

## REGIONAL DEVELOPMENT INCENTIVES: A CRITICAL OVERVIEW OF THE EVIDENCE\*

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### Introduction

This paper surveys evaluations of regional development investment incentives in Canada and other OECD countries. The objective is to shed some light on the performance of such programs, with an emphasis on the Canadian Regional Development Incentive Program (RDIP) in effect between 1969 and 1983. A comprehensive assessment of regional incentive programs should, normally, examine all dimensions of effectiveness and operational efficiency. However, this paper focuses on a resource allocation perspective and examines two key issues: incrementality, and economic efficiency.

In the first section, the incentive programs and their expected benefits and costs are described. The second examines incrementality, which is the share of subsidized investment or jobs that would not

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exist without the subsidy. The third focuses on efficiency aspects. A program is considered to be economically efficient if the resources allocated to it provide greater net benefits than their alternative uses. The issue is important. Even if a subsidized project is incremental, incentives may not be the most efficient use of funds.

### Regional Incentive Programs

#### Major Incentives

The most frequently employed regional incentive instruments in OECD countries are grants, credit facilities, tax concessions, and labour subsidies. Of the four main instruments, capital grants are the most common. Incentives are either automatic or administered on a discretionary basis. In automatic programs, the applicant that meets defined requirements receives a specified amount. In discretionary programs, the firm applies for government assistance and faces the possibility that the request will be rejected. Investment grants are usually administered on a discretionary basis but can be automatic, whereas most tax incentives are awarded automatically to eligible firms. Regional incentives can be project- or item-related. They tend to be selective by sector, activity, size of investment, type of project, and location. Most programs concentrate on the manufacturing sector, although the service sector is increasingly assisted. In most countries, the most generous incentives are concentrated in the most disadvantaged areas [39]. New low-cost incentives are emerging, which focus on the provision of information to improve business capabilities in technology, marketing, and management.

The main Canadian regional incentive program in effect from 1969 to 1983 was the Regional Development Incentive Program (RDIP). The objective was to encourage the establishment of new facilities or the expansion or modernization of existing facilities in order "to make a significant contribution to economic expansion and social adjustment" within designated regions. The program provided incentives primarily in the form of discretionary cash grants [12].

Since 1983, the principal regional incentive program in the country has been the Industrial and Regional Development Program (IRDP). The objective of IRDP is "to promote regional industrial development through the financial support of private sector initiatives with particular emphasis on projects, industries and technologies with the greatest potential for economic return, sustained growth and international competitiveness." Funding is to be directed to areas where most needed. To be supported, projects must be incremental, must be commercially viable within reasonable bounds of risk, and must provide significant economic benefits to Canada [14].

#### Expected Benefits

Regional incentives are expected to create permanent jobs, promote investment, and increase productivity in lagging regions. They are also expected to contribute to less quantifiable goals. Severe regional disparities can strain the fabric of national unity and generate social conflicts. It is argued that regional incentives can reduce that strain and provide a sense of fairness, regional balance, and stability in the country and also minimize welfare dependency by encouraging entrepreneurship and economic self-reliance. In poorer areas where the size of the private sector is weak, there is little alternative to public sector support [4], and often nothing else works. Incentives can lend support to positive national adjustment policies by diminishing the regional burden of adjustment. This may be achieved by promoting the establishment of new, viable activities or consolidating declining sectors around the efficient activities in order to replace non-viable businesses [39].

#### Expected Costs

The most common criticism of regional incentives is related to economic inefficiency. Regional incentives are supposed to encourage firms to locate and expand in areas where they would not normally locate, resulting in the loss of comparative advantage and national income. It is argued, particularly during hard economic times, that there should be reduced emphasis on regional policies because of the danger of weakening the traditionally strong areas of the country. Regional incentives represent an additional government instrument that may "overload the circuits of government and of private decision makers", making management of government more complex and uncertain [11]. The patchwork of local and national incentives can often create red tape, duplication between governments, and confusion in the private sector. Moreover, it is felt that discretionary incentives lend themselves to political intervention [39;45].

Most incentives tend to replicate the existing industrial structure in lagging areas and therefore do not solve the structural problems of the depressed areas [28]. Incentives could also increase the risk of countervailing measures by foreign governments, thereby threatening healthy industries and areas. Further, incentives are often too small or too broad in scope or offered for too short a period of time to trigger the decision to invest or induce large location shifts away from the optimal location. As a result, incentives will often influence investment decisions at the margin [18]. In order to have an unequivocal effect, the subsidy must be "large" relative to the assisted investment [18]. The visibility of large incentives given to large firms in an area creates

pressure to give similar amounts to other firms, whether they are required or not. Also, losers are more likely to be helped by target-specific measures than are winners [35].

