

TOWARD A BEST PRACTICE FOR EVALUATING THE IMPACT OF GOVERNMENT PROGRAMS ON JOB CREATION

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Abstract: This article reviews and analyzes the results of a literature search for studies evaluating the impact of government programs on job creation. Issues that complicate the interpretation of any impact measurement method are identified. Advantages and disadvantages for each methodology are described. It is concluded that no single methodology allows for a complete assessment. The use of a combination of user/company surveys and user-selected case studies is recommended. If a financial analysis is required, a modified cost/benefit analysis should be included. The weaknesses of each of these methodologies are minimized by the introduction of complementary methods.

Résumé: Cet article présente et analyse les résultats d'une recherche documentaire visant à repérer des évaluations de l'impact de programmes gouvernementaux sur la création d'emplois. Les facteurs qui compliquent ce type d'analyse sont décrits. Les avantages et inconvénients de chaque méthode sont présentés. On conclut qu'aucune méthode n'est totalement suffisante en elle-même. Il est recommandé d'utiliser un ensemble d'enquêtes auprès des usagers, d'analyses de cas choisis par les usagers et, lorsqu'une analyse financière est requise, d'analyses coûts/bénéfices. Les faiblesses de chaque méthode sont compensées par la présence de méthodes complémentaires.

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Since the Great Depression, governments have accepted responsibility for job creation. The works of John Maynard Keynes (1936) and other economists have provided the intellectual foundation for the role of government in the economy.

The topic of creating work versus creating wealth has remained controversial. The economic impact of the Atlantic Canada Opportunity Agency was recently debated in these pages (Thomas & Landry, 2000a, 2000b; Watson, 2000). Government programs of this type appear to create employment in the designated region, but whether they increase wealth at the national level remains to be determined.

During the last decade, Canadian governments have adopted public accountability approaches that rely on performance evaluation. Alberta was the first provincial government to publicly report results based on performance measurements (Bradley & Bradley, 2001). The government of British Columbia is following a similar approach (McDavid, 2001). Evaluation activity is on the rise in the Ontario public service (Segsworth, 2001) and in Manitoba (Warrack, 2001). Quebec has recently introduced a performance management framework (Cabatoff, 2001).

Governments still hold the view (very likely with public support) that one of their responsibilities is to maintain, if not increase, the level of employment. The trend toward increased accountability to the public for government operations means that job creation programs have been, and will continue to be, evaluated as to their impact and as to the achievement of program objectives.

The purpose of this article is to review current practice for the evaluation of job creation programs in Canada, the United States, and Europe. A search of recent publications uncovered 55 relevant documents. The methodologies used by practitioners were tabulated and characterized in terms of advantages and disadvantages. We believe that our recommendation for a hybrid approach represents a contribution toward a best practice for the evaluation of job creation programs.

Our focus is on improved methodology as opposed to the development of economic policy. However, the acquisition of higher quality information will enable the adoption of more accurately targeted government policies. In addition, we believe that the hybrid approach

will also be useful for the evaluation of government programs in related areas such as innovation and sustainable development.

Specific objectives of this research are:

- to review existing information on economic, social, and job impacts of government programs;
- 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 identify the best methods for conducting 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 program evaluators in their data collection and to present a recommended approach.

What is meant by — or should be considered in measuring — job creation, displacement, and maintenance is examined in the next section. Issues that complicate the interpretation of any impact measurement method are identified. Those that are general in nature and apply, in some form or another, to any or all of the impact-measuring methodologies are outlined.

Next, methodologies identified in the literature review are presented 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.

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. Examples of studies that use each methodology are then highlighted.

Finally, recommendations on preferred methodology (or combination of methodologies) are presented.

SEARCH METHODOLOGY AND INFORMATION SOURCES

The search methodology for data collection employed electronic online searching, a review of print sources and studies, and reports conducted by federal, provincial, state, and special interest organizations. It focused primarily on Canada, the United States, and Western Europe. In addition, requests for information were made to Industry Canada, the Alberta Research Council, the Conference Board of Canada, and other experts known to the authors.

