A Literature Review on Best Practices of Job Studies

Submitted to

Industry Canada

Submitted by

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1.0 Executive Summary

The objective of this report is to review the best practices in Canada, Western Europe and the United States (US) for evaluating a government program's impact on job creation. This search of available processes covers the more common, and most effective methods used to measure the impact of government (federal and provincial) programs on job creation. The review concentrated less on cases in which job creation is the primary objective of the government program (as in the case of the "Welfare to Work" Programs in the US), and more on cases in which the impact on employment creation, maintenance or displacement is an indirect one. In addition, other non-governmental program's impact studies were reviewed to ensure that the best methodologies were considered.

Before examining best practices, what is to be measured needed to be clarified. Job creation, displacement and maintenance were defined. This laid the framework in which to examine each methodology. The issue of job upgrading was also reviewed because, although not covered in most of the literature, it can be an important measure of the impact of employment programs.

Once the framework was in place, the best methods for undertaking the measurement required were reviewed. Methodologies found in the review of existing literature are identified, and ranked in decreasing order of usage. To ensure the applicability of using these practices in the case of CSBFA, the review has concentrated less on cases in which job creation is the primary objective of the government program (as in the case of the "Welfare to Work" Programs in the US), and more on cases in which the impact on employment creation, maintenance or displacement is an indirect one. Unfortunately there was very little information on other loan programs. Any impact studies, if they existed, have not been published to the public and are not available to the public. Attempts were made to contact the offices, but no response was received. Where a specific measurement is common to a specific industry, this is indicated. More often, though, impact measurements have crossed industry and national borders. Each methodology has its own strengths and weaknesses, and the advantages and disadvantages of each method are described. Once each methodology has been reviewed, it is examined in the context of job creation, maintenance and displacement.

Specific examples of studies that use each methodology are highlighted within the report. These sources are not referenced within the actual report, but a companion appendix volume categorizes the sources used in this report in terms of methodology, industry, region and size of firm.

Issues inherent in all impact measures were also identified and described. These issues complicate the interpretation of any of the impact measurements that were identified. They are general in nature and apply, in some form or another, to any and all of the impact measuring methodologies outlined and should be examined and discussed before any impact study is undertaken to ensure that any difficulty that may exist is minimized.

Conclusions were made in the context of the questions to be answered by a study of the Small Business Loans (SBL) Program planned by Industry Canada in the future. The benefits, drawbacks and opportunities presented by each methodology were examined in this context and it was concluded that no one methodology could measure all that needed to be measured. Based on this, it is the recommendation of this report to apply a combination of selected case studies and user surveys to the upcoming Industry Canada review to ensure that measures are taken accurately, and the results are useable and facilitate conclusions. This recommended combination, very similar to the hybrid method used by CanMET in its 1994 study “An Investment in Canada”, will allow not only for the measurement of direct impacts on job creation, displacement and maintenance that can be attributed to the SBL Program, but also the impacts that have occurred outside of the borrowing firm. Combining these methods will provide a more complete assessment of not only what benefits have been created, but also what costs have been incurred, and the overall net creation of jobs attributable to the financial assistance within a firm and outside of it. The resources allocated for the future review may limit the extent to which these methods can be used; therefore, the recommendations are also ranked in increasing order of resource intensive alternatives.

2.0 Introduction

Through the Small Business Loans Administration, Industry Canada is responsible for administering a loan-sharing program, which is delivered by 1500 financial institutions. Under this program, these authorized financial institutions can make loans up to $250,000 over a lending term no longer than 10 years. While the financial institutions are responsible for credit decisions and monitoring of loans, the Government of Canada pays the lender 85% of any eligible loss incurred on defaulted loans, after the usual realization protocol of the institution is undertaken. This program was implemented in 1961 to increase the amount of financing available to small business enterprises for establishment, expansion, modernization and improvement.

In 1998, the Small Business Loan Act was reviewed, and both internal and external research proved that the program remained a useful tool for small and medium sized enterprises (SME)s. However, this review also uncovered the need for improved administrative and reporting procedures, and the possible extension of the program to cover capital leasing. The act was renamed the Canada Small Business Financing Act (CSBFA). The primary objective of CSBFA is to increase access to financing for SMEs, which has, as a related secondary effect, impacts on employee levels and job creation. Upon its creation, a performance evaluation framework was developed, which included determining the impact of this program on job creation, maintenance and displacement in the borrowing firm, in the industry and in the economy as a whole. This framework was developed at the inception of the CSBFA, so consequently the program collects estimates of job creation in the firm at the time of the loan. There is nothing in place currently to follow up with these firms to compare projected employment impacts with actual impacts.

Industry Canada plans to undertake a review of the impact of the CSBFA loan program on job creation, maintenance and displacement in the firm, the industry and the Canadian economy as whole. For the review to be effective and the results to be useful, a literature review of the best practices of the methodologies used in job impact studies was undertaken. The results are presented in the following sections of this report.

3.0 Objectives Of Report

The objective of this report is to review the best practices in Canada, Western Europe and the United States (US) for evaluating a government program's impact on job creation. This search of available processes will cover the more common, and most effective methods used to measure the impact of government (federal and provincial) programs on job creation. To ensure the applicability of using these practices in the case of CSBFA, the review has concentrated less on cases in which job creation is the primary objective of the government program (as in the case of the "Welfare to Work" Programs in the US), and more on cases in which the impact on employment creation, maintenance or displacement is an indirect one. Unfortunately there was very little information on other loan programs. Any impact studies, if they existed, have not been published to the public and are not available to the public. Attempts were made to contact the offices, but no response was received. Where a specific measurement is common to a specific industry, this is indicated. In addition, other non-governmental program's impact studies were reviewed to ensure that the best methodologies were considered.

The report has the following objectives:

- ✓ To identify the most relevant indicators of job creation, displacement and maintenance and their corresponding methodologies (what is being measured and how to measure it);
- ✓ To review existing information on economic, social and job impacts of government programs; and to identify the best methods for conducting the measurements to obtain the information required (how are we going to undertake the measurement);
- ✓ To categorize these methodologies in terms of their usage for a region, industry and economic sector, where distinctions of this nature are possible;
- ✓ To illustrate drawbacks, shortcomings and opportunities presented by each method;
- ✓ To summarize the findings to assist the subsequent Industry Canada study in its data collection and present a recommended approach;
- ✓ To categorize and summarize the literature reviewed for future reference.

It is through the realization of these objectives that this report will aid Industry Canada's upcoming 2001 review to answer the following questions:

- ✓ What impact does the SBL Program have within the borrowing firm in terms of job creation, maintenance and displacement by borrowers; loan data and loan loss data by sector and by job creation; loan loss data by loan and firm size and by job creation (as well as loan data by firm and job creation); claim costs per job created?
- ✓ What are the related costs and benefits?
- ✓ What impacts does the SBLA program have on the creation, maintenance and displacement of jobs outside the borrowing firm?

