

VALUE-FOR-MONEY ANALYSIS OF ACTIVE LABOUR MARKET PROGRAMS

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Abstract: Accountability requirements by central agencies in government have imposed expectations on management to show results for resources used — in other words, “value for money.” While demonstrating value for money means showing that the program has relevance and a rationale and that the program logic and theory make sense, the core of value for money lies in showing that a program is cost-effective. Unfortunately, many public programs and policies do not provide quantifiable outcomes, and this limits conclusions on value for money. However, labour market training programs are amenable to cost-effectiveness analysis (CEA), provided that the evaluation methodology meets certain conditions. This article reviews CEA in the context of labour market training, especially programs directed to economically disadvantaged groups. After reviewing the data availability and the analytical methods commonly used to support value-for-money analysis of training programs, the authors present several practice improvements that would increase the “value” and validity of value-for-money analysis.

Résumé : Les critères d'imputabilité des agences centrales gouvernementales ont créé des attentes quant à la gestion visant à montrer les résultats des ressources utilisées, soit en d'autres termes, l'« optimisation des ressources ». En démontrant l'optimisation des ressources, nous démontrons la pertinence d'un programme et la clarté de ses fondements théoriques et logiques, mais le principe central de l'optimisation des ressources repose sur la démonstration de coût-efficacité du programme en question. Malheureusement, plusieurs politiques et programmes publics ne se prêtent pas à une analyse quantitative des résultats, et ceci limite les conclusions que l'on peut tirer quant à l'optimisation

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des ressources. Toutefois, les programmes de formation sur le marché du travail se prêtent à une analyse coût-efficacité, dans la mesure où la méthodologie d'évaluation respecte certains critères. Cet article examine l'analyse coût-efficacité dans le contexte des programmes de formation sur le marché du travail, et plus spécifiquement les programmes visant les groupes économiquement désavantagés. À la suite d'un examen des types de données disponibles et des méthodes d'analyse qui peuvent être utilisées afin d'établir l'optimisation des ressources dans les programmes de formation sur le marché du travail, les auteurs recommandent des améliorations au niveau de l'application de ces méthodes, qui pourraient augmenter la « valeur » et l'utilité de l'analyse de l'optimisation des ressources.

Accountability requirements by central agencies in government have imposed expectations on management to show results for resources used. Because the term “value for money” has positive associations with efficiency, good management, and outcomes that are uniquely the result of the intervention, the evaluation of public sector programs must determine whether programs offer value to the taxpayer.

Government has a long history of offering supply- and demand-side programming to encourage return to work by economically disadvantaged persons such as employment insurance clients and social assistance recipients. Supply-side programs are interventions that improve the capacity of workers to find and retain employment. Sometimes this merely consists of basic courses in résumé writing and other “light” interventions; in other cases, an active labour market program (ALMP) may include substantial educational upgrading and financial support to take training in a trade or even to learn how to start a business. In contrast, demand-side programming offers incentives, such as targeted wage subsidies, to employers to hire workers. Some programs combine both supply- and demand-side methods, such as on-the-job training, where employers receive a wage subsidy and workers learn skills. Finally, some interventions work to improve the information available to employees and employers, as well as the functioning of the labour market.

Part II of the *Employment Insurance Act* specifies a set of employment benefits and support measures that may be funded to support employees, employers, and the operation of the labour market. Canada has entered into agreements with provinces and territories to deliver programming in support of delivering these employment benefits and support measures (EBSMs). A central goal of the summative evalua-

tions of the federal-provincial-territorial labour market development agreements (LMDAs) is the measurement of the cost-effectiveness of the EBSMs.

The article starts with a review of value-for-money concepts, placing cost-effectiveness in relation to cost-benefit and cost-utility analysis. We show that while cost-effectiveness is probably the most useful of the three methods for measuring value for money for training programs, it is possible to extend the approach to include elements of cost-benefit analysis. As we show, the measurement of outcomes and costs assumes central importance in this discussion. We present a synopsis of active labour market programs drawing from a survey of the literature that was originally commissioned by Human Resources and Social Development Canada (HRSDC).

From a cost-effectiveness perspective, the value-for-money problem reduces the methods to measure the outcomes attributable to the program and the costs of the interventions used to achieve these outcomes. For ALMPs, the central challenge turns on the measurement of net impact, that is, the change in outcomes for program participants attributable to the intervention. Measurement of cost often presents fewer challenges, especially if government uses grants and contributions to third parties to deliver programming. The article concludes with a critical assessment of data and methods currently used to establish the value for money of ALMPs and proposes approaches that could be used for improved assessment of labour market interventions.

MEASURING VALUE FOR MONEY

Value for money appears throughout the evaluation and audit literature. Treasury Board of Canada has recently defined a value-for-money “tool” as addressing two general questions: (a) Program relevance —Are we doing the right thing? and (b) Program performance — Are we achieving value? (Treasury Board of Canada Secretariat, 2006).

Relevance requires that the program or intervention addresses an important problem. Little value exists in doing useless things well. One might add “rationale” to the relevance question, because the validity of the program theory establishes that the outputs produced by the program lead to the required outcomes or results. Only by establishing a tight link between the activities and outputs of the program and the associated outcomes can one conclude that the

resources committed have responsibility for the results. This is the attribution problem in evaluation.

Finally, the value-for-money tool developed by Treasury Board requires a program to be economical, efficient, and effective. Economical programs acquire resources at least cost. Efficient programs combine these resources to produce the required outputs at least cost. Consequently, cost-effective programs produce outcomes or results at least cost. This article focuses on measuring the cost of producing required outcomes.

PRELIMINARY COMMENTS

Results chains may be used to represent programs delivered by government.¹ Mapping the acquisition of inputs (human and other resources), their coordination into the production of outputs, and the consequent interaction of those outputs with the social and physical environment reduces public interventions to a manufacturing analogy. Although the results chain has limits, most specifically that these program schematics exclude confounding factors that interfere with realization of desired outcomes, this model is a metaphor for discussing aspects of value for money. Indeed, the program performance question of the new value-for-money tool of Treasury Board expresses value for money as the economical acquisition of resources, the efficient coordination of inputs into outputs, and the realization of outcomes at the lowest cost possible. Most evaluators and economists tend to emphasize the latter question, arguing that the relevant question is whether a program produces results at the lowest cost. Whether the program acquires office supplies at least cost is not relevant.