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

The information sources used are listed in alphabetical order: Alberta Research Council; Alberta Treasury; Business Development Bank of Canada; Canada Centre for Remote Sensing; CANMET; Conference Board of Canada; European Commission; Human Resource and Development Canada; International Quality and Productivity Centre (Canada); National Institute of Standards and Technology Strategic Planning and Economic Analysis Group (Canada); National Research Council (NRC); Natural Resources Canada; Natural Sciences and Engineering Research Council (NSERC); OMBWatch (U.S. special interest group publication); Organization for Economic Cooperation and Development; Performance Management Network (Canada); Statistics Canada; University of Manitoba; U.S. Department of Labor; and Western Economic Diversification Canada. The databases used were ABI Inform – University Microfilms and Harvard Business Review.

IMPACT MEASURES

Before determining the best practices to measure the impacts of government programs, what is actually to be measured in each case

should be defined. The most appropriate definitions for job creation are those developed by Industry Canada, which are summarized below. These definitions were chosen because they clearly and concisely articulate the concepts relative to the sources reviewed.

Job creation may be defined as jobs created as a result of the borrower having received a loan (G. Elias, Industry Canada, personal communication, April 2000). This definition can be extended to jobs created as a result of any program that is being evaluated. 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. The definition also allows for the inclusion of the number of employees created outside the borrowing firm (e.g., suppliers or distributors), which allows for an examination of both direct and indirect job creation. Many of the studies reviewed also classify employees created in much the same way. In a report for the National Research Council on measuring the impacts of R&D (ARA Consulting Group, 1998), newly created positions were further classified as to the type of position (engineer, scientist, and technician). This allows for a more accurate quantification of benefits created by these new jobs. The 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 of positions created in this way allows for a clearer assessment of the job creation impact.

The concept of job maintenance is one that has received the least focus in the literature, primarily owing to the difficulty of measuring maintenance of jobs both within a firm and outside of the firm. Industry Canada (G. Elias, personal communication, April 2000) has defined maintenance as “the jobs that have continued to exist as a result of the borrower” having received a loan. Again this can be extended to any program. This definition not only encompasses the 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 the 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” (G. Elias, Industry Canada, personal com-

munication, April 2000). 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 U.S. 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, American industry researchers Schuh and Triest (2000) define 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 impact or the difference between job creation and job destruction.

An issue that is not addressed in the literature is the measurement of job upgrading resulting from government loans to firms. Upgrading involves the upgrading of existing employees’ skills so they can move into better positions. Hence the number of employees within a particular firm may remain the same, but the quality of these positions, or the employees’ skills, would be upgraded. There is significant economic benefit to be gained by this to both the firm and the country as a whole.

These definitions create the “what” that can be measured in any planned impact study. The following section examines issues inherent in impact measurement methodologies that were uncovered in the literature.

ISSUES INHERENT IN IMPACT STUDIES

Many issues can complicate the gathering and interpretation of any of the impact measurements identified above. These issues are general in nature and apply, in some form or another, to all methodologies. They should be examined before a study is designed and

implemented and need to be reviewed and discussed in the interpretation of the data that were gathered for the impact survey.

Incrementality

The major issue that should be addressed in any impact study is the concept of incrementality: “the amount of benefit that is directly attributable to the involvement of the program.” Incrementality is difficult to define and difficult, if not impossible, to measure with precision. In the issue of job creation, the question is: how can a study measure the number of jobs that would have been created in the absence of the job creation program?

There is no consensus on how to deal with this issue, or on methodologies to handle the concerns related to incrementality. In a study measuring the capital subsidy costs and jobs created in the U.S., Howland (1990) articulates what is commonly held as the best way to deal with this issue. The study defines incrementality as “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” (p. 2). Howland suggests that the best way to determine this is to conduct in-depth case studies of what has been undertaken, and also suggests conducting interviews of the firms themselves.

The commonly agreed-upon solution 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 the results of questions asked in surveys. 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”). These assumptions result in criticism that is difficult to counter. Most authors look at the situation before the program benefits were received and the situation at some point in time after, and examine the impacts of the difference between the two.

Direct and Indirect Impacts

Another issue that must be addressed is the difficulty in measuring indirect impacts that are caused by economic and social factors such as job creation and displacement. The “ripples” created by these new or moved jobs are hard to identify, harder to attribute, and, the fur-

ther the end recipient is away from the direct intervention, more difficult 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 (attributed to the job creation program) has had on outside firms working in tandem with distributors or suppliers or in direct competition to them.