In a federal system, the use of target-specific measures, such as regional incentives, makes it more difficult to achieve an overall harmonious industrial policy because, it is presumed, governments can work at cross purposes, whether this is intended or not [37]. The costs of transferring money from taxpayers to incentive recipients can be high. They include the cost of tax collection, the efficiency loss (dead-weight loss) due to distortions originating in the tax-subsidy system (reduced incentive to work, allocative cost of a non-neutral tax regime, tax avoidance by taxpayers), and government's and applicants' administration costs. These costs may represent about 40 percent of the incentive costs [6;21;47].

Governments do not have a foolproof way to identify incremental and viable projects [18]. Firms, particularly large ones, will present their case in such a way as to demonstrate that the project cannot proceed without the incentive. Also, the incrementality of automatic tax incentives is not obvious: existing studies show a wide spectrum in the results [7;8;22;27;32;33;34]. It is contended that the tax system is so complex that it is difficult for governments to assess, in advance or *a posteriori*, their impact.

Finally, the multiplicity of non-efficiency objectives should be signalled. It would be odd if the programs were found to be economically efficient when economic efficiency is not their only, or even their prime objective. Regional incentives, it is argued, should be judged primarily on the basis of the achievement of non-efficiency objectives, such as those promoting regional balance and fairness.

### Incrementality

An incentive will entail incremental activity if it causes the recipient firm to modify its behaviour. This change may affect the existence of the project as such, or it may simply be associated with size or timing. Five types of research attempting to measure incrementality are noted: trend analysis, descriptive studies, micro-simulations, surveys, and econometric estimations.

### Trend Analysis

The trend approach examines a data series (investment, employment) over a no-policy period and projects this trend into a period of active policy. The size of the policy effect is the difference between the actual

position and the position given by the trend line. There is no test of a causal relationship.

Upon examination of Canadian investment data, Usher [46] and Dudley [15] conclude that RDIP had no major impact. The Economic Council of Canada [16] compares the rate of increase of new establishments by industry and province with that observed in previous years without RDIP. It concludes that between 25 and 59 percent of new establishments in the Atlantic region were incremental. If the rate of net births in an industry, with RDIP, is greater than the rate of net births before RDIP, the excess is considered to be incremental. As no consideration was given to other factors that may have influenced the birth or death of new establishments, we remain skeptical about the validity of the results.

In the United Kingdom, there is an attempt to improve upon the trend method by neutralizing the effect of non-regional policy forces on investment and employment, by removing the effect of the designated area's industrial structure. This is achieved by assuming that the area's industrial structure is the same as the national structure. The gap between the actual and adjusted trend series represents the size of the policy effect. No other external factors are assumed to have an influence on incrementality. Using the above approach, Ashcroft [2], Moore and Rhodes [36], and Begg, Lythe and McDonald (see [2;38]) conclude that the U.K. regional policy (incentives and disincentives) had a significant impact on investment and employment in lagging areas.

### Descriptive-Intuitive Approach

In 1973, DREE [13] attempted to assess the effectiveness of RDIP grants in encouraging relocation. The researchers assume an investment project for three-digit manufacturing industries, and determine in which category it would fall: strong economic motive; low, medium or strong preference; and most unlikely to locate in the region. They apply these results to the RDIP population of new establishments, and conclude that RDIP had a significant impact: about 80 percent of the investment and 70 percent of the jobs are deemed to be incremental. The importance given to the influence of markets, resources, or labour in determining preferred locations is unclear.

LeGoff [29] studies the relocation potential of RDIP grants by examining the location, the industry, and the nature of projects. He makes strong assumptions: all modernization or expansion projects in designated regions and all projects in the Montreal-Cornwall area are assumed to involve no locational option. Industries are grouped into three categories by location coefficients: those for which designated areas are the natural environment; those that spread their activities all over the country (footloose industries); and those for which the indus-

trialized areas are the natural environment. Projects that fall into the first category are said to involve no locational option. The author concludes that only 25 percent of the capital associated with RDIP from 1969 to 1974 may involve a locational option and be incremental. Relocation would not then be the main thrust of RDIP.

### Micro Simulations

Simulations consist of a model of a firm, in which the incentives are introduced and the effect on some measure of earnings is calculated. The reaction of the firm is then discussed. There is no test of a proposition. In Canada, Dudley [15] treats RDIP grants as a reduction in shareholders' investment, and measures just how much of an increase in operating costs the firm may endure without experiencing a lower rate of return. He compares the cost reduction potential of RDIP to estimates of operating cost increases in designated areas and concludes that the former is too small. The model reflects financial conditions of an average Canadian manufacturing firm and may not be representative of firms receiving RDIP grants.

