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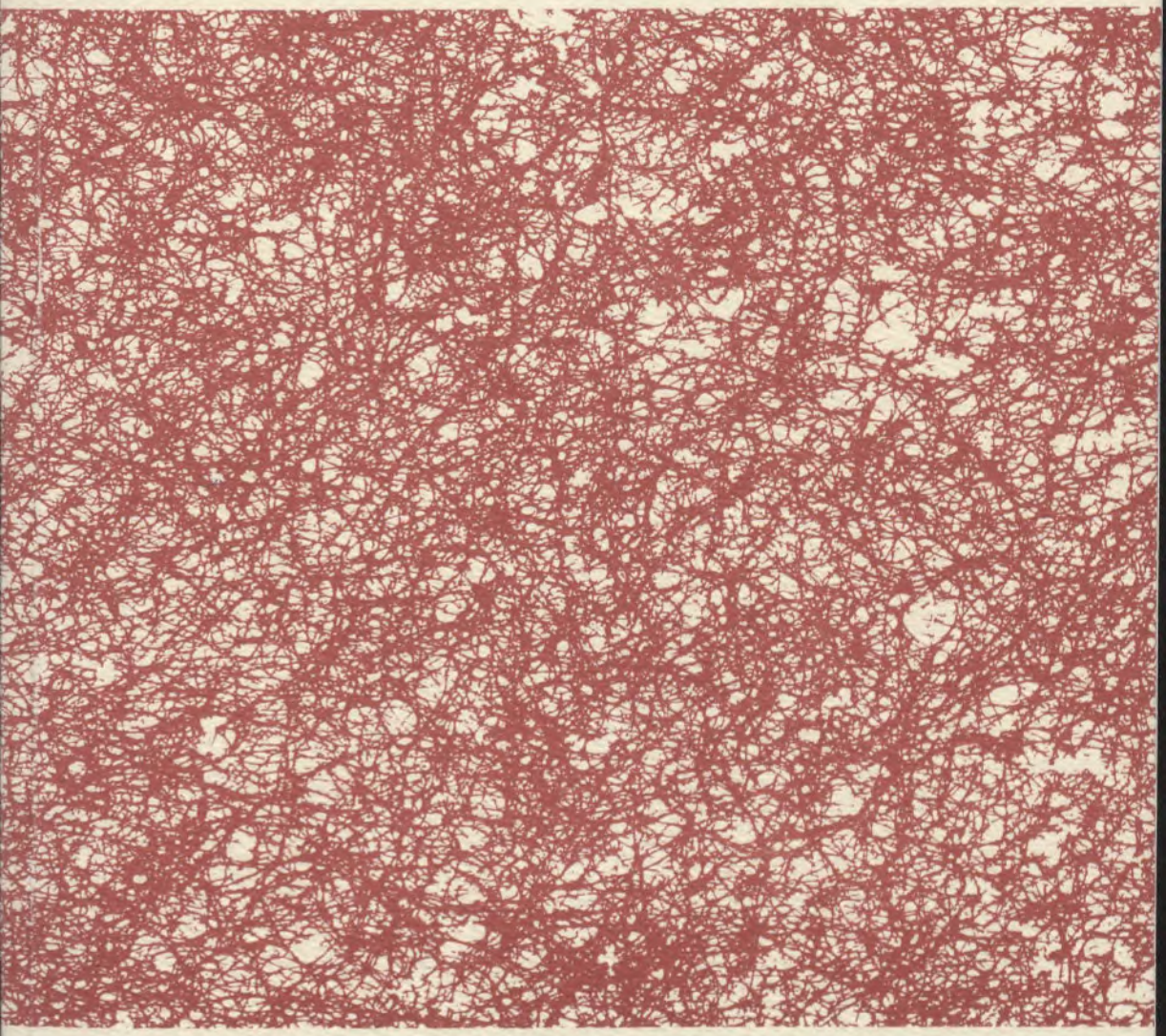


A COLLOQUIUM ORGANIZED BY THE SCHOOL OF URBAN AND REGIONAL PLANNING, QUEEN'S UNIVERSITY, AND THE FEDERAL DEPARTMENT OF REGIONAL ECONOMIC EXPANSION

CANADIAN REGIONAL PLANNING AND DEVELOPMENT IN TRANSITION

A COLLOQUIUM ORGANIZED BY THE SCHOOL OF URBAN AND REGIONAL PLANNING, QUEEN'S UNIVERSITY, AND THE FEDERAL DEPARTMENT OF REGIONAL ECONOMIC EXPANSION

TABLE OF CONTENTS

Introduction 5

Abstracts/Résumés 7

Some Recent Demographic Trends that are Related to Regional Policies, by Leroy O. Stone 19
- Comments by Christopher Taylor 62
- Comments by Thomas N. Brewis 65
- Leroy Stone's Response to the Comments 67

Charting the Delivery of Regional Policy, by Gerald Hodge 69
- Comments by Guy Steed 94
- Gerald Hodge's Response to the Comments 96

Concepts and Methods of Regional Analysis, by Sergio Sismondo 97
- Comments by Maurice Yeates 122
- Comments by Peter Harrison 123
- Sergio Sismondo's Response to the Comments 124

A Financial and Economic Framework for Investment Appraisal, by John C. Evans 127
- Comments by J. Ross Millar 153
- Comments by Dan Usher 154
- John Evans' Response to the Comments 158

The Challenge of Rural Development and the Public Response in Canada, by Mohammad A. Qadeer 161
- Comments by Allan J. Barry 182
- Mohammad Qadeer's Response to Allan Barry's Comments 184
- Comments by Allan Steeves 185
- Mohammad Qadeer's Response to Allan Steeves' Comments 189

Biographies 191
- Authors 191
- Commentators 192

INTRODUCTION

The idea to hold the colloquium on Canadian Regional Planning and Development in Transition, which took place on February 16, 1977 in Kingston, was developed during 1976 between the School of Urban and Regional Planning at Queen's University and the federal Department of Regional Economic Expansion (DREE).

The theme of the colloquium arose essentially from a general interest in exploring trends perceived in the emphasis or direction in the process of regional planning and development in Canada: What have been the results of the substantial experience with regional economic development policies and programs in the last decade? What can be learned from empirical evidence or program evaluation methodology? There appeared to be growing disenchantment with the concept that "bigger is better". There also were questions about the extent and significance of population migration to smaller places and rural areas; about the decline in growth rates for metropolitan centres; and finally, about the current ideas and concepts at the forefront of the field in Canada and possibly abroad.

To address these questions, five papers were commissioned. Topics were varied and included a paper on demographic changes; a paper suggesting an approach to understanding and evaluating regional development efforts; a paper that provided some insights into the research currently being carried out at DREE; a paper that dealt with methodology in project evaluation; and a paper addressing integrated rural development in Canada and in Pakistan.

In addition, commentators were asked to prepare comments on the papers. These are appended to the texts of each paper. Three of five authors asked for an opportunity for rebuttal: these responses are also included.

Overall, the papers provide some perspectives on recent regional development efforts in Canada which will be of interest to practitioners, professional academics, and students of regional development planning.

Neither the colloquium nor the publication of these papers would have been possible without the support of a number of individuals. While it is perhaps unfair to single out any person, special mention is due Mark Daniels, Assistant Deputy Minister, Planning and Coordination, Department of Regional Economic Expansion, and Gerald Hodge, Director of the School of Urban and Regional Planning, Queen's University, who recognized the need for a colloquium; and to Dan Mrkich, Planning Officer, Department of Regional Economic Expansion and Gordon Kumagai, Assistant Professor, School of Urban and Regional Planning, Queen's University, who conceived the idea and did much of the organizing for the colloquium.

SOME RECENT DEMOGRAPHIC TRENDS THAT ARE RELATED TO REGIONAL POLICIES

by Leroy O. Stone

ABSTRACT

This paper is an introductory survey of some recent demographic developments that seem pertinent to the formation of policies on the economic or political well-being of Canadian communities or regions. A summary of the main points follows.

Provincial percentage shares of the national population have seldom been stable from one decade to another. However, since 1951 some provinces have been showing marked downward shifts in their proportions of the national population. A study of the demographic processes underlying these shifts suggests that among the important factors there are several that are not too sensitive to mild distribution policies. Stabilizing the provincial shares of the national population at their present levels is a herculean task.

The declines of population growth rates since the 1950s have been shared by the twenty-two 1951 Census Metropolitan Areas (CMAs), as well as by the provincial non-metropolitan populations. Both continued to show positive growth rates between 1971 and 1976. However, the metropolitan areas failed to increase their aggregate share of the national population over the same period.

Furthermore, the growth of the proportion of the national population in the big three of Montreal, Toronto, and Vancouver seems to be slowing mark-

CERTAINES TENDANCES DÉMOGRAPHIQUES RÉCENTES RELATIVES AUX POLITIQUES RÉGIONALES

par Leroy O. Stone

RÉSUMÉ

Le présent document est en fait une enquête préliminaire sur certains phénomènes démographiques récents qui semblent pertinents à l'élaboration de politiques touchant le bien-être économique ou politique des communautés ou des régions du Canada. Voici un résumé des principaux points étudiés.

D'une décennie à l'autre, les pourcentages des proportions provinciales de la population ont été plutôt variables. Cependant, depuis 1951, certaines provinces accusent des baisses marquées dans leurs proportions de la population nationale. Une étude des processus démographiques sous-jacents à ces baisses révèle que parmi les facteurs les plus importants, il en existe plusieurs qui ne sont pas tellement touchés par des politiques modérées de répartition. Stabiliser les proportions provinciales de la population nationale à leur niveau actuel représente une tâche herculéenne.

Depuis les années 50, les baisses des taux d'accroissement de la population se sont fait sentir dans les vingt-deux régions métropolitaines du recensement de 1971 (RMR), de même que chez les populations non métropolitaines de la province. Entre 1971 et 1976, ces deux catégories ont continué à enregistrer des taux d'accroissement positifs. Toutefois, les régions métropolitaines n'ont pas réussi, au cours de la même période, à augmenter leurs proportions agglomérées de la population nationale.

edly. Growth rates in more and more of the core-central cities of metropolitan areas are lagging substantially behind that of Canada, especially if we eliminate international migration from consideration. In general, the most buoyant population growth rates in Canada today may be found in the municipalities that ring the cores of metropolitan areas.

The vitality of Canada's many small communities is a matter of increasing academic and political interest. Their population does not, to date, appear to be growing faster than that of Canada as a whole, despite their much smaller base level. At the same time, signs of outright 'withering away on the vine' seem to appear mostly among the very tiny ones (cf. Hodge and Qadeer, 1976; Stewart, 1976). So far, a minimum population of about 5 000 and good proximity to metropolitan centres seem to characterize a substantial proportion of the more buoyant small communities.

This paper offers preliminary estimates of the components of population growth and turnover of a sample of Canada's small communities for 1966-71. As usual, inter-area variation in growth is largely the result of variation in net migration; but within a given area and a specific time period, natural increase will most often be a weightier factor in growth than net migration. The levels of gross migration (in-migration plus out-migration) are high in relation to the small-area base populations. Policies aimed at promoting greater viability in Canada's small communities will have to contend with high rates of population turnover, and avoid unduly simplistic assumptions to the effect that some areas only gain migrants

De plus, l'augmentation de la proportion de la population nationale dans les trois grands centres urbains, soit Montréal, Toronto et Vancouver, semble ralentir sensiblement. Le taux d'accroissement d'un nombre de plus en plus grand des villes principales des régions métropolitaines accuse un retard considérable sur celui du Canada, et tout spécialement si nous ne tenons pas compte de la migration internationale. De façon générale, on peut affirmer que c'est dans les municipalités entourant le centre des régions métropolitaines qu'on retrouve aujourd'hui les taux d'accroissement de la population les plus progressifs au Canada.

La vitalité de nombreuses petites communautés canadiennes suscite de plus en plus l'intérêt des milieux académique et politique. Leur population ne semble pas, du moins jusqu'à présent, augmenter plus rapidement que celle de l'ensemble du Canada, malgré leur niveau de base beaucoup moins élevé. En même temps, les très petites communautés semblent montrer des signes évidents de « dépérissement »*. Jusqu'ici, une grande partie des petites communautés les plus progressives semblent avoir pour caractéristiques une population minimale de 5 000 habitants et la proximité des centres métropolitains.

Le présent document donne des évaluations préliminaires sur les composantes de la croissance et du mouvement de la population d'un échantillonnage de petites communautés du Canada pour la période de 1966 à 1971. Comme d'habitude, la variation interrégionale au niveau de la

* *Cf.* Hodge et Qadeer, 1976; Stewart, 1976.

and others only lose them according to the performance of their economies. The most economically buoyant communities lose out-migrants as well as gain in-migrants, and their out-migration rates can be quite substantial in relation to the population base.

croissance est en grande partie le résultat de la variation du taux migratoire net. Mais, à l'intérieur d'une région donnée et d'une période déterminée, l'accroissement naturel sera souvent un facteur plus important au niveau de la croissance que le taux migratoire net. Les taux migratoires bruts (migrations intérieures et migrations extérieures) sont élevés en comparaison avec les populations de base des petites régions. Les politiques visant à promouvoir une plus grande viabilité des petites communautés du Canada devront tenir compte des taux élevés de mouvement de la population et exclure les hypothèses simplistes selon lesquelles seules certaines régions accueillent des migrants et seules d'autres en perdent en raison de leur performance économique. Les communautés les plus florissantes perdent des migrants externes, de même qu'elles accueillent des migrants internes, et leur taux de migration extérieure peut être relativement élevé par rapport à la population de base.

CHARTING THE DELIVERY OF REGIONAL POLICY IN POST-INDUSTRIAL CANADA

by Gerald Hodge

ABSTRACT

Despite an ever-widening array of policy initiatives on regional development, we have not moved very far toward our objectives and it is not clear that we've been heading in the right direction. It is the purpose of this paper to illuminate the elements

MISE EN APPLICATION DE LA POLITIQUE RÉGIONALE AU CANADA POSTINDUSTRIEL

par Gerald Hodge

RÉSUMÉ

En dépit d'un éventail d'initiatives politiques de plus en plus large, en matière de développement régional, nous ne nous sommes pas beaucoup rapprochés de nos objectifs, et il n'est pas sûr que nous nous soyons engagés dans la bonne direction. Ce document vise à

of the complex policy structure erected for achieving improved regional balance. The perspective is on the "delivery" of programs: what is to be delivered, through what means, to whom, and with what effectiveness? The paper does not provide answers to these questions but rather suggests a framework within which policy delivery can be charted. But in so doing, it reveals that some implicit assumptions about the implementation of regional development programs are tenuous.

Some regions require intervention that is welfare-oriented, some require a development intervention and some, under conditions of rapid change, may have to shift from one to the other. What impact are current regional policies having on the needs of Canadian regions? In this paper that impact is considered at, or near, the end-point of the policy system – the actual terrain of the region where the problems are: where the policies, legislation, and programs are expected to take effect.

The analytical framework suggested is able to accommodate the complexity of the regional system and policy output as well as encompass the end-point of policy delivery systems. Its basic dimensions are: (1) the destination of policy outputs; (2) the channel for delivery of policy outputs; and (3) the medium used to effect change.

Destinations need to be identified both by type (individuals, firms, local governments, etc.) and by whether they are final users (e.g., family) or intermediaries (e.g., a provincial housing agency). These can be arrayed as a set of rows in a matrix. Channels must show distinctions between agents of

clarifier les éléments de la structure politique complexe construite en vue de rétablir l'équilibre régional. Quant à la perspective du document, elle se situe au niveau de la « mise en application » des programmes : qu'est-ce qui doit être mis en oeuvre, par quel moyen, à l'intention de qui et avec quelle efficacité? Ce document n'apporte pas de réponses précises à ces questions, mais suggère plutôt un cadre de travail permettant d'élaborer le système de mise en application de la politique. Il démontre, cependant, que certaines hypothèses implicites concernant la mise en oeuvre des programmes de développement régional sont plutôt minces.

Certaines régions nécessitent une intervention axée sur le bien-être, d'autres, une sur le développement et d'autres encore, soumises à des conditions changeant rapidement, devraient peut-être évoluer d'un groupe à l'autre. Quelles sont les répercussions des politiques régionales actuelles sur les besoins des régions du Canada? Dans ce document, ces répercussions sont considérées comme le but ultime, ou presque, du système politique, le terrain réel de la région où les problèmes se situent, là où l'on prévoit appliquer la politique, la législation et les programmes.

Le cadre de travail analytique proposé peut s'adapter à la complexité du système régional et à l'efficacité de la politique, comme il permet également de cerner le but ultime des systèmes de mise en application de la politique. Ses dimensions fondamentales sont les suivantes : 1) la destination des résultats de la politique; 2) le mécanisme de mise en application des résultats de la politique; 3) le moyen utilisé pour effectuer un changement.

public policy delivery (e.g., through ministries or through proprietary corporations). Channels can then be arrayed as the columns of a matrix in a FROM/TO flow table. The medium of policy outputs is the 'flow' to destinations such as funds, services, and/or projects.

This proposal is heuristic. Its analytical power lies in its ability to capture interrelations in policy delivery, a not insignificant capability. Reading down a column one finds the types of decision units an agency's regional policy outputs are lodged with. The rows constitute the recipients and reading across, one finds the agencies on which regional decision units depend. The intersection of a column and row represents a meeting point between sources of regional policy outputs and regional recipients. It is through these meeting points – the end-points of administration – that policy is being delivered.

A rendering of the federal policy structure to suit the matrix formulation showed 70 different mediums (funds, services, or projects) employed for regional outputs; 30 different means for disbursing funds; 35 different agencies providing services; and 20 different agencies making investments in physical facilities.

This policy structure also shows a great variety of administrative arrangements. Resources for regional policy are administered through 'normal' departmental organization in only half the cases; the remainder are managed through more or less independent agencies (e.g., DEVCO, CMHC, TDC).

A matrix for DREE reveals that the department has transactions with a wide array of decision units in its differ-

On doit déterminer les destinations selon les catégories en cause (particuliers, firmes, gouvernements, etc.); on doit également préciser s'il s'agit de consommateurs (par exemple, la famille) ou d'intermédiaires (par exemple, un organisme provincial de logement). Ces destinations peuvent être dressées en une série de rangées dans une matrice. Les mécanismes doivent préciser les distinctions qui existent entre les agents de la mise en application publique de la politique (par exemple, par l'entremise des ministères ou des sociétés). Les mécanismes peuvent ensuite être dressés en colonnes dans une matrice sous forme de tableau de déroulement des opérations DE/À. Le moyen utilisé pour obtenir les résultats de la politique est le « flux » des destinations, telles que les fonds, services ou entreprises.

Cette proposition est heuristique. Son pouvoir d'analyse repose sur son habileté à saisir les interrelations dans la mise en application de la politique, une capacité tout de même importante. En parcourant une colonne, on découvre le genre de décisions que doit prendre un organisme selon les résultats d'une politique régionale. Les rangées représentent les destinataires et, en les examinant, on découvre les organismes dont dépendent les décisions régionales. L'intersection entre une colonne et une rangée constitue un point de rencontre entre les sources des résultats d'une politique régionale et les bénéficiaires régionaux. La politique est mise en application en fonction de ces points de rencontre, « les fins ultimes de l'administration ».

Un compte rendu de la structure de la politique fédérale pour une adaptation à la formule de la matrice mentionne 70 différents moyens (fonds, services ou entreprises) utilisés pour

ent direct programs. Is this a broad-based attack on regional problems or a 'shot-gun' approach? Moreover, some program outputs are delivered directly to decision units (e.g., firms, families) while others are delivered to intermediaries (e.g., provincial ARDA committees). The nature and quality of what is delivered is affected by the character and operating approach of the agent chosen by DREE to deliver policy output.

This matrix approach may be used not only to chart policy delivery in extant regional programs but also to prognosticate on the needs of emergent regional problems situations. How, for example, should policy outputs be structured in urban fields, resource regions, or non-metropolitan regions?

obtenir les résultats régionaux attendus; 30 différents moyens pour accorder des fonds, 35 différents organismes pourvoyeurs de services et 20 différents organismes prêts à investir dans des installations physiques.

En outre, cette structure de la politique fait état d'une grande variété de dispositions administratives. Les ressources destinées à une politique régionale sont administrées par l'organisation « habituelle » d'un ministère dans seulement 50 p. 100 des cas; des organismes plus ou moins indépendants (par exemple, DEVCO, SCHL, TDC) sont responsables des autres cas.

Une matrice traitant du MEER révèle que ce ministère a des rapports avec une grande variété d'unités de décisions dans ses différents programmes directs. S'agit-il de s'attaquer à la base aux problèmes régionaux ou est-ce une approche au hasard? De plus, certains résultats du programme sont appliqués directement aux unités de décisions (par exemple, les entreprises, les familles), alors que d'autres sont appliqués aux intermédiaires (par exemple, les comités provinciaux de l'ARDA). La nature et la qualité de ce qui est appliqué sont influencées par le caractère et l'approche de l'agent choisi par le MEER pour mettre en application les résultats de la politique et par l'approche qu'il a utilisée.

Cette approche, celle de la matrice, peut être utilisée non seulement pour élaborer la mise en application de la politique dans les programmes régionaux en vigueur, mais également pour prévoir les besoins découlant de problèmes régionaux qui surviennent. Comment, par exemple, les résultats de la politique devraient-ils être structurés dans les centres urbains, les régions riches en ressources ou les régions non métropolitaines?