A challenge for all cost-effectiveness analysis is when to assess the outcomes — in the immediate, intermediate, or long term. As discussed in more detail in relation to ALMPs, the issue becomes deciding how to balance the attribution of outcomes to the program outputs, best done in the short term, with the understanding that some programs will require time to show results. Searching for outcomes too soon risks finding relatively modest results, but waiting too long risks including factors other than the program in producing the outcomes.

The formal methods for assessing the final question about program performance are known as cost-effectiveness analysis (CEA), cost-util-

ity analysis (CUA), and cost-benefit analysis (CBA). We now turn to a more formal explanation of these methods before discussing active labour market interventions.

COST-EFFECTIVENESS, COST-UTILITY, AND COST-BENEFIT ANALYSIS

CEA and CBA appear to be used interchangeably in many contexts, a practice that obscures important conceptual and technical differences. CBA is much more challenging than CEA, and for most evaluations, analysts would do well to execute a cost-effectiveness analysis, let alone attempt a cost-benefit analysis. In some instances, a CEA can extend to incorporate some elements of a CBA, but before explaining CEA in more detail, it is useful to start with an explanation of CBA to understand its challenges.

The Challenges of Cost-Benefit Analysis

Current practice in cost-benefit analysis has its origins in applied welfare economics first developed by Pigou (1932), who attempted to demonstrate that a benevolent government can intervene in society through a system of taxes and subsidies to increase social welfare. Subsequent economists, in particular Hicks (1939), Samuelson (1947), and Coase (1961), reformulated (some would say destroyed) the Pigovian concepts to lay the foundation for modern cost-benefit analysis. The insight of this group is that interventions by government can be expressed through a system of cash equivalent transfers among “winners” and “losers.” The winners are program beneficiaries, while the losers are those that suffer consequences and/or must pay for a project. For example, the winners in a new airport may be travellers who benefit from improved service, while the losers may be residents in the area who experience increased noise.

The notion of financial compensation leads to the definition of cost-benefit analysis as the “evaluation of alternatives according to their costs and benefits when each is measured in monetary terms” (Levin & McEwan, 2001). CBA provides a powerful conceptual framework for assessing a program in terms of the difference between its costs and benefits — if the discounted value of benefits exceeds the discounted value of the costs, the program is unambiguously beneficial. Discounting is explained briefly below, but Nas (1996) and Treasury Board of Canada Secretariat (1998) outline two accessible treat-

ments of CBA, while the book by Just, Hueth, and Schmitz (2004) is the standard graduate-level text on the applied welfare economics foundations of CBA.

CBA faces some important challenges, not the least of which is estimating the money value of every benefit and cost that might arise due to the program. For example, in transportation projects, one benefit might be increased safety as measured by reduced injury and death rates. Valuing a life often uses estimates of lifetime earnings or examines the increased wages needed to induce people to work in industries where death and injury rates are higher than average. Translating benefits into financial equivalents represents one of the core challenges for CBA. A similar challenge exists for estimating the financial equivalence for costs, such as the cost of wages in high unemployment areas; if people are unemployed, should we count their wages as the full cost of a program? Economists typically adjust compensation costs to produce a “shadow wage” that reflects the “true” costs of using a resource in the production of outputs.

Enumerating the range of benefits and costs also challenges cost-benefit analysis. For example, the benefits of a training program for disadvantaged persons would typically include the increased wages enjoyed by the trainees upon re-employment. Other benefits could include reduced unemployment and increased taxes to government from having more of the population employed. Other less direct benefits could include the long-term demonstration value to children of seeing parents productively employed. This latter benefit was identified as an important part of the rationale for welfare reform (see HRSDC, 1999). However, placing a financial value on such indirect benefits or “intangibles” clearly represents a significant hurdle to valuing the outcomes of many programs.

Other challenges for CBA include the following:

- Time alters the financial estimates of costs and benefits. A cost incurred now is valued more than a cost that will only be incurred in several years. Similarly, a benefit that arises in the future has less value than one received now. This time preference has been firmly established by the experimental literature (see Coller and Williams, 1999, for a typical study), but it also is intuitive whenever financial benefits and costs occur over time. If interest rates are 10%, then I should be indifferent to a choice between receiving \$100 now and \$110 a year from now. In other words, \$110 to be received in one year

has a present value of \$100. The process of converting future costs and benefits into a present equivalent is termed “discounting” future values to a present equivalent. The interest rate used to make the conversion is the “discount rate.”

- Of course, I might have a pressing need for the cash right now, in which case I would not use the prevailing market interest rates. The “social discount rate” reflects adjustments to the market-based discount rate, similar to the adjustments to the market wage in high- or low-unemployment settings.
- Some projects are so large in terms of benefits or costs that winners win really big and losers lose considerably. When government programs substantially alter the distribution of income for a large number, cost-benefit analysis confronts very significant challenges in providing a framework for determining the value of the program. Dealing with changes to the distribution of income and wealth represents an area of controversy and ongoing development. Adler and Posner (2001) provide a good summary of ethical and other challenges for CBA.

Assuming that one can translate all benefits and costs into present-day financial values, a cost-benefit analysis provides a very convenient way of summarizing the value for money of projects. If the discounted present value of benefits exceeds the discounted present value of costs, the program or project should proceed. One feature of CBA is that the ratio of discounted dollar value of benefits (outcomes) to discounted dollar value of cost indicates unambiguously the value of the program or intervention. Any program that has a benefit-cost ratio of more than one is valuable on its own merit. Among several alternative programs, choosing the one with the highest benefit-cost ratio represents an optimal decision. However, the conceptual and computational requirements of a CBA can be severe. Most-for-money studies would be well advised to attempt a cost-effectiveness analysis.

Cost-Effectiveness Analysis

CEA has become widely used in education and health care, where shorter-term outcomes may be expressed using concrete measures such as increased lifespan in years, reduced incidence of drop-out, and increased academic standing using standardized tests. The outcomes must be quantifiable and completely attributable to the intervention. Levin and McEwan (2001) offer many examples of CEA, especially in education.

In addition to quantifiable outcomes, CEA also obviously requires accurate measures of the cost of the intervention. Finally, a CEA requires the comparison of at least two interventions, one of which can be the current intervention or status quo.