Timing Issues

It is difficult to determine at what point after the job creation program's "birth" to calculate the number of jobs created. If job totals are taken or counts are done immediately after implementation of the job creation program and the first round of hiring, subsequent employment expansions are overlooked; thus the number of new jobs will be underestimated. The opposite is also true: 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 Howland dealt with before she conducted her study measuring capital subsidy and job creation in the U.S. (1990). One method of dealing with the timing issue is to follow a particular firm over a number of years to determine the total job impact on the firm. Kramers (1998) used this approach in a study of the economic impacts of R&D projects by the Alberta Research Council.

Time scale itself is industry dependent. Six months is considered long term to companies in the technology/high tech industries, whereas 10 to 20 years is long term to industries such as pharmaceuticals and biotechnology. The dynamics within an industry also have to be taken into account when determining intervals for doing before and after job counts.

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 trade-off between the increased detail 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 to only a portion of the firms in the program more than cover the total investment of the program as a whole, then it may not be 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: representative by size, by region, by industry? The difficulty with small samples is that, even if representative, results can be difficult to project on a program-wide basis. Also, most job creation studies focus on the success stories. Critics argue that unsuccessful examples should not be highlighted; using them to identify lessons learned is important. The *Managers' Guide to S & T Impact Assessment* (Natural Resources Canada, 1995) reviews the choices for different sampling methods and their benefits and drawbacks.

Validation Issues

For the results from any job creation 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 institutions' 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 of the firm. 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. When it comes to actually undertaking the impact study, the use of a third party, such as an independent consultant, to gather the data may lend greater credibility to a study.

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 senior official of a company to sign off on the data (Kramers, 1998) and is one way for the firm to acknowledge 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.

IMPACT MEASUREMENT METHODOLOGIES/BEST PRACTICES

Table 1 provides a summary of the results of the literature search. Of the studies identified, 62% were from Canada, 27% from the United States, and 5% from Europe. The methodologies used by practitioners were classified as case studies, user/company surveys, cost/benefit analysis, modified cost/benefit analysis, econometric methods, peer review and modified peer review, or accounting-type approaches.

The most frequently used methodologies were case studies, being cited 31% of the time in the reports and publications reviewed, and user and client surveys, cited 25% of the time. Cost/benefit analysis and modified cost/benefit analysis accounted for 8% and 7% respectively. Econometric approaches were employed 10% of the time. The least used methodologies were peer review and accounting-type approaches, at 3% and 1% respectively.

We next provide a description of each methodology, including 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.

Case Studies

The case study 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 into where a program is making a difference.

Usually this method examines a number of specific cases or projects that 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 often they either are chosen in 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

Table 1
Summary of Studies Evaluating the Impact of Government Programs on Job Creation

<i>Publication</i>	<i>Region</i>	<i>Methodologies</i>
(Agency for Health Care Research and Quality, 2000)	United States	• User/company surveys
(Alberta Research Council, 1993)	Canada	• User/company surveys • Case studies
(Anielski, 1997)	Canada	• Case studies
(ARA Consulting Group, 1997)	Canada	• General source
(ARA Consulting Group, 1998)	Canada	• User/company surveys • Case studies • Cost/benefit analysis • Modified cost/benefit analysis • Econometric methods
(ASRA, 1998)	Canada	• General source
(Auer, 1999)	Europe	• General source
(Barre, 1997)	Canada	• General source
(Bayswater Consulting Group, 1999)	Canada	• User/company surveys • Case studies
(Belinko, 1996)	Canada	• General source
(Belinko and Hollington, 1997)	Canada	• User/company surveys • Case studies • Cost/benefit analysis • Modified cost/benefit analysis • Peer review
(Belzil, 2000)	Europe	• Econometric methods
(Bingham and Bowen, 1994)	United States	• Econometric methods
(Bojnec and Konings, 1999)	Europe	• Econometric methods
(Canadian Research Management Association, 1996)	Canada	• General source
(CANMET, 1994)	Canada	• User/company surveys • Case studies • Modified cost/benefit analysis
(CANMET, 1997)	Canada	• User/company surveys • Case studies
(Conference Board of Canada, 1997)	Canada	• General source
(Corder, 1998)	United States	• General source
(Davis and Haltiwanger, 1994)	United States	• Econometric methods
(Department of Labor, 2000)	United States	• User/company surveys
(DPA Group Inc., 1998)	Canada	• Case studies
(Fadaie, 1998)	Canada	• User/company surveys • Case studies
(Felsenstein, Fleischer, and Sidi, 1999)	Israel	• Accounting-type approaches
(Felsenstein and Persky, 1997)	United States	• Econometric methods
(Grier, 1998)	Global	• Case studies
(Grier, 1999)	Canada	• User/company surveys
(Guelllec, 1996)	Global	• General source
(Guthrie, 1996)	Canada	• General source