4.0 Organization

This report first examines what is meant by, or should be considered in, measuring job creation, displacement and maintenance. More specifically, what measures should actually be used to determine impact. Next, methodologies described in the literature review are identified, and ranked according to usage, with most used being ranked first. As impact study methodologies have evolved over time, those described first have become the preferred approaches.

Where a specific measurement is common to a specific industry, this is indicated. More often, though, impact measurements have crossed industry and national borders. Each methodology has its own strengths and weaknesses, and the advantages and disadvantages of each method are described. Once each methodology has been reviewed, it is examined in the context of job creation, maintenance and displacement. Specific examples of studies that use each methodology are highlighted within the report. These sources are not referenced within the actual report, but a companion appendix volume categorizes the sources used in this report in terms of methodology, industry, region and size of firm.

Some issues, which complicate the interpretation of any of the impact measurement methods, are identified. These obstacles are general in nature and apply, in some form or another, to any and all of the impact measuring methodologies outlined later. Finally, conclusions regarding which methodology (or combination of methodologies) is recommended for Industry Canada's upcoming review of the job impacts of its loan-loss sharing program are presented. These recommendations not only take into account the best practices described in the literature, but also consider what is presently done at Industry Canada (in terms of data collected and indicators measured) and how these can be combined to offer the best path for Industry Canada's upcoming review.

5.0 Literature Search: Methodology and Information Sources

The methodology for data collection employed electronic on-line searching, a review of print sources and studies, and reports conducted by federal, provincial, state and special interest organizations. It focused primarily on Canada, Western Europe and the United States. In addition, requests for information were sought from Industry Canada, Alberta Research Council, the Conference Board of Canada and other experts in, or documents about, "best practices" known to the authors.

The following is a list of Information Sources and Databases presented in alphabetical order.

Information Sources

a. Alberta Research Council
b. Alberta Treasury
c. Business Development Bank of Canada
d. Canada Centre for Remote Sensing
e. CanMET
f. Conference Board of Canada
g. European Commission (Brussels)
h. Human Resource and Development Canada
i. International Quality and Productivity Centre (Canada)
j. National Institute of Standards and Technology Strategic Planning and Economic Analysis Group (Canada)
k. National Research Council
l. Natural Resources Canada
m. Natural Sciences and Engineering Research Council
n. OMBWatch (US special interest group publication)
o. Organization for Economic Cooperation and Development (Paris)
p. Performance Management Network (Canada)
q. Statistics Canada
r. University of Manitoba
s. US Department of Labor
t. Western Economic Diversification Canada

Databases

a. ABI Inform – University Microfilms
b. Harvard Business Review

Those sources that contained relevant information, and were used in this report are outlined in this document's bibliography.

6.0 Impact Measures

Before determining the best practices to measure the impacts of the CSBFA on job creation, displacement and maintenance, what is actually to be measured in each case should be defined. The most appropriate definitions for this study are those developed by Industry Canada in the *"Evaluation Framework for the Small Business Loans Program" report (June 1998)* and they are summarized below. These definitions were chosen because they clearly and concisely articulate the concepts relative to the sources reviewed.

In this report, job creation is defined as ***"jobs created as a result of borrowers' having received a SBL loan"***. This definition categorizes the number of newly hired employees in terms of hours per week, with employees being classified as full time, part time or casual. This definition also allows for the inclusion of the number of employees created outside the borrowing firm (suppliers or distributors, for example). This allows for an examination of both direct and indirect job creation as a result of the introduction of a SBL loan. Many of the studies reviewed also classify employees created in much the same way. In a recent IRAP impact study, newly created positions were further classified as to the type of position (engineer, scientist, technician). This allows for a more accurate quantification of benefits created by these new jobs. This quantification of the value of a new position is very industry specific. It has been documented in various studies that jobs created in the service sector of the economy are valued very differently than those jobs created in the natural resources industries, such as oil extraction. The classification in this way of positions that were created allows for a clearer assessment of the impact of job creation. A further classification is one that categorizes newly created jobs according to the time frame of the position. Job creation calculations are skewed if very short-term jobs (6 months, for example) are counted as well as other jobs of longer terms.

The concept of job maintenance is one that has received the least focus in the literature. This is primarily due to the difficulty in measuring maintenance of jobs both within a firm and outside of the firm. Industry Canada has defined maintenance as ***"the jobs that have continued to exist as a result of the borrowers' having received a loan"***. This definition not only encompasses number of jobs or employee hours that have been retained, in this case with the addition of a loan, but also refers to those jobs outside of

the firm (distributors or suppliers) that have been maintained as result of one firm receiving a loan.

Job destruction, on the other hand, refers to ***"jobs (or employee hours) that have been replaced by other resource inputs as a result of (the) loan, such as technology"***. This definition defines job destruction as employees terminated, positions cut, or hours reduced as a result of the introduction of new resource inputs in the borrowing firm, and, also those of other firms, as a result of one firm receiving the loan. The literature reviewed in this study focuses more on job reallocation and the resulting wage effects and less on the actual measurement of jobs "destroyed", because of the introduction of new technology caused by loans. However, there have been some preliminary studies of the relationship between job creation and destruction in the manufacturing industry in the US. Although these studies have focused more on job flows within and between firms, they have constructed a basis on which a method for measuring this destruction can be built.

In one specific study, Schuh and Triest (2000), defines a common measure of the total impact of gross job creation and destruction as being job allocation. They calculate job destruction as very simply the difference between employment upon receipt of the loan, and current employment. They see job allocation as net job creation impact or the difference between job creation and job destruction.

An issue that is not addressed in any of the literature is the measurement of job upgrading resulting from government loans to firms. Upgrading involves the upgrading of existing employees skills so the same employee can move into a better position. This could result in the number of employees within a particular firm remaining the same, but the quality of these positions, or the upgrading of employee skills to be overlooked and ignored. There is significant economic benefit to be gained by this to both the firm and the country as a whole, but it would be underestimated if this issue were not addressed.

These definitions create the "what" that will be measured in Industry Canada's upcoming impact study. The following section examines the different impact measurements methodologies that were uncovered in the literature. Following this, the issues that are evident in all impact studies will be reviewed.

7.0 Impact Measurement Methodologies/Best Practices

The purpose of this review is to examine existing reports and publications written on the topic of measuring the economic impact of government programs on indicators such as job creation, displacement and maintenance. The methodologies currently in use were defined and examined. The review found that while individual reports primarily dealt with regions (Canada, US, Western Europe, etc.), or with sectors, the "best practices" identified cross both industry and territorial boundaries. It is for this reason that while some practices are more applicable in certain sectors or industries, the subcategorizaton based on the practice itself was seen as the most useful. In the appendices, sources have been categorized in terms of specific methodology, and region, firm size and industry within which each methodology was used.