As an aside, CUA is the extension of CEA incorporating a subjective valuation of the value placed on the outcome by program participants. Primarily used in health-care evaluations, this method uses survey and other techniques to place a value on results such as increased lifespan. For example, if a procedure extends life by five years, but places substantial limits on the activities in which patients may participate, CUA incorporates a quality-of-life adjustment that attenuates the outcome. Aside from the techniques used to estimate the quality of life, Levin and McEwan (2001) explain these procedures.

CEA is a more specific and narrower calculation than CBA, which simply forms a ratio of activity, output, or outcome to its cost. For this reason, it serves as a measure of economy, efficiency, and effectiveness. It calculates the cost of producing one unit of activity, output, or outcome. As stated above, measuring the cost-effectiveness of outcomes represents the most common use of CEA.

Unlike CBA, which collects all outcomes and forms an estimate of their money value, CEA concentrates on a single measurable outcome, such as increasing hours worked or the earnings from paid work. CEA also does not attempt to value indirect outcomes, while a CBA would attempt to include all results. Finally, CEA typically does not use discounted costs, although nothing precludes such time-value adjustments. The CEA ratio is simply the cost of producing one unit of outcome.

Also, unlike CBA, CEA needs more than one alternative. For example, to know that Program A costs \$2,000 per graduate is not particularly useful. However, to know that Program B requires \$3,000 to produce a graduate (presumably an equivalent output) provides management with strategic information to potentially reallocate resources. Of course, this assumes that financial information includes all elements of cost and that the graduates in the two active labour market programs are similar.

This model differs from a CBA, which examines *all* benefits and costs, private and public, tangible and intangible, converts everything to a money value, and then takes the discounted sum of benefits and

costs before presenting the final ratio, which immediately communicates the “value” of the single program with reference to any other intervention. When faced with more than one program, managers should obviously select the one with the highest benefit-to-cost ratio, all other things being equal. However, it is possible to adjust CEA to incorporate some features of the CBA, as discussed below, but unless the analyst expresses multiple outcomes, tangible and intangible, as a money value, the boundary between CEA and CBA remains intact. Before discussing how CEA may be extended toward a CBA, it is important to explore active labour market program to serve as a basis for exploring value-for-money concepts.

DEFINITION OF AN ACTIVE LABOUR MARKET PROGRAM

In North America, active labour market programming has evolved in two contexts. First, many policies address the issue of how to return previously employed workers to work. This might include modest interventions to support job search, or more substantial support to switch trades and careers. In Canada, the effectiveness of active labour market programs has formed a common element of many studies of unemployment and, more recently, the evaluation of the Labour Market Development Agreements that serve as the federal-provincial-territorial platform for Part II of the *Employment Insurance Act*. Similarly, in the United States many studies have examined the CEA of ALMPs in the context of public and private employment insurance programs.

Second, the training offered under welfare reform programming also typically addresses the needs of two broad groups. There are those who temporarily receive social assistance, but who have a high level of education and job experience and really need modest assistance to return to work. They represent a somewhat similar problem as returning previously employed persons to work. Then there are those whose basic education and motivations to work are low. The latter group often contains many without high school and with minimal job experience who usually require a prolonged training process. Each of these policy problems poses a different challenge for measuring the cost of obtaining a result. (See Ochel [2004] for a good review of welfare reform.)

Typical elements of an ALMP include supply- and demand-side interventions, as well as measures to improve the functioning of the labour market by improving information and planning. Government

has typically invested significant resources in supply-side interventions such as assessment, job search support, counselling, training, and education to increase the quality of labour supply. Demand-side measures include direct stimulation of labour demand (grants to municipal governments and firms for work placement) and wage subsidies to reduce the cost of labour (includes non-financial support to employers who accept apprentices and participants). Finally, labour market measures include matching of workers to jobs through matching workers to vacancies, increased planning by industry to estimate future needs, and alignment of training capacity to meet those needs.

The studies reviewed as part of a survey completed for HRSDC fall into four categories as shown in Table 1. A publication may appear more than once if it analyzes more than one type of intervention.

Table 1
Classification of Articles by Intervention Type

Intervention category	Study (see References)
Supply-side measures	
A. Assessment, counselling, training, and education to increase the quality of labour supply (includes apprenticeship and vocational training)	Athanasou (1998), Bassi and Ludwig (2000), Beaton (1995), Dockery et al. (2001), Ellig et al. (2000), Fadden and Lalonde (1995), Heinrich (1998), Hollenbeck (2003), Hülsmann (1997), HRSDC (1996, 1999), McConnell and Glazerman (2001), Revell et al. (2000), Temple (1995), United Nations (2000)
Demand-side measures	
B. Direct stimulation of labour demand	Dockery et al. (2001), HRSDC (1997), Roy and Wong (2000)
C. Wage subsidies to reduce the cost of labour	Bassi and Ludwig (2000), Corson and Haimson (1996), Corson et al. (1991), Decker and O'Leary (n.d.), Dockery et al. (1997), HRSDC (1997), Orr et al. (1997), United Nations (2000)
Labour market enhancement	
D. Matching of workers to jobs through job search assistance and matching vacancies to worker availability	Corson and Haimson (1996), Corson et al. (1991), Decker and O'Leary (n.d.), Decker et al. (2000), Dolton and O'Neill (2001), HRSDC (1996, 1997, 1999), Meyer (1995),

CONCEPTUAL ISSUES IN CEA OF ALMPS

The cost of the assessment and classification activities in a training program varies with the needs of the client, as do the costs of providing the entire course of the intervention. This process is more costly for some clients than for others. Simply comparing unit costs of outcomes across programs assumes that clients and the interventions are homogeneous. Programs may target specific clients, such as social assistance recipients, and this may allow the evaluator to compute the relative costs of offering training to clients with different needs. For example, social assistance recipients with university education who receive welfare due to divorce, illness, or another kind of setback typically recover employment quickly with some job-matching, résumé building, and counselling. More expensive to move from training to work are clients with little education and no job experience who have dependent children.

As an aside, the obverse of calculating the unit cost of reaching a specific output or outcome is the calculation of the number of participants produced for a dollar of intervention. These are equivalent expressions. Few studies of training reviewed in the survey below use this “productivity” perspective, but some unpublished (proprietary) studies by firms certainly focus their training evaluations on this perspective.