(continued on page 12)

Table 1 (continued)

<i>Publication</i>	<i>Region</i>	<i>Methodologies</i>
(Guthrie and Gagnon, 1997)	Canada	• Case studies
(Haines and Riding, 1994)	Canada	• General source
(Hickling Corporation, 1997)	Canada	• User/company surveys
(Howland, 1990)	United States	• Case studies
(Jordan, 1996)	United States	• General source
(KMPG, 1998)	Canada	• Cost/benefit analysis
(Kramers, 1998)	Canada	• Econometric methods
(Laurent, 2000)	Canada	• User/company surveys
(Malzer and Parker-Corthey, 1998)	Canada	• Case studies
(Montague, 1997)	Canada	• General source
(Natural Resources Canada, 1995)	Canada	• Econometric methods
(Ombwatch US, 1998)	United States	• User/company surveys
(Orton and Macdonald, 1997)	Canada	• Case studies
(Rank, 1997)	Canada	• Cost/benefit analysis
(Riding, 1996)	Canada	• Modified cost/benefit analysis
(Robson, 1995)	Canada	• Peer review
(Roy and Wong, 2000)	United States	• General source
(Schuh and Triest, 2000)	Canada	• Case studies
(Sonnen and Bromfield, 1994)	Canada	• User/company surveys
(Statistics Canada, 1998)	Canada	• Case studies
(Stevenson, 1996)	Canada	• Cost/benefit analysis
(Tassey, 1998)	United States	• General source
(Taylor, 2000)	United States	• General source
(Western Economic Diversification Canada, 1995)	Canada	• User/company surveys
(Yan, 2000)	United States	• Case studies
		• General source

examination of corporate financial statements 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 they 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. It is hoped that this understanding will allow similar situations to be prevented in the future.

Case studies often provide very compelling data on how and why the impacts occurred and are very useful for checking the validity of data from less detailed sources such as user/company surveys. A typical example of the use of case studies is provided in *An Investment in Canada* (CANMET, 1994). The information collected in surveys was analyzed using a form of cost/benefit analysis and presented as case studies in the final report. The use of case studies 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 CANMET was involved.

User/Company Surveys

Whether in knowledge-based industries or in the manufacturing sector, user surveys or surveys of participants (in this case firms) are one of the most frequently employed methodologies. In this method, participants are interviewed or surveyed by questionnaire to collect not only specific company data (such as increase in number of employees or increase in sales), but also the perception of the company about the benefits incurred by its association with government programs in which they have participated. In other words, what are the impacts the company feels the program has made on their firm, and what are the impacts these companies have made in terms of social and economic indicators? Surveys are used extensively because of their versatility in gathering data and information on almost any issue.

Before conducting the survey, three preliminary steps are involved: (a) defining the evaluation information needs; (b) developing the survey to meet those needs; and (c) pre-testing the survey. Use of these steps decreases wasted resources in collecting unusable or irrelevant data. The pre-testing step also reduces the occurrence of

answers that are affected by a lack of understanding of the questions. There are various ways to avoid obtaining biased, favourable answers. A large number of questions, designed to include 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 previously, 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 one of the most commonly used methodologies, only one typical example will be highlighted. Other sources can be found in the bibliography compiled by Heidrick, Kramers, and Spadavecchia (2001).

CANMET (the Canadian Centre for Mineral and Energy Technology) decided to launch an extensive assessment of the economic impacts (including job generation) and effects of the jointly funded industry research and development programs that the Centre was involved in (CANMET, 1994, 1997). To aid in data collection, the Centre 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 with both social and economic impacts of the research. The case study method 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 outlined in this article.

Heidrick and Kramers (2002) have applied this approach to assess the impacts of university-based research, sponsored by government and industry, and found it to be simple and cost effective.