CONCEPTS AND METHODS OF REGIONAL ANALYSIS

by Sergio Sismondo

ABSTRACT

After the 1973 review which led to the decentralization of the Department of Regional Economic Expansion, the new Analysis and Liaison Branch became involved in a series of analytical projects with rather special characteristics. It is the primary purpose of this paper to discuss the characteristics that distinguish analysis in this policy context from other forms of analysis.

A paradigm which relates values, policies, structural phenomena and system outputs is presented and discussed. The paradigm, inherently an heuristic device, is derived from general systems theory and applied to the complex world of decision-making in regional development.

Several analytical experiences which are considered prototypical of the class of projects undertaken by the branch are described and compared to the paradigmatic prescriptions outlined earlier. An assessment of the strengths and weaknesses of current activities is derived from this.

Finally, some characteristics of the policy-making environment are hypothetically modified in order to discover how it might change through time for researchers willing to become or remain associated with policy-making systems. Two directions of change are explored. In the first, the policy-making system tends toward a greater capacity to incorporate multi-variate simulation results in the decision process. In the second, the policy-making system tends toward a greater capacity to respond to feedback from the population segments affected. The merits of these two evolutionary possibilities are then compared.

CONCEPTS ET MÉTHODES D'ANALYSE RÉGIONALE

par Sergio Sismondo

RÉSUMÉ

Après la révision de la politique effectuée en 1973 et qui a conduit à la décentralisation du ministère de l'Expansion économique régionale, la nouvelle Direction de l'analyse et de la liaison a préparé une série de travaux analytiques présentant des caractéristiques assez spéciales. Le but premier de ce document est de préciser les différences qui existent entre l'analyse dans un contexte de politique et les autres formes d'analyse.

On y présente un modèle ayant trait aux valeurs, aux politiques, au phénomène de la structure et aux résultats du système. Le modèle, un moyen proprement heuristique, provient d'une théorie générale sur les systèmes et s'applique au domaine complexe de la prise de décisions en matière de développement régional.

Plusieurs expériences d'analyse, considérées comme des prototypes de la catégorie de travaux entrepris par la Direction, sont décrites et comparées aux règles du modèle mentionné dans le paragraphe précédent. À partir de cette comparaison, il est possible d'évaluer les points forts et les lacunes des activités en cours.

Finalement, on suppose que certaines caractéristiques du milieu d'élaboration des politiques sont modifiées afin de découvrir comment ce dernier pourrait évoluer au cours des années pour les chercheurs désireux de devenir ou de demeurer associés aux systèmes d'élaboration des politiques. On explorera deux directions de changements possibles. Dans le premier cas, le système tend vers une plus grande capacité

A FINANCIAL AND ECONOMIC FRAMEWORK FOR INVESTMENT APPRAISAL

by John C. Evans

ABSTRACT

Project appraisal usually requires the integration of a broad range of data on the engineering, technical, marketing, financial, and economic aspects of an investment opportunity. The appraisal process described in the paper has been developed by the Program Evaluation Division of the Department of Regional Economic Expansion.

In any project evaluation, it is important to distinguish between the private and public perspective. The private perspective, on one hand, makes use of a discounted cash-flow analysis to determine commercial viability; the public perspective, on the other, focuses on the net present value of social benefits and costs in order to determine economic viability. Economic externalities provide the links between the cash-flow items and the net social benefits; special attention is given to the differences between (a) the private and social dis-

UN CADRE FINANCIER ET ÉCONOMIQUE POUR L'ÉVALUATION DES INVESTISSEMENTS

par John C. Evans

RÉSUMÉ

L'évaluation d'un projet exige habituellement une grande variété de données sur les aspects de l'ingénierie et de la commercialisation, de la technique, des finances et de l'économie d'une possibilité d'investissement. Le processus d'évaluation décrit dans le présent document a été élaboré par la Division d'analyse des programmes du ministère de l'Expansion économique régionale.

Dans toute évaluation d'un projet, il est important de faire la distinction entre les perspectives privée et publique. D'une part, la perspective privée utilise une analyse de flux monétaire actualisé pour déterminer la viabilité commerciale; d'autre part, la perspective publique insiste sur la valeur nette actuelle des bénéfices et coûts sociaux afin de déterminer la viabilité économique. Les aspects économiques extérieurs établissent le lien entre les éléments du flux

count rates, (b) the market value and social opportunity cost of foreign exchange, and (c) the private wages bill and the social opportunity cost of labour. Both commercial and economic viability are important in determining the magnitude of direct public sector financial assistance for projects.

The project appraisal methodology is then examined in relation to the problems of efficiency and equity as they arise in the context of regional development.

monétaire et les bénéfices sociaux nets; on accorde une attention toute spéciale aux différences entre : *a*) les taux d'escompte privé et social; *b*) la valeur marchande et le coût d'option social des devises étrangères; *c*) la masse globale des salaires privés et le coût d'option social de la main-d'oeuvre. Les possibilités de viabilité tant commerciale qu'économique sont importantes pour déterminer l'ampleur de l'aide financière directe aux entreprises du secteur public.

La méthode d'évaluation d'un projet est ensuite examinée en fonction des problèmes d'efficacité et de capital qui surviennent dans le contexte du développement régional.

THE PUBLIC RESPONSE TO THE CHALLENGE OF RURAL DEVELOPMENT IN CANADA

by M.A. Qadeer

ABSTRACT

About 35 per cent of the Canadian population lives in rural areas, villages and small towns. These are not bucolic communities living in a Victorian paradise. The mass society has engulfed rural and small communities. Sociologically, they resemble cities. Economically, they support a wide variety of activities: farming, mining, manufacturing, retirement and tourism, trade, etc. A typical Canadian rural community is more likely to be a community of working-class commuters or an industrial

LA RÉACTION DU PUBLIC FACE AU DÉFI DU DÉVELOPPEMENT RURAL AU CANADA

par M. A. Qadeer

RÉSUMÉ

Environ 35 p. 100 de la population canadienne vit dans des régions rurales, des villages ou de petites villes. Ce ne sont pas là des communautés bucoliques vivant dans un paradis victorien. La société de masse a englouti les petites communautés et les communautés rurales. Du point de vue sociologique, elles ressemblent à des villes. Du point de vue économique, on y retrouve une grande variété d'activités : l'agriculture, l'exploitation minière, la fabrication, la retraite, le tourisme et le commerce, etc.

town than a farm centre. Economic bases of Canadian rural communities vary over a wide range. The only pervasive characteristic of these communities is that they tend to constitute the lower strata for their respective regional social systems. They are the equivalents of the working-class neighbourhoods of cities. In the absence of higher social echelons, rural communities tend to be truncated social organizations. The poverty observable in rural communities is a reflection of this condition.

Rural development in Canada has been pursued through sectoral programs. These programs have ranged from agricultural development, social service delivery strategies, growth centres, settlement rationalization and municipal planning through land-use regulation to rural industrialization and regional planning. These programs have generally met with the familiar fate: the programs succeed but their objectives fail.

Rural development in Canada has been conceived from a national and regional perspective. It must be regarded as a task or development from the 'bottom up'. In such an approach, the starting point should be an individual community. Through block grants and technical assistance, a rural community must be encouraged to meet its needs and seek the goal of becoming an integrated social structure. A regional plan should arise out of the reconciliation of the individual community plans. A regional plan thus becomes a mechanism of 'trading off' individual community goals and programs.

Au Canada, une communauté rurale typique ressemble davantage à une communauté de banlieusards de la classe ouvrière ou à une ville industrielle qu'à un centre agricole. Les bases économiques des collectivités rurales canadiennes sont d'une grande variété. Leur seule caractéristique commune est qu'elles ont tendance à constituer la couche inférieure de leur système social régional respectif. Elles sont en fait l'équivalent des quartiers ouvriers des villes. En l'absence de classes sociales plus élevées, les communautés rurales ont tendance à être des organisations sociales tronquées. La pauvreté que l'on peut observer dans les communautés rurales est le reflet de cette situation.

Au Canada, le développement rural s'est poursuivi grâce à des programmes sectoriels qui pouvaient s'appliquer au développement agricole, aux stratégies de distribution de services sociaux, aux centres de croissance, à la rationalisation des peuplements et à la planification municipale par des règlements sur l'utilisation des terres, l'industrialisation rurale et la planification régionale. De façon générale, ces programmes ont connu le sort habituel : ils ont réussi, mais les objectifs n'ont pas été atteints.

Le développement rural, au Canada, a été conçu selon des perspectives nationale et régionale. Il doit être envisagé comme une tâche ou un réaménagement à partir de la base. Dans une telle optique, une communauté individuelle devrait servir de point de départ. L'octroi de subventions en bloc et l'apport d'une aide technique doivent inciter la communauté rurale à satisfaire à ses besoins et à tenter de devenir une structure sociale intégrée. La conciliation des plans des communautés individuelles doit déboucher sur un plan régional, le-

quel devient ainsi un mécanisme de « négociation » des buts et des programmes des communautés individuelles.

SOME RECENT DEMOGRAPHIC TRENDS THAT ARE RELATED TO REGIONAL POLICIES

*by Leroy O. Stone**

Contents

Some Major Redistribution Patterns 20

Metropolitan Redistribution Patterns within the Major Regions 29

Population Distribution Shifts Within the Nearby Hinterlands of Metropolitan Areas 32

Rough Estimates of Demographic Processes for Small Regions 40

Conclusion 49

Appendix A: A Rough-and-Ready Procedure for Estimating Population Growth Components in a Small Community .. 53

Bibliography 59

* In revising the first draft of this paper the author has benefited from comments on that draft by Tom Brewis and Chris Taylor. The author is solely and personally responsible for the opinions expressed, or any misinterpretations of data, in this paper. No agency's views are being reflected or opposed in these opinions.

Some Major Redistribution Patterns

Several questions on the population dimension of regional policies have been discussed from time to time. Two matters of apparently substantial interest are the shifting provincial shares of the national population and the degree of concentration of this population into a handful of centres called 'metropolitan areas'.

The population counts from the 1976 census suggest the continuation of a particular pattern of provincial redistribution of population. Over the twenty-five years since 1951, five-year censuses show that only three provinces have been receiving progressively higher percentage shares of the national total — Ontario, Alberta and British Columbia (see Table 1). Alberta's increases have been much more gradual than those of Ontario and B.C. The pace of Ontario's increase slackened significantly from 1971 to 1976, as compared to previous five-year periods since 1951. Very gradually *declining* percentage shares are shown in the census data for New Brunswick, Nova Scotia, Manitoba, and Saskatchewan. Quebec's percentage share held virtually steady at 29 per cent from 1951 to 1966, but by 1976 the *preliminary counts* suggested a recent fall to 27 per cent.

Provincial variation in net migration ratios is the most important factor in provincial population *growth* rate *variation*. Table 2 shows some of the pertinent data. However, this table also makes absolutely clear the importance of distinguishing between a question on area *variation* of growth rates and one on the reasons for the growth rate levels *within a single area*. *Natural increase* is far more important than net migration in accounting for the level of the growth rate in the vast majority of provinces. Thus an analysis of growth that emphasizes *variance explained* is not likely to tell us much about the growth level in a single area.

Since 1966, British Columbia has been the only province in which net migration has been consistently more important than natural increase in accounting for its growth level. Net migration was also the predominant factor in Alberta from 1966 to 1971. Natural increase and net migration were about equally important components of Ontario's population growth rate over the 1966-71 census period, but over the next five years, the natural increase component regained its dominance.

Table 1

Provincial Percentage Shares of Canada's Population, 1951 to 1976

	1951	1956	1961	1966	1971	1976
Canada (in thousands)	14 009	16 081	18 238	20 015	21 568	22 598
	%	%	%	%	%	%
Newfoundland	2.6	2.6	2.5	2.5	2.4	2.4
Prince Edward Island	0.7	0.6	0.6	0.5	0.5	0.5
Nova Scotia	4.6	4.3	4.0	3.8	3.7	3.6
New Brunswick	3.7	3.4	3.3	3.1	2.9	2.9
Québec	28.9	28.8	28.8	28.9	27.9	27.1
Ontario	32.8	33.6	34.2	34.8	35.7	35.9
Manitoba	5.5	5.3	5.1	4.8	4.6	4.4
Saskatchewan	5.9	5.5	5.1	4.8	4.3	4.0
Alberta	6.7	7.0	7.3	7.3	7.5	8.0
British Columbia	8.3	8.7	8.9	9.4	10.1	10.7
Yukon & Northwest Territories	0.2	0.2	0.2	0.2	0.3	0.3

Sources: 1966 Census of Canada, *Vol. I - Population,* Table 1;
1971 Census of Canada, *Bul. 1.1-2, Population, Historical,* Cat. No. 92-702, Table 1; and
1976 Census of Canada, final population counts in Statistics Canada *Daily.*

Table 2

Estimated Net Migration and Natural Increase Ratios,[1] Canada and the Provinces, 1951-56 to 1971-76.

Area	1951-56	1956-61	1961-66	1966-71	1971-76
	%	%	%	%	%
	Net migration ratios				
Canada[2]	4.3	3.0	1.4	2.3	2.3
Newfoundland	0.5	-3.9	-5.2	-4.1	-1.2
Prince Edward Island	-8.2	-3.3	-4.4	-1.9	0.9
Nova Scotia	-1.7	-3.3	-5.5	-0.6	1.0
New Brunswick	-4.0	-3.0	-5.7	-0.3	1.4
Québec	2.4	2.4	1.2	-0.7	-0.3
Ontario	8.3	5.7	3.8	5.3	3.0
Manitoba	0.0	-0.5	-3.1	-2.5	-1.1
Saskatchewan	-4.4	-4.7	-4.9	-8.4	-4.6
Alberta	6.7	5.8	-0.3	4.1	7.0
British Columbia	11.6	7.5	8.6	11.9	9.1
	Natural increase ratios				
Canada	10.5	10.4	8.3	5.4	4.3
Newfoundland	14.4	14.2	13.0	10.0	8.0
Prince Edward Island	9.1	8.7	8.1	4.8	4.5
Nova Scotia	9.8	9.4	8.1	5.0	4.1
New Brunswick	11.5	10.8	8.9	5.7	5.2
Québec	11.7	11.3	8.7	5.0	3.7
Ontario	9.3	9.7	7.8	5.4	4.3
Manitoba	9.4	8.9	7.6	5.1	4.6
Saskatchewan	10.3	9.8	8.2	5.3	4.1
Alberta	12.8	12.8	10.1	7.2	5.9
British Columbia	8.4	9.0	6.4	4.7	3.8

[1] The natural increase ratio is defined as (Births-Deaths)/(Population at the start of the time interval). The net migration is estimated by the difference between population change and natural increase (over the given time interval), and the denominator of the net migration ratio is the same as that of the natural increase ratio. Thus the sum of the two ratios is the overall growth rate for the period in question.

[2] Canadian totals for the 1951-56 period exclude the Yukon and Northwest Territories.

Sources: 1956 Census of Canada, Volume III, Table 2;
1961 Census of Canada, Volume 7.1 Table 1;
1966 Census of Canada, Bulletin S-401, Catalogue Number 99-601, Table 1;
1976 Census of Canada, final population counts in Statistics Canada *Daily;*
Vital Statistics, Volume I, 1974, Cat. No. 84-204, Table 4;
Vital Statistics, Volume III, Table 4; and
unpublished data from Vital Statistics Division for 1975.

The case of Québec is especially notable. While its net migration ratio has been relatively low over 1966-71 and 1971-76 (by rough estimate) and this has contributed to the fall in its share of Canada's population, its natural increase ratio has plunged from being one of the highest before 1966 to one of the lowest since that time. Thus the *natural increase* factor has contributed substantially to the sudden fall in Québec's share of Canada's population.

The growth in the proportion of Canada's population living in the twenty-two 1971 Census Metropolitan Areas (CMAs) appears to have slowed substantially (see Table 3). In 1951, 46 per cent of the national population resided in these areas. Roughly two percentage points or more were added to that figure every five years until 1971. However between 1971 and 1976 the percentage of Canada's population in the CMAs seems to have remained nearly stalled at about 55 per cent.

The figure shown in Table 3 for 1976 is probably too low. However even if we allocate seven-tenths of the difference between the final and preliminary census counts to the CMAs, we still get only a 55.3 per cent concentration in those areas over the course of the year. Judging from the indications provided by the 1976 Census of Canada, the 'rush to the metropolis' has been stalled in its tracks, at least for the time being.

Table 3

Percentage of Canada's Population in Metropolitan Areas, 1951 to 1976
(1976 figures based on preliminary population counts.)

	1971 Area Units					1976 Area Units	
Area	1951	1956	1961	1966	1971	1971	1976
Canada (pop. in 000s)	14 009	16 081	18 238	20 015	21 568	21 568	22 993
1971 Census CMAs	45.6%	48.2%	50.9%	53.4%	55.1%	55.0%	55.1%
Largest three CMAs[1]	24.2%	25.5%	27.2%	29.0%	29.9%	29.7%	29.4%

[1] Montreal, Toronto and Vancouver.

Sources: 1966 Census of Canada, Volume I, Table 1;
1976 Census of Canada, Population, Preliminary Counts; and
unpublished data prepared by Ministry of State for Urban Affairs and Census Field of Statistics Canada.

The census suggests that the concentration of Canada's population into the three largest metropolitan areas (Montreal, Toronto, Vancouver) may be actually *falling* (see Table 3). However we must recognize area variations in the accuracy of census counts, and bear in mind that there is a continuing debate on the boundaries of the metropolitan areas. In spite of these caveats, the census data suggest that in the late 1970s and 1980s we should become prepared to witness a pattern that has already appeared in the United States, where the relative attraction of the biggest metropolitan areas is in decline.

A number of American commentators have noted the declining relative growth of their largest metropolitan areas which are, of course, much larger than those in Canada. Tucker (1976) has just shown that even U.S. internal migration flows are now favouring non-metropolitan areas. David Burnham of the School of Urban and Regional Planning at Queen's has studied U.S. population growth data for the period from 1960 to 1973, by standardizing area boundaries for each growth-rate calculation in each metropolitan area size-group. He found that U.S. metropolitan areas with a population of at least one million in 1960 may have had an absolute population decline since 1970. Those interested in further details on these figures should write to Mr. Burnham for a copy (cf. Forestall, 1975).

This section must not close without raising the statistical artifact issue. In general, beyond a certain population size, increasing mass makes a rapid growth rate difficult to achieve. With a very large mass, even a very low growth rate may involve a large number of people and represent substantial regional adjustment problems. When we compare the metropolitan area growth rate with the national growth rate, there is a necessary convergence of the two rates as the proportion of the national population in metropolitan areas approaches 1.0. These obvious points alone cannot justify treating the Canadian convergence trend as a statistical artifact, however. In 1971 the proportion of Canada's population in the twenty-two Census Metropolitan Areas was just over 50 per cent; twenty years earlier it was about 45 per cent. These values could hardly cause the statistical artifact phenomenon to dominate the Canadian convergence trend. It undoubtedly influences the computed growth rates, but its relative importance remains a moot point.

It can be argued that, in its spatial structure, the Canadian economy is increasingly being organized around a system of linked urban areas (cf. Simmons, 1975), with the largest metropolitan areas at its centre. In this system intermediate importance is assumed by a set of medium-sized cities. This urban system could be said to generate (and/or mediate) flows to and from a set of broad regions that have had distinctive histories of development, cultural influences, and possibly some degrees of specialization in particular kinds of raw material extraction and processing.

Keeping this concept in mind, it is of interest to look at recent population growth rates of metropolitan areas, of relatively large cities outside metropolitan areas (called Census Agglomerations), and of other parts of Canada. A lack of time has prevented us from breaking down these other parts in a way that preserves constant boundary units for the calculation of population growth rates. However, this breakdown could be done without great difficulty by using provincial boundaries.

Table 4 shows recent growth rates for the three kinds of areas just mentioned, and for a small sample of constant boundary centres with a population of less than 30 000. From 1951-56 to 1966-71 the twenty-two 1971 Census Metropolitan Area populations have grown at a faster rate than Canada as a whole, holding their boundaries constant as of 1971. Until 1961, the gap between the two rates was slightly above one percentage point (average annual growth rates); but since 1961 the gap has fallen to slightly below one percentage point. Over the 1966-71 census period the national average annual population growth rate was 1.5 per cent: from 1971 to 1976 it was 1.3 per cent.

The Census Agglomerations have not managed to grow as rapidly as the Census Metropolitan Areas, although there are a number of individual exceptions. The 'Remainder of Canada', mostly the small urban centres and rural communities, has grown even more slowly. These are all approximately 'constant boundary' growth rates. It is well-known that the growth of centres includes lateral expansion and the rise of new centres. However, for the purposes of this paper, I wanted to consider figures that eliminate (as much as feasible, with a modest effort) the effects of boundary changes on the computed growth rate.

The data in the last line of Table 5, which represents a sample of 216 small centres for which boundary changes have been statistically controlled, may be more representative of 'Small Town Canada' than those in the fourth line. The rates in the last line are based on the aggregate population of the centres. The figures suggest growth rates quite similar to the national one (even though they are somewhat below it) in all but one of the four periods. The exception is the 1966-71 period, when the growth rate for the sample areas was seven-tenths of a percentage point below the Canadian one.

