactions) that were roughly equal in terms of size. Because some IRB recipients had identical index scores, it was not possible to divide the results into three groups of exactly the same size. The following table shows the range for each of the three groups.

Table D4: Distribution of Impact Categories

Level of Impact of IRB Transactions	Index Score Range	Median Score	Number of Respondents (Percent of all IRB Recipients)
Low	19 – 49	41	42 (33%)
Medium	50 – 64	56	45 (36%)
High	65 – 91	71	39 (31%)

These results were then cross-tabulated with the following variables:

- IRB transaction size in dollars,
- Industry sector of the IRB recipient,
- Direct/Indirect type of IRB transaction (obligation type),
- Procurement sector (Air, Land or Marine),
- Region, and
- Size of firm (number of employees).

Initial Analysis:

The impacts of the IRB transactions on recipients do not appear to be equally distributed across the above variables. In particular, an initial review found that the high impact transactions appeared most common within the following categories:

- Larger IRB transactions (\$10M and above in dollar value) made up 44% of all high impact transactions);
- The manufacturing sector reported 69% of all high impact transactions;
- Indirect IRB transactions were 46% of all high impact transactions;
- Air related government procurements were associated with 59% of all high impact transactions; and
- Ontario-based IRB recipients had 49% of all high impact transactions.
- Small firms with less than 100 employees participated in 51% of all high impact transactions.

However, this initial analysis stems primarily from the fact that these types of IRB transactions were often the most common types of transactions for all survey respondents. For example, Air procurements made up 57% of the IRB transactions in the survey and 48% of all survey respondents were located in Ontario. Clearly, a more detailed comparison analysis is required,

and follows below.

Comparison Analysis:

Table D5: Size of IRB Transaction and Level of Impact

Transaction Size (\$) (1)		Impact of Transaction (2)			
		Low	Medium	High	Total
\$1 to \$500k	Number of Respondents	16	17	5	38
	Share by Impact Level	42%	45%	13%	100%
\$500k to \$10M	Number of Respondents	15	14	17	46
	Share by Impact Level	33%	30%	37%	100%
\$10M+	Number of Respondents	11	14	17	42
	Share by Impact Level	26%	33%	41%	100%
All Survey Respondents	Total Number of Respondents	42	45	39	126
	Share by Impact Level	33%	36%	31%	100%

Notes:

1. Size of IRB transaction was calculated in terms of Canadian Content Value which includes only Canadian labour and parts.
2. The overall assessment of impact was based on cumulative score of individual indicators.

The analysis found that as the size of the IRB transactions increased in dollar value, there were more and more high impact transactions. As shown in Table D5, among the lower dollar value IRB transactions (\$500k or less), 42% of these transactions were in the low impact group. By comparison, 33% of all survey respondents had low impact transactions. Only 13% of lower dollar value IRB transactions were in the high impact group, but 31% of all IRB transactions in the survey were in the high impact group. By contrast, 41% of the largest transactions (\$10M+) were in the high impact group and only 26% fell into the low impact group.

Table D6: Industry Sector and Level of Impact

Industry Sector		Impact of Transaction (1)			
		Low	Medium	High	Total
Manufacturing	Number of Respondents	22	30	27	79
	Share by Impact Level	28%	38%	34%	100%
Professional, Scientific, and Technical Services	Number of Respondents	7	8	9	24
	Share by Impact Level	29%	33%	38%	100%
Educational Services	Number of Respondents	9	4	2	15
	Share by Impact Level	60%	27%	13%	100%
Other	Number of Respondents	4	3	1	8
	Share by Impact Level	50%	38%	13%	100%
All Survey Respondents	Number of Respondents	42	45	39	126
	Share by Impact Level	33%	36%	31%	100%

Notes:

1. The overall assessment of impact was based on cumulative score of individual indicators.
2. Not all percentages add up to 100% because of rounding.