Although the calculation of the net cost of activities and outputs is a very useful role for CEA in program management, the most common application of CEA in the training literature calculates the cost of producing a unit of *net outcome*. The term “net” indicates that the evaluator has controlled the external influences on outcomes and estimated the exact relationship between the ALMPs and the change in employment of clients.

Two issues are fundamental to the measurement of the CEA of ALMPs: (a) What is the outcome? and (b) When should one measure the outcome: immediately after the training or over some time period?

Outcomes of interest in labour market programs typically relate to some form of job involvement and typically include increases in earnings, increases in hours worked, or change in job status from part-time to full-time. Other more indirect measures include reduction in social assistance or employment insurance use, although establishing that

reductions are due to program participation presents challenges as discussed below.

Time presents an important challenge. For a “job ready” trainee, who only needs help with résumés and the location of potential employers, the elapsed time between intervention and finding work may be a matter of a few months. A follow-up survey after a year may be sufficient to establish return to work in stable employment. Another trainee may require remedial basic education, addictions counseling, child-care support, and trades training before being ready for work. In this case, the training process represents a series of stages; successful completion of the stages represents outcomes, starting with the completion of various educational and training steps and culminating in permanent employment after several years. Choosing where to position a CEA along the outcomes is an important decision for the evaluator.

Because CEA is the ratio of an outcome (increased earnings, hours worked, etc.) over cost, two conceptual problems confront the evaluator seeking to measure the performance ALMPs. First, if the goal is to measure the cost-effectiveness of outcomes, the *net* impact of the program on changes in employment must be estimated through experimental, quasi-experimental, or other techniques. It is essential that the outcomes represent those due solely to the program net of any confounding influence. Second, the true cost of the program requires calculation. Of these two problems, the first tends to be more difficult, but subtleties in measuring program costs should not be underestimated.

REVIEW OF THE COST-EFFECTIVENESS OF ACTIVE LABOUR MARKET PROGRAMS

Although most of the studies cited purport to measure the cost-effectiveness of outcomes, some actually measure the unit cost of outputs. In addition, many studies of training effectiveness measure the costs of activities. These latter studies do not appear in the survey.

The treatment of outcomes by selected articles and studies falls into four methods for assessing net outcomes, with a fifth set that presents a range of approaches:

1. Direct observation-accounting studies (Bassi & Ludwig, 2000; Beaton, 1995; Campbell, 1994, 1995; Dockery, Kelly, Norris,

- & Stromback, 2001; Dockery, Koshy, Stromback, & Ying, 1997; Ellig, McTigue, & Richardson, 2000; United Nations, 2000)
2. Quasi-experimental (Dolton & O'Neill, 2001; Heinrich, 1998; HRSDC, 1996, 1997, 1999)
 3. Random assignment (Corson, Decker, Dunstan, & Kerachsky, 1991; Corson & Haimson, 1996; Decker & O'Leary, n.d.; Decker, Olsen, Freeman, & Klepinger, 2000; McConnell & Glazerman, 2001; Meyer, 1995; Orr, Bloom, Bell, & Doolittle, 1997)
 4. Simulation studies (Van Leeuwen, 1999)
 5. Other — unclassifiable (Athanasou, 1998; EKOS Research Associates, 2002; Fadden & Lalonde, 1995; Huang, 2001; Hülsmann, 1997; Roy & Wong, 2000; Revell, Kregel, Wehman, & Bond, 2000; Temple, 1995).

Most of these studies either analyze a specific program or summarize the results from several similar studies, but other studies provide methodological overviews. Considerable variation exists within categories. A few studies, especially in the “other” category, are not actual analyses of a particular ALMP but are general surveys of practice. These are useful overviews of methodologies or results and are briefly reviewed below.

Direct Observation/Accounting Studies

Outcomes/outputs measured with these studies include

- number of trainees (Beaton, 1995; Ellig et al., 2000)
- increased recipient incomes as a result of the intervention (United Nations, 2000)
- unit costs per trainee (Dockery et al., 1997)
- productivity of training the employee (Bassi & Ludwig, 2000)
- increased value of output produced by apprentices/participants (Dockery et al., 2001)
- reduced participation in social assistance, unemployment insurance/employment insurance (UI/EI) (Dockery et al., 2001; HRSDC, 1997).

Note that the first measure above is an *output*, while the remaining five are *outcome* measures. Many articles (such as Bassi & Ludwig, 2000; Beaton, 1995; Hollenbeck, 2003; McConnell & Glazerman,

2001; United Nations, 2000) estimate benefit on several dimensions of output, such as numbers trained, courses completed, qualifications gained, and so on. Another approach is to use firm-level data to calculate trainee productivity based on incremental output. Still other methods use the employer's opinion of the intervention's impact on the productivity of the typical employee (Dockery et al., 1997). Finally, one study (Dockery et al., 2001) measures benefit as the increased income enjoyed by a family because of participating in an ALMP, which is analogous to using incremental earnings of the participant or the reduction in use of social assistance.

In these studies, costs are usually just the direct total cost associated with program delivery participation. Social costs, such as losses incurred in diverting employees from work to the ALMP, usually do not appear in the calculation. In most cases, only total program costs appear, with the implicit assumption that marginal and average costs do not vary with numbers of participants/apprentices.

Most studies compute simple ratios of outcome to cost or *net costs*, defined as the value of outcomes less costs. However, one study (Campbell, 1994, 1995) is a good primer on how to use other financial ratios, such as return on investment (ROI) and payback, to quantify benefit to the firm. A main advantage of such approaches is that financial managers understand these ratios; their use places the CEA of ALMPs in the same framework as estimating the return on other investments. The use of ROI has some similarity to CBA in that the benefits are expressed as money value equivalents and discounted over time. However, ROI also focuses on the benefits to the company and not to society as a whole, which would be included in a full CBA.

Some of these direct observation/accounting studies try to show how the results may be used. For example, Ellig et al. (2000) show the unit cost of various training programs as a way to guide the reallocation of resources among programs, and the United Nations (2000) presents the case that its CEA approach may be replicated in other developing country contexts.