We must bear in mind, however, that by eliminating boundary changes, we may have stacked the cards against the small centres (cf. Hodge and Qadeer, 1976). In addition, we still have to tell the story of the 1971-76 period, when the growth rates of the largest Census Metropolitan Areas may have slackened substantially when compared to those for other areas of Canada. (Final 1976 census population figures for small centres were not available when this paper was written.)

Table 4

Estimated Average Annual Growth Rates for Canada and Types of Canadian Region, 1951-56 to 1966-71 (Constant boundaries approximated)

Type of area[1]	1951-56	1956-61	1961-66	1966-71
	%	%	%	%
Canada	2.76	2.52	1.86	1.49
Census Metropolitan Areas[2]	3.80	3.65	2.69	2.21
Census Agglomerations	2.63[1]	2.49[1]	2.13[4]	1.39[2]
Remainder of Canada	1.75[1]	1.28[1]	0.08[4, 5]	0.05[2, 5]
Sample of 216 small centres[2]	2.41	2.36	1.46	0.81

[1] Census Agglomerations are mostly city municipalities with a population of over 30 000 along with their adjacent built-up territory. "Remainder of Canada" means parts of Canada outside CMAs and CAs. This table was prepared by Queen's University students, Malcolm Boyd and Yue-Kwan Tam.

[2] All data are based on 1971 area units.

[1] Data are based on 1961 area units.

[4] Data are based on 1966 area units.

[5] Since CMAs that underwent boundary expansions between 1961 and 1971 received most of their new territory from this category, the growth rates shown in these two columns for the remainder of Canada are unduly deflated for the purposes of comparison.

Sources: Unpublished census tabulation;
1971 Census of Canada, *Population: Incorporated Cities, Towns and Villages,* Bul. 1.1-8, Cat. No. 92-708, Tables 8 and 9;
1966 Census of Canada, *Population: Incorporated Cities, Towns and Villages,* Vol. 1 (1-7), Cat. No. 92-607, Tables 11 and 12; and
1961 Census of Canada, *Population: Geographical Distributions,* Vol. I (Part 1), Tables 10 and 11.

Table 5

Average Annual Growth Rates for the Metropolitan and Non-metropolitan Parts of the Five Major Regions of Canada from 1951-56 to 1971-76 (Area units as of 1971)

Area	1951-56	1956-61	1961-66	1966-71	1971-76
Canada[1]	2.76	2.52	1.86	1.49	1.28
Atlantic CMAs	3.24	2.49	1.62	1.33	2.64
Atlantic non-CMA	1.36	1.20	0.58	0.67	0.73
Quebec CMAs	3.40	3.65	2.86	1.39	0.90
Quebec non-CMA	1.88	1.34	0.69	0.09	0.36
Ontario CMAs	4.00	3.49	3.01	2.42	1.31
Ontario non-CMA	2.22	1.95	0.91	1.34	1.58
Prairie CMAs	4.99	4.58	2.66	2.41	2.19
Prairie non-CMA	0.83	0.59	0.16	-0.35	0.45
British Columbia CMAs	3.39	3.36	2.41	2.85	1.81
British Columbia non-CMA	4.03	2.59	3.37	3.38	3.27

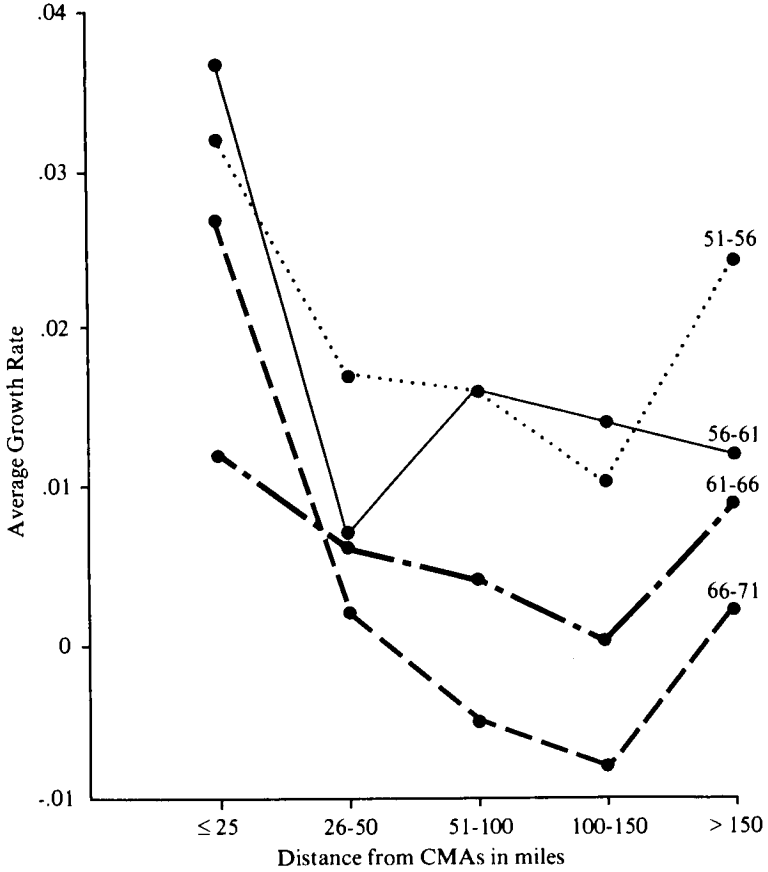
[1] The figures shown pertain to all of Canada, including the Yukon and Northwest Territories.

Sources: Unpublished census tabulation, 1971 Census of Canada, Volume 1.1, Tables 2 and 8; and
1976 census final population counts in Statistics Canada *Daily*.

Another important point is that there are clearly identifiable sub-sets of small centres that appear to be showing significantly higher-than-average growth rates in recent years. This information has been brought to my attention through work done by three students in the School of Urban and Regional Planning – Stewart Clatworthy, Yue-Kway Tam and Kent Stewart. They show that recently, small areas within twenty-five miles of a CMA tend to show *relatively* buoyant growth (see Chart 1). The same appears to hold true for small towns with a population in the neighbourhood of 10 000.

Chart 1

Average Annual Growth Rates for a Sample of 216 Small Centres, Classified by Distance Zone from the Nearest Census Metropolitan Area 1951-56 to 1966-71



Source: Reproduced from Clatworthy and Tam (1976), and based on Census of Canada population statistics.

Metropolitan Redistribution Patterns Within the Major Regions

What do the data suggest about the trends in population redistribution between metropolitan and non-metropolitan areas within the five so-called "Major Regions of Canada" (Atlantic, Québec, Ontario, Prairies and British Columbia)? In answering this question it would be most desirable to subdivide the non-metropolitan category areas into more homogeneous units. However, we have not had the time to do this so as to statistically control the effects of boundary changes on the calculated growth rates. We recognize the need to be cautious about generalizing from growth rates for two very heterogeneous categories of area; therefore a comparison of metropolitan area and non-metropolitan area growth rates is made for each major region (see Table 5).

Throughout the five census periods from 1951-56 to 1971-76, metropolitan area growth rates have been higher than non-metropolitan ones. The significant exception is British Columbia, where the metropolitan growth rate exceeds the non-metropolitan over the course of only one five-year stretch. Indeed, B.C. non-metropolitan areas have grown faster than the nation over the twenty-five-year period under review. See Tables 5, 6 and 7.

The population growth rate of non-metropolitan areas in Ontario has now overtaken that of the metropolitan areas. The gap was reduced from two percentage points over the 1961-66 period to one percentage point from 1966 to 1971, while the 1976 census counts showed that between 1971 and 1976 the metropolitan area growth rate was in fact the lower of the two. We must bear in mind, however, that all of these observations are based on the census definition of metropolitan area boundaries.

The case of Québec again merits careful attention. It was the only major region whose population grew at an average annual rate of less than 1 per cent between 1971 and 1976. Québec *non*-metropolitan areas have been growing at that low rate since 1961-66. The narrowing gap between the two Québec growth rates (Table 5) reflects steady decreases in the rates for the metropolitan areas, from a high of nearly 4 per cent annually from 1956 to 1961, to a low of just under 1 per cent per annum between 1966 and 1971.

In the Atlantic and Prairie regions there is no similarly clear convergence pattern of the metropolitan and non-metropolitan area growth rates. The regional variation in the convergence pattern is no doubt related to regional differences in the highly heterogeneous non-metropolitan area category. Evidently, a further breakdown of this category is needed.

Table 6

Average Annual Growth Rates, Census Metropolitan Areas, Canada, 1951-56, 1956-61, 1961-66, 1966-71, 1971-76

(Data for periods 1951-56 to 1966-71 are based on area units as of 1971. Data for the period 1971-76 are based on area units as of 1976.)

	51-56	56-61	61-66	66-71	71-76
Calgary	.069	.066	.034	.040	.031
Chicoutimi-Jonquière	.030	.029	.008	.001	.003
Edmonton	.070	.054	.033	.031	.022
Halifax	.041	.025	.016	.012	.013
Hamilton	.038	.032	.026	.017	.010
Kitchener	.036	.037	.043	.033	.026
London	.032	.029	.023	.024	.013
Montréal	.034	.038	.030	.013	.005
Ottawa-Hull	.033	.043	.029	.026	.022
Québec	.025	.029	.028	.019	.016
Regina	.045	.044	.030	.012	.014
St. Catherines-Niagara	.042	.020	.020	.012	.011
St. John's	.027	.031	.019	.023	.017
Saint John	.018	.021	.012	.005	.011
Saskatoon	.054	.054	.039	.017	.011
Sudbury	.058	.033	.014	.026	-.001
Thunder Bay	.035	.031	.011	.007	.008
Toronto	.044	.040	.035	.028	.015
Vancouver	.034	.035	.034	.030	.015
Victoria	.032	.027	.019	.022	.022
Windsor	.026	.008	.019	.016	-.001
Winnipeg	.029	.029	.013	.012	.010

Source: Reproduced from Hunter (1976), and based on Census of Canada population statistics.

Table 7

Estimated Net Migration and Natural Increase Ratios for Census Metropolitan Areas,[1] 1966-71

Area	Natural increase ratio[2]	Net migration ratio		Per cent of 1966-71 census in-migrants who were from abroad
		Total net migration based on vital statistics[3]	Estimated net internal migration ratio[4]	
	%	%	%	%
Calgary	8.0	14.0	9.7	22.1
Chicoutimi-Jonquière	5.8	-5.1	-2.6	9.8
Edmonton	8.5	6.6	5.2	19.6
Halifax	5.9	-1.8	0.7	13.9
Hamilton	5.3	3.3	2.7	33.9
Kitchener	7.3	10.7	5.4	29.7
London	5.3	8.2	4.5	24.4
Montreal	4.5	0.9	1.2	36.7
Ottawa-Hull	5.8	5.7	7.4	22.2
Québec	4.9	4.4	6.2	8.9
Regina	7.2	-0.9	0.2	10.1
St. Catherines-Niagara	4.3	2.0	0.4	29.3
St. John's (Nfld.)	8.0	4.9	2.6	10.9
Saint John	4.7	-5.7	0.8	11.0
Saskatoon	7.5	1.6	0.6	10.5
Sudbury	7.5	0.5	4.6	14.8
Thunder Bay	3.7	0.0	1.2	20.1
Toronto	6.2	8.0	0.4	55.0
Vancouver	3.7	12.8	7.2	32.0
Victoria	0.6	8.7	9.5	17.8
Windsor	5.2	2.4	0.5	38.9
Winnipeg	4.4	-2.6	-0.4	26.6

[1] The data in the first two columns are based on the municipalities (within CMAs) for which vital statistics were available and which did not have 1966-71 census boundary changes.

[2] See Table 2, footnote [1]

[3] See Table 2, footnote [1]

[4] See Table 2, footnote [1] (ignoring the reference to inter-provincial migration only). It is very likely that these figures are biased upward (i.e. in the direction of *positive* net migration because the statistics do not include persons who had moved away from a given CMA but failed to report their 1966 place of residence adequately in the 1971 census. Also the actual levels of the figures in any one row (line) are NOT comparable. The census migration data (3rd and 4th column from the left) refer only to persons who were alive on June 1, 1966. What is significant is the pattern of variation within a single column, and the *general* order of magnitude of each number. Precise comparisons of the levels of numbers are to be avoided throughout in this table.

Sources: Vital Statistics, Catalogue No. 84-202, 1966 to 1971;
1971 Census of Canada, Catalogue No. 92-702, Bulletin 1.1-2 and Catalogue No. 92-746, Bulletin 1.5-6.

Now we return to the issue of the statistical artifact which arises within the growth rate comparisons because of the relative population sizes of the areas being compared. Since 1951, the base population of Ontario metropolitan areas has risen much more rapidly than that of the non-metropolitan areas: this has strengthened the influence of statistical artifact. However, a similar pattern is not observed in British Columbia. The fact that the non-metropolitan area is getting a progressively larger share of the province's population does not seem to be reducing the gap between its growth rate and that of the metropolitan areas. It could be that the sizes are just not large enough for the statistical artifact influence to interfere significantly. However, these observations do suggest that we have to be cautious about calling all of the convergence trend in population growth rates a statistical artifact.

Population Distribution Shifts Within the Nearby Hinterlands of Metropolitan Areas

Over the last 25 years, we have seen metropolitan areas consistently outstripping the national population growth rate. Much of the recent policy concern about the area distribution of population growth has been directed toward these areas. A related concern has been the pattern of population redistribution within and in the immediate hinterland of the metropolitan areas. It is relevant, therefore, to study the pattern of population growth for the component parts of the territory made up of a metropolitan area and its immediate hinterland. Table 8 presents pertinent data on five-year population growth rates from 1951-56 to 1966-71.

In order to compile this table each Census Metropolitan Area and its adjacent municipalities have been subdivided into "rings" of approximately constant boundary areas. At the centre of the rings, for a particular CMA, is the urban core for the approximate "real" central city; this is the group of municipalities which contain the major continuous built-up area (in the CMA). Around the core is Ring One, or the remainder of the CMA as defined for the 1971 census. Thus the urban core municipalities plus Ring One form the CMA as defined for the census.

Table 8

Five-year Growth Rates for Two Parts of Each 1971 Census Metropolitan Area, and for Selected Rings of Surrounding Municipalities

(Calculations based on constant boundary areas as of 1971)

Area	1971 population in 000s	Growth rates 1951-56 %	1956-61 %	1961-66 %	1966-71 %
Canada	21 568	14.8	13.4	9.7	7.7
Calgary CMA	403	42.1	38.5	18.5	22.0
Urban core municipalities[1]	403	42.1	38.5	18.5	22.0
Ring I[2]	32	3.4	-17.3	-3.0	26.2
Ring II[3]	106	10.3	9.0	5.3	1.4
Ring III	177	6.2	11.6	-0.2	10.8
Chicoutimi-Jonquière CMA	134	21.0	15.7	4.2	0.6
Urban core municipalities	110	19.7	15.8	3.6	1.0
Ring I	23	27.8	15.2	7.2	-1.4
Ring II	19	18.5	4.6	-0.7	4.9
Ring III	37	24.5	17.5	5.0	3.2
Edmonton CMA	496	42.1	30.8	18.2	16.5
Urban core municipalities	438	45.0	30.4	16.6	14.8
Ring I	58	18.0	34.0	34.4	32.2
Ring II	88	2.3	1.7	-3.3	5.8
Ring III	123	3.2	3.4	1.4	4.1
Halifax CMA	223	23.2	13.4	8.6	6.1
Urban core municipalities	187	21.1	11.5	6.9	4.0
Ring I	36	41.4	28.0	19.8	18.1
Ring II	28	25.1	29.8	12.8	13.0
Ring III	44	5.9	5.3	2.1	8.6
Ring IV	102	8.9	5.2	3.2	4.3
Hamilton CMA	499	21.2	17.4	14.0	9.0
Urban core municipalities	441	18.6	15.2	13.6	8.9
Ring I	58	52.4	38.4	17.7	9.7
Ring II	115	8.1	8.3	9.0	8.0
Ring III	44	7.2	8.9	2.5	5.4
Kitchener CMA	227	19.8	20.3	24.2	18.0
Urban core municipalities	151	24.8	23.1	27.8	19.2
Ring I	76	12.2	15.7	17.7	15.6
Ring II	92	14.8	15.4	14.0	14.9
Ring III	64	10.7	8.6	9.3	10.5

Table 8
(continued)

Area	1971 population in 000s	Growth rates 1951-56 %	1956-61 %	1961-66 %	1966-71 %
London CMA	286	17.1	15.4	11.9	12.7
Urban core municipalities	223	20.4	17.1	14.6	14.8
Ring I	63	8.7	10.9	3.8	5.9
Ring II	78	9.5	8.0	1.7	7.7
Ring III	77	6.6	4.7	4.4	5.8
Montréal CMA	2 743	18.9	21.1	16.0	6.7
Urban core municipalities	2 555	18.4	20.4	15.1	5.9
Ring I	188	29.1	34.1	32.0	19.2
Ring II	158	13.0	14.2	7.5	6.9
Ring III	199	9.7	14.4	8.9	6.2
Ring IV	124	8.9	7.5	8.9	5.1
Ottawa-Hull CMA	603	18.0	24.3	15.7	13.9
Urban core municipalities	514	16.0	24.0	14.6	9.2
Ring I	88	39.7	26.4	25.2	52.3
Ring II	51	5.8	9.2	3.5	14.5
Ring III	63	3.9	5.8	0.4	2.4
Ring IV	160	14.1	6.2	2.5	1.8
Québec CMA	481	13.5	15.4	15.3	10.0
Urban core municipalities	413	12.8	14.6	15.0	8.4
Ring I	68	19.5	21.8	17.0	20.7
Ring II	34	6.0	5.6	4.9	5.6
Ring III	37	9.5	4.0	3.4	0.4
Regina CMA	141	25.4	24.7	16.4	6.3
Urban core municipalities	139	25.8	24.8	16.9	6.4
Ring I	1	1.9	15.4	-17.6	-2.4
Ring II	9	-1.2	2.9	- 6.4	-6.2
Ring III	57	15.4	2.9	- 2.9	-9.1
Ring IV	43	-1.6	-0.4	-4.1	-8.8
St. Catherines-Niagara CMA	303	23.3	10.6	10.7	6.3
Urban core municipalities	125	26.1	12.1	13.9	8.6
Ring I	179	21.5	9.7	8.7	4.8
Ring II	28	15.3	10.6	12.9	9.7
Ring III	11	6.3	9.0	7.9	7.1

Table 8
(continued)

Area	1971 population in 000s	Growth rates 1951-56 %	1956-61 %	1961-66 %	1966-71 %
St. John's CMA (Nfld.)	132	16.1	15.2	10.2	12.2
Urban core municipalities	98	12.3	11.5	9.4	12.7
Ring I	34	30.5	27.6	12.6	10.5
Ring II	40	13.2	4.0	-5.0	-5.8
Ring III	24	8.9	1.7	-1.2	-0.4
Ring IV	18	17.0	12.3	7.7	19.2
Saint John CMA (N.B.)	107	9.5	11.0	6.2	2.4
Urban core municipalities	91	9.1	10.1	4.6	-0.7
Ring I	16	13.6	18.6	19.6	24.8
Ring II	9	4.0	-9.7	1.5	10.0
Ring III	31	5.9	58.7	7.9	-4.8
Ring IV	21	3.8	-2.3	-3.3	1.2
Saskatoon CMA	126	31.0	31.0	21.3	9.1
Urban core municipalities	126	31.0	31.0	21.3	9.1
Ring I	20	3.8	-2.0	-5.1	0.7
Ring II	28	-3.4	-5.4	-5.2	-9.1
Sudbury CMA	155	34.0	18.1	7.3	13.7
Urban core municipalities	95	25.4	9.8	5.5	7.0
Ring I	61	60.5	38.2	10.8	25.8
Ring II	7	125.7	62.6	17.8	34.1
Ring III	2	9.4	14.3	3.8	17.9
Thunder Bay CMA	112	18.9	16.5	5.8	3.8
Urban core municipalities	108	18.8	16.6	6.0	3.7
Ring I	4	19.6	13.2	2.4	5.3
Ring II	3	31.7	11.6	-10.0	7.5
Toronto CMA	2 628	24.6	22.1	19.3	14.8
Urban core municipalities	2 345	23.6	20.9	17.6	13.4
Ring I	283	37.6	37.0	37.5	27.9
Ring II	237	24.8	21.7	16.5	16.0
Ring III	61	20.4	10.2	8.2	15.2
Vancouver CMA	1 082	18.5	19.1	12.9	16.0
Urban core municipalities	814	14.5	13.6	11.3	11.0
Ring I	268	43.8	47.1	19.0	34.4
Ring II	56	22.1	4.0	13.5	16.1
Ring III	27	17.2	10.7	9.0	9.0
Ring IV	20	21.4	4.1	5.4	26.0

Table 8
(continued)

Area	1971 population in 000s	Growth rates 1951-56 %	1956-61 %	1961-66 %	1966-71 %
Victoria CMA	196	18.5	14.4	12.5	11.7
Urban core municipalities	158	16.0	12.4	11.0	7.2
Ring I	38	38.7	28.3	21.7	35.9
Ring II	37	13.6	9.8	12.2	14.0
Ring III	102	26.4	13.9	18.3	16.9
Ring IV	28	28.5	14.3	74.3	31.3
Windsor CMA	259	14.2	4.2	9.7	8.5
Urban core municipalities	210	13.2	3.7	9.2	5.6
Ring I	48	19.4	6.8	12.2	23.2
Ring II	58	10.4	6.0	7.5	11.0
Ring III	75	9.0	5.4	7.6	5.2
Winnipeg CMA	540	15.5	15.5	6.8	6.2
Urban core municipalities	533	15.6	15.3	6.7	6.1
Ring I	7	14.5	29.1	11.9	17.6
Ring II	61	2.2	5.0	3.4	1.8
Ring III	75	7.0	0.4	1.6	-2.8
Ring IV	58	0.6	-3.1	-3.0	-6.9

[1] The urban core municipalities form a group that contains one continuous built-up area that includes the CMAs largest municipality. Except for the parts of such a group that are not within the continuous built-up area, this group may be said to form the 'real' central city of the CMA (its metropolis).