The description of each methodology includes a discussion of the advantages and disadvantages of each method. Many of the disadvantages that have been identified are only drawbacks if the pitfalls of each methodology are not handled properly. An awareness of these could minimize the drawbacks if the method were employed in the future. The best strategy for Industry Canada to use in its upcoming 2001 study is identified in this analysis by reviewing each methodology in the light of the issues that are to be covered in this future study.

The obvious first step was to examine what is done by the US Small Business Administration, which has very similar programs. Since it's founding on July 30, 1953, the U.S. Small Business Administration has delivered about 20 million loans, loan guarantees, contracts, counseling sessions and other forms of assistance to small businesses. Although this will change in the future with the introduction of the Government Performance and Results Act introduced in 1993, which mandates an evaluation of a government agency's be done in regular intervals, the SBA has not undertaken an impact study on the job creation that has resulted from their program. The office is now beginning to review methods to measure the impacts, but this review has not yet been published.

7.1 User/Company Surveys

Whether in the knowledge-based industries or in the manufacturing sector, user surveys, or surveys of participants (in this case firms), are the most used

methodology. In this method, participants are interviewed or surveyed by questionnaire to collect not only specific company data (like increase in number of employees, increased sales), but also the perception of the company to the benefits incurred by its association with programs such as the SBL. In other words, what are the impacts the company feels the program has made on their firm and in turn, what impact these companies have made in terms of social and economic indicators. Surveys are used extensively in this evaluation because of their versatility in gathering data and information on almost any issue in an evaluation. As well as actually conducting the survey, three preliminary steps are involved. They are: 1) defining the evaluation information needs, 2) developing the survey to meet those needs and 3) pretesting the survey. Use of these steps decreases wasted resources in collecting unusable or irrelevant data. The pretesting step also decreases answers that are affected by a lack of understanding of what is being asked. There are various ways to overcome the obstacle of obtaining biased, favourable answers. A large number of questions, designed with different aspects of client relevance and useful measures can be asked. Asking questions that require detailed answers on social and economic impacts, comparing results with primary and secondary data collected before hand, and conducting follow-up interviews are methods used to test the accuracy of some responses. Follow up interviews can be done in person or over the telephone. Although this is the methodology that was most used in the sources reviewed and several examples could have been used, only one example will be highlighted in the report itself. Other sources have been categorized according to the region, industry and firm size, and can be found in the Appendix.

CanMET (Canadian Centre for Mineral and Energy Technology) decided to launch an extensive assessment of the economic impacts (which includes jobs) and effects of the jointly funded industry research and development programs that the center was involved in. To aid in their data collection, the center developed a questionnaire used in personal interviews with clients (or those involved in the research programs). Some of these interviews were carried out in person and some over the telephone. The information compiled dealt both with social and economic impacts of the research that had been undertaken. The case study method outlined in the next section was used to further assess the

impacts. This illustrates (as do most of the sources that were looked at in this review) that client surveys work best in combination with one, if not more of the methodologies outlines below.

i. advantages:
   - ✓ one can gather the views of a large number of participants
   - ✓ easier to analyze issues such as attribution and incrementality
   - ✓ easily and reliably administered
   - ✓ costs are lower than most quantitative methods
   - ✓ allows customer involvement and "buy in"
   - ✓ mail out surveys are auditable, can get a large sample
   - ✓ measures direct and indirect impacts
   - ✓ current information on jobs in borrowing firms

ii. disadvantages:
   - ✓ structuring the survey result can be tricky and may require follow up interviews to fully understand results
   - ✓ follow up with companies to ensure receipt of the information in a timely manner (and to minimize non respondent number) is also time consuming
   - ✓ often requires considerable time to identify users, develop survey methodology and analyze results
   - ✓ some information may not be accessed by simply asking the questions since some companies do not publicize company information.
   - ✓ subjective and hard to quantify results
   - ✓ sample must be representative to be able to use results to make program wide assessments
   - ✓ companies tend to answer with what they believe the researcher wants to
   - ✓ respondents of survey may not be a represenative sample and therefore the results may not be statistically valid

7.2 Case Studies

This method involves a detailed analysis of particular firms to determine their associated socioeconomic impacts. It involves a combination of various data collection methods and is valuable for understanding how processes work and providing insights to where a program is making a difference. Usually this method examines a number of specific cases or projects which one anticipates will be revealing about the program as a whole. An attempt is made to choose cases that are representative of the target population, but they are often chosen in either a non-scientific manner, or are too few in number for statistical generalizations to be made. Information for case studies can be based on a detailed examination of corporate financial statement and comprehensive interviewing with corporate managers, accountants and technical personnel. Case studies involve a detailed and thorough analysis of programs or firms to track and document the evolution of economic and social impacts associated with the activities of these companies. This method also allows for lessons learned from less successful firms to be traced back to the probable cause (or causes) of their failure. This understanding hopefully allows similar situations to be prevented in the future. Case studies often provide very compelling data on how and why the impacts occurred and are highly useful to check the validity of data from less detailed sources like client surveys. An example of the use of case studies is provided in the 1994 CanMET Study “An Investment in Canada”. The information collected in surveys conducted was analyzed using a form of cost benefit analysis and presented as case studies in the final report. This allowed for a thorough review of specific programs and a detailed examination of the direct and indirect economic benefits (including jobs), of the research and development programs in which the Centre was involved.

i. advantages:
   - ✓ excellent for documenting why impacts occur and the roles of the various parties
   - ✓ measures direct and indirect impacts
   - ✓ allow for a more holistic, detailed analysis

ii. disadvantages:

- ✓ difficult to generalize and extrapolate using this information because of small sample size
- ✓ highly labour intensive
- ✓ difficult to add up results of a group of case studies to obtain a measure of total impact of the group
- ✓ hard to extrapolate information to other participants, statistics may not be accurate
- ✓ Case studies usually focus on the success stories and can therefore be considered by many to not be statistically sound.

7.3 *Cost/ Benefit Analysis*

A project or firm's benefits are determined by subtracting the economic and social costs to a firm from the gross economic and social benefits. Cost can include both direct costs attributable to job creation (training, salary, overhead, etc) and also indirect costs, such as those involving job destruction or displacement. Benefits must also include not only tangible benefits (increased productivity of firms, increased revenue, deceased unemployment for the economy as a whole), but also the intangible (such as job maintenance and wealth creation). In the case of the SBL program, costs could be determined by calculating the present value of annual loan outlays minus annual loan repayment plus annual administrative costs. The most common perspective to adopt for a cost benefit analysis is a societal one whereby all costs and benefits to society are accounted for. Since this takes the perspective of society as a whole, the analysis is more comprehensive and more difficult since the secondary effects of a program must be considered.