The impacts of IRB transactions on manufacturing firms were generally consistent with the distribution of impacts for all survey respondents. However, service firms (i.e. professional, scientific and technical services) had slightly more high impact transactions (38%) than the relative frequency of these IRB transactions among all survey respondents (31%).

Educational services had fewer of high impact transactions than expected (only 13%) but this was probably because these IRB recipients tended to have low scores for sales and marketing impacts. In addition, there were very few responses from this sector (only 15 IRB recipients) which limited the ability to make general conclusions about the sector as a whole.

Table D7: Direct and Indirect Transactions and Level of Impact

Obligation Type		Impact of Transaction			
		Low	Medium	High	Total
Direct	Number of Respondents	9	13	9	31
	Share by Impact Level	29%	42%	29%	100%
Indirect	Number of Respondents	22	15	18	55
	Share by Impact Level	40%	27%	33%	100%
Undefined	Number of Respondents	11	17	12	40
	Share by Impact Level	28%	43%	30%	100%
All Survey Respondents	Total Number of Respondents	42	45	39	126
	Share by Impact Level	33%	36%	31%	100%

Note: The overall assessment of impact was based on cumulative score of individual indicators.

The largest number of direct IRB transactions (42%) fell in the medium impact group. By contrast, indirect IRB transactions tended to be in either the low impact group (40%) or the high impact group (33%). For indirect IRB transactions, medium impact transactions were relatively underrepresented (only 27%) compared to their share for all IRB transactions in the survey (36%).

Table D8: Procurement Sector and Level of Impact

Procurement Sector		Impact of Transaction			
		Low	Medium	High	Total
Air	Number of Respondents	30	20	23	73
	Share by Impact Level	41%	27%	32%	100%
Land	Number of Respondents	7	11	9	27
	Share by Impact Level	26%	41%	33%	100%
Marine	Number of Respondents	5	14	7	26
	Share by Impact Level	19%	54%	27%	100%
All Survey Respondents	Total Number of Respondents	42	45	39	126
	Share by Impact Level	33%	36%	31%	100%

Note: The overall assessment of impact was based on cumulative score of individual indicators.

For the Air procurements, 41% of respondents reported having low impact IRB transactions. By comparison, only 33% of all survey respondents had low IRB transactions. Interestingly, Air procurements had a smaller share of medium impact IRB transactions (27%) versus what might be expected (36%), but the percentage of high impact transactions (32%) was consistent with results for all survey respondents (31%).

By comparison, Land and Marine transactions were most frequently in the medium impact group (41% and 54%). Only 19% of Marine transactions were low impact whereas 33% of all survey respondents reported low impact IRB transactions. At the same time, 27% of of Marine transactions had a high impact on the IRB recipients compared with 31% for all survey respondents. A similar pattern occurred for Land transactions. Both high impact and low impact transactions were less common than what was found for all survey respondents.

Table D9: Region and Level of Impact

Region		Impact of Transaction			
		Low	Medium	High	Total
Atlantic	Number of Respondents	4	7	4	15
	Share by Impact Level	27%	48%	27%	100%
Quebec	Number of Respondents	4	12	7	23
	Share by Impact Level	17%	52%	30%	100%
Ontario	Number of Respondents	23	19	19	61
	Share by Impact Level	38%	31%	31%	100%
West	Number of Respondents	11	7	9	27
	Share by Impact Level	41%	26%	33%	100%
All Survey Respondents	Total Number of Respondents	42	45	39	126
	Share by Impact Level	33%	36%	31%	100%

Note: The overall assessment of impact was based on cumulative score of individual indicators.

Overall, the percentage of high impact transactions in each region (27% to 33%) matched what was found for survey respondents as a whole (31%). However, there were some minor regional differences for impact. Specifically, IRB recipients in Quebec had fewer low impact transactions than expected (17% versus 33%) and more medium impact transactions than expected (52% versus 36%). Conversely, IRB recipients in western Canada had more low impact transactions than expected (41% versus 33%) and fewer medium impact transactions than survey respondents as a whole (26% versus 36%). For the Atlantic recipients, it was difficult to generalize given the small number (15) of survey participants from this region. The distribution of IRB transactions for Ontario was similar to the results for all survey respondents.