The Auditor General of Canada completed one important study in the Canadian context (Fadden & Lalonde, 1995). It reviewed the evaluations of 12 training programs to determine the cost-effectiveness of training delivered through Employment Insurance (*EI Act*, Part II). The outcomes included the percentage of respondents who found work and the percentage of employed participants. Simple outcome-cost

ratios appear for each program. The Auditor General concluded that evaluation managers did not compute cost-effectiveness or use the evaluation information to improve their programs. Major concerns expressed in this report included data quality; whether graduates of the ALMP displaced employed workers; and whether interventions, especially trades/skills training, met the skill needs in the economy. The last two qualifications are really a request to include factors that would appear in a wider CBA. In fairness, this study is now over a decade old. More important, none of the studies tracked outcomes beyond the job placement. Most analysts would want to measure the persistence of employment and would recommend at least a year of follow-up.

Quasi-experimental CEA

These studies represent what economists typically deem to be mainstream CEA for training. Unlike accounting studies, which implicitly assume that any observed change in outcome (earnings, employment, or productivity) is solely due to the intervention, quasi-experimental approaches use statistical modelling in an attempt to measure a *net* impact that may be attributed solely to the ALMP.

Typical outcomes measured in these studies include

- increased earnings (Heinrich, 1998; HRSDC, 1996)
- net costs to government such as avoided income assistance or lower UI/EI (HRSDC, 1999)
- increased tax receipts due to earnings by government (HRSDC, 1999).

The information on outcomes usually comes from follow-up surveys of clients or administrative records (income assistance and UI/EI files) that record altered use of these programs.

As with the accounting studies, costs typically include the direct costs of the ALMP and the income support costs while clients received interventions, and these usually come from administrative records.

Most studies used program and comparison groups in an attempt to estimate net outcome, but few attempted to control for selection bias (HRSDC, 1999). Studies that use cross-sectional estimates of net impact invariably produce models with poor statistical fit (low R^2), which merely shows that many unmeasured factors account for

the variation in net outcomes. Current standards of research dictate procedures such as difference-in-differences and care in data definition to ensure that all treatment group members actually participated and that control group members have not received treatment. Most administrative data sets have substantial omissions that may be supplemented with follow-up survey data (Decker et al., 2000; HRSDC, 1996, 1997, 1999). In one case, multiple administrative data sets may be combined (Heinrich, 1998). A major issue for any form of net outcome study, not just CEA, is how privacy legislation may be raising barriers to the combining of administrative data or, more complicated still, the merging of client survey and administrative data.

One of the most active areas of quasi-experimental methods for measuring the net impact from training programs uses propensity matching and difference-in-differences estimates. This has become the standard method for evaluating the net impact of the Labour Market Development Agreements (see Nicholson, 2001). The propensity-matching process typically uses administrative data of participants and non-participants and a statistical model to create program and comparison groups that are statistically equivalent. Propensity matching tries to mimic the experimental models developed through random assignment. A useful recent review of this literature is in Dehejia (2005).

Discounting the many “matching” studies that use training data as a basis for exploring the technique, relatively few examples exist in the literature of full cost-effectiveness studies using this technique. However, the summative evaluations of the Canadian Labour Market Development Agreements all use statistical matching methods and measure the effectiveness of the interventions in reducing the use of the EI fund, which is nothing more than cost-effectiveness.

The propensity-matching model has become a dominant methodology for evaluating training programs, so it is safe to predict that it will become a common feature of assessing the cost-effectiveness of training. It is also important to note that this methodology has its critics, primarily among proponents of the randomized experiment (see Smith & Todd, 2005, for a good review of this debate).

Random Assignment

Ideally, if the assignment to treatment and control groups is maintained, it is possible to use simple difference-of-means tests to measure the net outcomes. From there, it is simple to calculate cost-effective-

ness, at least of near-term outcomes. Over the longer term, external influences may differentially affect the experiences of those in treatment and control groups. Statistical modelling may be required to control for these factors.

Some studies move toward a CBA by including indirect impacts such as displacement effects (impact of newly trained workers displacing established workers) and benefits to society of having an increased number of unemployed off social assistance (Orr et al., 1997). One study (McConnell & Glazerman, 2001) connects unemployment with crime and attempts to measure the benefits of a reduction in crime arising from program participation and eventual employment. These extensions have elements of a CBA.

In the United States, the *Job Training Partnership Act* mandated that state governments and other organizations that wished to partner with the federal government in delivering ALMPs would have to use random assignment to evaluate effectiveness. The result is many high-quality studies that used randomized designs. These represent what many would argue are the “state of the art”; however, despite the apparent rigour of these studies, they have several shortcomings, including:

- lack of control for changes in economic growth (Orr et al., 1997)
- selection bias and attrition damaging the integrity of the treatment and control groups (Orr et al., 1997)
- poor outcome variables, such as quarterly wage records that do not track changes in status well (Decker et al., 2000) and a subjective follow-up interview (McConnell & Glazerman, 2001).

Ensuring that control group members do not receive treatment can be challenging, and few studies are able to assure this. Many members of economically disadvantaged groups have participated in some form of training at some point prior to the program, and controlling for these confounding influences is very difficult.

The most relevant studies in a Canadian context are the randomized experiments of earnings supplements under the Self-Sufficiency Project (SSP). An earnings supplement is not strictly speaking an ALMP, but the SSP does illustrate the principles of randomized experimental design, and the papers associated with the project do show that these policies do more than pay for themselves.

Simulation Studies

One interesting study (Van Leeuwen, 1999) uses a macro model to simulate the overall cost-effectiveness of an economy-wide ALMP consisting of assessment, counselling, and training. Using information from surveys of employers and employees on the self-reported effects of this intervention, the model predicts changes in overall income (as a function of productivity, employability, job security, and wages) arising from the ALMP. The costs include direct expenditures of assessment, counselling, and training. Based on various scenarios presented to respondents in the survey, the model can produce net cost estimates for a variety of scenarios, such as

- refunding various percentages of training costs
- refunding training-related absenteeism cost
- reducing employee taxes in return for participation in training
- training subsidies.

This study supports a general equilibrium estimate of net training benefits and the identification of optimal policy. This is a prospective study, not intended to guide any program. It is sensitive to the nature of simulation models, which, unfortunately, the article does not describe. The self-report data clearly have potential for bias. As well, projections tend to be linear and the modelling of behaviours, responses, and interactions among actors in the economy is complex. The main value of such an approach is that it provides a sophisticated “back of the envelope” for policy exploration.