The data required for cost/ benefit studies can come from varied sources. Searches of comprehensive program files should yield a significant amount of cost information, which would be supported by surveys or personal interviews. Unfortunately, sometimes these program files are incomplete or otherwise unusable. Cost benefit analysis deals directly with the question of net worth of a program. The purpose, though, is not so much to estimate specific benefits and costs, but rather to summarize them in a way that allows overall judgment and

comparison. This is a rigorous methodology when used properly, and the end results are dollar values that can easily be understood in terms of jobs created. Different regions and industry have developed different values for jobs created. For example, utilizing Alberta Economic development statistical data, it can be estimated that in the manufacturing industry $100,000 in sales translates into 1 job, whereas in the commodities industries (such as oil refining) 1 job may be extrapolated from $1,000,000 in sales. The most accepted practice for developing these "formulae" for different industries and regions is by dividing total sales by total jobs for that region or industry. This gives a rough value that the particular industry or region places on a specific type of job, and therefore allows for quantitative values to be translated into the indicators that are of the most use to us.

Studies that have used this method include a 1998 study done by the DPA Group Inc for the Natural Sciences and Engineering Research Council to evaluate the cost effectiveness of its Strategic Grants Program This study collected information through the use of questionnaires and looked at all of the benefits and costs that resulted from grant supported research. The study concluded that cost/ benefit analysis for the program was limited in its usefulness because of the difficulty in identifying and quantifying benefits. The study did find, however, that many of the grant projects were well defined in terms by the end user and results, and, because of this it was felt that this made the projects more amenable to further quantitative analysis.

i. advantages:
   - ✓ does allow sensitivity analysis to be carried out in a fairly systematic and rigorous way
   - ✓ results are quantifiable, easily understood
   - ✓ results can be extrapolated
   - ✓ when assessing the "profitability" of entire project, quantifiable results can easily be translated into dollars spent/saved
   - ✓ results are more statistically sound, not as subjective as qualitative results

ii. disadvantages

- ✓ usually underestimates the cost of the program
- ✓ once monetized, the costs and benefits have to be discounted to common point in time, assessed and compared; present value is skewed because there is little guidance as to which discount rate to select
- ✓ tradeoff between low costs of small sample and applicability
- ✓ some industries are easier to survey and obtain high and accurate response rates than others, leading to difficulty in comparable of results among studies
- ✓ data collection requirements are very demanding
- ✓ high cost
- ✓ difficulty in ensuring that you are measuring all of the benefits and costs and reducing benefits and costs to a common denominator; all benefits and costs of a program cannot easily be converted into monetary values
- ✓ because of the assumptions required to perform a benefit cost analysis, results are often criticized
- ✓ because of the discounting factor projects (used is assess the NPV of the program) are valued more highly is cash flows occur in near term rather than long term, bias against RD firms
- ✓ does not explain particular outcomes and results, just gives numerical, quantifiable results
- ✓ does not handle the distributive effect of a program

7.4 Modified Cost/Benefit Analysis

Partial cost/ benefit analyses are increasingly being undertaken where a select group of winner firms (or success stories) could be individually analyzed for costs and benefits. If the sum of the benefits is sufficiently large, one could reasonably conclude that the costs associated with the whole program can be more than accounted for by the associated benefits. In a 1997 evaluation of the Networks of Centres of Excellence Program prepared for the NCE Program Evaluation Committee by the ARA consulting Group Inc, the group used modified cost/benefit analysis to *"identify benefits that may result from NCE related*

research". It found that reviewing the benefits that were associated with the success stories was the best method available for research programs since either benefits had not be realized, or if they had they were difficult to quantify. The choice of project examined was taken from an initial list suggested by the networks. Unfortunately the analysis focused on benefits that could easily be quantified and therefore probably underestimated both the overall benefit and cost for each program reviewed. While conservative estimates are preferred to those that overestimate benefits, neither gives an accurate picture of the real cost and benefits associated with these programs.

i. advantages
   - ✓ allows sensitivity analysis to be carried out in a systematic and rigorous way
   - ✓ results are quantifiable, easily understood
   - ✓ results can be extrapolated
   - ✓ when assessing the "profitability" of entire project, quantifiable results can easily be translated into dollars spent/saved
   - ✓ results are more statistically sound, not as subjective as qualitative results

ii. disadvantages
   - ✓ underestimates the cost of the loan program
   - ✓ because of its focus on the "big winners", ignores the overall net profitability of the program
   - ✓ once monetized, the costs and benefits have to be discounted to common point in time, assessed and compared; present value is skewed because there is little guidance as to which discount rate to select
   - ✓ some industries are easier to survey and obtain high and accurate response rates than others, leading to difficulty in comparable of results among studies
   - ✓ although not as demanding as full cost benefit analysis, data collection requirements are still relatively resources demanding
   - ✓ difficulty in ensuring that you are measuring all of the benefits and costs and reducing benefits and costs to a common

denominator; all benefits and costs of a program cannot easily be converted into monetary values

- ✓ because of the assumptions required to perform a benefit cost analysis, results are often criticized
- ✓ because of the discounting factor projects (used is assess the NPV of the program) are valued more highly is cash flows occur in near term rather than long term, bias against RD firms
- ✓ does not explain particular outcomes and results, just gives numerical, quantifiable results
- ✓ because it deals more with the success stories, does an even poorer job of handling the distributive effect of a program

7.5 Econometric Methods

Usually conducted at the macro level (entire economy, industry and sub sector) this method attempts to statistically explain variations in output, cost or employment in terms of other variables such as wages and prices. It is also used as a forecasting tool to predict continuing effects in the future. A useful example is the econometric method used by Informetrica in their 1994 study on the economic impacts of the small business loans act prepared for Industry Canada. This study set out to measure the economic impacts (including output, employment and incomes) of loan guarantees under the SBLA, and used the Informetrica Model (TIM), which is an econometric model that represented the Canadian economy. This study looked at impacts of these loan guarantees in a broad sense, and did not concentrate on job creation alone. It did this by creating a “base case” which assumed there were no SBLA program and an “impact case” introducing the SBLA program into the society. A comparison of these led to the measure of net effect of the program. While still taking a macroeconomic view of economic impacts, TIM did link a collection of industry models as descriptions of aggregate performance. This allowed for anomalies in industry to be highlighted, somewhat. TIM provided a forecast using a complex method that incorporated labour costs, profits and foreign prices. The study itself did quantify and highlight some costs and benefits, but the process was resource consuming,

complex and expensive. Also, like any econometric model, the study and subsequent conclusions were based on simple, static assumptions. Although the model was stated as being dynamic, forecasts were made in a world created from simple assumptions and highly challengeable variables. It is for these reasons that this type of methodology has decreased in usage in a variety of industries (knowledge based, biotechnical, high tech) in recent years because of its high cost and its highly contestable assumptions and results.