[2] Ring I is comprised of the remainder of the CMA as defined for the 1971 census.

[3] Ring II consists of municipalities adjacent to and surrounding Ring I; Ring III consists of municipalities adjacent to and surrounding Ring II; and Ring IV consists of municipalities adjacent to and surrounding Ring III. However, the delineation was done in such a way as to keep the outer boundary of each ring constant for 1951 to 1971.

Sources: 1971 Census of Canada, Catalogue No. 92-702, Bulletin 1.1-2 and Catalogue No. 92-708, Bulletin 1.1-8.

Additional rings of municipalities are then delineated around the CMA. Ring Two consists of the municipalities that are adjacent to the CMA, plus any others that must be added (because of boundary changes) in order to form a constant outer boundary for the ring from 1951 to 1971. Similarly, Ring Three immediately surrounds Ring Two and Ring Four surrounds Ring Three.

Not every CMA has four rings around its urban core. The number of rings depends on the size of the CMA and on the proximity of the CMA to others. The choice of the number of rings, in individual cases, is largely arbitrary (and is based on personal judgement as to the zone of immediate influence of the CMA). A tedious and time-consuming effort was expended on each entry to ensure that boundary changes would have a negligible effect on the growth rates calculated for each ring.

Table 8 shows the resulting data for each CMA. The first line shows the corresponding five-year population growth rate for Canada as a whole. The first line for a particular CMA contains the five-year growth rate for the CMA, *as defined for the 1971 census, not* for the sum of the CMA plus surrounding rings. It is *not* advisable to compute national averages of growth rates for a given type of ring (e.g. a Canadian average growth rate for all Ring One areas), because the type of area that comprises a given ring varies markedly from one CMA to another.

It was suggested above that recently there has been a significant decline in the growth-rate difference between the metropolitan and non-metropolitan populations of Canada. A substantial component of this recent development is a progressive decrease of growth rates in the *urbanized cores of the larger CMAs.* However as late as 1966-71, most of the urban cores of CMAs were still growing more rapidly than Canada as a whole (although we must bear in mind the tremendous differences between the population sizes of these units). During the 1966-71 period, ten of the twenty-two CMA urbanized cores were growing more slowly than Canada as a whole, whereas only five of these areas showed such a pattern between 1951 and 1956. In every period since 1951-56, the number of CMA urban cores growing more slowly than Canada has risen. It is a good guess that this trend has continued through 1971-76, when the largest municipalities of several Census Metropolitan Areas sustained absolute declines in population.

A list of CMAs with *urban core municipalities* growing more slowly than the country as a whole over the 1966-71 census period follows:

Area	*1966-71 growth rate (%)*
Canada	7.7
Chicoutimi-Jonquière urban core	1.0
Halifax urban core	4.0
Montreal urban core	5.9
Regina urban core	6.4
Saint John (N.B.) urban core	-0.7
Sudbury urban core	7.0
Thunder Bay urban core	3.7
Victoria urban core	7.2
Windsor urban core	5.6
Winnipeg urban core	6.1

The CMAs with urban core municipalities achieving growth rates of at least five percentage points *above* the national one are:

Area	*1966-71 growth rate (%)*
Canada	7.7
Calgary urban core	22.0
Edmonton urban core	14.8
Kitchener urban core	19.2
London urban core	14.8
St. John's (Newfoundland) urban core	12.7
Toronto urban core	13.4

These two lists show that the population of a CMA, or of its urban core, had very little correlation with the tendency to lag behind, or substantially surpass, the national growth rate in 1966-71.

When we compare the growth rates of the CMA rings, as defined for Table 8, it is important to bear in mind that some Census Metropolitan Areas have extensive urban development around their urban cores, while others do not. The latter group includes the Prairie and Atlantic CMAs in particular.

The Ring One zones continue to be areas of unusally rapid population growth as compared to Canada as a whole. (Bear in mind that Ring One is comprised of the band of municipalities that are immediately adjacent to the CMA urban cores.) The list of areas in which the Ring One five-year growth rates for 1966-71 exceed the overall CMA growth rates by at *least five percentage* points as follows:

Area	CMA growth rate (%)	1966-71 Ring One growth rate (%)
Edmonton	16.5	32.2
Halifax	6.1	18.1
Montreal	6.7	19.2
Ottawa-Hull	13.9	52.3
Québec	10.0	20.7
Saint John (N.B.)	2.4	24.8
Sudbury	13.7	25.8
Toronto	14.8	27.9
Vancouver	16.0	34.4
Victoria	11.7	35.9
Windsor	8.5	23.2
Winnipeg	6.2	17.6

For only three CMAs are the 1966-71 Ring Two growth rates at least five percentage points *above* the CMA growth rates. (Bear in mind that Ring Two is made up of the municipalities that are directly adjacent to, but outside of, the defined CMA boundaries.) These areas are Halifax, Saint John (N.B.), and Sudbury. The comparative figures are shown below:

Area	CMA growth rate (%)	Ring Two growth rate (%)
Halifax	6.1	13.0
Saint John (N.B.)	2.4	10.0
Sudbury	13.7	34.1

Table 8 shows that in ten of the CMAs the Ring Two growth rate for 1966-71 was *below* that of the CMA. In three of them there was an absolute population decline in the Ring Two area: these were Regina, St. John's (Newfoundland), and Saskatoon. As we move out toward the Ring Three and Ring Four municipalities (where they are delineated) we see even more areas where absolute declines of population are evident.

These broad patterns agree with the findings of Clatworthy and Tam, and are based only on a sample of 216 municipalities with a population of less than 30 000 (Chart 1). Within CMA hinterlands, the area immediately adjacent to the CMA urban cores continues to show much higher than average rates of population growth. The drop in growth rates within the urban cores is an important reason for the convergence of metropolitan and non-metropolitan population growth rates in Canada (although there are others). Small centres with good commuting access to an urban core are the ones most likely to attract some of its population.

Shortage of time has not permitted an analysis of the demographic processes underlying the growth rate variations just summarized. However, in terms of net migration *rates,* we might reasonably expect that internal migration flows will benefit the Ring One zones most strongly. The urban cores, especially in the larger centres, may be 'relying' much more heavily on international migration in relation to their surrounding rings) to attain substantial positive net migration rates. It may also be reasonably assumed that young families will continue to favour residence in the Ring One zones more than others, and therefore boost the natural increase potential of these areas. I plan to provide data for evaluating these speculations at a later time.

We must be constantly aware of the necessity to use arbitrary boundary lines in delineating the area units mentioned above. The relatively high growth rates of CMA Ring One zones, for example, may be merely a reflection of the normal and historic process of lateral expansion by vigorous urban centres. However, by including additional rings that are not parts of the CMAs we have shown clearly that the concentration of relatively high growth rates is indeed in the immediate zone of easy commuting to and from the CMA urban cores.

Rough Estimates of Demographic Processes for Small Regions

If regional policies are to be aimed partly at the management of growth in small communities, it would be advisable to provide supporting analyses of their growth performance. An important preliminary step for population growth analysis is the effort to estimate patterns of inter-community variation in the underlying demographic processes. A further step would be to connect the estimated patterns of migration and natural increase with their hypothesized important determinants and consequences. Finally, a clarification of the ways in which policies might be brought to bear effectively on those determinants is required.

Unfortunately, substantial hurdles stand in the path of such a research strategy. Among them is the poor development of both theory and empirical work on the determinants of the patterns of inter-area variation in the demographic processes, particularly for small regions (in fact this holds true for all kinds of regions). The potential complexity of interrelationships among the pertinent variables suggests that simple formulations leading to elegant mathematical functions may be largely inadequate to deal with the problem of explanatory analysis. It is tempting to think that elaborate systems of simultaneous equations and exotic estimation procedures are the route to success; but it is advisable to confront this temptation with a few grains of salt such as the

following: (1) a single parameter intended to represent the influence of a variable over a large part of its range may be inherently incapable of doing so outside of a small neighbourhood of the average value of that variable, (2) the statistical configurations that a particular data set embodies, and which determine values of parameter estimates, may vary substantially over time and space, with the result that the parameter estimates may not be significantly more stable than the *pattern* of their estimation errors, and (3) when we are dealing with small numbers, one common problem is the substantial error variation in *all* variables (including the ones to which functions are being fitted). Faced with such error variation, we simply cannot routinely apply standard cookbook recipes for analysing the performance of a model. We all know how to sketch theoretical solutions to individual problems (handling their interactive effects is something else again), but practical solutions are seldom feasible.

The problem of error variation caused partly by measurement problems and partly by random fluctuations in small numbers assumes major importance when we turn to the study of small communities in Canada. Analysts bemoan the lack of statistics on the components of population growth and turnover in small communities, but we must confront some very hard facts when we get down to population sizes below 5 000. It becomes a prohibitively expensive proposition to produce high-quality data for simple things like births, deaths, migration, and population size of subgroups within this range. It is easy to conceive of a well-designed and executed survey or administrative data system in a few small areas, but the cost of such an effort quickly runs into the tens of thousands of dollars and hundreds of skilled man-hours. Now multiply that cost over even half of the communities in the country, and you will get an idea of the army of practicing statisticians, and statistically wise administrators, that would be required. In short, when we turn to the analyses of small communities we must be ready to live with large margins of error in our estimates, and be ready to work out procedures for drawing very limited conclusions because of those margins of error. If, for example, you are fitting functions to migration data which suffer from unsystematic errors (that easily range up to 100 per cent with very small populations), you can forget about refined applications of cookbook recipes of estimation and estimate evaluation. Requiring R-squares of 0.90 and above (a minimum required for accurate fits) when there are no mathematically necessary relations among the variables is excessive when you are dealing with small communities. In this context, the results of traditional significance tests which assume very simple profiles of random error may be entirely misleading. In short, in our statistical techniques and generalizations in the world of small communities we will have to develop and live with the 'rough-and-ready' and the 'robust', rather than the highly refined and mathematically sophisticated.

With those thoughts in mind I shall present the preliminary results from an effort to provide some rough-and-ready estimators of the components of population growth and turnover for a sample of small Canadian municipalities. The significance of this effort is twofold. First, you cannot look up any source of 'official' statistics and find this type of data being estimated. Yet an effort to establish such data is vital to improving our understanding of the demography of small Canadian communities. Second, these estimation efforts are important because they can document the deficiencies in existing data bases, and point out ways to improve data bases for the purposes of analysis.

The rough-and-ready estimation procedure may be described as follows. Generally, we 'predict' the level of net migration as a simple function of a measure called the cohort growth rate. Where necessary, natural increase can then be obtained from the estimated net migration and the overall population growth rate. Then we predict level of in-migration from functions of symptomatic indicators such as population size, births, and building permits. Next, the estimated out-migration is obtained by subtracting the net migration from the in-migration. The gross migration, or population turnover, is the sum of the in-migration and the out-migration. All the results are then expressed as a percentage of the base population. The practical point is that the predicting variables may be regularly and directly measurable for small communities from available data sets; whereas the migration variables are available only very irregularly, if at all. Measurement errors are a pressing problem, however.

Very simple least-squares estimation (with minor modifications) is used throughout to obtain measures for the parameters in the predicting functions. However, partly because the set of regions used to estimate the parameters has a much larger average population size than the set to which the functions would normally be applied (once estimated), interval estimates, based upon a study of the *pattern* of the residual error term, are emphasized. The quality of these interval estimates leaves much to be desired, although it can be improved substantially by an accumulation of knowledge from repeated application of the general procedure with different data sets. It should be noted that I have deliberately avoided defining interval estimates on the *a priori* assumption that the residual error terms have any general shape (e.g. a normal distribution). The usefulness of such an assumption, when we are of necessity dealing with a small number of area units, can only be appraised in the light of experience gained from studying profiles of residual errors. I have therefore intentionally ignored the statistical cookbook procedures for arriving at regression interval estimates.

Some will argue that the residual error terms are highly unstable, but I see no reason why their *overall* profile should be any more unstable than the estimates of the parameters. Indeed, the very work done for this paper indicates to me that with the data sets in question the regression intercepts and slopes are both highly unstable in different data subsets, and seriously wrong when one goes substantially outside the immediate neighbourhood of the average values of the predictor variables. A claim of parameter stability for these data is analogous to a declaration of faith in divine providence. The search for robustness, which I think is so important when handling available demographic data for small communities, requires that we push interval estimation.

The foregoing remark applies mainly to the estimation of the migration flows, in-migration and out-migration. There is a mathematically necessary connection between the cohort growth rate and the net migration rate which causes an extremely high correlation (R-squared generally *above* 0.90) between them. There is an inherent bias in the least-squares regression estimate of the net migration rate by the cohort growth rate. A formula reflecting this bias is shown in the appendix. For centres with a population of 1 000 to 10 000, Clatworthy and Tam have empirically estimated a bias term which is almost certainly dominated by the inherent bias I have just mentioned. Both the data for the parameter estimates and the empirically-estimated correction factor are given in the appendix. With the correction for inherent bias, then, the estimator of the net migration ratio for a small community may be used to provide useful point estimates.

In short, what I recommend is a simple two-step estimation process in which we make use of information from the *profile* of residual errors. This information is needed partly because of known major differences between the sample used to estimate the parameters and the regions to which the estimates will be applied, in order to achieve reflections of the demographic process operating in small communities.

The network of predicting functions may briefly be summarized as follows:

Net migration	=	Net Migration Ratio	×	Appropriate Base Population	=	f (Cohort Growth Rate)
In-migration	=	f (Population Size, Births, Building Permits)				
Out-migration	=	In-migration	−	Net Migration		
Population Turnover	=	In-migration	+	Out-migration		
Natural increase	=	Population Change	−	Net Migration		

The process of estimating these functions for the 1966-71 census is under way; only partial results are available at this time. In the next paragraph some tabular material on the parameter estimates is introduced briefly. The appendix contains a more detailed technical discussion of the procedures used. Before going into these data, I wish to note that several students in the Urban and Regional Planning School have contributed to the production of the data I am presenting at this time.

The data developed to date may be summarized as follows. Using 1966-71 census data, the net migration ratio function was fitted for a sample of 116 centres with a population of 30 000 by Clatworthy and his colleagues (See Chart 2). For 68 of these centres I have computed the derived natural-increase rates (See Chart 3). I have also computed interval estimates of in-migration and out-migration ratios for these areas using *only* the population size predictor. These data are summarized in Charts 4 and 5.

Chart 2 is divided in two: the top half shows the profile of estimated net migration rates for 50 centres with a population of 1 000 to 5 000; the bottom half shows the corresponding profile for 50 centres with a population of less than 1 000. In both charts the greatest weight of the distribution is on the side of net migration *losses*. This pattern is much more clearly visible for centres with a population of *below* 1 000. This coincides with our previous remark that one finds substantial proportions of areas among these very small centres.

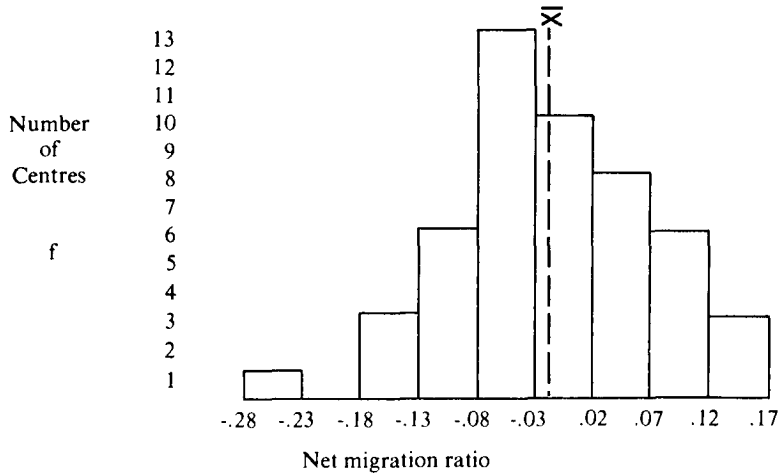
Charts 3 to 5 show natural increase and gross migration flow data for 68 small centres. As expected, the natural increase ratio profiles contain predominantly positive values. However, a few negative values sometimes occur in small communities where the younger age groups are heavily depleted by net out-migration. This has already happened in some rural parts of the United States. Despite the wide margins of error indicated by the interval estimates of the in-migration and out-migration, it is apparent that population turnover is high in relation to the base populations of these communities. Census data suggest this to be true for all sizes of communities in Canada. A substantial portion of the citizens who may participate in local planning may not stay, due to out-migration, to see or be affected by the results of implemented plans.

Volumes of commercial and social services, which depend much more on population turnover than on net migration or sheer growth, may be related to demographic processes using turnover data of the sort reflected in Charts 4 and 5.

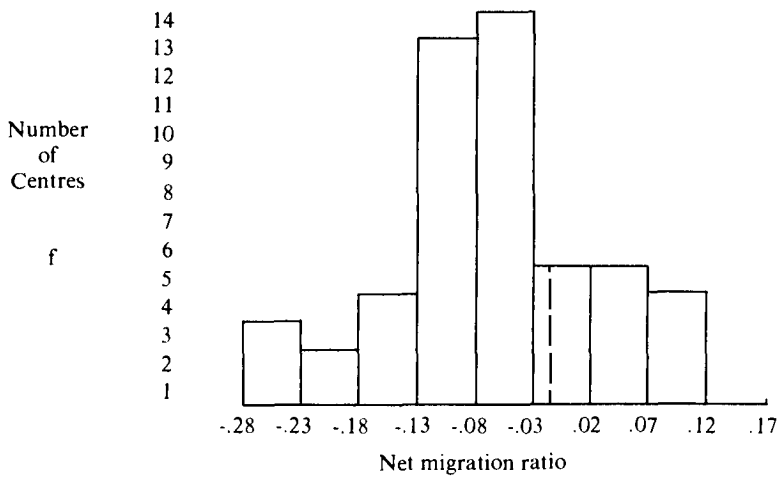
Chart 2

Predicted Net Migration Rates for Two Samples of Small Population Centres, Canada, 1966-71 (Estimates based on regression on cohort growth rates[1])

Fifty centres with population between 1 000 and 5 000



Fifty centres with population less than 1 000

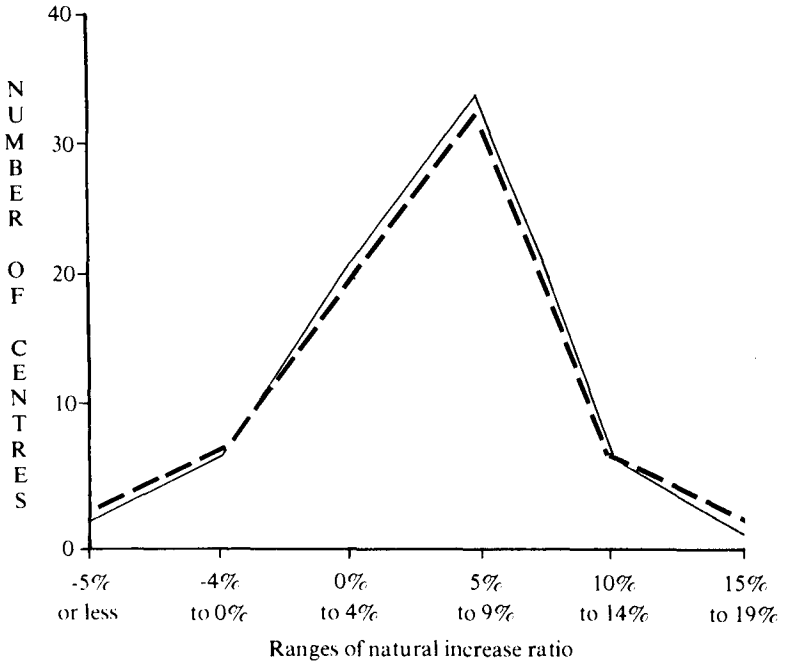


[1] See the appendix for a discussion of the estimation procedure.

Source: Clatworthy, Hatton, Lucat, McMaster, Stewart and Tam, 1976.