### Surveys

There are three categories of surveys. The first consists of questionnaires reaching a large number of respondents over which the researcher has no control. The response rate is usually low, and there is the problem of not accounting for the characteristics of the nonrespondents. The second type consists of structured interviews, which enable the researcher to have some control over the respondent. The number of firms surveyed is usually small. This approach is difficult to adapt to particular situations, which may imply that valuable information is lost. The third category consists of case studies. They are more flexible and are supported by analysis of the industry and other factors that may explain why the firm went ahead with the project. The researcher has more information on the firm and can develop better insight from more in-depth interviews of respondents. The case study is loosely structured and adapts itself to particular circumstances. Respondents' bias can be cross checked against alternative sources of information (corporate objectives, project's files, other executives, industry associations, financial institutions, government files, program administrators) and minimized. Given that no two respondents will be treated alike, the researcher will have difficulty in generalizing, and those interested in the research will have difficulty checking the information-gathering process. Case studies are quite time-consuming and therefore involve small samples.

All surveys suffer from two major flaws. The first one, quite apparent in the questionnaire approach, is bias. A respondent may not want to admit to a windfall gain situation. The second flaw is an information problem. After receiving the incentive, the firm is not in a situation where it has to decide what it would have done without the incentive, which is the question asked, usually a number of years later. The respondent may not have such information if he has never seriously considered the no-incentive option. His answer may be nothing more than an educated guess. The structured interview and, to a higher degree, the case study, give greater insight into the possibility of a windfall situation.

There is no agreement on the degree of incrementality achieved either in Canada or in foreign countries. In Canada, the Atlantic Provinces Economic Council [4], through a mail questionnaire, evaluated the relocation potential of RDIP for new plants in the Atlantic provinces in 1971 and concluded that RDIP had a significant impact on their location: 80 percent of the new establishments were deemed incremental. The Atlantic Development Council [3] in 1973 covered 80 firms by structured interviews and 205 through the mail to examine the effects of RDIP on location and investment decisions. There are no questions on the firm or its environment, nor built-in checks to the answers concerning incrementality. The survey reveals that 94 percent of the projects and 84 percent of the jobs are influenced by incentives. While the relocation potential appears to be extremely weak, the program is deemed to have a strong influence on timing, size of project, and technology for 64 percent of the projects.

In 1979, LeGoff and Rosenfeld [30] studied firm reaction to Canadian incentive programs. Thirty-five firms, 21 of which had received an RDIP grant, were interviewed with a structured questionnaire. The questionnaire covered the firm, its environment, its financial difficulties, the reasons motivating the project, and incrementality. About 75 percent of the firms indicated that their project was incremental, and these firms accounted for 50 percent of capital expenditures covered in the survey. Where firms received multiple forms of assistance, only one program, RDIP, usually was crucial to the investment decision. Of the 21 RDIP firms in the sample, 72 percent claimed that the grant had an influence on their investment decision, 37 percent claimed a change in time/size of the project due to RDIP, while 15 percent said they would have located elsewhere without the incentive. Incrementality tended to be higher for projects with the following characteristics: small; new products and modernization; high-risk/high-profitability; and problem sectors where foreign competition was high. Incrementality tended to be lower for larger projects, expansion projects, firms that had undertaken a similar project in the past, and projects that

were necessary for the normal continuation of operations of the firms. The smaller firms tended to modify the size or timing of their project rather than abandon it if assistance was not granted. Smaller firms also emphasized cash flow and financing considerations, whereas large firms put more weight on return on investment. Given the small size of the sample, these results should be interpreted as indicative rather than as definite conclusions.

Springate [42] undertook field research in 31 companies receiving RDIP grants (14 large and 17 small). He concluded that government assistance did not modify the investment decision in roughly 50 percent of the cases. The effects on large company investments are found to be small. They produce few changes with respect to project timing, size, or technology used. Relocation of projects is minimal. The higher rate of return may attract projects from abroad and induce new economically marginal projects. Government assistance does not modify the investment decision in any way in about two-thirds of the cases. For small companies, Springate finds an insignificant impact on location. Large and small concerns do not accelerate their projects due to the predominant influence of capacity considerations, except that planned purchases of plant and equipment are advanced in time, which makes the project larger than it would have been without RDIP.

The Tate [44] research, based on case studies of 35 firms receiving RDIP and Department of Industry, Trade and Commerce assistance, attempts to improve understanding of corporate investment decision-making, so that it may be possible to adjust the amount of assistance to the level that is adequate to induce investment. The survey is based on interviews with senior executives, with added information provided by discussions with grant officers. Tate suggests that government officials should differentiate their analysis of investment projects according to the type of market involved (local, national, international). For cases involving little discretion in investment options, the usual financial analysis may be sufficient. For cases involving considerable discretion in such options, government officials must get information on the alternatives open to the firms, the corporate strategic considerations, and the weight the firm puts on political and economic risk. Tate also provides some information on incrementality. Three categories of respondents are reported: those not influenced in any way by the grant (20 percent); those influenced in some way by the incentive, but for which a smaller grant would have been sufficient (45 percent); and those that depended on the entire amount of the grant to go ahead with the project (35 percent).

There are a number of European surveys concerned with the investment, moving, and location decisions and the impact of regional incentives (see [38;2]). Nichol [38] surveyed thirty-six studies, originat-

ing in France, Great Britain, Germany, Denmark, and the Netherlands, and concluded that financial incentives played an insignificant role in the investment and location decisions.