i. advantages:
   - ✓ not subjective, more statistically valid than qualitative results
   - ✓ can extract information from noisy raw data and correct biases
   - ✓ assumptions are explicit making, transparency a non issue, and allowing results to stand up to scrutiny

ii. disadvantages:
   - ✓ is a static model
   - ✓ based on historic evidence
   - ✓ does not review indirect impacts
   - ✓ process is expensive and cumbersome
   - ✓ based on specific simple assumptions - estimates requires assumptions about the determinants of prices which are tested and measured; if those assumptions turn out to be false, the indicator becomes irrelevant. These assumptions are often questioned by those who do final review

7.6 Accounting-Type Approach

This approach was created by Felsenstien, Fleischer and Sidi in their article "Measuring The Employment Impacts Of A Regional Small Business Assistance Program" wherein the authors examine data from the Regional Entrepreneurship Promotion program funded by the Department of Urban and Regional Development of the Jewish Agency in Israel. Although the Program is targeted at small businesses that are excluded from the mainstream small business assistance (loan) program run by the government, it does provide a different method for measuring the economic employment impact that these small business have.

The authors propose that "before and after headcount" studies, which just calculate employment rates in the firm before the financial assistance and after, are too simplistic and do not deal with indirect effect of job creation. The basic approach involves taking program generated employment impact as a starting point and then adjusting these figures to account for the issues of a no-program situation (similar to the "base case" idea in econometric analysis, which created a "case" embodying the situation if the loan program did not exist; it therefore deals with the idea of incrementality), displaced employment and indirect employment effects. This allows for gross employment figures to be adjusted to arrive at a more realistic net employment impact because gross employment is adjusted (downwards) to account for deadweight employment (employment that would have occurred regardless of the financial assistance) and further to account for displaced employment. Employment impacts are refined in successive stages and the net employment impact is distilled from the initial gross impact, representing the benefit side of the program. The cost would be measured by the amount of financial assistance involved.

Raw data that would later be adjusted was collected from application files. From this, deadweight employment was estimated using a fairly detailed three step procedure that separated loan recipients based on loan guarantees (which was seen as an indicator of risk and therefore of probability of receiving funds from another source. The authors do admit, however, that this method probably underestimates employment creation (by overestimating deadweight employment). The employment displaced by these REP assisted firms is estimated using simple economic base theory which divides employment into "basic" (serving non local demand) and "non basic" (serving local demand). It is the non-basic employment that they see as likely to displace existing employment (and identifying economic activities in each category is done by calculating what they define as location quotient).

Although an involved process, the proposed method does illuminate the double counting that occurs if simple "head counting" is done. If employment in sectors serves only local demand, then employment created will likely displace

employment that already existed. How can this be measured as “employment creation” or “employment gain”? The final step in constructing what they refer to as an employment account, is to expand the net effect by a suitable multiplier as to capture the indirect (household and community) impact of this net job creation, whether they are impact attributable to the project under analysis or those “induced from the disturbance”.

This approach is a modified econometric model in terms of its creation of both an impact and a base case. It unfortunately falls prey to many of the disadvantages that the above model does. Also, it has not been replicated in any other region in the world. It does highlight some interesting aspects of measuring indicators such as job creation, but its added complexity and resources may not create any extra value to the measurements made or the resulting conclusions.

i. advantages
   - ✓ not subjective, more statistically valid than qualitative results
   - ✓ can extract information from noisy raw data and correct biases
   - ✓ assumptions are explicit making, transparency a non issue, and allowing results to stand up to scrutiny
   - ✓ does illuminate the double counting that occurs if simple “head counting” is done

ii. disadvantages
   - ✓ is a static model
   - ✓ based on historic evidence
   - ✓ process is expensive and cumbersome
   - ✓ based on specific simple assumptions - estimates requires assumptions about the determinants of prices which are tested and measured; if those assumptions turn out to be false, the indicator becomes irrelevant. These assumptions are often questioned by those who do final review
   - ✓ because of lack of supporting literature or program, effectiveness of the method itself have not been examined, nor its sustainability.

7.7 Peer Review or Modified Peer Review

This method is used throughout knowledge-based firms and projects to assess impact of research and development. Economists, social scientists and civil servants are asked to provide a socio economic impact assessment. While this method could not be used alone, it could be use in conjunction with other methods to incorporate statistics and perception of the impact the firm and the program have made indirectly. Some of NSERC's targeted programs have expert panels, which assess both the scientific merits and the potential user relevance of research projects. At NRC, modified per reviews are carried out in parallel with program evaluations and the results are brought together at the end of the review exercise. The only studies that use this methodology were those measuring the impacts of R&D and this methodology worked well here because, unlike researchers, economists and social scientists have the expertise to evaluate social and economic impacts. Unfortunately, according to the research, this methodology is used in these situations only since they are not very useful when used in different industries.

i. advantages:
   - ✓ allows experts in areas such as economist and social scientists review the information or raw data, and use expertise to extrapolate
   - ✓ allows for more objective opinions because of third party nature

ii. disadvantages:
   - ✓ difficult to get enough impact info to cover all possible cases
   - ✓ information package comprehensive – confidentiality issue
   - ✓ qualitative and subjective

8.0 Issues Inherent to Impact Studies

There are many issues that can complicate the gathering and interpretation of any of the impact measurements identified in the previous section. These issues are general in nature and apply, in some form or another, to all methodologies. These issues should be examined before a study is designed and implemented and need to be reviewed and discussed in the interpretation of the data gathered for the impact survey.

8.1 Incrementality

One of the major issues that should be addressed in any impact study is the concept of incrementality, which is the amount of benefit that is directly attributable to the involvement of the program. The actual definition of incrementality varies across programs and across impact studies. It is not only difficult to define; it is difficult, if not impossible, to measure with precision. In the issue of job creation, the question is: how can a study separate the number of jobs that would have been created in the absence of SBL program involvement?

Unfortunately, there is no consensus on how to deal with the issue of incrementality, or on one methodology that handles all of the concerns related to incrementality. In a 1990 study measuring the capital subsidy costs and job created in the US, Marie Howland articulates what is commonly held as the best way to deal with this issue. Although her study dealt more with capital subsidy program and less on loan loss guarantee programs like the CSBLA, the explanation can be used across program boundaries. The study lays incrementality out to mean "***the number of jobs attributable to a …program as the difference between jobs created with the help of the program and those created in the program's absence***". The study suggests the best way to determine this is to conduct in depth case studies of financing that has been undertaken. They also suggest the alternative of conducting interviews of the firms themselves.