Chart 3

Profiles of Natural Increase Rates[1] for Sixty-eight Small Population Centres, Canada, 1966-71

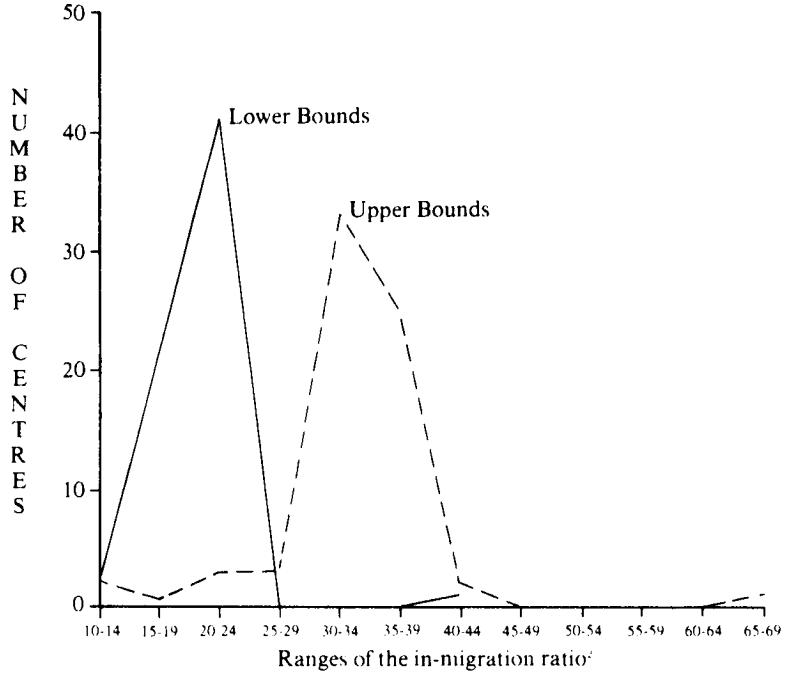


[1] The solid line refers to the vital statistics estimate: (births-deaths/1966 population). The dotted line is derived from the regression estimates of net migration ratios as follows: natural increase rate = (population growth rate – regression estimate of the net migration ratio).

Source: Vital Statistics, Cat. No. 84-202, for 1966 to 1971;
1971 Census of Canada, Cat. No. 92-708, Bulletin 1.1-8;
and unpublished tabulation provided by Ed. Clatworthy based on Statistics Canada data.

Chart 4

Profiles of Interval Estimates[1] of 1966-71 In-migration Ratios for Sixty-eight Small Population Centres in Canada (60 per cent confidence intervals)



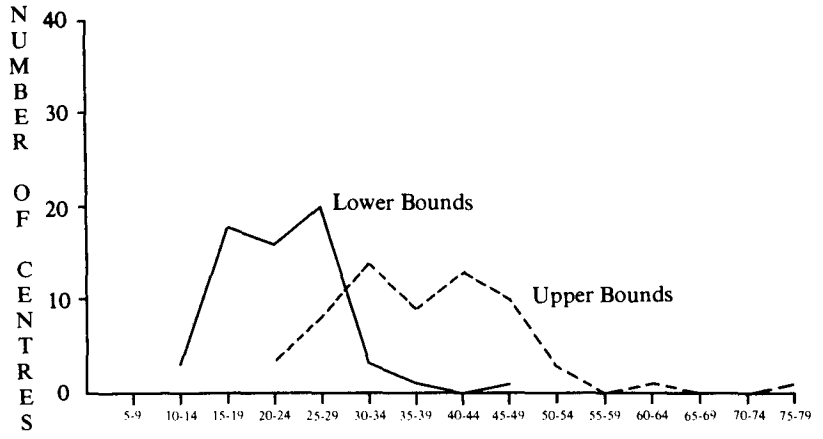
[1] The interval estimation procedure is discussed in the appendix. These curves reflect 60 per cent confidence intervals.

[2] Estimated ratio of in-migrants to the 1971 population.

Source: 1971 Census of Canada, Cat. No. 92-708, Bulletin 1.1-8, Table 7.

Chart 5

Profiles of Interval Estimates[1] of 1966-71 Out-migration Ratios for Sixty-two Small Population Centres in Canada (60 per cent confidence intervals)



[1] The interval estimation procedure is discussed in the appendix. These curves reflect 60 per cent confidence intervals.

[2] Estimated ratio of out-migrants to the 1966 population.

Source: 1971 Census of Canada, Cat. No. 92-708, Bulletin 1.1-8, Table 7.

Conclusion

Population growth management at the local community level should involve careful attention to the network of economic and social interactions between the community and the major nodes of activity and decision-making in Canada. This is not a new idea by any means; but our data on the distribution of growth rates among small communities tend to reinforce it. First, we need to have more theoretical and empirical studies centered on the inter-community interactions mentioned above. Then we need to measure the specific aspects of the 'roles' played by particular centres in the interaction network more systematically, in order to see more clearly whether and how we can intervene effectively in the determination of their growth paths.

When we are rationalizing interventions, we must explicitly conceptualize the assumed linkages between policy instruments and the specific demographic processes that underlie population growth and turnover. The distinctions between the *related* objectives of influencing the *level of growth* in a given area and of managing the *pattern of growth rate variation* over several areas should be worked out. It could well be that the indicated policy instruments, when we shift emphasis from one objective to the other are quite different. Policy advisors concerned with the growth level in a given area should distrust analysts who are anxious to derive sweeping policy implications from complex cross-section analyses of inter-area growth rate *variation.*

Research scientists and policy advisors are going to be hampered by serious measurement errors in data and unstable parameters on small communities for quite a while. Policy-making in this environment has to be largely a process of leaning on experienced 'gut feelings' and on trial and error. The relevant experience most certainly includes the findings of the academic researchers, but definitive indications of assured paths to success in policy should be believed by no one.

Policy advisors who are interested in improving the viability of small communities in Canada will need to soberly confront the predominance of net migration losses and the high ratios of population turnover in these areas. In the regions which share the very low birth rates of the 1970s we will see even higher percentages of small areas with outright population losses when the final 1976 census figures are released. It seems very important then to pinpoint areas where the prospects for improved viability are best and those in which only herculean efforts are likely to help reverse trends considered to be undesirable. This is not a new point by any means, and Brewis (1969) has made it quite clearly in his own work.

When the predominance of net migration losses and high population turnover are confronted, caution should be exercised in making the assumption that 'development' will soon lead the community's sons and

daughters to remain at home rather than move away from the community. Although we do not as yet understand the underlying processes, there is a great deal of cross-section evidence suggesting that higher-than-average 'development' is not associated with lower-than-average rates of out-migration. (Perhaps we will not gain a better understanding of this until good longitudinal studies of community migration become available.) So far, the evidence suggests that higher-than-average 'development' will make a community more attractive to outsiders whose in-migration will help compensate for the volume of out-migration. (One key factor we know nothing about here is the typical proportional weight of *former* in-migrants among the out-migrants from a community.)

In any event, in an era of very low rates of natural increase, those who insist on trying to keep their communities tranquil, closed to outsiders but growing nicely, will have a small problem on their hands. There are some, of course, who want zero growth, but at this stage of our history they rarely mean zero economic growth. In many local communities positive economic growth may require attractiveness to outsiders.

Whatever the future holds, unless we propose to prohibit the community's sons and daughters from moving to what they think are greener pastures for their own personal lives, continued absolute population decline may be very hard to stave off in places where natural increase rates are very low.

Looking at a broader scale of Canadian settlement patterns, it is clear that policies to alter broad regional (and especially provincial) growth rate differences and re-structure the settlement patterns of new immigrants should be supported by much more study of the pattern and strengths of the forces that seem to underlie the growth trends we have seen. We also need a careful assessment of the scale of policy intervention needed to shift these forces effectively, and whether our major political pressure groups are ready to countenance such scales, before we become too optimistic about our ability to alter the major redistribution trends in a major way.

It may well be that once these trends get locked into a politico-economic system they become somewhat like major natural disasters (such as hurricanes and earthquakes), with their own 'logic', momentum and self-adjusting mechanisms which man can alter only marginally. For example, the rate of increasing population concentrations in the very large metropolitan areas may slow down of its own accord as a result of self-correcting forces related to such things as accumulated 'diseconomies' and social 'disamenities'. The practical goal of policy might be mainly to influence the momentum of these big 'natural' forces. There is a similar idea in the notion that local development policies should be predicated on good indicators and analysis of growth

potential, so that implemented policies can ride (rather than buck) major 'natural' waves of population and economic change. We like to think that our future is largely in our own hands, but this line of speculation suggests that this is only very partially true. We should be wary of grandiose assumptions that by a series of largely non-disruptive plans (and concensus politics puts a premium on minimizing disruptive planning; it attempts to keep as many people as possible happy) we can buck these immense forces which our system has now evolved *over a period of decades.*

In spite of these negative remarks concerning the effectiveness of large-scale planning in bucking major forces in Canada, it can be said that the time seems to be growing ripe for a renewed effort to stimulate growth in regions outside of the largest metropolitan areas. The latter will remain dominant as the centres of decision-making and innovation but my guess is that there is a significant message in the established American data, and the growing Canadian indications, that the net attraction of these areas is actually on the decline. Academics and policy advisors must redouble their efforts to theorize and 'research' these new trends usefully, so that we may have a better idea of how to ride the crests of the newly-emerging waves of activity redistribution within Canada–if, of course, that is what we want to do.

I would like to close by offering a set of hypotheses about what has been happening to the spatial pattern of demographic forces in the 1970s. Have we, thus far, witnessed a *major* shift in historic (since 1971) migration patterns? My answer is 'no' with one exception: the steadily growing attraction of Alberta. The growing focus of internal migration flows upon the outskirts of metropolitan areas is not a new development of the 1970s. The likely recent appearance of positive net migration gains in some Atlantic provinces has historical precedents as early as the 1930s. The so-called reversal of heavy net migration losses from Saskatchewan is a restoration of historic patterns, *not* a new trend. So far our data may point to a 're-population' of the countryside only on the edges of metropolitan areas. If the newly-proposed immigration policies are successful we may indeed see a bigger shift in the regional pattern of net migration gains and losses, but for the most part thus far, historic migration patterns are holding firm.

The big changes in the pattern of redistribution, the relative decline of Québec's share of the Canadian population and the sharp drop in the gap between metropolitan and non-metropolitan growth rates reflect migration, of course, but they also reflect the revolutionary change in natural increase since the early 1960s. I speculate that the decline of birth rates has been especially sharp not only in Québec (as compared to the rest of Canada), but in the core zones of the metropolitan areas as well.

If these speculations are correct, and they need to be tested as new data become available, then we must be careful about overplaying the role of migration in the recent population redistribution patterns. Country-side watchers like to talk about the back-to-the-land movement, but what needs to be appreciated is that as the population gets bigger and more affluent, a constant low rate of back-to-the-land migration will produce more and more observations of people leaving the city to live in the country. This process is similar to that of the rising visibility of 'kooks' and 'weirdos' as a city grows. Ottawa people like to talk about this new local phenomenon, but a lot of people seem to forget that as the city gets more and more into the "big leagues" we will necessarily see more and more 'kooks' and 'weirdos' — given their tendency to spatial clustering — even though their proportion of the population at large may not have changed much.

APPENDIX

A Rough-and-Ready Procedure for Estimating Population Growth Components in a Small Community

Let nmr_{vs} be the vital-statistics-and-population-change estimate of the net migration rate (over a specified time period) for an area

NM_{vs} be the estimated net migration

P_{t-h} mean the population of the area at the start of a time interval of length *h*

B be births between times *t-h* and *t*

D be deaths between *t-h* and *t*

$$NM_{vs} = P_t - P_{t-h} - B + D \quad \ldots (1)$$

$$nmr_{vs} = NM_{vs}/P_{t-h} \quad \ldots (2)$$

gr be the population growth rate

$$gr = (P_t - P_{t-h})/P_{t-h} \quad \ldots (3)$$

P(a) be population aged *a*

cgr_{15+} be the cohort growth rate for persons aged 15 and over *at time t-h.*

$$cgr_{15+} = [P_t(20+) - P_{t-h}(15+)/P_{t-h}(15+)] \quad \ldots (4)$$

The regression estimator for the net migration rate is

$$nmr_{vs} = f(cgr_{15+};\lambda)+u \quad \ldots (5),$$

where λ is a vector of parameters, and u is a residual term.

In this work we have used

$$nmr_{vs} \cong a_0 + a_1 \cdot cgr_{15+} \quad \ldots (5a).$$

The terms a_0 and a_1, are linear least-squares regression parameters, and for 1966-71 they have been estimated (by Clatworthy and others) for a sample of 116 small constant-boundary areas with populations of between 1 000 and 30 000. Clatworthy and Tam estimated a correction for bias, in expression

(5a) for a *new* sample of 100 small areas where they had *independently* computed nmr_{vs} using data for expression (1). I believe that their estimate is dominated by the following term:

$$(a_o + a_1 \cdot cgr_{15+}) - (cgr_{5+} + cgr_B + 2 - R_{5+} - R_B) \quad \ldots (6),$$

where

cgr_{5+} means the cohort growth rate for persons aged 5 and over in 1966

cgr_B is the cohort growth rate for those born between 1966 and 1971

R_{5+} is the proportion surviving to age 10+, among those alive in the region in 1966

R_B is the proportion surviving to age 0-4 in 1971.

In any event, the function estimated for 116 Canadian centres of between 1 000 and 30 000 in population by the Queen's students is

$$nmr_{vs}(66\text{-}71) \cong 0.052 + 0.987 \times cgr_{15+} + 0.158^* \quad \ldots (5b).$$

The students estimated separate functions for such centres in four major regions of Canada and discussed the statistically significant differences in these 'regional structures'. I believe that measurement errors and sampling fluctuations in the data set are too large to warrant much attention to the minor regional variations shown by the small samples used. The margin of error in the population counts alone does not warrant the pursuit of minor regional variations in the parameter structures (see Table 1 by Clatworthy, Hatton, Hunter, Lucht, McMaster, Stewart and Tam, 1976).

Once an expression like (5b) is applied to a given region, the natural increase rate (1966-71) is readily estimated using expression (8) below. In this expression nir denotes the natural increase rate. By definition:

$$nir = (B\text{-}D)/P_{t\text{-}h} \quad \ldots (7).$$

$$nir \cong gr - nmr_{vs} \quad \ldots (8).$$

* 0.518 is the estimate of bias.

However, when data on the number of births and deaths are available (they are, with a two-year lag in publication, for incorporated cities, towns and villages with populations of 1 000 and over) expressions (1), (2) and (7) should be preferred to (5a) and (8). There is a great number of small Canadian communities for which (1), (2) and (7) cannot be used, because basic statistics are unavailable: for these areas (5a) and (8) may often be applicable, since they only require population size estimates by very broad age groups.

The work now under way does not consider the use of the *profile* of residual error terms as a source for interval estimators; however, to replace the point estimate defined by (5a), it may be advisable to re-estimate (5b) with a much larger sample of centres in order to get a good look at that profile. This situation arises when we plan to apply an expression like (5b) — which was estimated from data for centres larger than 1 000 in population — to a large number of centres that are substantially below 1 000 in population. A related exercise would be to study the stability of the (5a) parameter estimates over samples of a completely different average population size. The development and use of the profiles of residual errors are outlined in the discussion of the estimation of in-migration.

The indirect estimation of a small community's in-migration level, over the 1966-71 period for example, must be viewed as an exercise in which we are merely trying to hit a target through the use of crude symptomatic indicators and estimated parameters of 'prediction functions'. In short, this is NOT an exercise in explanatory analysis. Moreover, it is an exercise in which we exhibit a definite preference for data that local community analysts are likely to be able to get from existing sources, rather than for the more "ideal" data which are not available at tolerable cost. Our aim is to do our best with the tools that are virtually in our hands, rather than define tools we would like to have and then promptly terminate the exercise because of the frustration of trying to use the available ones.

Three symptomatic indicators are reasonably available for incorporated centres with population of 1 000 and more — population levels, the number of births and building permits. The measurement errors in the series for these variables are serious. Furthermore, direct estimates of in-migration for a suitable class of communities were tabulated for urban centres with populations of 10 000 to 40 000 only from 1971 census data. We are therefore regretfully forced to make our initial efforts at parameter estimation from this data base.

Initially, simple linear regression parameters are estimated. The intention has been to average the results of three different estimating functions, because of the extremely high correlation among the symptomatic indicators and because of the small size of the sample (41 area units). In the function that

uses population size we used the 1966 population data, to reserve the 1971 data for computing 'predicted' in-migration rates which can show some area variation. The first step, then, was to obtain the parameter estimates for the second to the fourth expressions that follow.

$$\text{In-migration} = 1/3\ \text{In-migration estimate one} + \text{In-migration estimate two} + \text{In-migration estimate three} \quad (9)$$

$$\text{In-migration estimate} = 588 + 0.21932 \times \text{1966 Population}, R^2 = 0.66 \quad (10)$$

$$\text{In-migration estimate two} = 520 + 2.43724 \times \text{1966-71 inter-censal births}, R^2 = 0.59 \quad (11)$$

$$\text{In-migration estimate three} = 1\,529 + 4.30008 \times \text{1966-71 building permits issued}, R^2 = 0.58 \quad (12)$$

However, the intercept values shown above (588, 520 and 1 529) are *NOT* used: intercepts adjusted to different ranges of size of the predictor variable are roughly *estimated.* It is most desirable to tailor the slope estimates in a similar way, but the limitations of the currently tabulated data prevent this. Future work will pursue this matter, since the data we have indicate quite clearly that the relationship between in-migration and the symptomatic indicators is not linear (and simple non-linear forms we considered provide no improvement over the linear functions). In any event, we are going to adopt a common regression slope; the overall sizes of areas for the present are shown in expressions (10) to (12).

In order to obtain the adjusted regression intercepts, sub-intervals of values on the predictor variables are first designated. For a given sub-interval, we first obtain an independently estimated (i.e. NOT estimated by the regression function) *average* in-migration for centres *in that sub-interval* (e.g., for the population-size predictor this estimate is the product of the average in-migration ratio for all centres and average population of centres within the sub-interval). Let's call this value $\bar{y}_i$. We then obtain the product of the estimated regression slope and the estimated average value of the predictor variable within that sub-interval, which can be called $b \cdot \bar{x}_i$. The adjusted intercept is $a_{oi} = \bar{y}_i - b\bar{x}_i$. These (shown in Table 9) are used in place of the ones shown in expressions (10) to (12). In applying (10) to (12) to a given centre, therefore, we must first locate the adjusted intercept value applicable to it. We have experimented with the use of adjusted intercepts for a sample of 77 units (the 41 mentioned above plus the 1971 census CMAs and Census Agglomerations) and found that this does improve the accuracy of the interval estimates. Indeed, this approach is required if we are to avoid absurd and unaccceptable results when estimating for very small centres.

Table 9

Adjusted Intercepts for Use in Estimating In-migration for Centres with a Population of Less Than 10 000

(Population size is the predictor variable)

Size of centre[1]	Adjusted intercept[2]
0- 100	68
101- 200	132
201- 300	231
301- 500	403
501- 1 000	718
1 001- 2 500	1 812
2 501- 5 000	4 615
5 001-10 000	5 866

[1] The size groups are arbitrarily chosen. They are taken from Hodge and Qadeer (1976), Table 3.

[2] The estimating function is $Y = a + bX$, where "Y" is in-migration, "X" is population, "b" is the slope and "a" is the intercept. Due ONLY to limitations in the available data, the slope that is estimated for centres with a population of 10 000 to 30 000 is being used for all centres. A *rough estimate* of the intercept for a particular size-group mentioned above (for which no in-migration data have yet been tabulated from the 1971 census files) is $\bar{y}\bar{P}-b\bar{x}$; where "$\bar{y}$" is the average in-migration ratio for centres of 10 000 to 30 000, P is the 1971 average population of centres *within the particular size group*, b is estimated at 0.21932, and $\bar{X}$ is the average size of the predictor variable for the size group in question.

Sources: 1971 Census of Canada, Catalogue No. 92-709, Bulletin 1.1-9; and
1971 census unpublished tabulation.

Partly because the parameter estimates are drawn from a sample with a relatively high average population, because the symptomatic indicators are really poor variables in the context of explanatory analysis, and because of very serious measurement errors throughout the data set (*including* the census migration statistics) the *point* estimates indicated by an application of expressions (10) to (12), even after adjustment of the intercepts, are not to be taken seriously as accurate measures. All they really give us are measures of the level of in-migration we *could expect* IF the predictor variables were major determining factors and the estimated parameters reasonably accurate. The point estimates merely form the bases for *interval estimates* that make use of information from the *profile* of the residual errors. Given a large enough sample, the residual errors can be used to suggest that a certain percentage of point estimates, within a particular range, will have errors (positive or negative) of a given magnitude or less. For example we can make statements of the following *form:*

> 'If the point estimate is in the range of 0 to 999 in-migrants, then an error of prediction at least as large as ± 50 per cent of the value of the point estimate is likely to arise four out of ten times, on the basis of the regression residual indications. Thus if the point estimate is, say 500, then we would suggest, on the same basis, that the range of 250 to 750, covers the correct value with 60 per cent confidence.'

Statistics textbooks show more elegant ways to arrive at such statements on the basis of *a priori* assumptions about the distribution of the residual errors. With the types of data considered here, the writer prefers to approach all such assumptions through an accumulation of empirical evidence. It is notable, however, that large samples are needed to get adequately stable pictures of the residual error profiles, especially for sub-groups of sample observations. For this reason, we have (so far) been working with profiles for the *entire* sample of observations. Much more work remains to be done in this area. For the time being, the *interval estimates,* though based on a shaky foundation, are far superior to the point estimates.

Given the interval estimates of the in-migration ratio (imr), we compute interval estimates for the out-migration rate (omr) and the gross migration rate (gmr). The pertinent definitions are:

$$\text{imr} = (\text{In-migration})/P_t \qquad \ldots (13)$$

$$\text{omr} = (\text{In-migration}) - (\text{Net migration})/P_{t\text{-}h} \qquad \ldots (14)$$

$$\text{gmr} = (\text{In-migration}) + (\text{Out-migration})/\tfrac{1}{2}(P_t + P_{t\text{-}h}) \qquad \ldots (15)$$

My application of these procedures to Statistics Canada data, during this search for new information on small communities in Canada is largely incomplete. Only partial and preliminary data are presented in this report.