Cost/Benefit Analysis

A firm's benefits are determined by subtracting the economic and social costs to a firm from the gross economic and social benefits. Costs can include both direct costs attributable to job creation (training, salary, overhead, etc.) and indirect costs, such as those involving job destruction or displacement. Benefits must also include not only tangible benefits (increased productivity of firms, increased revenue, decreased unemployment for the economy as a whole), but also the

intangible (such as job maintenance and wealth creation). The most common perspective to adopt for a cost/benefit analysis is a societal one in which all costs and benefits to society are accounted for.

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, to 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 the net worth of a program. The purpose, however, is not so much to estimate specific benefits and costs, but rather to summarize them in a way that allows overall judgement 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 industries 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 one job, whereas in the commodities industries (such as oil refining) one job may be extrapolated from \$1,000,000 in sales (Alberta Research Council, 1993). The most accepted practice for developing these “formulae” for different industries and regions is to divide 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 thus allows for quantitative values to be translated into indicators that are easy to communicate.

Studies that have used this method include a study done by the DPA Group Inc. (1998) for the Natural Sciences and Engineering Research Council (Canada) to evaluate the cost effectiveness of its Strategic Grants Program. This study collected information through 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 difficulties in identifying and quantifying benefits. The study did find, however, that many of the grant projects were well defined in terms of the end user and results, and it was felt that this made the projects more amenable to further quantitative analysis.

Modified Cost/Benefit Analysis

Partial cost/benefit analyses are increasingly being undertaken in which a select group of success stories are analyzed for costs and

benefits. If the sum of the benefits is sufficiently large, one can reasonably conclude that the costs associated with the whole program are more than accounted for by the benefits. In a 1997 evaluation of the Networks of Centres of Excellence Program prepared for the NRC Program Evaluation Committee (Canada), the ARA Consulting Group Inc. (1998, p. 7) used modified cost/benefit analysis to “identify benefits that may result from NRC related research.” It found that reviewing the benefits associated with the success stories was the best method available for research programs, since benefits either had not yet been realized or, if they had, were difficult to quantify. The choice of projects examined was taken from an initial list suggested by the Networks. Unfortunately, the analysis focused on benefits that could easily be quantified, and therefore 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.

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 Infrometrica in their 1994 study on the economic impacts of the Small Business Loans Act (SBLA), prepared for Industry Canada (Sonnen & Bromfield, 1994). This study set out to measure the economic impacts (including output, employment, and incomes) of loan guarantees under the SBLA, using the Infrometrica Model (TIM). The study looked at impacts of these loan guarantees in a broad sense, and did not concentrate on job creation alone. It created a “base case” that assumed there was no SBLA program and an “impact case” introducing the SBLA program into the economy. A comparison of these led to a measure of the net effect of the program. While still taking a macroeconomic view of economic impacts, TIM did link together a collection of industry models as descriptions of aggregate performance. This allowed for anomalies in industry to be highlighted. TIM provided a forecast using a complex method incorporating labour costs, profits, and foreign prices. The study did quantify and highlight some costs and benefits, but the process was resource-consum-

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

Accounting-Type Approaches

Felsenstein, Fleischer, and Sidi created this approach when the authors examined data from the Regional Entrepreneurship Promotion program funded by the Department of Urban and Regional Development of the Jewish Agency in Israel (Felsenstein, Fleischer, & Sidi, 1999). Although the program was targeted at small businesses excluded from the mainstream business assistance programs, it does provide a different method for measuring the employment impact that these small businesses have.

The authors propose that “before and after headcount” studies, which only calculate employment rates in the firm before the financial assistance and after, are too simplistic and do not deal with indirect effects 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), displaced employment, and indirect employment effects. This allows gross employment figures to be adjusted in order to arrive at a more realistic net employment impact. This is because gross employment is adjusted (downwards) to account for deadweight employment (employment that would have occurred regardless of the financial assistance) and 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.

The approach is a modified econometric model in terms of its creation of both an impact and a base case. It unfortunately has many of the disadvantages of the econometric model. It does highlight some interesting aspects of measuring indicators such as job creation, but its added complexity and resources may not create extra value to the measurements made or the resulting conclusions.