### Econometric Studies

In this group one finds investment, firm movement, and employment studies. In the first category, LeGoff, using a neoclassical investment function, introduces Canadian RDIP incentives in the cost of capital, under very strong assumptions [27]. Incentives are constrained to have a positive impact, because the lower the price of capital, reduced by RDIP, the higher the investment. The program is judged to be effective, with 75 percent of assisted investment considered to be incremental. LeGoff acknowledges that data and estimation methods were too gross to single out the effect of RDIP, and that the incrementality was overestimated because of the way RDIP was introduced in the cost of capital.

A U.S. study [23] measures the influence of state incentives on investment and location decisions. The incentive is introduced either by the amount lent or through dummy variables for the years the program was in effect. The study has serious specification problems (simultaneity) and poor statistical results. No conclusion can be reached. In Great Britain, Ashcroft [2;38] studies Scottish investment behaviour. The explanatory variables are relative pressure of demand (unemployment rate), the number of permit refusals, and the amount of regional incentives. The author concludes that regional policy had a significant influence on Scottish investment. The model provides a good statistical fit but is subject to serious flaws: area attractiveness variables are not included in the approach; the unemployment coefficient is of the wrong sign; and the number of permits variable is not significant, which is surprising in light of other results (surveys and quantitative research).

In the firm movement category, we find four British studies, mostly through the Nichol survey [38]. In the first three studies, by Moore and Rhodes [36], Ashcroft and Taylor (see [38]), and Bowers and Gunawardana (see [38]), movement of firms is determined by a demand pressure variable (male employment, area relative unemployment, change in income or a capacity measure, job vacancies) and incentives (present value, number of permit refusals). Slight differences in the specification and data lead to conflicting results. In the fourth study, also by Ashcroft and Taylor (see [38]), the authors divide the estimation of the impact of regional policy on firm movement to designated areas into two parts: the determination of total firm movement; and the determination of movements to the designated areas. The number of total movements is determined by changes in

national income, capacity considerations, lagged investment, and permit refusals. This last policy variable is significant. The ratio of moves to designated areas to total moves is a function of the attractiveness of the designated areas, measured by both the relative unemployment in the area and regional policy variables, represented by permit refusals, value of investment incentives, and a special development area program. Relative unemployment is the major factor determining attractiveness, whereas permits prove to be insignificant. The authors then modify their approach slightly: a two year lag for policy variables is introduced, instead of a one year lag; and a dummy is introduced to account for the local employment (incentive) act. Attractiveness of the area represented by relative unemployment is no longer significant. They now conclude that all policy instruments play a significant role. The drastic change in outcome resulting from minor modifications is disturbing. Also, we notice a simultaneity problem between the ratio of moves to the designated areas to total moves, and the value of investment incentives: the larger the number of moves, the greater the amount of incentives given out.

Finally, two French studies [5;24] perform a factor analysis of employment determinants in French regions. The studies identify the extent to which supply side factors (labour, industrial structure, transport and telecommunication infrastructure, level of services) and government assistance are correlated with the variation in employment in each region. It is concluded that regional policy measures, including government assistance, are not a determinant factor. Correlation between variables is not sufficient to come to a conclusion on causality. Results are also sensitive to the choice of proxy variables.

No firm overall conclusion can be derived as to whether regional incentives had a substantial impact. The econometric method suffers from limitations related to data reliability, boldness of assumptions, estimation methods, and model specification. Moreover, the surveyed studies are associated with periods of rapid economic growth; it is not clear to what extent this is the cause of the strong showing of the incentive variable. In addition, the regional investment specifications do not capture forgone investment elsewhere. As a general observation, econometric studies of incrementality of regional incentives, as well as national fiscal incentives, show that slight variations in model specification may result in significant differences in the findings [7;22;32;33;34]. One cannot, given the state of the art, be sure enough of the validity of econometric results for policy considerations. Until a more solid body of econometric research on incrementality is established, their policy relevance and cost-effectiveness remain to be proven.

### Policy Implications for Incrementality

The overall picture is confusing, as there is no consensus on the degree of incrementality. Results appear to be sensitive to a wide variety of factors: the methodology, the regional policy package, the incentive measure, the national and international economic performance, and in the case of econometric studies, the model specification. The various methods also differ in their ability: (1) to isolate the effects of regional policy from other forces; and (2) to separate the total policy effect into its individual components. On methodological grounds, structured interviews and case studies are the least flawed and therefore the most promising, even though they do not constitute foolproof methods of assessing incrementality.