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Comments by Christopher Taylor

First, I would like to congratulate Leroy Stone for again taking the debate about demographic policy a step further with his approach (with assistance from students here in Urban and Regional Planning) to the estimation of small community population growth components. I look forward to further development and refinement of these techniques.

I wish to focus my remarks on the critical policy observations that are raised in the concluding sections of the paper. First, let me support Dr. Stone's contention on the increasing complexity which is evident when one examines demographic variables. It seems somewhat paradoxical that as these questions enter the public domain, they seem to be becoming increasingly oversimplified. Hence, we frequently hear that Canada has reached ZPG, that Saskatchewan could shrink to half its present size by 2001, or that a wave of "fertility fever" is about to sweep over Canada and the U.S. It's time that population specialists like Dr. Stone countered these misleading assertions by entering the public domain, through the news media, for example, and refuting the false presentations. That problem, however, is a topic for another day.

Dr. Stone makes a very good point when he stresses the need to differentiate between influencing the level of growth in a given area and managing the growth rate variation pattern over several areas. The urban objectives exercise conducted throughout the 1971-74 period by the federal government seemed to focus on a need to reduce concentration of population in the largest metropolitan areas, and maintain provincial shares at 1971 census levels. It was never made clear, however, how these two strategies were related, and whether efforts on one may have cancelled efforts on another.

Urban Objectives Strategy – (Provincial Viewpoints)

The federal government is not totally to blame for its failure to develop a comprehensive urban strategy. There are conflicting viewpoints among the provinces in this area. For example, on the issue of provincial shares, Quebec has forcefully made the case that it would like to maintain its share, if at all possible. Ontario has consistently opted out of discussing the issue, while Alberta seems very interested in increasing its share. It will take a major political effort for the provinces to come to any kind of agreement on dividing up the Canadian "population pie" by the year 2001, and if that agreement is reached, there is no guarantee, as Dr. Stone has stated, that policy will be directed to achieve the agreed-upon goals.

At the community level, reduced population growth rates are leading to major concern about long-term planning. Just last week, the Bureau of Municipal Research argued that the long-term plan for Metropolitan Toronto to

the year 2001, called Metroplan, had serious flaws because its projections of population growth were far too high. The City of Ottawa is currently debating with the regional municipality about the anticipated future population growth in the area. Nervous developers are watching these and other debates, realizing that in times of slow growth, wrong decisions about where growth will occur can be fatal. Demographers are feeling increasing pressure to predict, rather than project the future population, so that developers and governments can plan more rationally.

Prospects for Improved Viability

I would be interested in having Dr. Stone pursue the point he makes that policy advisors should "pinpoint areas where the prospects for improved viability are best and those in which only herculean efforts are likely to help reverse trends considered to be undesirable". I am not sure what criteria he would choose to make this decision, but I would be more interested to know what he would suggest doing once the information were obtained. I envisage something like "small community triage" and I am not sure politicians, especially liberal ones, would be willing to say to any community, "Sorry, but for the good of everybody we've decided to stop helping you".

Techniques in Future Planning

The point is well taken that future planning, especially in the demographic field, is precarious. Nevertheless, the derivations of most projections are based on some assumptions about historic patterns. In many cases, these patterns become institutionalized to become de facto goals – hence planning is trend-driven, not goal-directed. An interesting case in point was the response in Saskatchewan to the 1974 Statistics Canada projection that Saskatchewan's provincial population would fall to 450 000 by 2001. This created a tremendous uproar, and led to the Premier writing to Ottawa to complain about the assumptions used. This case was an exception, however. Too often, from the village right up to the national level, projections are accepted with little or no thought, and assumptions become de facto goals.

A Shift in Trends or Not?

Dr. Stone does not believe we are witnessing a major shift in historic migration patterns, with the exception of Alberta. Again, I'd like to hear more on this point from him. How far back can and should one go to judge historical

precedent? Does one use a base of 25 years, 50 years or 100 years? Demographers, for example, have argued at length as to whether the post-war baby boom was simply an aberration in a century-long trend of declining fertility or whether in fact, it represents a series of demographic waves which move from one generation to the next, with large and small family sizes alternating.

If Dr. Stone is right about the historic trends, then the projections for Saskatchewan indicating declining population should never have been made in the first place! But even Dr. Stone, in this paper, uses data bases of 25 years (from 1951 to 1976); this is a fairly short historical pattern. The most recent data for 1971-76 show an increasing trend to non-metropolitan growth; this may be the continuation of a historic trend when viewed in terms of the last 25 years, but an aberration when viewed over the last 50 or 100 years.

Rural Fundamentalism

A resurgence of rural fundamentalism in Canada may mean more than simply people "going back to the land". We may see the decline in the number of farmers stabilize; we could even see an increase in their number as income stabilization and agricultural land protection schemes are enacted. The improved viability of small communities may also create a slowing of the rate of outmigration from the land. In short, I am not sure that we will not actually see an *increase* of country dwellers, but I admit this is sheer speculation on my part.

Research

We need a much better "handle" on what the characteristics of the new migrants are and why they are moving. Questions such as the impact of the UIC and skilled immigration into Canada on distribution need to be investigated. On the latter, Spencer Star has argued: "...in Canada, immigration has reduced the flow of workers from depressed to buoyant areas because immigrants have been brought in as cheap substitutes for Canadians in order to fill vacancies." The lack of good fertility data also hampers research. The recent decision not to proceed with a national fertility survey means that we will continue to ride on the coattails of the Americans in guessing the fertility future of Canadian women.

Comments by Thomas N. Brewis

Implications for regional policy of the demographic changes which Leroy Stone has outlined depend essentially on two things: first, our perception of the interrelationship between demographic change and economic performance; second, the objectives which we want to pursue with our regional policies and the spatial distribution we want to achieve for social and political as well as economic reasons.

One point on economic performance might be made at the outset: to the extent that population is growing more rapidly in the wealthier provinces (Ontario and the West) than it is in the poorer provinces (Atlantic and Québec), the proportion of the national population in disadvantaged regions is declining. A similar decline is continuing in rural population as compared to the urban and this too reduces the burden of adjustment. More people are now living in areas of the country where their economic prospects are at least potentially brighter than they were before and proportionately fewer are living in areas with poorer prospects. To that extent it can be said that the demographic changes involved in the rural-urban shift and the shift to Ontario and the West, are moving in the right direction from the standpoint of a spatial improvement in resource allocation.

But whether the shift in population will move us closer to equality of per capita incomes across the country, or achieve similar unemployment levels in the different regions is another matter. Depending on circumstances, divergences could increase or decrease. For one thing, industrial location is becoming increasingly market-oriented, and for another, migration tends to be selective. To the extent that migration is selective and is draining away the younger and more able members of a community, migration could add to the burdens of those who remain by increasing the cost of services and possibly reducing opportunities for employment and potential income. Like many other blessings in this world, migration can be a mixed one.

I am assuming that greater equality of per capita incomes and reduced unemployment levels across the country remain the predominant objectives of regional policy; but if the focus of attention shifts to power and regional output then we are in quite a different ball game. If provinces are interested in maintaining or increasing the share of the national output and population which they have had in the past, with an eye (perhaps) to political influence, we have to look at demographic change in quite a different light. The continued decline of the population of Québec in relation to that of Ontario and the West is a matter of deep concern to many in Québec. Westerners, for their part, feel that Québec has received an undue allocation of federal attention and resources under DREE and other programs....

Rural Scene

The exodus from agriculture and the smaller, more remote communities can be expected to continue. As in the European Community and elsewhere, economies of scale and technological change explain the decline in the farming population. As for smaller communities, the lack of varied employment opportunity, low and precarious incomes, the cost of providing adequate services – private or public – and inadequate social life point to their continuing attrition. The younger people especially seem certain to leave, with resultant imbalances in age structure. With few exceptions, then, there is no alternative to a policy of acquiescent or active encouragement of concentration of the residents of such communities into larger centres.

I expect, moreover, that the minimum size of viable communities will grow over time partly because of the continuing trend towards specialization of activity and partly because of economies of scale in production. There are economic thresholds below which satisfactory services cannot be provided.

There is little doubt in my mind about the need to re-group small communities in rural areas. If ARDA is retained this could be one of its prime functions.

Urban Scene

The current development of satellite communities around major urban centres is one which regional policies in the future might well encourage. Proximity to both larger urban centres and to the surrounding countryside offers a varied lifestyle with the potential for more and better choices of employment opportunities.

Problems arise, admittedly, where satellite towns become essentially dormitory communities. There would seem to be a case for providing the infrastructure necessary to encourage their economic development.

Urban growth, in general, is an essential component in much regional development and a strong case can be made for encouraging a greater concentration of people in areas of scattered population where incomes are low and precarious. Urbanization is a panacea; but the alternatives in many cases are so bleak that there seems to be no feasible alternative. The trends which Leroy Stone has pointed out on this are welcome.

I agree completely with him when he observes that policies aimed at diverting population growth away from metropolitan areas will have to contend with very significant contrary forces. The growth of the service sector in the economy virtually ensures the failure of such policies, services being predomi-

nantly city-oriented. Moreover, I cannot see the virtue in policies which attempt to turn that tide. The task of DREE, as I see it, is to temper and modify the forces of the market, not to buck them. To do that DREE needs to know what those forces are and that is where demography can help.

Demographic trends, however, are often difficult to project and birth rates and migration patterns can change unexpectedly; this makes prediction a risky procedure. To mention one possibility, if, as an aspect of the changing political scene, migration from overseas were to become a provincial rather than a federal responsibility, the resulting divergent policies could become significant in the regional distribution of population. The public response to changing circumstances must also be borne in mind. Few things are more fickle than public opinion and the politicians who determine policy have time horizons which are notoriously short.

As for long-term strategy, my summary recommendations for regional policy in the light of present and anticipated demographic changes as indicated by Leroy Stone would be to:

1. strengthen regional centres and encourage the creation of satellite communities;

2. encourage the re-grouping of people in remote communities;

3. improve the communication network between smaller and larger centres; and

4. facilitate migration out of less promising into more promising areas.

On balance, and confining my attention to an economic context, I would argue that demographic forces are working in the direction of improving the spatial allocation of resources and that the main tasks for regional policy are to supplement them and to ease the process of transition.

Leroy Stone's Response to the Comments

Leroy Stone did not offer a response.

CHARTING THE DELIVERY OF REGIONAL POLICY IN POST-INDUSTRIAL CANADA

by Gerald Hodge, Queen's University

Introduction

The short history of recent regional development efforts in Canada is a checkered one. The quest for an "improved regional balance", as the Economic Council of Canada has called it,[1] is little more than a decade old. Its passage has been marked by a succession of acronyms – ARDA, ADA, ADB, FRED, DREE – each a part of an evolving policy structure. But despite the ever increasing array of regional development policies, an improvement in the Canadian regional balance still seems an elusive objective. Complicating the problem is the fact that in Canada, as in most advanced countries, certain parts of society are already in an early phase of post-industrialization (e.g., Ontario and British Columbia), while other parts remain in various phases of industrialization (e.g., Québec and Nova Scotia).

We have not moved very far toward our objectives in regional development, and it is not at all clear that we have been heading in the right direction. A complex policy structure has been erected at the federal government level (with counterparts in almost all of the provinces) that is little enough appreciated, let alone evaluated. It is the purpose of this paper to illuminate the elements of the complex policy structure for regional development, and to suggest a relevant approach to regional policy evaluation after a study of overall development tendencies in Canadian society. The perspective throughout is on the "delivery" of programs: what is intended to be delivered, through what means, to whom, and with what effectiveness? The Economic Council, in one of the few attempts at regional policy evaluation, provides a suitable preface for the remainder of the paper:[2]

> Our work in this difficult area of policy evaluation is still very preliminary. Much remains to be done in clarifying the most effective mix of policies to achieve improved regional balance along with our other basic economic and social goals. This clarification must be approached both comprehensively and systematically, supported by much more effective use of modern evaluation techniques.

Problem-solving in policy as often as not involves assessing where one is at present and where the current programs are leading. Moreover, the more policy-makers deal in complex issues (or complexes of issues), the more difficult the terrain of the problem is to hold in mind. And it becomes equally difficult to keep in view where and how policy is being delivered.

Starting from the premise that policy "flows" from goals through programs to some destination(s) in the problem situation, this paper explores a means for charting that flow. A matrix format that can help illuminate the end-point of a policy system is suggested: i.e., the point of transaction between policy-makers and decision units who actually implement policy intentions. Some key background concepts are presented before proceeding with a description of the analytical framework. This is done for more than merely orientation: too often, in problem-solving situations the assumptions are not stated – or, one sometimes feels, even recognized.

The Social Terrain of Post-Industrialism

The analytical approach that is outlined in the sections to follow depends on certain key concepts which derive from ways of viewing and thinking about the Canadian social terrain that is already emergent – post-industrialism. The conditions that accompany this trend affect the nature of social problems and the relations between welfare and development. Before proceeding to the regional development policy structure, therefore, we will briefly describe some basic notions on post-industrial society.

The trend toward a *post-industrial* society in Canada seems already irreversible. Its primary characteristics are an unprecedented scope and complexity of activities and enterprises (public and private), new technologies for manipulating both the world and people, and a process of change that is both rapid and uneven.[3] The social environment of a post-industrial society takes on the character of a *turbulent field*[4] because of the increased size and complexity of its activities together with their increased interdependence. Unpredictable connections arise among them as a result of the accelerating but uneven change rate. As Trist points out, "this turbulence grossly increases the area of relevant uncertainty for individuals and organizations alike,"[5] (and, he might have added, for regions, too).

Rapid but uneven change coupled with the increased interdependence in post-industrial society raises problems of adaptation for individuals, economic sectors, firms, governments, and regions. If policies for alleviating regional disparities or responding to differences in regional tastes seek only to *reduce* complexity (i.e. to promote uniformity in growth rates, economic structure or

mix of public goods), they are bound to prove maladaptive. The higher levels of complexity now coming into existence require policies that will allow increasing complexity to be *tolerated*; policies that will promote higher quality performance in all individual, organizational, and regional units.

Turbulent environments give rise to a new breed of *diffuse social problems:* regional disparity is an excellent example. They are called "meta-problems" by Chevalier[6] and "problem domains" by Trist;[7] both are speaking in a Canadian context. For example, finding a substitute for coal mining in Cape Breton or for farming in the Interlake Region of Manitoba has involved much more than offering incentives for attracting new industries. Displacing people from under-sized farms in the Gaspé, Québec or from outports in Newfoundland demands complementary action to refurbish urban places in the region in order to attract and hold migrants.

The interdependence of post-industrial environments spawns clusters of social problems that were once insular. Meta-problems are ecological; the number of meeting points involved is vast. We have become used to a society with few general objectives (e.g., promote economic growth, open up the West); its social problems (except in national or international crises) have, for the most part, taken care of themselves. But the older, simpler processes of adaptation – the "free play" of the market or federalism, for instance – are no longer wholly reliable. Thus the necessity of intervention by government in matters of regional balance and difference in regional tastes arises. But the effective solution to regional meta-problems requires the collaboration of all concerned. The whole syndrome must be treated; unfortunately the interdependence of its constituent problems often means that the interests and needs of individuals, firms and institutions overlap.

In simpler, or at least earlier, times, regional policy in Canada was largely compensatory. The performance short-falls in the market economy demanded some intervention, but only to provide relief for "passing" dislocations. The fiscal stabilization policies and area redevelopment programs devised during the Great Depression were often of this type.

This kind of regional policy was primarily *welfare*-oriented. It was aimed at maintaining the "steady state" in the growth of the economy of Canada. Even as the domains in which action was taken became more numerous, and *preventive* measures (e.g., tariffs and land-grant procedures) and then *improvement* measures (e.g., the terminal elevator system and, more recently, urban infrastructure) were added, the notion still persisted that intervention need only be passive. Temporary measures, or "relief" as welfare used to be called in social assistance circles, were all that were deemed necessary to industrialism and the free market.

Welfare policy was thus seen as opposed, or at least only compensatory, to the main development thrusts of Canadian society. As a consequence, there are few instances of (the now-numerous) regional welfare policy measures being coordinated among themselves, let alone with development measures. Moreover, agencies using these early approaches (such as the Prairie Farm Rehabilitation Administration from the 1930s[8]) still exist, even though their present usefulness is debatable.

The underlying need for intervention in the turbulent social environment of post-1950 Canada is clear and various efforts at development have been undertaken. Rapid and uneven change in both industrial and urban situations has generated programs that are aimed at helping the nation reach *higher-order* steady states. This is the definition of development; it is the feature of most DREE programs and of the research and development programs of the Department of Industry, Trade and Commerce, for example.

Dimensions of an Analytical Framework

The nature of the analytical framework we are striving to establish is determined in part by the background concepts and assumptions stated above. To reiterate briefly, regional problems, no matter what their cause, are complex problems of the "problem domain" type. They, like the turbulent social environment they emerge from, are characterized by considerable interdependence of parts and means of adaptation. Some regions require welfare-oriented intervention (to maintain steady states) and some require intervention for development purposes (to seek higher-order steady states). However under conditions of rapid and uneven change, the nature of intervention may have to shift from one to the other within any region. Added to all of this is the fact that solutions to the various regional development problems tackled thus far seem far from attainable.

This paper will examine the delivery of regional policies to determine the impact (if any) they have on the needs of Canadian regions. The idea of impact is a relative one. It is necessary to pose two questions – "Impact *of* what?" and "Impact *on* what?" – as a beginning. Then the perspective must be identified: is impact to be viewed in relation to existing conditions, in relation to planning objectives, or in relation to standards of development?[9]

In the perspective of this paper, impact needs to be considered at, or near, the end-point of the policy system. That is, the concern needs to be with the nature of what is being delivered (e.g., money, physical facilities or services) and where it is destined in the social system (e.g., the individual, the family,

the community or the region). This will facilitate a comparison of intended and actual results of policy. But it is also necessary to push well beyond this two-dimensional evaluation (despite the still-considerable difficulties in dealing with externalities as well as the secondary and tertiary effects of single programs). As we stated at the outset, we already operate within a complex policy structure within a complex environment.

This view of an interconnected, turbulent environment, even if acceptable as a view of the world for Canada, can be "distilled" in different ways for policy analysis purposes. One approach, which may be termed the "rationalization of decision-making systems", is exemplified in an admirable way by the Economic Council of Canada in 1971.[10] It stresses the links between objectives, strategies and programs (with some appropriate feedback loops in its more thoughtful versions) and is, in its essence, the "territory" (N.B. not the actual terrain of the region where the problems are) of the decision-making system – the bureaucracy and the politician.

The way in which this paper "distills" the complex post-industrial world of regional policy is to work from the locus of the problem – the social systems variables of the region. The aim may be termed the "maximization of effectiveness of programs." The basic paradigm of this perspective is an interrelated set: of the *social goals,* which we want to achieve for a region; of the *policy variables,* which are the output of policy-making such as legislation and programs, and of *system variables* which are the region in terms of its structural, behavioural and flow elements.[11]

The system variables may be viewed as made up of:

a) the attitudes, tastes, and choices of individuals, households, institutions, and firms on the activities and resources of the region (BEHAVIOUR);

b) flows of goods, people, financial transactions, information, and energy resulting from the behavioural patterns in the region (FLOWS); and

c) the spatial and functional manifestations of decisions and flows (STRUCTURE), such as the densities, employment mix, transportation routes, and population composition.

To conduct research on policy formulations for regional development we need to know how the system variables are likely to perform in response to the policy initiatives we use: we must find out how the behaviour of firms, households, etc., responds to policy changes.

Thus, the analytical framework should be able to accommodate the complexity and interdependence of the regional system and of the policy output, as well as be able to encompass the end-point of policy delivery systems. The basic parameters that should be reflected in the framework are: (1) the destination of policy outputs; (2) the channel for delivery of policy outputs; (3) the medium used to effect change, i.e., the policy variable. Each of these is outlined below.

(1) *The Destination of Policy Outputs*

Policy outputs in regional policy seek to influence the behaviour of decision units connected with maintaining or changing a region's condition. These decision units are usually located within the region: they may be individuals, family units, business firms, government units, or institutions (public and private); they may also be located wholly (e.g., national financial institutions) or partially (e.g., transportation services) outside the region. The destination of policy is, therefore, a decision unit which can, hopefully, use the policy output (usually a program) as an input to complete or expand its transactions in the particular region.

The ultimate hope of policy, of course, is that the stimulation of all the various transactions will produce a more benign regional situation (i.e., reduced regional income differences or the satisfaction of regional tastes).