Peer Review and Modified Peer Review

Peer review is used throughout knowledge-based firms to assess the impact of R&D projects. Innovation is an important source of high quality jobs. Economists, social scientists, and civil servants are asked to provide a socio-economic impact assessment. Although this method could not be used alone, it could be used in conjunction with other methods to incorporate statistics and perceptions 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 peer 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. This methodology worked well in those cases because, unlike researchers, economists and social scientists have the expertise to evaluate social and economic impacts.

TOWARD A BEST PRACTICE

Table 2 provides a summary of the advantages and disadvantages of the methodologies reviewed above. It is apparent that no one methodology will allow for a complete assessment of the social and economic impacts of job creation programs.

User/company surveys and case studies are the most frequently used methodologies and are often used together in a complementary manner. Quantitative and qualitative feedback obtained directly from customers and partners through user/company surveys can focus on critical success factors and enhance the credibility of the evaluation process. One of the most frequently employed methodologies is user/company surveys because of the following benefits:

- It is a straightforward tool.
- It could become an integral part of project management.
- Working directly with users ensures the accuracy and credibility of information.

A statistically valid sample of all of the firms involved in the job creation program should be the target of a series of questions in the form of telephone interviews. The sample needs to be representative across industry, firm size, and region. Telephone interviews are

preferred because of their higher rates of response. The survey itself will ask questions of the CEO, or someone in a comparable position in the firm, because of the need to sign off on results for audit purposes. Mail surveys should be signed off by the person completing them and should be followed up by telephone interviews to expand upon these results. A third party firm with expertise in this area should be consulted in the creation stage of the survey process to allow for maximum effectiveness. Great care must be taken to ensure that questions are specific enough to measure the number of jobs, but 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 (e.g., jobs in the fast food industry as opposed to jobs in IT) will allow for a more comprehensive evaluation of impacts.

Root causes, lessons learned, and trends can be uncovered, analyzed, and explained with case studies because of the greater amount of detail and analysis offered by this method. While user/company surveys provide breadth to the evaluation, case studies add depth. Case studies also deal with the issue of timing, examining the firm from the beginning of its relationship with the 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. The approach will also indicate what factors were important in obtaining the maximum impact from the program. Case studies also provide a method to present the information collected by user/company surveys.

Taken together, cost/benefit analysis and modified cost/benefit analysis are the third most used evaluation method. These analyses provide a financial component to the evaluation and attempt to answer the often asked question: What is enough value gained for the money spent? As noted in the above review of the cost/benefit analysis methodology, the largest percentage of benefits will likely come from a small percentage of successful companies. Modifying the cost/benefit analysis methodology to focus primarily on success stories simplifies this part of the evaluation process. The first step is for program officers to identify success stories from the program. Because of the assumption that most of the benefits associated with the program originate from a small percentage of cases, the net benefit calculated could be extrapolated to essentially encompass the program as a whole.

Table 2
Summary of the Advantages and Disadvantages of Methodologies

<i>Methodology</i>	<i>Advantages</i>	<i>Disadvantages</i>
User/company surveys	<ul style="list-style-type: none"> • can gather the views of a large number of participants • easier to analyze issues such as attribution and incrementality • easily and reliably administered • lower costs than most quantitative methods • allows customer involvement and “buy in” • mail-out surveys are auditable; can obtain a large sample • measures direct and indirect impacts • current information on jobs in borrowing firms 	<ul style="list-style-type: none"> • 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 is time consuming • often requires considerable time to identify users, develop survey methodology, and analyze results • some information may not be accessed since some companies do not publicize company information • subjective and hard to quantify results • companies tend to answer with what they believe the researcher wants to hear
Case studies	<ul style="list-style-type: none"> • excellent for documenting why impacts occur and the roles of the various parties • measures direct and indirect impacts • allows for a more holistic, detailed analysis 	<ul style="list-style-type: none"> • difficult to generalize and extrapolate 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 therefore are considered by many to not be statistically valid
Cost/benefit analysis	<ul style="list-style-type: none"> • allows 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 	<ul style="list-style-type: none"> • 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 • trade-off between lower costs of small sample and applicability • some industries are easier to survey and obtain high and accurate response rates from than others • data collection requirements are very demanding • high cost • difficulty in ensuring that all of the benefits and costs are measured and reducing benefits and costs to a common denominator • the assumptions required to perform a cost/benefit analysis often lead to criticism