It is difficult to generalize results derived in the other OECD countries to Canada in view of the differences in the nature of the regional problem and institutional environment. For example, the U.K., which exhibits the most numerous and widest spectrum of evaluation studies, is associated with a policy situation where there was a need to decongest highly industrialized urban centres through the use of disincentives. Therefore, by a process of elimination, we focus on the conclusions of three Canadian studies, which used the case study or structured interview approaches: Springate [42], LeGoff and Rosenfeld [28], and Tate [44]:

- About 50 percent of subsidized investment would not have gone ahead without government assistance. Size and timing are influenced in about one-third of all cases. Relocation is marginal.
- Firm and project characteristics definitely have an impact on the degree of incrementality. Smaller businesses and riskier projects are more likely to be influenced by incentives.
- In the case of large projects, analysis of incrementality cannot be complete without an understanding of their financial situation and corporate strategy. Other factors, including availability and ease of financing, project profitability, and attractiveness of alternative locations, also appear to influence incrementality.

### Economic Efficiency

Little literature is available on the assessment of the economic efficiency of an incentive program. The existing studies are based on project analysis methodology, the key steps of which are summarized below. Full details on the methodology<sup>1</sup> are available in Evans [19;20].

<sup>1</sup>While there are a few areas of benefit-cost analysis that may be considered controversial, it is not the purpose of this paper to critically discuss the methodology.

The purpose of economic efficiency analysis is to assess the net gain from allocating resources to a particular project. To that end, adjustments are performed to convert private revenues and costs into benefits and costs to society. The differences in the valuation of private and social benefits and costs are called externalities. The net social benefits of the project are derived as follows.

The net private cash flow, which determines if a project is commercially viable, is increased or decreased by taking into account the following externalities: subsidies (-); taxes and duties (+); foreign exchange lost by imports and payment of interest/dividends/loan reimbursements to foreign countries (-); foreign exchange earnings from exports, import replacement, and foreign financing (+); labour benefits resulting from additional labour income net of the social opportunity cost of labour (+ or -); indirect labour benefits less cost of indirect labour (+ or -); displacement of output<sup>2</sup> (-); government's administrative cost (-); applicants' costs (-); deadweight loss resulting from the distortions of the tax/subsidy system (-); environmental cost (-).

The net private benefits adjusted by externalities are discounted by the social discount rate, which represents the rate of return that would be obtained if the resources were instead utilized elsewhere. It is calculated as the weighted average opportunity cost of capital, where the weights reflect the extent to which the required funds are likely to be drawn from alternative domestic investment projects, consumption, and foreign sources [25].

If the discounted private net cash flow is positive, the project earns more than the normal private, risk-adjusted rate of return and should not normally require any incentive. If the discounted private net cash flow is negative but the discounted economic net benefit is positive, the government may want to assist the project. The level of financial assistance could be the smaller of the amount necessary for the project to achieve a "normal" private rate of return or the value of the positive discounted net economic externalities of the project. Net economic externalities represent the difference between net private benefits and net social benefits.

Evidence suggests that the largest contributors to economic externalities of a project in a lagging region are the labour externalities. The value of key parameters and externalities have already been estimated in Canada [19;26] in the case of labour<sup>3</sup> (5 to 25 percent of the wage bill, depending on the project's location); foreign exchange (7 percent

<sup>2</sup>The economic value of a project's output is equal to the sum of the opportunity costs of the resources released by the other project's output when it contracts (displacement) and the economic value of the incremental output in the economy.

<sup>3</sup>In the case of temporary jobs in seasonal or cyclical industries, the net social cost of job creation may amount to up to 50 percent of the wage bill [17].

of net exports); discount rate (between 7 and 10 percent or higher for riskier projects) [9;25]; and deadweight<sup>4</sup> and administrative costs (about 40% of program costs). They are greatest when the project creates permanent rather than temporary jobs, employs local rather than migrant workers, offers high skill, high paid jobs, and employs direct and indirect labour that would otherwise be unemployed. Other possible large contributors are the governments' taxes, output displacement, foreign exchange earnings, and deadweight losses [19;20;46].

Three benefit-cost studies of regional incentive programs have been reviewed.

*In Canada*, Swan and Glynn [43] published in an Economic Council Discussion Paper an assessment of the economic benefits of RDIP for the years 1970-1971. RDIP grants appear to be extremely efficient. The benefit-cost ratios are estimated to vary between 3 and 19, according to the set of assumptions selected. Job incrementality of between 39 and 68 percent is assumed. Benefits include the value of labour income created by incremental jobs and the avoided migration costs. Costs include the program administration expenditures, the deadweight loss resulting from the transfer of funds from taxpayers to incentive recipients, the value of incentives paid to incremental jobs, and the value of incremental forgone leisure.

*In the U.K.*, Schoefield [41] attempts to measure the net economic benefits of regional policy between 1960 and 1966. The U.K. policy combines financial inducements, provision of public services and negative controls in congested areas. The net benefits are estimated to vary between 54 million and 1 billion British pounds. Incrementality of 75 percent is assumed, based on a sample survey of firms located in assisted areas. The results vary according to the value of parameters, including the discount rate, time horizon, incrementality factor, opportunity cost of labour, and degree of output displacement in non-assisted areas. Benefits include net addition to national output; that is, labour and capital income due to regional policy augmented by national multiplier effects and avoided infrastructure costs in non-assisted areas resulting from migration forestalled by the policy. Costs include administrative cost, public infrastructure associated with the program, firms' migration costs, and job displacement in assisted and non-assisted areas.