The commonly agreed upon conclusion is to take a holistic approach and deal with the process as a chain. If the chain is taken apart to be examined, the chain

is destroyed and the process breaks down. This leads, in most cases, to incrementality being measured by using results of questions asked in firm surveys. As was described above, some methodologies deal with incrementality by creating a hypothetical base case (the “hypothetical after”) and comparing it to what has occurred in reality (the “real after”). As pointed out, the assumptions upon which the hypothetical case is based are simple and this is a clear drawback to using these kinds of impact measuring methods. Most the methodologies in the literature look the situation before the loan was received and the situation at some point in time after the loan was utilized, and examine the impacts of the difference between the two.

8.2 Direct and Indirect Impacts

Another issue that must be addressed is the difficulty in measuring indirect impacts that are caused by economic and social impact such as job creation and displacement. The “ripples” created by these new or moved jobs are hard to identify, harder to attribute and, the further the end recipient is away from the direct impact, almost impossible to measure. Direct and indirect impacts differ not only between industries but also between firms within a specific industry.

It is easier to identify and quantify simple benefits that accrue to a single group or a single company. In most of the studies reviewed, the measurement of indirect impact was dealt with by asking the firms directly. While this may lead to less than objective answers, most firms do know what impact their increased or continued business (as attributed to the receipt of the loan) has had on outside firms working in tandem with (distributors or suppliers) or in direct competition to them.

8.3 Timing issues

It is difficult to determine at what point after the firm’s “birth” to calculate the number of jobs created. If job totals are taken or counts are done immediately after the granting of the loan and the first round of hiring, subsequent employment expansions are overlooked, and the number of new jobs will be underestimated. The opposite is also true. For a company that fails shortly after opening, actual job creation of that firm will be overestimated. The longer an

impact study waits to do its assessment or count of jobs, the more difficult it will be to separate the employment effects of post subsidy investments and macroeconomic conditions from the employment effect. Any delay may make it more difficult to keep track of key contacts that may no longer be with the organization. This issue was one that Marie Howland dealt with well before she could conduct her 1990 study measuring capital subsidy and job creation in the US.

Time itself is industry dependent. What some consider long term may be six months to companies in the technology/high tech industries, but will mean tens of years to industries such as pharmaceutical and biotechnical. The dynamics within an industry also have to be taken into account when determining intervals for doing before and after job counts.

8.4 Sample size

Whether all firms will be examined, or only a sample taken is also an issue that must be dealt with regardless of methodology undertaken. With most methodologies, there is a tradeoff between the increased detailed of program wide research and the increasing costs associated with increased detail. In methodologies focusing on cost/benefit analysis, if the study's sample size is large enough to show that the benefits of only a portion of the firms in the program more than cover the total investment of the program as a whole then it is not necessary to choose a representative sample. Other methodologies using a small number of projects require the selection of a representative sample if the results are to be used to extrapolate the overall performance of the program. The obstacle lies in the definition of representative. Would they be representative by size, by region, by industry? The difficulty with small samples, which is evident in the use of case studies, is that, even if representative, results can be difficult to project on a program wide basis. Random sampling also runs into the problem of incomplete data, which result in unfair and unrealistic indicators of performance. Also, most job creation studies focus on the success stories, while completely ignoring the unsuccessful firms. Critics argue that while these unsuccessful examples should in no way be highlighted, using them to identify lessons learned

is important. In Natural Resources Canada's *Guide To S & T Assessment*, the guide reviews the choices for different sampling methods and their benefits and drawbacks.

There are statistical rules set up to determine what sample size would be valid in specific situations. Unfortunately, in this specific context, are benefits randomly distributed? Does taking a random, statistically valid sample, fail to highlight some of the firms that have had enormous success? These pitfalls should be avoided to ensure that this information collected, regardless of the method, can be used and the conclusions drawn can be extrapolated

8.5 Validation issues

For the results from any job creation impact assessment to be valid, reliable and useful, the data upon which the results are based must be valid and auditable. Many impact assessment studies had financial institution's files as their main raw data source. These files are protected in many countries by confidentiality laws, and cannot be handled or examined without expressed permission. In most cases, studies have shown that many of the companies provided written approval for the information to be released publicly. In doing so, these companies verify the information to be released. Some information, especially from bigger or more successful companies will only be made public through annual reports (which do not always give unbiased statistics). When it comes to actually undertaking the impact study, using an independent third party such as a consultant to gather the data may lend greater creditability to a study compared to one conducted completely in house but can be affected by the desire of these companies to keep results confidential, and away from competitors. In addition, the sample size and make up of the sample will also lend to the validity of the results.

The most important feature of any information collected is its ability to be audited. This allows for greater reliability to be attributed to the measures and greater validity to be attributed to the conclusions. This can be done by actually getting a

company to sign-off, by a senior official of the firm, on the data. This way the firm is acknowledging the validity of the information accompanying the signature. Regardless of the methodology chosen, rules for how the measurement will be validated, or made auditable need to be set up at the beginning.

9.0 Current Situation at Industry Canada

Before recommending what methodology would best serve Industry Canada in its upcoming study, and its future assessments of the economic impacts of its Small Business Loans, it is useful to look at what is being done now in terms of data collected. This provides information that will be useful in the study, but is already contained in-house and will not have to be remeasured. The 1998 Evaluation Framework for the Small Business Loans Program done by Industry Canada highlight and categorize the information that is collected by Industry Canada. This information includes number of loans, number of jobs created and forecasted SBL program revenues and costs. As the last item suggested, the information that is collected is done upon receipt of the loan, and the remaining information is only forecast, based on assumptions made at the time the information is gathered. Some types of information are collected at regular intervals, but information on jobs created, maintained or displaced by borrowing firms (and indirectly by borrowing firms) is only done at the loan's inception. What this means to the Industry Canada upcoming study is that information has to be compiled almost from scratch. This leads to the question of at what time interval to attempt to measure (do you measure all or a sample of firms from the beginning of their association with the SBL, or just a specific term i.e. the last five years). This question is directly related to what methodology is chosen, and how resource intensive the study will be.

10.0 Conclusions and Recommendations

Based upon a review of both the objectives of Industry Canada's upcoming review, and the examination of the "best practices" available for measuring the impacts (both within borrowing firm and outside) of the CSBFA on job creation, maintenance and displacement, the following conclusions and recommendations are made.

There is no one methodology that will allow for a complete assessment of the economic impacts Industry Canada wishes to measure. It is for this reason that it is proposed that a combination of three of the methodologies outlined above be employed. As in the 1994 CanMET report "An Investment in Canada", it is recommended that the combination of user or selected case studies and user surveys that include a modified cost benefit analysis be used. The weaknesses of each of these methodologies will be minimized by the introduction of the other. This hybrid of methodologies will allow for the most detailed information to be collected and examined and the most comprehensive conclusions to be made. These are prioritized in terms the most effective use of resources, with the most effective being mentioned first.