In general, policy outputs may affect the behaviour of decision units either *directly* or *indirectly*. For example, in depressed areas, direct assistance may be given to farmers wishing to enlarge their holdings; or, direct incentive grants can be made available to persuade industrial enterprises to locate in the region. These same farmers and industrial firms may also find policy outputs designed to help them indirectly. For instance, farmers may be given assistance to establish a community pasture; this time funds are not put directly into the hands of the farmer but his *access* to opportunity is improved. Similarly, the industrial firm may have its location decision supported by a government program to train workers for skills needed in the plant. There is yet another form of indirect policy output that is widely used: the improvement of the environment of decision units. A prime example is the federal Department of Regional Economic Expansion (DREE) program which helps communities improve their municipal services and facilities. There are similar programs in housing, transportation and water resources management. These all affect only the physical environ-

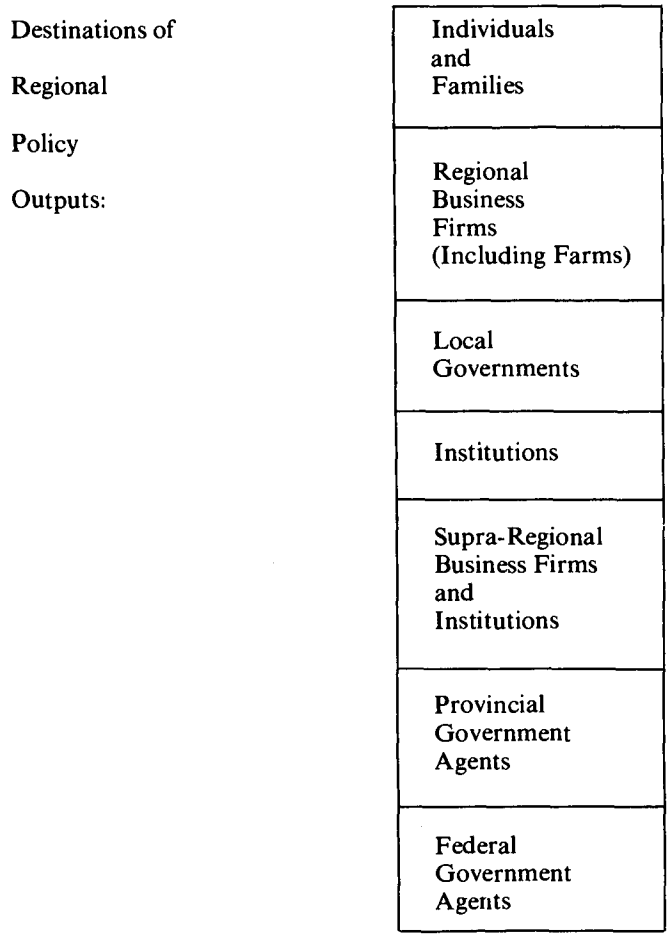
ment; but there are also programs to improve the economic and social environments such as those establishing marketing boards or enhancing health services.

In viewing the destination of policy outputs, therefore, one must be concerned with two important factors:

a) the end-point of the program; to whom is the output of policy being delivered – is it delivered to individuals, firms, local governments, institutions, provincial governments, or federal government agencies?

b) the type of receiving unit; is it a "final" user or an intermediary? Is this, for example, an income transfer to a family *or* a grant to a provincial housing agency?

The array of possible destinations for regional policy is very large. While it may be reduced for analytical purposes, it is important to recognize that this array reflects the true scope and complexity of regional problems.



(2) *The Channel for Delivering Policy Outputs*

The source of policy outputs must now be considered, but not in the usual sense of that term. For in public policy areas there is always one ultimate source of funds – the public purse. While the amount of funds available is important in determining cost-effectiveness, right now we are more interested in how these funds are channelled to the decision units of a region.

Allocations are made from the public purse to agents of the government according to a variety of criteria, some technically-based, others politically-based. These criteria are of interest in the development of new policy, but may be assumed to be generally stable over long periods of time. In any case, when we are considering the end-point of public policy delivery, we must find *where* the resources are deposited for delivery.

Each government agent brings special attributes to the task of supplying public policy. An agent may derive authority from a number of constitutional bases (e.g., one may be a ministry, another a proprietary corporation of government, etc.), and even if constituted similarly, they may be organized differently (e.g., centralized *versus* decentralized) or have a unique "style" of operations. The distinctions that can be made between them are limitless. Nevertheless, this is a very important variable — as our seemingly interminable "tinkering" with governmental structure indicates.

At least four types of agents (or channels) are employed in the delivery of regional public policy outputs. In the federal government they may be channelled through a ministry and any of its constituent parts (e.g., branches, services) or through a proprietary corporation such as the Cape Breton Development Corporation or the Central Mortgage and Housing Corporation. Variations on the latter type in Canada include the national regulatory agencies such as the Canadian Transport Commission and the Canadian Wheat Board.

Regional public policy outputs from the federal governement may also be channelled to provincial governments, which in turn change them to the regional decision units. The most useful distinction here is whether the funds are "earmarked" for a specific purpose, as in shared-cost programs, or are unconditional grants. For "earmarked" funds, the channel at the provincial level (e.g., department or branch) usually has to be specified at the time of agreement; or, some joint federal-provincial committee may be established. The province may have complete discretion in channelling unconditional federal grants.

Channels for Delivering Policy Outputs

Federal		Provincial	
Ministry e.g., DREE	Agency e.g., Cape Breton Development Corporation (DEVCO)	Designated Agent e.g., Agricultural and Rural Development Agreement (ARDA) Committee	Department e.g., Highways

(3) *The Medium of Policy Outputs*

Having discussed both the origins and destinations of regional policy output, we now turn to the nature of the delivered policy outputs. Of primary concern here are the outputs which constitute a direct addition of the funds made available to decision units in (or which are associated with) a region.*

Conventionally, regional policy outputs are viewed as a transfer of *funds* from the federal government to the region. One example of this is provided by the DREE Special Areas program, which provides grants for urban infrastructure. Funds in the form of incentives grants are also transferred by DREE to industrial firms in certain designated areas under its industrial incentives program. The subventions paid to Cape Breton coal miners provide yet another example of a transfer of funds.

Regional policy outputs may be delivered by mediums other than cash funds. The two most important ones are the delivery of *services* and the creation of *projects.* As examples of these we can point to DREE: operations carried on through its Maritime Resource Management Services (MRMS) unit and the Prairie Farm Rehabilitation Administration (PFRA), both of which provide federal services in a region; while the activities of the Northern Canada Power Commission demonstrate direct federal participation in the infrastructure of a region through physical projects.

* There are policy outputs that may affect a region's development but not be manifest as additions to a region's resources: these include general tariff, fiscal and monetary policies, and the actions of regulatory agencies to establish and maintain national standards. These are not considered here.

Another distinction needs to be made on the operational strategy followed by the different federal policy channels. Some agencies, and DREE is a good example, plan their delivery of resources through a set of programs. They are visible and the "rules" for gaining access to resources are spelled out. This is also true for much of the activity of the departments of Indian Affairs and Northern Development, and Agriculture. Other departments such as the Department of the Environment, operate through their own field services (e.g., the Environmental Protection Service, the Fish and Marine Service). These may well be capable of making substantial additions to a region's resources, but the terms for gaining access to these "field service" resources are not as highly visible as those for the "program" funds.

In summary, the medium used to distribute regional policy outputs may be (a) funds; (b) services; or (c) projects. These may be offered through programs where the timing and scale of resource use are spelled out, through ongoing federal services, or by some other means.

Matrix Mapping for Policy Delivery

The analytical framework which we are striving to define should, as we noted previously, have the capacity to deal with the delivery of complex policy outputs to a complex set of regional destinations from a complex of government agencies. One very useful way of capturing this linked quality is by employing simple FROM/TO matrices. In this way the *flow* of policy outputs *from* agency *to* decision unit can be traced. Such a matrix formulation has precedents in interregional trade flow analyses, inter-zonal transportation movements, and, of course, in inter-industry (input-output) relations.

Thus a matrix may be conceived to show the sources or "channels" of regional policy outputs (FROM) and the decision units, or "destinations" in the region to which they are addressed (TO). The nature of the policy output, or "medium," could then be entered into the appropriate cell. By using the parameter distinctions we made earlier, and listing the *columns* of the matrix, with the *destinations* in the *rows,* we have a basic format, as illustrated in Figure 1.

By reading down a column of the matrix one finds the type of decision unit reached by the agency regional policy outputs. The recipients of policy outputs comprise the rows: by reading across a row one finds the agencies on which the regional decision units depend.

Figure 1
Flow Matrix for Charting
Regional Policy Delivery

CHANNELS FOR DELIVERING POLICY OUTPUTS

FROM / TO	Federal		Provincial	
DESTINATIONS OF REGIONAL POLICY OUTPUTS	Ministry e.g., DREE	Agency e.g., DEVCO	Designated Agent e.g., ARDA Committee	Department e.g., Highways
Individuals and Families				
Regional Business Firms (including Farms)				
Local Governments				
Institutions				
Supra-Regional Business Firms and Institutions				
Provincial Government Agents				
Federal Government Agents				

The intersection of a column and a row represents a point of transaction between a source of policy outputs and a regional recipient. It is through these points that assistance must be (or at least is being) delivered. As we mentioned earlier, Selznick has referred to them as the "end-points of administration."[12] They imply the need to consider the bureaucratic means by which the transactions are actually carried out. If we remember that similar considerations arise at each "end-point", a *little* of the complexity of the policy structure is conveyed.

An initial breakdown of the interactions among regional policy outputs may be obtained by entering in each cell (as applicable) the medium used for the policy output – funds, services, or projects. These could be entered together on one matrix or on separate matrices (with the latter approach the separate matrices might be conceived of as "layers" of the same policy structure).

A further elaboration is to develop composite matrices for all the agencies involved in delivering regional policy outputs. If this were done for a single region, the matrix could have the columns (channels) contain all the ministries which are involved. These columns could, in turn, be subdivided either between internal and external ministerial agencies or between type of medium employed. Yet another way would be to array all the different mediums employed as separate columns.

Each of these breakdowns helps reveal different facets of the regional policy complex. For example, if we keep the rows (destinations) constant, the various matrices show not only the amounts of resources which are to be delivered, but also by whom they are delivered, and in what form. This method bears upon one of the crucial questions in regional policy: how can we focus our resources on regional problems in a *concerted* way?[13] In other words, how can we focus the efforts of the several organizations which control the resources toward specific ends? Matrices such as this can help map important aspects of the organizational terrain upon which policy endeavours are played out.

Charting Regional Policy Delivery: Some Examples

A. *An Overview of Federal Programs*

The matrix form proposed above can be used in a variety of ways. One may use the concepts relating to the origin of regional policy to determine the channels being used and the form (the medium) in which the policy outputs are disbursed. This approach may be applied to the full spectrum of federal regional development activities, for example. In this way, something of the complexity of the regional policy structure in Canada can be understood.

Federal ministries are involved in regional policy matters in different ways and at different levels. Four levels seem to encompass their regional involvement which ranges from activities clearly intended to channel regional policy, to activities important mainly for the backdrop they provide to regional decision units. Ministries may therefore be considered as: (1) applied regional policy channels; (2) inherent regional policy channels; (3) contributory regional policy channels; or (4) contextual regional policy channels.

After the definitions of each of these levels, each federal ministry is listed (in Table 1) according to its involvement in regional policy and by the form taken by its policy output.

(1) *Applied Regional Policy Channels.*[14] The agents of public policy in this category have a *mandate* to channel resources directly to one or more regions in the country. Their aim is to deliberately improve the balance between regions by manipulating factors such as incomes, employment, and infrastructure (social and physical).

The Department of Regional Economic Expansion was established precisely for these purposes. It has a legislative mandate to improve the economic development of certain designated regions. The Department of Indian Affairs and Northern Development has a similar regional mandate for social and economic development in the Northwest and Yukon territories.

(2) *Inherent Regional Policy Channels.* Some agents of public policy are "region-oriented" simply because of their economic and social mandate: that is, their activities (such as agriculture and transportation) have a clear connection to the space economy of the nation.

The Department of Agriculture, for example, deals with an economic sector vital to many provinces; some devote much of their territory to agriculture. The Department of Fisheries and the Environment is in much the same position; its role in environmental protection involves it with significant portions of Canadian space. The Ministry of Transport is concerned with the means by which the regions of the Canadian space economy are linked to one

to another. The Department of Energy, Mines and Resources and the Ministry of State for Urban Affairs deal with resource development and urban development, respectively – again, both are significant components of the space economy.

(3) *Contributory Regional Policy Channels.* Government activities which *take place* in different Canadian regions may contribute directly to development in those regions. Most obvious are programs which result in the existence of significant regional establishments.

The departments of National Defence, Public Works, and Solicitor General are the most obvious candidates for this category. Each develops substantial physical facilities in various parts of the country which contribute to the economic base in each locality. In some areas, these facilities may even dominate the economic base. In the Northwest Territories and in certain northern provincial locations, the Department of National Health and Welfare also operates health-care facilities that are of this type.

(4) *Contextual Regional Policy Channels.* Some government agents provide a *backdrop* to the decision environment for regional policy through their activities and practices. Their programs are seldom intentionally "regional," but may be vital to the success of programs operated by other agents.

The Department of Finance, through the Tariff Board (Industrial Development Branch) and through the provision of loans for small business, as well as for farm and fisheries improvements, can significantly affect the climate of decision-making in a region. This is also true for many of the activities of the Department of Industry, Trade and Commerce in tourism, industrial innovation, and so on. Similarly, the departments of Communications and Labour and the Ministry of State for Science and Technology may influence the decision-making climate of a region without a great deal of visible activity.

Table 1 reveals the complexity of the regional policy structure in Canada today. A first scan of this table shows the following:

a) There are about 70 different mediums employed for regional policy outputs by the federal government;

b) There are nearly 30 different means to disburse *funds* which may affect regional development;

c) There are more than 35 different agencies providing *services* that explicitly or implicitly affect regional development; and

Table 1

Medium Used for Regional Policy Outputs by Federal Government Channels

MEDIUM USED		
Funds	Services	Projects
(1) *APPLIED REGIONAL POLICY CHANNELS*		
a. *Department of Regional Economic Expansion*		
Regional Development Incentives Act	Maritime Resource Management Service	Cape Breton Development Corporation (DEVCO)
Fund for Rural Economic Development (FRED)	Prairie Farm Rehabilitation Administration (PFRA)	PFRA
Agricultural and Rural Development Act (ARDA)	DEVCO	
Newfoundland Resettlement Program		
Special Areas Program		
DEVCO		
b. *Department of Indian Affairs and Northern Development*		
Indian and Eskimo Affairs Program	Community Affairs Branch	National Parks
Northern Affairs Program	Economic Development Branch	National Historic Sites
Education/Cultural Development Branch	Education/Cultural Development Branch	Northern Canada Power Commission
Community Affairs Branch (Welfare)	Northern Natural Resources and Environment Branch	Panarctic Oils Canals Branch
Prospectors Assistance Program		Northern Roads Program Northern Resources Airstrip Program
(2) *INHERENT REGIONAL POLICY CHANNELS*		
a. *Department of Agriculture*		
Prairie Farm Assistance Administration	Economics Branch	Research Branch (Experimental Farms, Institutes, Laboratories)
Farm Credit Corporation	Research Branch	
Small Farm Development Program	Canadian Grain Commission	
	Canadian Dairy Commission	
	Canadian Livestock Feed Board	

Table 1 (continued)

	MEDIUM USED	
Funds	Services	Projects
b. *Department of Energy, Mines and Resources*		
	Resource Management and Conservation Branch	Atomic Energy of Canada Ltd.
	Mines Branch	Eldorado Nuculear Ltd.
	Geological Survey	
	Mineral Resources Branch	
	Polar Continental Shelf Project	
	National Energy Board	
c. *Department of the Environment*		
Canadian Saltfish Corporation	Environmental Management Service	
Freshwater Fish Marketing Corporation	Canada Land Inventory	
	Environmental Protection Service	
	Fisheries and Marine Service	
d. *Ministry of Transport*		
	Canadian Surface Transportation Administration	St. Lawrence Seaway Authority
	Arctic Transportation Agency	National Harbours Board
	Transportation Development Agency	Canadian Air Transportation Administration
		Northern Transportation Company Ltd.,
		Canadian National Railways
		Air Canada

Table 1 (continued)

	MEDIUM USED		
	Funds	Services	Projects
e.	*Department of National Health and Welfare*		
	Guaranteed Income Experiments Directorate	Indian and Northern Health Services	Indian and Northern Health Services
	Income Security Branch		
	Canada Assistance Plan		
f.	*Ministry of State for Urban Affairs*		
	Central Mortgage and Housing Corporation (CMHC)		CMHC
			National Capital Commission
g.	*Department of Justice*		
	Canadian Wheat Board		
(3)	*CONTRIBUTORY REGIONAL POLICY CHANNELS*		
a.	*Department of Manpower and Immigration*		
	Unemployment Insurance Commission	Manpower Training Branch	
		Special Programs Branch	
		Canada Manpower Centres	
b.	*Department of National Defence*		
	Canadian Armed Forces		Defence Construction Corporation
c.	*Department of Public Works*		
	Trans-Canada Highway Act		Design and Construction Division
d.	*Department of Secretary of State*		
	National Museums of Canada	Bilingual Districts Advisory Board	
e.	*Department of the Solicitor General*		
			Canadian Penitentiary Service

Table 1 (continued)

	MEDIUM USED	
Funds	Services	Projects
(4) *CONTEXTUAL REGIONAL POLICY CHANNELS*		
a. *Department of Communications*		
	Northern Pilot Project	
b. *Department of Finance*		
Industrial Development Branch	Tariff Board	
Small Business Loans		
Farm Improvement Loans		
Fisheries Improvement Loans		
c. *Department of Industry, Trade and Commerce*		
	Canadian Government Office of Tourism	
	Industry Group (Research and Development)	
	Export Development Corporation	
	Statistics Canada	

Source: Canada, Information Canada, *Organization of the Government of Canada.* Ottawa, 1974.

d) There are more than 20 different agencies which make substantial investments in physical facilities in the regions of Canada.[11]

It is notable that as one proceeds from the deliberate regional programs to those that are primarily contextual, the medium for delivering policy is more likely to be a "service" or a "project." It is also likely that the latter are not intended to deal with specifically regional problems. Indeed, regional considerations, especially for service agencies, may be only a small part of their operating strategy.

This regional policy structure also reveals a variety of existing administrative arrangements. There are, on the one hand, the resources for regional policy administered through the "normal" departmental organization; that is, through the branches, divisions and field services. However these "normal" regional policy resources – such as the Special Areas program of DREE, the services of the Education/Cultural Development Branch of DINA, or those of the Mines Branch of EMR – represent only one-half of the 70 different mediums through which regional policy is delivered. The remainder, such as DEVCO, the Farm Credit Corporation, CMHC and the Transportation Development Agency, operate more or less independently of ministry administration. Many operate under special legislation and with their own boards of directors. The question of coordination with the parent ministry is not insignificant; it is difficult even to imagine inter-ministerial coordination under these circumstances.

B. *DREE Policy Delivery at the "End-Point"*

Each interaction of a row and a column in these matrices represents an "end-point" where policy outputs may be delivered. These points comprise sets of *transactions* between the policy channels and regional decision units. For example, the operations of the DREE Special Areas program demand connections with municipalities if urban infrastructure grants are to be tendered. Similarly, the Prairie Farm Rehabilitation Administration must devise ways of dispensing aid to individual farmers. Each transaction is in itself a complex relationship involving considerations of the type of assistance, where it is tendered, the number and type of personnel required, the facilities needed, the reliability of the parties receiving assistance, etc.

A partial DREE matrix of transactions is depicted in Figure 2. In this simplified version of the matrix, distinctions are made among the many different departmental programs or approaches. A further distinction is made on whether the policy is delivered through DREE channels or through an associated (and somewhat independent) agency.

Figure 2

Flow Matrix of Policy Delivery for DREE

FROM / TO	DEPARTMENT OF REGIONAL ECONOMIC EXPANSION	
	Departmental Units	Associated Agencies
Individuals and Families	Newfoundland Resettlement Program Special ARDA	DEVCO PFRA
Regional Business Firms	RDIA	DEVCO
Local Governments	Special Areas Infrastructure	PFRA
Institutions		
Supra-Regional Organizations	RDIA	DEVCO
Provincial Government Agents	ARDA FRED	PFRA MRMS
Federal Government Agents	FRED	

N.B. Multiplex Corp.

Canada-Manitoba Gimli Agreement

Nfld. and Labrador Development Corp.

Metro Area Growth Investments Ltd. (Halifax-Dartmouth)

Atlantic Management Institute

Abbreviations:

ARDA - Agricultural and Rural Development Act
DEVCO - Cape Breton Development Corporation
FRED - Fund for Rural Economic Development
MRMS - Maritime Resource Management Services
RDIA - Regional Development Incentives Act

An examination of the first of these columns reveals that DREE has transactions with all the different types of recipients of regional policy outputs. This may be interpreted either as a very broadly based attack on regional problems, an eclectic ("shotgun") approach or a strategy of integrated programs. How, for example, are the funds distributed under the Special Areas infrastructure program coordinated with those disbursed through ARDA programs to assist rural communities located in or near designated Special Areas?

Beyond such structural questions are the behavioural questions associated with *how* regional policy outputs are delivered. DREE delivers some of its programs directly to the decision units, as with its industrial incentives grants to firms under the Regional Development Incentives Act (RDIA). Performance criteria which may be administered by DREE personnel are established for the firms receiving this aid. DREE also delivers programs to provincial governments, as with its Agricultural and Rural Development (ARDA) program. For example, in New Brunswick, ARDA funds are given to provincial rural extension services to provide field staff for "counselling of rural families". But in the latter example, DREE cannot control the content, quality, or timing of these services beyond standards outlined in broadly worded general agreements with the province. The point is not that DREE should have direct control over the delivery of all of its regional policy outputs. Rather, it is to recognize that the nature and quality of what is delivered is affected by the character and operating approach of the agent chosen by DREE to deliver its policy output. These agents have their own value systems, goals, operating standards, etc. which may drastically distort the intent of the original policy. This may even be true for the field services of the department itself. It is even more true for policy outputs channelled through autonomous units such as other federal and provincial departments or through agencies such as DEVCO and PFRA.