*In the U.S.*, Sazama [40] examines the extent to which U.S. state incentive programs (subsidized loans and loan guarantees in New York, Pennsylvania, Connecticut, Rhode Island, and Maine) create

<sup>4</sup>It has been estimated that for each additional dollar of tax raised there is a deadweight cost to the economy of between 15 cents and \$1.29 depending on the country and the methodology used [6]. In Canada and Quebec, this cost was estimated as between 35 and 55 cents [21].

more income than is forgone in the private sector within those states. The program is judged to be very beneficial. All benefit-cost ratios are greater than one, irrespective of the assumptions used. "Conservative" benefit-cost ratios vary between 1.2 and 6.8, while "probable" ratios vary between 3.8 and 43.2. All benefits and costs are measured from a state rather than a national point of view. On the basis of a questionnaire survey of incentive recipients, it was judged that 50 percent of the value of loans were incremental. Benefits of the program are equal to the wages and profits before taxes associated with incremental projects. Wage benefits are reduced by the amount of forgone leisure measured by average unemployment compensation. The costs include the administrative costs, the implicit subsidy associated with the incentive, the value of loans disbursed net of reimbursements, and the amount of loan defaults.

These studies share a data problem: all must rely on secondary sources of information and data proxies, because it was impossible for the authors to access directly program and firm data. The findings vary greatly according to the assumptions and the value of key parameters used, and the resulting benefit-cost ratios are quite high by the usual standards. As explained below, benefits are overvalued and costs undervalued.

### Benefits

The value of benefits are mis-specified. National income measures<sup>5</sup> such as labour income in the Canadian and U.S. studies [43;40] and capital income in the U.K. and U.S. studies [41;40], rather than the value of competitive output, are used as proxies for gross benefits. It is implied that the higher the wage bill, the more efficient a project is, irrespective of the project's profitability. In the Canadian and U.K. studies, the authors assume normal profits for all assisted projects because of lack of data on actual profits; no proof is given that they are as profitable as the "average" business in the economy [43;41]. Moreover, in the U.K. study, no windfall payments accruing to firms are assumed [41], thereby overestimating the net benefits.

The inclusion of a national multiplier effect in the U.K. study assumes that, in the absence of a regional policy, no economic expansion accompanied by multiplier effects would have occurred as a result of lower program expenditures, taxes, or borrowing by government. Also, the benefits of multiplier effects are included but not the associated costs [41], thereby overestimating the net benefits.

<sup>5</sup>Such a method, where gross output and multiplier effects are part of the benefits, is used mostly in Europe; see Chervel [10].

### Costs

In the Canadian study, it is assumed that output forgone or displaced in non-assisted areas as a result of incentives in assisted areas can be replaced at no cost by an appropriate stabilization policy to compensate for a reduction in aggregate demand in richer areas. This assumption is not tenable, because stabilization policies are not costless [43]. Capital and material costs associated with the firms' output in assisted areas are not accounted for in the Canadian and U.K. studies because they were not available to the authors. The opportunity cost of labour is approximated by the amount of unemployment compensation, irrespective of the type of labour being considered [40]. This assumption underestimates labour costs. Evidence suggests that, in the case of skilled and managerial labour, this opportunity cost is positive and is much greater than the wage bill [20]. In the case of the U.S. study [40], the value of loans (rather than the resource costs of equipment) and materials approximates the costs.

In the Canadian study, it is implicitly assumed that labour that would have migrated to richer areas in the absence of the incentive program would have earned as much income in richer areas as under the RDIA program [43]. Evidence suggests that higher income is gained in richer areas [20], and therefore costs are underestimated. It is also assumed in the Canadian study that a certain number of jobs created by incentives are substitutes for migration that would have occurred otherwise. This number varies arbitrarily from 0 percent in Quebec to 70 percent in provinces other than Quebec [43]. The higher the potential for substitution of migration, the greater the benefits in terms of avoided migration costs. In the U.K. study, the value of the proportion of jobs displaced by incentives in assisted and non-assisted areas is selected arbitrarily within a range of 20 to 80 percent of incremental jobs [41]. This wide range of values explains, in part, the great variability of the results in both the Canadian and U.K. studies [43;41].

In the U.S. study, it is not clear how implicit subsidies associated with loans and loan guarantees are treated [40]. In the same study, it is no surprise that benefit-cost ratios, calculated from a state point of view, are high, given that it is assumed that most benefits are concentrated within the state while significant costs lie outside the state. Specifically, funds originating from outside the state are assumed to be costless. Similarly, loan repayments by firms from their out-of-state sources have no opportunity cost [40], thereby underestimating real costs.