The use of case studies is our first recommendation because it is the cheapest and can stand-alone. User surveys can be added without incurring a lot of addition costs and will maximize the applicability and ability to extrapolate the information to the program as a whole. Thirdly, we suggest that to facilitate future impact studies, information such as actual number of jobs created (as opposed to expected number, which is the type of information currently collected) be collected and organized in a longitudinal research database. This database is the most expensive and resource-consuming alternative, but is the more long-term recommendation. Unfortunately, the studies reviewed that used this type of database focused on its use to track migration of laborers in the manufacturing industry, and did not deal with the impact of the migration. Because of this, the use of a LRD should not be used alone, but as an information tracking system that will facilitate impact reviews in the future. We have also included some recommendations for future approaches that could be undertaken if more resources are available.

10.1 Selected Case Studies

As noted in the above analysis of the cost benefit analysis methodology, the largest percentage of benefits will likely come from a small percentage of successful companies. It is for this reason that a selected case studies method is recommended. The first step in this process is identifying the success stories and it is here that loan officers can be asked to identify their top 10% of firms who received loans under the CSBFA. These firms should be obvious to loan officers, and will not necessarily have to meet a specific criteria regarding income, employees or capacity to repay their loan. While these things are related and will be existent in all firms chosen, the criteria would be hard to specify which would not create partiality to specific regions or industries. This will minimize bias from the loan officers, in that a percentage and not a specific number of firms need to be identified. Once these success stories are identified, they can be grouped in terms of cost and benefits associated with job creation, displacement and maintenance within industries, regions or firm size. Because of the assumption that most of the benefits associated with the program originate from a small percentage of firms, the net benefit calculated could be extrapolated to encompass the program as a whole.

The information collected and reviewed should be presented in case studies that examine each firm's experience individually. This will help deal with the issue of timing in that these case studies will examine the firm from the beginning of its relationship with Industry Canada Small Business Loans program until the present. This will give a more complete view of what benefits have been created, what costs have been incurred, and the overall net creation of jobs attributable to the financial assistance within a firm and outside of it. This approach will also indicate what factors were important in obtaining the maximum impact benefits from the Small Business Loan program.

10.2 User Surveys

A statistically valid sample of all of the firms involved in the loan program should be the target of a series of questions in the form of telephone interviews. This

sample needs to be representative across industry, firm size and region. Telephone interviews are preferred because of the their higher rates of response. The survey itself will ask questions of the CEO (or comparable position because of need to sign off results to ensure auditability) covering the information needed to answer the upcoming study's main concerns. Mail surveys, which would be signed off by the person completing it, would be followed up by telephone interviews to expand upon these results. A third party, with expertise in this area should be consulted in the creation stage of the survey process. This will allow for maximum effectiveness, setting questions up that would ask the same question in different ways. This is one way to test the validity of one answer against others in the same survey, testing overall reliability of the results. Great care must be taken to ensure that questions are specific enough to measure the number of jobs, but are sufficiently general to include other impacts such as the quality or types of jobs created. This is important because the different values placed on different types of jobs (i.e. ten jobs in the fast food industry as opposed to jobs in IT) will allow for a more comprehensive evaluation of impacts.

10.3 Future

To decrease the amount of resources needed in the future to assess the impact of this program, a condition on which future loans are granted could be the ongoing evaluation done by the borrowing firm. This will put the data collection and compilation onus on the borrowing firms themselves. This will free up program resources to organize the data provided and analyze the impacts on job creation. This would be similar to the Government Results and Performance Act enacted by the US government in 1993. This act mandates that government agencies set goals for performance and measure their results. It also calls on each government agency to create a strategic plan that covers a period of at least 5 years forward. The budgets allotted to each of these agencies are conditioned upon receipt of this evaluation.

This ongoing data collection will facilitate more long-term initiatives like creating large tracking databases like the US Census Board's Longitudinal Research Database (LRD). This database contains information on job flows among

employers in the manufacturing industry in the US. This is similar to the database suggested in the *Evaluation Framework For The Small Business Loans Program*. This database would combine data already on file with borrowing firm's evaluations and industry statistics, and would include information on both SBL borrowers and firms that have not borrowed. This will facilitate the comparison between these two types of firms, and enhance the ability to measure the incrementality of the program. This suggestion, however, requires a large commitment of money and human resources, and could only be undertaken in the framework of ongoing data collection by firms themselves.

Best Practices of Job Studies Literature Review – Appendix 1 Bibliography

[1] A Review Of Issues Surrounding Benefit Cost Analyses Of The Small Business Loans Program; KMPG Report Submitted To Industry Canada; May 1998

[2] Agency For Health Care Research And Quality – Performance Plans For FY 2000 And Performance Report Or FY 1999 – Appendix I Approach To Performance Measurement; http://www.ahcpr.gov/about/gpra2001/gpra01app1.htm

[3] Alberta Research Council – Development And Planning And Corporate Affairs; Milestones : How Alberta Research Council Contributes To The Economy Of The Province, February 1993

[4] Anielski, Mark; Refining The Art Of Performance Measurement Musing And Ideas Presented At Insight June 5, 1997 Conference

[5] ASRA Performance Management Framework

[6] Assessing The Impacts Of R&D : What Do We Know And What Can We Learn?; Presentation Handouts; R&D Impact Network Conference Board Of Canada June 1997 Conference

[7] Auer, Peter; "Job Creation : The Role Of Labor Market Institutions"; International Labour Review; 1999, Vol. 138, Issue 3, P. 328; Geneva

[8] Barre, Louis; Using Performance Indicators To Align Your Services With The Needs Of Your Clients; Presented At Insight June 5, 1997 Conference

[9] Belinko, Keith And Jennifer Hollington; Measuring The Impact Of Publicly Funded R&D; Conference Board Of Canada; 1997; http://www.confernceboard.ca:80/rdimpact/members.impact.htm

[10] Belinko, Keith; "The Government Viewpoint" Presented At Creating Wealth : Measurement For R & D Impact; Canadian Research Management Association, Noranda Technology Centre 1996 Workshop;

[11] Belzil, Christian, "Job Creation And Job Destruction, Work Reallocation And Wages"; Journal Of Labour Economics; April 2000, Vol. 18, Issue 2, P. 183; Chicago

[12] Bingham, Richard And William Bowen; "The Performance Of State And Economic Development Programs : An Impact Evolution"; Policy Studies Journal, Autumn 1994, Vol. 22, Issue 3, P.501

[13] Bojnec, Stefan And Josel Konings; "Job Creation, Job Destruction And Labour Demand In Slovenia" ; Comparative Economic Studies; Summer 1999, Vol. 41, Issue 2/3; Flushing

[14] Canmet : An Investment in Canada; Canada Centre For Mineral And Energy Technology Minerals And Metals Sector; Natural Resources Canada; 1994

[15] CanMet : Making an impact in Canada; Canada Centre for Mineral and Energy Technology Mineral and Metals Sector: Natural Resources Canada ;1997

[16] Corder, J. Kevin; "The Politics Of Federal Credit Subsidy : Small Administration 7(A) Loan Guarantees"; American Review Of Public Administration; June 1998, Vol. 38; Issue 2; Pg. 161; Parkville.