Other Studies

Several studies are not easily classifiable but still offer useful insights into the cost-effectiveness of training. One approach (EKOS, 2002) uses management opinion to assess the cost-effectiveness of ALMPs. This study reflects the poor cost and outcome data held by many public sector programs and demonstrates that CEA depends completely on specifying and collecting the data that support such analysis from the start of the program. Contrast this with the *Job Training Partnership Act* evaluations in the United States that mandated the use of randomized design to develop exact measures of net outcome. See Orr et al. (1997) for a review of these studies.

A similar opinion-based approach may be found in Temple (1995), which uses key informants in small- and medium-sized enterprises to

offer views on what constitutes cost-effective interventions. Finally, Huang (2001) uses surveys of managers to gather their impressions of what makes effective training. Statistical techniques, such as cluster analysis, sort respondents into “better” and “worse” performers.

These studies may be classed as “qualitative” CEA and actually represent a common approach used in many evaluations where management opinion responds to cost-effectiveness issues in the evaluation matrix. These studies can offer insights, but their overall usefulness is limited.

Challenges in Measuring Costs

In general, the studies surveyed do not discuss costs as widely as the problems of measuring outcome. The requirements for cost data in the application of CEA are simple: costs must be isolated to the intervention in question. Sometimes, administrative records from the program can support the estimation of intervention costs. Campbell (1994, 1995) itemizes the typical costs for a training program. A few studies explore interesting measures of costs. For example, McConnell and Glazerman (2001) defined “costs per slot year” (a slot being a specific period of programming), “costs per participant year,” and “cost per participant.” Where external agencies provide the ALMP, the grants/contracts are a convenient measure of intervention cost (HRSDC, 1999), which suggests that one advantage of funding to third parties to offer ALMPs is that costs are well defined.

The major challenge of costing is that the training programs may be only one element of a government department, agency, or training group. Budgets may define expenditure elements such as personnel who devote 100% of their time to assessment, counselling, training, and so on. A common challenge is to assign overhead costs and the costs of managerial staff who may be involved only intermittently in the program.

Traditional cost accounting simply uses variable costs (personnel) to prorate these overheads across the various interventions being compared. Activity-based costing deconstructs the interventions into activities, costs each activity (typically using the time spent by staff in each activity), and then reassigns the cost of each activity for each intervention.

Activities typical to an ALMP include counselling, case management, training, job search, direct classroom training, on-the-job training,

examination/certification of skills, interview coaching, and so on. Activity-based costing is most useful when some interventions are labour intensive and others are capital intensive. An accessible reference is in Cooper and Kaplan (1988), which has an excellent public sector examination. A simple guide to activity-based costing appears on the Treasury Board of Canada website (Treasury Board of Canada Secretariat, 1996).

The CEA literature in ALMPs has tended to ignore the determination of costs, with most studies either accepting the public accounts representation of cost or using the contracts/grants to third-party training as an expression of the cost of the intervention. Many of the studies included in the survey evaluated the training provided by third parties or departments where the program costs could be isolated. Programs that are more complex may pose problems, such as the Canadian Labour Market Development Agreements, where EI clients may select from a portfolio of interventions. Provinces are obliged to report on activities and costs for the agreement, but isolating the costs of training of specific interventions may be more problematic.

EXTENDING CEA TOWARD CBA

One popular model in the training literature appears to straddle CEA and CBA. Commonly termed a cost-benefit model, this approach first emerged in the evaluation studies conducted as part of the Greater Avenues for Independence (GAIN) model in California (Freedman, 2000). Table 2 summarizes the GAIN model.

Table 2
The Benefit Cost Framework for the GAIN Model

Costs		Benefits	
A.	Income assistance payments during training	E.	Increased benefit reductions because of earned income
+	B. Training allowances (books, special needs)	+	F. Reduced income assistance due to lower time on welfare
+	C. Cost of training	+	G. Increased taxes from employment earnings
=	D. Total costs	=	H. Total benefits

Notice that all measurement occurs in money units. Each element derives from a simple calculation. On the cost side, A is the cost of supporting participants, while B and C are financial totals for participants, which are easily derived from program information. The benefit side is a little more complex. The increased benefit reduction is the reduced social assistance because participants work and reduce their welfare payment. This is simply the forecasted net impact of training on employment and earnings and the resulting reduction in social assistance use. The second item, F, is closely related to E and reflects the fact that participants not only receive reduced welfare cheques, but they also do so more quickly than those who are not in the program. Finally, the increase in taxes from earnings by those previously employed needs to be counted even though this is typically small because wages are usually low for “graduates” from this training.

The ratio of benefits to costs offers a “pseudo” benefit-cost ratio. Comparisons to other training programs using the same model provide some basis for assessing relative program worth. Even if the evaluator only examines one program, when benefits exceed cost, a case can be made for maintaining the program.

This extension to CEA uses measures of net impact that are based on experimental and quasi-experimental methods. A major element of the outcome is the reduction in use of social assistance, expressed as a total reduction in money benefits paid. A minor outcome is the increased taxes due to increased earnings. The costs are financial costs of training and the social assistance that participants continue to receive while in training. The fact that outcomes and costs are all expressed in money terms allows the analysts to create a benefit-cost ratio. If the analyst tracked outcomes and costs over a longer time, say three years, and then discounted them, the transition to a partial CBA would be complete. The fact that indirect outcomes and costs were not included requires the designation of “partial” CBA.

Care must be taken in applying this model. If the time horizon for outcomes is too short, then cost item A may dominate benefit items E and F. In this case, a potentially useful program may be prematurely shelved. HRSDC (1999) provides a good example of how this model may be applied (in a Canadian context) and also reveals the pitfalls of comparing non-equivalent interventions and using a truncated observation horizon.

LIMITATIONS TO THE APPLICATION OF CEA TO ALMPS: LESSONS LEARNED

A general finding of many studies is that training is probably cost-effective. Two examples from the Canadian context illustrate this point: *Taking Charge!* (HRSDC, 1999) and *Nova Scotia Compass* (HRSDC, 1997). However, few studies are able to conclude definitively that ALMPs are good value: all suffer from methodological shortcomings. Aside from the general observation that researchers always cite data limitations as a qualification on their findings, for cost-effectiveness studies in ALMPs several important challenges must be met.