Table D10: Number of Employees and Level of Impact

Number of Employees		Impact of Transaction			
		Low	Medium	High	Total
0-99	Number of Respondents	18	22	20	60
	Share by Impact Level	30%	37%	33%	100%
100-499	Number of Respondents	8	9	7	24
	Share by Impact Level	33%	38%	29%	100%
All SMEs	Number of Respondents	26	31	27	84
	Share by Impact Level	33%	38%	30%	100%
500+	Number of Respondents	2	3	4	9
	Share by Impact Level	22%	33%	44%	100%
All Survey Respondents	Total Number of Respondents	28	34	31	93
	Share by Impact Level	30%	37%	33%	100%

Note: The overall assessment of impact was based on cumulative score of individual indicators.

Of the 126 survey respondents, information on the number of employees was not available for 33 IRB recipients (26%). This meant that it was difficult to draw firm conclusions about the largest IRB recipients from the survey because there were only nine respondents who had more than five hundred employees. However, the larger IRB recipients (i.e. 500 or more employees) were more likely to report high impact transactions (44%) than small and medium-sized enterprises (30%). By comparison, 33% of all respondents had high impact transactions.

Overall, the responses for the small organizations (less than 100 employees) were similar to those for medium-sized IRB recipients (100 to 499 employees).

Conclusion: High Impact Transactions

Finally, the comparison analysis results were aggregated and summarized in the table below to determine where the high impact transactions occurred.

Table D11: Distribution of High Impact Transactions

Variable	Category	Percentage of All High Impact Transactions	Percentage of All IRB Transactions
Transaction Size	\$1 to \$500k	13%	30%
	\$500k to \$10M	44%	37%
	\$10M+	47%	33%
Industry Sector	Manufacturing	69%	63%
	Professional Services	23%	19%
	Education	5%	12%
Obligation Type	Direct	23%	25%
	Indirect	46%	44%
Procurement Sector	Air	59%	58%
	Land	23%	21%
	Marine	18%	21%
Region	Atlantic	10%	12%
	Quebec	18%	18%
	Ontario	49%	48%
	West	23%	21%
Company Size	0-99	65%	65%
	100-499	23%	26%
	All SMEs	88%	91%
	500+	13%	10%

Note: The overall assessment of impact was based on cumulative score of individual indicators.

Table D11 shows that the high impact transactions were not evenly distributed among the various variables. Some groups were over-represented for high impact transactions:

- The proportion of high impact transactions increased with the size of the IRB transaction. The largest IRB transactions (\$10M or more) made up 33% of all IRB transactions but 47% of all high impact transactions. Conversely, the smallest IRB transactions (\$500k or less) were 30% of the transactions analyzed but only 13% of the high impact transactions.
- Manufacturing was slightly overrepresented with 69% of the high impact transaction but only 63% of all IRB transactions. Professional, scientific and technical services had 23% of the high impact transactions but only 19% of all transactions.

In contrast, there were no clear differences in the prevalence of high impact transactions by transaction type. Direct procurements made up 25% of the IRB transactions analyzed and 23% of the high impact transactions. IRB transactions for indirect procurements were 44% of all transactions and 46% of the high impact transactions.

Similarly, there were no clear differences by procurement sector for high impact transactions. Air procurement transactions were 58% of the IRB transactions in the survey analysis group and 59% of the high impact transactions. Land procurements were 21% of all transactions and 23% of the high impact transactions. Marine procurements were 21% of the IRB transactions in the survey analysis group and 18% of the high impact transactions.

Finally, the location of the high impact transactions matched the geographic distribution of the IRB transactions. The Atlantic region had 12% of all IRB transactions analyzed and 10% of the high impact transactions. Quebec had 18% of all transactions and 18% of the high impact transactions. Ontario made up 48% of the IRB transactions and 49% of the high impact transactions. The West had 21% of the transactions and 23% of the high impact transactions.