[17] Davis, Stephen J And John Haltiwanger; "Small Business And Job Creation : Dissecting The Myth"; Business Economics, July 1994, Vol. 29, Issue 3, P. 13

[18] DPA Group Inc.; Evaluation Of The Cost Effectiveness Of NSERC's Strategic Grants Program; Prepared For The Natural Sciences And Engineering Research Council, Jan 1998

[19] Evaluation Framework For The Small Business Loans Program; Industry Canada, June 1998

[20] Fadaie, Kian; A Case Study – CCRS Impact Study; Canada Centre For Remote Sensing, Natural Resources Canada; Presented At 1998 R & D Impact Network Conference - Conference Board Of Canada

[21] Felsenstein, Daniel And Joseph Persky; When Is A Cost Really A Benefit? Local Welfare Effects And Employment Creation In The Evaluation Of Economic Development Programs; 1997

[22] Felsentstein, Daniel; Aliza Fleischer And Adi Sidi; Measuring The Employment Impacts Of A Regional Small Business Assistance Program" Public Administration Quarterly; Fall 1999, Vol. 23, Issue 3, P. 313

[23] Grier, David; Measuring Impact At SRC; Saskatchewan Research Council, 1999

[24] Grier, David; WAITRO Report : Best Practices For Management Of Research And Technology Organizations Presented At The 1998 World Association Of Industrial And Technological Research Organization Conference

[25] Guellec, Dominique; The Economic Basis Of Innovation Statistics; Organization For Economic Cooperation And Development (O.E.C.D), Paris 1996

[26] Guthrie, Brian And Natalie Gagnon; Terminologies And Typologies Presented At The 1997 R & D Impact Network - The Conference Board Of Canada

[27] Guthrie, Brian; Business/Government Research Partnership : Facilitating Innovation And Measuring Effectiveness; Presented At The IQPC Conference "Performance Measurements For R&D"; Toronto, November 1996

[28] Haines, George And Allan Riding; Recent Experiences With The SBLA : Economic Impacts, Incrementality And Risk Profile Analysis; Report Prepared For Industry Canada, August 1994

[29] Howland, Marie; "Measuring capital subsidy costs and Job creation"; Journal of the American Planning Association; Winter 90, vol. 56, issue 1; p.54.

[30] Jordan, Jerry; Job Creation And Government Policy"; Economic Commentary, Oct 1996; http://www.cle v.frb.org/reserch/com/100196.htm

[31] Kramer's, John; The ARC's Performance Measures Presented At The RD Impact Network Workshop 1998 – The Conference Board Of Canada

[32] Labor Exchange Performance Measurement System - Notice; Department Of Labor – Employment And Training Administration Part IV; Federal Register August 2000

[33] Laurent, Anne; "The Results Act Is Dead"; Government Executive; May 2000, Vol. 32, Issue 5, P. 78

[34] Malzer, Erwin And Kathy Parker-Corthey; University Of Manitoba Economic Impact Study, February 1998

[35] Managing For Success: Developing Key Performance Indicators; Canadian Research Management Association 1996 Conference

[36] Measuring The Measurers: Assessment Of The GPRA; Independent Report By Ombwatch US; http://www.ombwatch.org/gpra/1998/aspen/ch1.html

[37] Montague, Stephen; Measurement Methods for R & D Impacts; Presentation to the June 1997 Regional Workshop Series on Assessing the Impact of R&D; Performance Management Network

[38] Natural Resources Canada – Canadian Centre for Remote Sensing Impact Study, prepared by Hickling Corporation – 1997

[39] Natural Resources Canada; Managers Guide To S&T Impact Assessment; 1995

[40] Orton, Larry, And Bruce Macdonald; Performance Funding In Alberta – The Next Step Presented At Insight June 5, 1997 Conference

[41] Proceedings For The Canadian Research Management Association 1997 Workshop, Conference Board Of Canada Impact Network

[42] R&D Impact Assessment : Insight From Cross Canada Workshop 1997 – Results Of Workshop Participants - Conference Board Of Canada – December 1997

[43] Riding, Allan; Impact Of SBLA Lending : An Evaluation Of The Economic Impacts Of The SBLA Program; Prepared By Equinox Management Consultants Ltd For Industry Canada; Dec. 1996

[44] Robson, John; "Ottawa's Non Existent Job Factory"; Alberta Report/Newsmagazine, November 11, 1995, Vol. 22, Issue 52, P.13

[45] Roy, Arun And Ging Wong; "Cost Effectiveness Of Direct Job Creation Programs" Canadian Public Policy; June 2000, Vol. 2, Issue 26, P. 157

[46] Schuh, Scott And Robert Triest; "The Role Of Firms In Job Creation And Destruction In US Manufacturing"; New England Economic Review; Mar/Apr 2000 P. 29.

[47] Seven Years Of GPRA Has The Results Act Provided Results?, Proceeds From The House Committee On Government Reform Subcommittee On Government Management, Information And Technology, June 2000; http://www.ombwatch.org/gpra/2000/gpratestimony.html

[48] Sonnen, C. A And G. Bromfield; The Small Business Loans Act : Economic Impacts; Report Prepared For Industry Canada Corporate And Industrial Analysis Branch, October 1994

[49] Statistics Canada, Science And Technology Redesign Project; Science And Technology Activities And Impacts : A Framework For A Statistical Information System; 1998

[50] Stevenson, Lois; The Implementation of An Entrepreneurship Development Strategy In Canada : The Case Of The Atlantic Region; Atlantic Canada Opportunities Agency In Cooperation With The Organization For Economic Cooperation And Development; Paris 1996

[51] Survey Of Job Creating Companies In Western Canada; Western Economic Diversification Canada; January 1995

[52] Tassey, Gregory; Lesson Learned About The Methodology Of Economic Impact Studies : The NIST Experience; National Institute Of Standards And Technology Strategic Planning And Economic Analysis Group, April 1998.

[53] The ARA Consulting Group; Report On Methodology For Measuring The Impacts And Benefits Of Research And Development; Prepared For The National Research Council, Jan 1998

[54] The Bayswater Consulting Group; “Measuring Performance Of Federal Science Technology Activities : A Manager’s Guide To Current Federal Practices” The Science Network Of Assistant Deputy Ministers Of The Canadian Centre Management Development

[55] Yan, Ellen; “Refining Credit Review Policy For Small Business”; Commercial Lending Review; Summer 2000, Vol. 15, Issue 3, P. 39; Boston.