- The training of economically disadvantaged people is a long-term proposition, and therefore outcomes need to be tracked over the longer run. Unfortunately, as one extends the outcome measurement period, other factors external to the training program enter to confound attribution of results to the interventions. One can specify sophisticated statistical models or use randomized control to refine the net impact assessment, but these either result in complex models that few managers understand or, in the case of randomization, are costly. One solution is to retreat along the results chain and measure immediate outcomes and outputs.
- Another problem is that it is invalid to compare the outcomes of a two-year program that tries to upgrade those with a grade eight education with a three-week program of résumé writing and job matching for those with post-secondary education. The potential for making a type two error (rejecting a valuable program) is high when comparing the outcomes of non-equivalent programs applied to non-equivalent populations. Programs must be compared appropriately. It is invalid to compare the cost-effectiveness of a labour market enhancement intervention directed to temporarily displaced university graduates with interventions that try to upgrade the basic academic skills of a single mother with a grade eight education. Yet some programs do just that (HRSDC, 1999).
- Related to this is the comparison of apparently similar treatments for similar populations, but in a different context. The evaluations of the Labour Market Development Agreements — agreements that fund training of employment insurance recipients — will eventually be used to compare outcomes in different jurisdictions and at different times. The business cycle and regional variation may introduce a variation in the

measured cost-effectiveness of the same interventions. It has been very difficult to adjust for these temporal and regional variations. One solution is to conduct analyses at the regional and national level. This has become especially important with Alberta's emergence as a "super-magnet" for workers.

- It is easy to confound outputs and outcomes. Some programs define attendance in a course as an output; others see the provision of the course as the output. For some populations, such as at-risk youth or social assistance recipients, just getting participants to attend a course, let alone complete the course, can be a significant outcome. Other outcomes could be improved morale and employee retention, which are tricky to measure and are often inferred simply by the fact that people show up for training.

Although much of the discussion has centred on measuring outcomes, accurate cost measurement can also be challenging. The costs of programs delivered by departments as part of a portfolio of interventions emerging from that unit must be properly measured using activity-based methods. These are very slowly coming into wider use, but they are often seen as part of a wide agenda of privatization since some jurisdictions have implemented activity-based costing as part of an efficiency drive. Further, these methods require disciplined time accounting for all staff, from clerk to CEO. Few areas of the public sector do this, although applications are emerging.

The institutional barriers to the data collection needed for proper statistical analysis of long-term outcomes suggest that CEA of outputs and immediate outcomes is likely to be more feasible.

Government uses ALMPs to change outcomes for at-risk populations, and outcomes must ultimately be the focus of any CEA. CEA will continue to have advantages over CBA because of costs of execution and conceptual simplicity. If government is serious about results-based management, then CEA needs to be a forethought, not an afterthought.

Evaluators are making progress in measuring cost-effectiveness. This article summarizes the challenges of measuring value for money in the context of active labour market programs. Continued success in this area will depend less on theoretical developments and more on mundane issues such as capturing high-quality data and seeking methods to create reliable administrative data sets.

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NOTE

1. Results chains are a common element of performance mapping. An example may be found in the business plan of the Transportation Safety Board for 2006–2007 at <http://www.tsb.gc.ca/en/publications/BusPlan/2006/biz_plan06_07.asp>.

REFERENCES

- Adler, M.D., & Posner, E.A. (2001). *Cost-benefit analysis: Economic, philosophical and legal perspectives*. Chicago: University of Chicago Press.
- Athanasou, J.A. (1998). A framework for evaluating the effectiveness of technology-assisted learning. *Industrial and Commercial Training*, 30(3), 96–103.
- Bassi, L.J., & Ludwig, J. (2000). School-to-work programs in the United States: A multi-firm case study of training, benefits, and costs. *Industrial and Labour Relations Review*, 53(2), 219–239.
- Beaton, D. (1995). *The cost-effectiveness of open and flexible learning for TECs*. United Kingdom: Research Strategy Branch. Retrieved April 3, 2007, from <www.voced.edu.au/td/int-530>.
- Campbell, C.P. (1994). A primer on determining the cost effectiveness of training — Part 1. *Industrial and Commercial Training*, 26(11), 32–38.
- Campbell, C.P. (1995). A primer on determining the cost-effectiveness of training — Part 2. *Industrial and Commercial Training*, 27(1), 17–25.
- Coase, R.H. (1961) The problem of social cost. *Journal of Law and Economics*, 3(1), 12–65.

- Coller, M., & Williams, M.B. (1999). Eliciting individual discount rates. *Experimental Economics*, 2, 107–127.
- Cooper, R., & Kaplan, R.S. (1988, September–October). Measure cost right: Make the right decisions. *Harvard Business Review*, 96–102.
- Corson, W., Decker, P., Dunstan, S., & Kerachsky, S. (1991). *Pennsylvania reemployment bonus demonstration: Final report*. Occasional Paper 92-1. Princeton, NJ: Mathematica Policy Research, Inc. for the Unemployment Insurance Service, U.S. Department of Labor.
- Corson, W., & Haimson, J. (1996). *The New Jersey Unemployment Insurance Reemployment Demonstration Project: Six-year follow-up and summary report*. Occasional Paper 96-2. Princeton, NJ: Mathematica Policy Research, Inc.
- Decker, P.T., & O'Leary, C.J. (1995). Evaluating pooled evidence from the reemployment bonus experiments. *Journal of Human Resources*, 30(3), 534–550.
- Decker, P.T., Olsen, R.B., Freeman, L., & Klepinger, D.H. (2000). *Assisting unemployment insurance claimants: The long-term impacts of the Job Search Assistance demonstration*. Princeton, NJ: Mathematica Policy Research Inc.
- Dehejia, R. (2005). Practical propensity score matching: A reply to Smith and Todd. *Journal of Econometrics*, 125, 355–364.
- Dockery, A.M., Kelly, R., Norris, K., & Stromback, T. (2001). Costs and benefits of new apprenticeships. *Australian Bulletin of Labour*, 27(3), 192–203.
- Dockery, A.M., Koshy, P., Stromback, T., & Ying, W. (1997). The cost of training apprentices in Australian firms. *Australian Bulletin of Labour*, 23(4), 255–74.
- Dolton, P., & O'Neill, D. (2001). The long-run effects of unemployment monitoring and work-search programs: Some experimental evidence from the U.K. *Journal of Labour Economics*, 20, 381–403.
- EKOS Research Associates Inc. (2002). *Evaluation of the national arts training contribution program and the national training program in the film and video sector: Final report*. Prepared for the Department of Canadian Heritage. Retrieved September 18, 2003, from <http://www.pch.gc.ca/progs/em-cr/eval/2002/2002_01/index_e.cfm>.