(continued on page 21)

Table 2 (continued)

<i>Methodology</i>	<i>Advantages</i>	<i>Disadvantages</i>
Modified cost/benefit analysis	<ul style="list-style-type: none"> • allows sensitivity analysis to be carried out in a systematic and rigorous way • results are quantifiable, easily understood • results can be extrapolated • 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 	<ul style="list-style-type: none"> • underestimates the cost of the overall 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 • some industries are easier to survey and obtain high and accurate response rates from than others, leading to difficulty in comparing results among studies • although not as demanding as full cost/benefit analysis, data collection requirements are still resource-intensive • difficulty in measuring all of the benefits and costs and reducing benefits and costs to a common denominator • results are often criticized; does not explain particular outcomes and results; just gives numerical, quantifiable results
Econometric methods	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • is a static model • based on historical evidence • does not review indirect impacts • process is expensive and cumbersome • based on simple assumptions
Accounting-type approaches	<ul style="list-style-type: none"> • not subjective, statistically valid • can extract information from noisy raw data and correct biases • assumptions are explicit, making transparency a non-issue • eliminates the double counting that occurs if simple “head counting” is done 	<ul style="list-style-type: none"> • a static model • based on historic evidence • process is expensive and cumbersome • based on specific simple assumptions
Peer review or modified peer review	<ul style="list-style-type: none"> • allows economists and social scientists to review the information and use their expertise to extrapolate • allows for more objective opinions 	<ul style="list-style-type: none"> • difficult to get enough impact information to cover all possible cases • confidentiality issue • qualitative and subjective

Econometric methods and accounting-type approaches are difficult to implement and are usually costly. Although they may appear more rigorous because of the use of an econometric model, the assumptions behind the model are frequently the object of criticism. The complexity of this methodology creates challenges for communicating evaluation outcomes, rationales, and lessons learned to clients.

The peer review methodology is valuable for specialized areas such as R&D. Because it is based on subjective judgement, committee deliberations are kept confidential and clients often have a limited understanding of the reasons supporting assessments and decisions.

RECOMMENDATION

It is recommended that the combination of user/company surveys and user-selected case studies be used. If a financial analysis is required, a modified cost/benefit analysis should be included. The weaknesses of each of these methodologies will be minimized by the introduction of the others.

User/company surveys are the workhorse methodology for acquiring facts and basic qualitative information. Case studies delve into trends, patterns, and lessons learned. The modified cost/benefit analysis simplifies the financial side of the evaluation, leveraging the Pareto principle to focus on the few cases that produce most of the benefits. The simplified approach to the financial component of the evaluation may appear simplistic but it is really a recognition that the diverse and complex nature of social and economic impacts cannot be boiled down to a single financial number, regardless of the high degree of sophistication of the financial analysis or of the econometric model. Sources of value such as training, job quality, sustainable development aspects, and the strengthening of communities and industrial clusters cannot be expressed in monetary terms. The increasingly complex demands of society compel practitioners to become skilled at measuring both quantitative and qualitative aspects and at summarizing them together in a balanced manner.

This hybrid of methodologies will allow for the most detailed information to be collected and examined and the most comprehensive conclusions to be made, while keeping the evaluation lightweight enough to be fast and cost effective. Favouring a simple and economical hybrid approach could also permit the evaluation to be repeated at periodic intervals, thereby providing insights into the dynamics of the program over time.

CONCLUSION

A literature search was conducted for studies evaluating the impact of government programs on job creation. Of the various methodologies employed, user/company surveys and case studies were used most frequently by practitioners. However, no one methodology allows for a complete assessment of the social and economic impacts of job creation programs. A hybrid of methodologies is recommended, involving user/company surveys supported by case studies and modified cost/benefit analysis and resulting in a balanced overall evaluation from three complementary perspectives. Repeating the evaluation on a periodic basis will offer insights into the dynamics of the program over time.

ACKNOWLEDGEMENTS

The authors thank Industry Canada for its sponsorship of this work and more specifically Senior Project Officer Gillian Elias for her helpful comments and suggestions.

NOTE

Only the most relevant references have been cited here. A complete list of references may be found in Heidrick et al. (2001). This report is available at <<http://strategis.ic.gc.ca/SSG/rd00283e.html>>.

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