As shown above, these studies suffer from a mis-specification of benefits and costs and a lack of reliability in the data. Both the lack of project data available to the authors on sales, capital, and operating



costs and the high level and wide range of net benefits make the results of the three studies unreliable. In fact Swann and Glynn had reservations about the use of their results for policy purposes [43], and Schofield acknowledges that the benefits of the regional policy are presented in a favourable light and that data estimation problems abound [41].

### Conclusion

The studies surveyed are quite insufficient for deriving clear conclusions about the performance of regional incentives. No foolproof method was identified for assessing incrementality and economic efficiency of a regional incentive program. All studies showed weaknesses, which reflects the complexity of assessing incrementality and economic efficiency.

With regard to incrementality, little convergence in the results was found. In Canada, the more solid studies using structured interview and case study approaches indicate that job and investment incrementality would fall, at the lower end of the spectrum, at about 50 percent. Incrementality is greater for small and riskier projects. Size and timing is more easily influenced than the decision to invest or move. The relocation potential seems marginal.

Concerning the efficiency issue, studies indicate large positive net benefits. In view of the serious problems regarding methodology and data quality and accessibility, results should not be considered reliable. Their extremely wide range of variation reduces their usefulness from a policy point of view. Also, if investment incrementality is only 50 percent, if incentives modify mostly projects' size and timing, and given that the prime objective of regional incentive programs is not economic efficiency, one should not expect the net benefits to be large, or even positive, as estimated.

In view of the need for upgrading the existing published methodologies for evaluating the current generation of regional incentive programs, we recommend avenues of research based on a combination of structured interviews and case studies, to derive incrementality, and on cash flow analysis adjusted for the main externalities, to obtain net economic benefits. This approach would provide a clearer linkage between the analyses of incrementality, corporate decision-making, commercial viability, and economic efficiency. It would be more appropriate for incentive programs providing most of the assistance to larger projects. A small sample of large projects is more amenable to case studies and cash flow analysis than a large sample of small projects. Also, evaluation resources are generally too scarce to apply such an approach to a large number of projects. Evaluation is more effective

if one assesses well a small sample of projects rather than deriving unreliable results for an entire program based on the blanket application of strong assumptions and guesstimates to all projects.

In view of the lack of recent and adequate published studies on the efficiency of regional incentive programs, research priority should be more oriented towards efficiency relative to incrementality. If the evaluators have direct access to a project's files, and major methodological weaknesses are corrected, results can be greatly improved.

### References

1. Allen, K. (ed.). *Balanced National Growth*. Lexington, MA: Lexington Books, 1979.
2. Ashcroft, B. "The Evaluation of Regional Economic Policy: The Case of the United Kingdom", in K. Allen (ed.), *Balanced National Growth* [1].
3. Atlantic Development Council. "Regional Development Incentives Program: Atlantic Region, Period 1969-1972". Halifax: May 1976.
4. Atlantic Provinces Economic Council. *The Atlantic Economy*. Fifth Annual Review. Halifax: 1971.
5. Aydalot, P., M. Noel, and C. Poitiers. *La Localisation des activités*. Collection T.E.M., No 2. Paris: Gauthier Villars, 1971.
6. Ballard, C., J. B. Shoven, and J. Whalley. "General Equilibrium Computation of the Marginal Welfare Costs of Taxes", *American Economic Review*, 75:1 (March 1985).
7. Bird, R. M. *Tax Incentives for Investment: the State of the Art*. Montreal: C.D. Howe Research Institute, November 1980.
8. Bosworth, B. P. *Tax Incentives and Economic Growth*. Washington: The Brookings Institution, 1984.
9. Burgess, D. S. "The Social Discount Rate for Canada: Theory and Evidence", *Canadian Public Policy*, 7:3 (Summer 1981), 383-394.
10. Chervel, H. *Manuel d'évaluation économique des projets: la méthode des effets*. Paris: Société d'Études pour le Développement Economique et Social, 1976.
11. Doern, B. G. and R. W. Phidd. *Ideas, Structure, Process*. Toronto: Methuen, 1983.
12. DREE. Annual Reports, 1969-1983.
13. DREE. "Assessment of the Regional Development Incentives Programs", April 1973.
14. DRIE. Annual Report, 1984.
15. Dudley, C. L. Jr. "A Theoretical Financial Analysis of the Long-term Subsidy Value of the Regional Development Incentives Program in Canada". Ph.D. Thesis, University of Berkeley, 1974.