- Ellig, J., McTigue, M., & Richardson, S. (2000). *Putting a price on performance: A demonstration study of outcome-based scrutiny*. Mercatus Center, George Mason University. Retrieved April 3, 2007, from <http://www.mercatus.org/Publications/pubID.1420/pub_detail.asp>.
- Fadden, R.B., & Lalonde, L.J. (1995, November). *Report of the Auditor General of Canada — Chapter 22 — Main Points, Support for Training*. Retrieved June 6, 2003, from <<http://www.oag-bvg.gc.ca/domino/reports.nsf/html/9522me.html>>.
- Freedman, S., Knab, J.T., Gennetian, L.A., & Navarro, D. (2000). *The Los Angeles Jobs-First GAIN evaluation*. New York: Manpower Demonstration Research Corporation.
- Heinrich, C.J. (1998). *Aiding welfare-to-work transitions: Lessons from JTPA on the cost-effectiveness of education and training services*. Joint Center for Poverty Research, Working Paper #3. Retrieved April 3, 2007, from <www.jcpr.org/wpfiles/heinrichs.pdf>.
- Hicks, J.R. (1939). The foundations of welfare economics, *Economic Journal*, 49(196), 696–712.
- Hollenbeck, K.M. (2003). *Net impact estimates of the workforce development system in Washington state*. Upjohn Institute Staff Working Paper No. 03-92. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.
- Huang, T.-C. (2001). The relation of training practices and organizational performance in SMEs. *Education and Training*, 43(8), 437–444.
- Hülsmann, T. (1997). *Literature review on cost-effectiveness in ODL systems*. Cambridge, UK: International Research Foundation for Open Learning.
- Human Resources Development Canada. (1996). *Evaluation study of the Canadian steel trade and employment congress: Phase II: Final report*. <http://www11.hrdc-drhc.gc.ca/pls/edd/contact.web_mail?p_to=&p_site=EDD#orderEDD>.
- Human Resources and Skills Development Canada. (1997). *Nova Scotia Compass: A summative evaluation*. Retrieved April 3, 2007, from <<http://www.hrsdc.gc.ca/en/cs/sp/hrsd/edd/reports/1997-000330/page00.shtml>>.

- Human Resources Development Canada. (1999). *Summative evaluation of Manitoba's Taking Charge! Volume 2*. Retrieved April 3, 2007, from <<http://www.hrsdc.gc.ca/en/cs/sp/hrsdcedd/reports/1999-000448/page00.shtml>>.
- Just, R.E., Hueth, D., & Schmitz, A. (2004). *The welfare economics of public policy*. Northhampton, MA: Edward Elgar.
- Levin, H.M., & McEwan, P.J. (2001). *Cost-effectiveness analysis: Methods and applications* (2nd ed.). Thousand Oaks, CA: Sage.
- McConnell, S., & Glazerman, S. (2001). *National job corps study: The benefits and costs of job corps*. Princeton, NJ: Mathematica Policy Research Inc.
- Meyer, B.D. (1995). Lessons from the U.S. unemployment insurance experiments. *Journal of Economic Literature*, 33(1), 99–131.
- Nas, T.F. (1996) *Cost-benefit analysis: Theory and application*. Thousand Oaks, CA: Sage.
- Nicholson, W. (2001, March). *The design of summative evaluations for the employment benefits and support measures*. Retrieved April 3, 2007, from <<http://www.hrsdc.gc.ca/en/cs/sp/hrsdcedd/reports/2001-000486/page00.shtml>>.
- Ochel, W. (2004). *Welfare-to-work experiences with specific work-first programmes in selected countries*. CESifo working paper no. 1153. Munich: Center for Economic Studies and Ifo Institute for Economic Research, University of Munich. Retrieved April 3, 2007, from <<http://www.cesifo-group.de>>.
- Orr, L., Bloom, H., Bell, S., & Doolittle, F. (1997). The benefit and costs of JTPA Title II: A Programs: Key findings from the National Job Training Partnership Act Study. *Journal of Human Resources*, 32, 549–576.
- Pigou, A.C. (1932). *The economics of welfare*. London: MacMillan.
- Revell, G., Kregel, J., Wehman, P., & Bond, G.R. (2000). Cost effectiveness of supported employment programs: What we need to do to improve outcomes. *Journal of Vocational Rehabilitation*, 14, 173–178.

- Roy, A.S., & Wong, G. (2000). Direct job creation programs: Evaluation lessons on cost-effectiveness. *Canadian Public Policy – Analyse de Politiques*, 26(2), 157–169.
- Samuelson, P. (1947). *Foundations of economic analysis*. Cambridge, MA: Harvard University Press.
- Smith, J., & Todd, P. (2005). Does matching overcome Lalonde's critique of non-experimental estimators? *Journal of Econometrics*, 125, 305–353.
- Temple, H. (1995). *Cost effectiveness of open learning for small firms: A study of first experiences of open learning*. London: National Institute of Economic and Social Research.
- Treasury Board of Canada Secretariat. (1996). *The ABC process*. Retrieved September 9, 2005, from <http://www.tbs-sct.gc.ca/fin/sigs/ABC/ABCPRCES_e.asp>.
- Treasury Board of Canada Secretariat. (1998). *Benefit cost analysis guide*. Retrieved April 3, 2007, from <http://www.tbs-sct.gc.ca/fin/sigs/Revolving_Funds/bcag/BCA2_E.asp>.
- Treasury Board of Canada Secretariat. (2006). *Modernizing evaluation tools: Value for money analysis*. Retrieved April 3, 2007, from <http://www.tbs-sct.gc.ca/eval/ppt/dec06-001/vfmp-por_e.asp>.
- United Nations, Economic and Social Commission for Asia and the Pacific. (2000). *Cost-effective employment promotion for the rural poor*. New York: Author.
- Van Leeuwen, M.J. (1999). *The costs and benefits of lifelong learning: The case of the Netherlands*. The Netherlands: University of Amsterdam. Paper presented at the European Conference on Educational Research, Lahti, Finland, September 22–25, 1999. Retrieved July 4, 2003, from <<http://www.leeds.ac.uk/educol/documents/0000001150.htm>>.

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