16. Economic Council of Canada. *Living Together: A Study of Regional Disparities*. Ottawa: 1977.
17. Employment and Immigration Canada. *Unemployment Insurance in the 1980s: Report of the Task Force on Unemployment Insurance*. Ottawa: 1981.
18. Ernst and Whinney. *Government Incentives Programs in Canada: Are They an Effective Tool in Stimulating Investment in Productive Plant and Equipment*. Discussion paper 152. Ottawa: Economic Council of Canada, April 1979.
19. Evans, John. "A Financial and Economic Framework for Investment Appraisal", in *Canadian Regional Planning and Development in Transition*. Kingston: Queen's University, February 1979.
20. Evans, John. "A Manual for the Analysis and Appraisal of Industrial Projects in Canada, Part I and Part II". Draft prepared for the Department of Regional Industrial Expansion, 1983.
21. Fortin, B. *Le Marché du travail au Québec*. Montréal: Institut C.D. Howe, Comité Québec, 1985.
22. Harman, F. J. and J. A. Johnson. "An Examination of Government Tax Incentives for Business Investment in Canada", *Canadian Tax Journal*, 26:6 (Nov.-Dec. 1978), 691-704.
23. Hellman, D. A., G. H. Wassal, and L. H. Falk. *State Financial Incentives to Industry*. Lexington, MA: Lexington Books, 1975.
24. Jaeger, J. P. "Approche de la localisation industrielle en France", *Revue Economique du Sud-Ouest*, 21 (1972), 375-415.
25. Jenkins, Glenn P. *Capital in Canada: Its Social and Private Performance 1965-1974*. Discussion Paper No. 98. Ottawa: Economic Council of Canada, 1977.
26. Kuo, G. and G. Jenkins. "On Measuring the Social Opportunity Cost of Foreign Exchange", *Canadian Journal of Economics*, 18:2 (May 1985), 400-415.
27. LeGoff, J. P. "Impact des incitations à l'investissement du gouvernement fédéral canadien dans le secteur manufacturier de 1969-1974", *L'Actualité Economique*, 53:3 (July 1977), 370-389.
28. LeGoff, J. P. "Programmes gouvernementaux d'aide financière aux entreprises: quelques réflexions", *Gestion*, 6:1 (February 1981), 81-83.
29. LeGoff, J. P., "Les subventions à l'investissement: leur potentiel de relocalisation", *L'Actualité Economique*, 53:3 (July 1977), 448-455.
30. LeGoff, J. P. and B. Rosenfeld. *Les Réactions d'entrepreneurs canadiens à divers programmes d'aide à l'investissements*. Discussion Paper 153. Ottawa: Economic Council of Canada, April 1979.
31. Malkin, D. "Étude sur les facteurs de localisation des emplois industriels", *Sesame*, December 1971, Paris.

32. May, J. Douglas. "An Econometric Study into the Effects of Post-War Fiscal Policy on Investment Expenditures in Canadian Manufacturing". Ph.D. thesis, University of York, 1971.
33. May, J. Douglas. "Investment Incentives as Part of an Industrial Strategy", *Canadian Public Policy*, 5:1 (1979), 70-79.
34. McPetridge, D. G. and May J. D. "The Effects of Capital Cost Allowance Measures on Capital Accumulation in the Canadian Manufacturing Sector", *Public Finance Quarterly*, 4:3 (July 1976), 307-322.
35. Migue, J. L. "Politiques régionales: traitement du malade ou maladie du guérisseur?", *Canadian Public Administration*, 21:2 (Summer 1978), 195-212.
36. Moore, B. and J. Rhodes, "Regional Economic Policy and the Movement of Manufacturing Firms to Development Areas", *Economica*, 43 (February 1976), 17-31.
37. Neufeld, E. P. "Technology and Industrial Strategy", Royal Bank of Canada, December 1983.
38. Nichol, W. R. *An Appreciation of Regional Policy Evaluation Studies: A Comparative Study*. International Institute of Management, March 1980.
39. OECD. *Positive Adjustment Policies: Managing Structural Change*. Paris: 1982.
40. Sazama, G. W. "State Government Industrial Loan Programs", *Journal of Regional Science*, 10:3 (December 1970), 385-396.
41. Schofield, J. A. "Economic Efficiency and Regional Policy", *Urban Studies*, 13:2 (1976), 181-192.
42. Springate, David J. V. "Regional Development Incentive Grants and Private Investment in Canada: A Case Study of the Effect of Regional Development Incentives on the Investment Decisions of Manufacturing Firms." Ph.D. thesis, Harvard University, 1972.
43. Swan, N. and A. Glynn. *The Costs and Benefits of Industrial Location Grants*. Discussion Paper No. 93. Ottawa: Economic Council of Canada, July 1977.
44. Tate, Donald G. "Government Assistance and Corporate Investment in Canada". Draft, Ph.D. thesis, Harvard University, 1980.
45. Usher, Dan. *The Benefits and Costs of Firm-Specific Investment Grants: A Study of Five Federal Programs*. Discussion Paper No. 511. Kingston: Queen's University, Institute for Economic Research, 1983.
46. Usher, Dan. *A Critique of the Canadian Program of Subsidizing Investment in the Less-Developed Regions*. Discussion Paper No. 145. Kingston: Queen's University, January 1979.
47. Usher, Dan. "Some Questions About the Regional Development Incentives Act", *Canadian Public Policy*, 1:4 (Fall 1975), 557-575.