In other words, the espoused objectives of a ministry like DREE are subject to the interpretation of the agent at Selznick's "end-point of administration". That interpretation will be a function of the operating values and style of the organization actually involved in the transaction.

The foregoing considerations arise from observing the matrix columns; viewing the rows evokes a different but analogous set of considerations. These concern the nature and behaviour of the recipients of policy outputs; they address the question we posed earlier: To whom is policy output being delivered? Each row represents a different type of recipient both in terms of organization and role within the social and economic system of a region. Families present a different organizational format for receiving assistance from, say, a business firm. Furthermore, each decision unit acts more or less independently from others of the same set.

This brings us to another side of this question — the "impact" of each decision unit within the regional system: what kind of "impact" will policy delivered to one kind of decision unit have on the regional problem as compared to another kind of decision unit?

In short, at the end-point of administration, the concern must be not only with *how* regional policy outputs are dispensed, but also to *whom* they are delivered. We have observed that many *transactions* are taking place. For each there are at least two participants, each with a value system, principles of operation, goals, etc. Thus, the manifestation of regional policy objectives is subject to the interpretations played out at the end-stage of the process, and it is important to understand the nature of the various transactions at this stage.

Emergent Demands on Regional Policy Delivery

It is tempting to suggest from this admittedly limited examination of regional policy delivery systems that we are probably well-equipped to fight the preceding "war" in regional development. But aside from hortatory conclusions, several questions emerge from a study of Canada's developing post-industrial terrain. Two of them derive from a consideration of the capabilities of the policy delivery system at both its beginning and end-points, given the array of regional problems today. A third derives from an anticipation of issues we have yet to face in Canadian regional development.

The questions are:

(1) How well is the overall regional policy structure suited to the "turbulent field" of post-industrial development in Canada?

(2) How can delivery systems for regional policy best be fitted to the needs of specific regions?

(3) What regional policy response is needed to effectively confront emerging issues in regional development?

Each of these is discussed briefly in light of the concepts developed in previous sections.

(1) In the matrix examination of the federal structure for regional policy one is struck by the diversity of channels and mediums that are available. This diversity in government is rooted in the same post-industrial salients that have changed much of the rest of Canadian society. But this equivalence between government and non-government sectors does not mean that solutions to policy problems

will be facilitated. The rapid and uneven change coupled with the increased interdependence in Canadian society calls for the adaptation of existing government structures and processes to the changing and diverse regional problems. Geoffrey Vickers, in discussing this phase of history, has noted that we must be able to match the "lead times" for mounting policy responses to problems with the time for predicting the incidence of post-industrial problems.[15] The "lead times" of the former seem to be increasing while those of the latter are decreasing. Do we already have a too-cumbersome, too-complicated policy structure for dealing with regional problems?

(2) The examination of the DREE policy delivery milieu showed an emphasis on a "top-down" process. This perspective does not always do justice to the actual needs at the regional level. As we noted earlier, it is the socio-economic system variables in the region which absorb policy outputs and then take action to modify regional conditions. The decision units that are to pursue a modified behavior are found in the rows of the matrix formulation. It is not sufficient to identify to whom a policy was delivered: it is necessary to assess whether the destination was the most effective delivery point and whether the medium was the most appropriate. For example, an industrial incentive which attracts a new firm but necessitates the import of labour to staff it may not solve either an unemployment or income problem for the people of the region. That some of this is recognized by DREE is clear from the results of their policy review of 1973. The emerging approach of emphasizing the "developmental opportunities" for the particular region is a cogent step in federal regional policy.[16] Eventually regional strategy should proceed from the viewpoint of the region itself rather than according to "imported" government strategies.

(3) Already visible is an array of new regional issues that are both different from the traditional ones of income and employment disparity and inseparable from them. Massive resource development in non-metropolitan regions for the purpose of supplying the material needs of the metropolis (in Canada or abroad) is one of these issues. Environmental degradation and other quality-of-life issues are also important and different from previous regional issues. To these we should add the questions of the desirable distribution of future population in the regions sometimes described as "growth management" and the effect of future energy shortages or shifts on regional patterns. Can the current regional policy structure cope with these issues? If we retain the present organizational environment which promotes random interaction of policy agents, the likely answer is no.

Footnotes

1 Economic Council of Canada, *The Challange of Growth and Change,* Ottawa, Queen's Printer, Fifth Annual Review, 1968, 141 ff.

2 *Ibid.,* p. 144.

3 *Cf.,* Donald Michael, *The Unprepared Society,* New York, Harper/Colophon, 1968, and F.E. Emery, "The Next Thirty Years: Concepts, Methods and Anticipations," *Human Relations,* 20:3 (1967), to name two of the best sources on trends toward post-industrialism.

4 Bertram M. Gross, "The City of Man: A Social Reckoning," in W. Ewald, Jr., ed., *Environment for Man: The Next Fifty Years,* Bloomington, Indiana University Press, 1967. pp. 136-156.

5 Eric Trist, *The Relation of Welfare and Development in the Transition to Post-Industrialism,* Los Angeles, U.C.L.A., Western Management Science Institute, 1968, Working Paper No. 1, p. 5.

6 Michel Chevalier, *Stimulation of Needed Social Science Research for Canadian Water Resource Problems,* A working paper prepared for the Science Secretariat, Ottawa, 1967.

7 Eric Trist, *Social Aspects of Science Policy,* a paper presented to the Roundtable on Science and Society, University of Toronto, School of Social Work, 1969.

8 Helen Buckley and Eva Tihanyi, *Canadian Policies for Rural Adjustment,* A Study of the Economic Impact of ARDA, PFRA and MMRA, Ottawa, Queen's Printer, 1967, Economic Council of Canada Special Study No. 7.

9 This parallels the notion of performance goals and achievement goals described in Sidney Sonenblum and Louis H. Stern, "The Uses of Economic Projections in Planning," *Journal of the A.I.P.,* 30:2 (May 1964). pp 110-122.

10 Economic Council of Canada, *Design for Decision-Making,* Eighth Annual Review, 1971.

11 Gerald Hodge, *Urbanization in Regional Development,* Part II, "A Research Agenda," prepared for the Canadian Council on Urban and Regional Research, Ottawa, 1969.

12 Philip Selznick, *TVA and the Grass Roots,* (Berkeley and Los Angeles: University of California Press, 1949).

13 *Cf.,* John Friedmann, *The Implementation of Urban Regional Development Policies: Lessons of Experience,* Los Angeles, UCLA, 1971.

14 The Economic Council of Canada used a similar term in its Fifth Annual Review, *op. cit.,* 165 ff.

15 Geoffrey Vickers, as quoted in Trist, *op. cit.,* Appendix VI.

16 Canada, DREE, *The New Approach,* Ottawa, 1976, pp. 14-16.

Comments by Guy Steed

This has been an exciting decade for those of us interested in regional development, one of both significant national resource commitment to help resolve regional problems in Canada, and of extensive experimentation with the means of delivery. Some of you may have waded through the proliferating collection of subsidiary agreements between DREE and the provinces since 1974. You have no doubt been impressed, if not pleased, by the dazzling range of initiatives — from funds to build or support regional water supplies, industrial parks, historic tourist attractions, urban arterials, fisheries marine service centres, planning units and industrial commissions, to support for the establishment of a relief herdsman service in the N.B. dairy industry and the creation of an internationally recognized centre for the exploitation of the resources of northern oceans and ice-related expertise. It is relevant to ask: Is this a massive "shot gun" approach or a flexible and concerted strategy to resolve regional problems? Clearly there is a major need for effective evaluation of these recent initiatives and I believe we are all indebted to Professor Hodge for a most original paper which hopefully may lead us toward a suitable system or procedure of evaluation.

I see his contributions to be threefold: the illumination of some recent elements of regional development policy through a brief consideration of relevant concepts drawn mainly from organization theory; the introduction of a matrix analytical framework which neatly assists in organizing, simplifying and relating the complex variety of origins, destinations and mediums used to effect regional change; and the generation of some pointed questions on the controls over delivery, the capabilities of the delivery system and the capacities of the current policy structure to cope with an array of new regional issues.

I wish to make five related comments on my understanding of Hodge's contribution: First, from my viewpoint as a teacher I expect Hodge's matrix framework will prove to be a most helpful contribution for introducing students to a seemingly bewilderingly complex subject. It is both a device for description and a first step in the process of evaluation. Second, I doubt that effective evaluation will proceed much beyond this initial step until we have much greater clarity in both the *definition* of what comprises these so-called regional problems, and in statements of the objectives to be achieved. As Hodge indicates early in his paper, the more policy-makers deal in complex issues, the more difficult the terrain of the problem is to hold in mind. Should there be mounting pressure from those supporting the "management-by-objectives" approach for explicit aims, with operational objectives and monitored outcomes, then perhaps we shall have room for effective evaluation of regional policy. The goals and issues are too complex and variable for me to support such an approach at present.

Third, academics and bureaucrats are often thought to be at loggerheads over the time perspective of regional policy. The former are often accused of crystal-gazing for their orientation over the long term, while the latter, viewed perhaps as more practically oriented, feverishly fight the latest fires, "confined", as the Canadian Council on Rural Development puts it, "by the straightjacket of the ad hoc and the short term." Distinctions between such time perspectives are most important, though not easily made. Nevertheless, perhaps we might adapt Hodge's matrix by dividing each column to indicate those entries which are basically short-term, ameliorative responses to immediate and specific problems as opposed to those which are aimed at longer term structural change.

Fourth, it might be useful to reorganize Hodge's matrix within an "urban field" or systems framework, while also considering the distinctions between short- and long-term elements. My interest in this is based both on the conception of modern regional development being largely urban-focused, and on the feeling that certain urban-oriented spatial configurations would probably increase our capacity to adapt to changing circumstances. How can we place enough emphasis on long-term regional flexibility at a time when the areas of relevant uncertainty have grossly increased in conditions of turbulent field environments? Is there relevance for much of Canada in the argument recently proposed by Professor Chisholm at Cambridge in a discussion of the British scene (*Regional Studies* 1976, p. 212)? "...instead of "regional" policy we need a policy for the urban system, designed to enhance that system's flexibility in the long run, flexibility, that is, in employment in the face of changing circumstances".

Finally, it might also be useful to relate Hodge's matrix of "applied regional policy channels" to other areas of federal policy. Just as Hodge has indicated that the objectives of various federal ministries may have an inherent, contributory and contextual as well as applied regional policy impact, so DREE regional programs may impinge directly and indirectly on other policy areas. To what extent, I wonder, is Canada's industrial strategy (a key buzzword in Ottawa not so long ago) now being surreptitiously formed under the guise of regional policy? Is the selection of sectoral development strategies in fact being closely interrelated with regional strategies in an attempt to strengthen our international competitive position?

Reference

Chisholm, Michael, "Regional Policies in an Era of Slow Population Growth and Higher Unemployment." *Regional Studies,* Vol. 10 (1976) No. 2, pp. 201-203.

Gerald Hodge's Response to the Comments

Gerald Hodge did not offer a response.

CONCEPTS AND METHODS OF REGIONAL ANALYSIS*

A review from the perspective of the federal Department of Regional Economic Expansion

by Sergio Sismondo

I. Introduction

To render the work of academics "policy-relevant" only a few conditions need be met; foremost among these is excellence, and following that, certain formal considerations such as an adherence to empiricism (as opposed to speculation), and others much too technical to be elaborated here. By the same token, to render the work of policy analysts interesting and instructive to academics requires that it be performed with excellence, and little else besides....

However, we can certainly learn from each other since we are immersed in the same subject matter – namely, the multitude of spatial, political, social and economic factors which impinge on the progress of the less wealthy regions of Canada. I trust that we have come here in this spirit: not to persuade each other of the merits of one approach over another, nor to put down each other's interests, but rather to showcase some of our recent work for what are essentially instructive purposes.

Problems which concern the Analysis and Liaison Branch of the Department of Regional Economic Expansion (DREE) cover a wide spectrum of disciplines: politics, economics, sociology, geography, and psychology. In addition, they take on a great variety of forms and are approached by means of an equally large variety of methodologies. In order to classify issues and methods of such varied natures, it is necessary to begin with a comprehensive description of policy research, after which we may discuss the relations between its parts more systematically.

A version of this paper was delivered by J. Ross Millar at a meeting of a task force on integrated regional development, held by the International Institute for Applied Systems Analysis in Laxenburg, Austria in April 1977.

II. A Paradigm of Policy Research

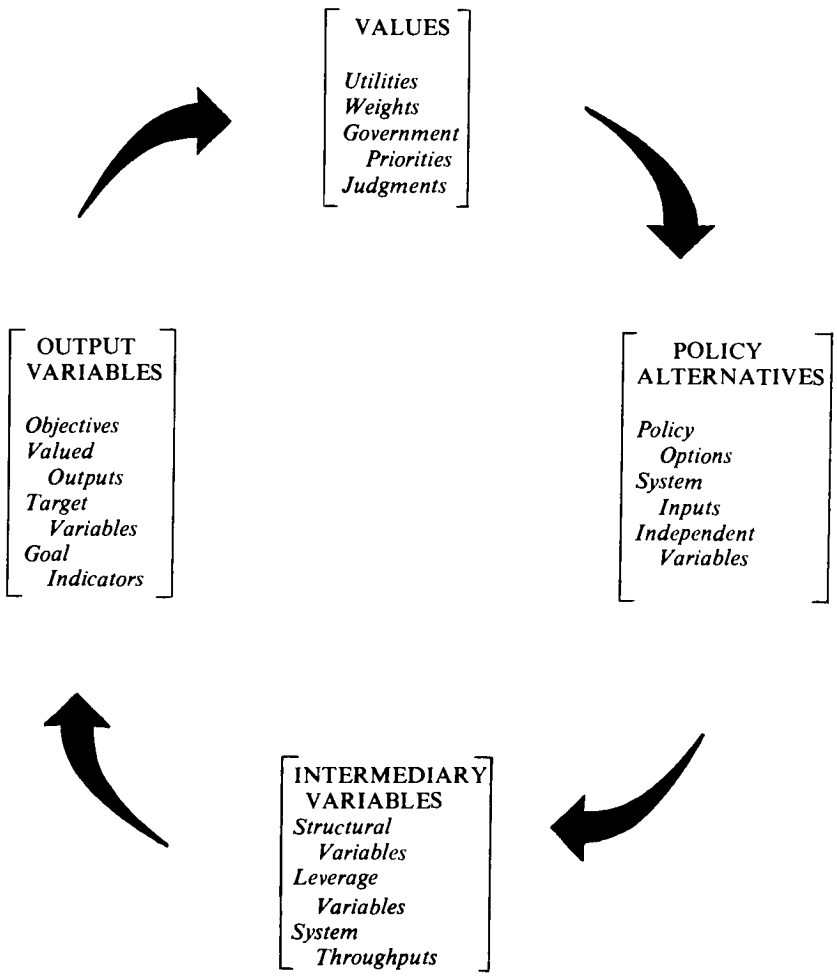
The most abstract conception of policy research requires the definition of only six classes of conceptual entities:

- *Policy Alternatives* — Which are also known in the literature, depending on the discipline of the author, as *policy options, system inputs, independent variables etc.;*
- *Intermediary variables* — Which are also known as *structural variables, leverage variables, system throughputs, etc.;*
- *Output variables* — Which are also known as *objectives, valued outputs, target variables, goal indicators, impact variables, effect variables, dependent variables, system outputs, etc.;*
- *Values* — Which are also known as *utilities, weights, government priorities, judgments, etc.;* again according to the perspective of the author;
- *Mapping functions* — Which relate by logical, mathematical, or statistical means a specific variable in one of the above categories to a specific variable in another set; and
- *Mapping functions* — Which relate variables to each other within one of the above sets.

These six categories of conceptual entities can be arranged in a sequence derived from an intuitive understanding of the social system and its change through time. Chart 1 depicts such a sequence. The chart shows that policy alternatives are hypothetical interventions in the social system designed to alter its functioning and its rules. Their impact on the conditions of people (output variables) is largely understood through their consequences on intermediary variables, which are (more often than not) the structural characteristics of the society. For instance, the distribution of income in society — one output variable from the viewpoint of individuals — is manipulated by a number of government policies. For example the taxation policies largely determine the reward structure (an intermediate and structural variable) of the society. Another pertinent example, a society's transportation policies, a series of structural, intermediate, and leverage variables, are designed to influence the location of industry and employment (output variables for individuals). Following the loop clockwise we find that structural variables are the major determinants of individual actions and personal well-being, that is, of the

Chart I

A General Paradigm of Policy Research, Showing the Functional Relations Between Its Components



outputs of the social system for people. In turn people's perceptions of their conditions — their sense of well-being and scope for meaningful action — determine the relative weights, utilities and values which form the input data to the major decision-making components of the system. Finally, the diagram shows that policy alternatives bear a direct relation to these values, and, in fact, are derived from them.

In summary, Chart I shows that policy changes (as inputs) are possible in any given system, and that they can be formulated in terms of their effects on the structure of the system. Structures and outputs are themselves interrelated by deterministic[1] chains. On the basis of new circumstances produced by such outputs, policy options can be again assessed, negotiated and modified after considerable re-focusing of issues among population segments in order to keep the system capable of sustaining a high quality of life for its members. The nature of feedback is implied by such re-assessment in the political process.

The major advantages of a general paradigm as in Chart I are that it reminds us of the categories of variables and relationships that must be substantially specified for particular analysis, and that it shows these variables to be directly or indirectly related in a circular feedback system. It does not reveal the specific nature of the substantive variables, nor the closeness of their deterministic links. But it does give us their taxonomy and a fixed point of reference for the discussion of their general characteristics.[2]

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[1] The term *deterministic* is used here to mean a broad category of relations including probabilistic ones, "determining the boundaries of", causal relations, etc.

[2] The paradigm, in its simplicity and great level of abstraction, also tends to obscure some rather important characteristics of the phenomena of concern. Some salient examples of complicating factors are: (a) structural change and individual actions are in a state of resonance, thus the arrow connecting intermediary to output variables is not strictly uni-directional; (b) all four categories of concepts are constrained by exogenous givens or data, for instance by policies, structures, outputs, and values of neighbouring systems (e.g. another country); (c) the functional relations between categories are mutable and tend to be themselves functions of levels attained by certain variables; for instance, the proportion of money saved is related functionally to changes of income, but by a function that changes with time according to many economic variables, including levels of income; (d) each social system is nested within larger ones or is composed of nested systems — thus at each system level, policies, structures, outputs, and values are determined or constrained by variables at other system levels; (e) each variable change is constrained by the level attained in the variable at previous points in time; (f) similarly, each variable in the system is evolving through time as a function of previous policy interventions and other events, representing, as it were, a moving target; and (g) researching and gaining knowledge of one set of relations is in itself an intervention leading to changes of perceptions and values. A more detailed discussion of these and other aspects of the paradigm appear in previous papers by the author.

The complete conceptual domain of policy research is the (infinite) set of all possible sequential combinations of these elements. The morphology of any one research endeavor can be described in terms of the six categories. Any specific research involves discovering, quantifying, or otherwise explicating given elements of one or more sets that have correspondence to given elements in other sets. An example of a problem might be to discover the relationship between a range of policy alternatives and a specified set of output indicators. Or, given a set of relations known to be (to some extent) representative of reality: to discover the policy alternative that best achieves a specified set of target goals.[3] In the next section, a sample of policy endeavors is examined by way of illustration from the perspective offered by the paradigm.

[3] One methodology currently in vogue would state the policy-research question in less linear ways; nevertheless, it is quite possible to state it in terms of the paradigm: the task of policy analysis is to discover a policy, among the elements of a large set of alternatives, which reacts, in a desired manner, with a sub-set of objectives which are also to be discovered among the elements of a large set of objectives. Stated this way, the problem is so fundamentally lacking in guidance parameters that according to some the only avenue to a solution is to obtain a fix on intermediary variables which are known *a priori* to be empirically related to an important sub-set of objectives as well as to a feasible range of policy alternatives. To construct a simple example: in the conduct of policy research in regional development, knowing that a large set of indicators can represent desired outcomes and that a large, undefined set of policy alternatives is in the realm of the conceivable, imaginative new ideas would emerge by studying in depth the causes and effects of an intermediary variable such as cost of transportation. The necessary prerequisites for the choice of this variable are met, at least in theory, since we know cost of transportation to be a relevant consideration in the location of industry — and therefore of employment opportunity, capital movements, industrial structure, and a large number of other objective or output variables — and we also know *a priori* that the cost of transportation is a policy-manipulable (or *malleable*, in Etzoni's terms) variable. We can influence it by subsidies, construction and organizational innovations.

III. A Classification of Projects and their Components

Paradigms cannot be tested; they generate theories which can be tested. What follows in this section, therefore, may not be considered an empirical test of the preceding section, but rather an illustration of its relevance. The output generated by twenty analysts (Policy Analysis Division and Economic Development Analysis Division) over the sample time from June to December 1976 has been classified according to the emphasis given to the concepts outlined; in addition it has yielded some interesting observations.[4]

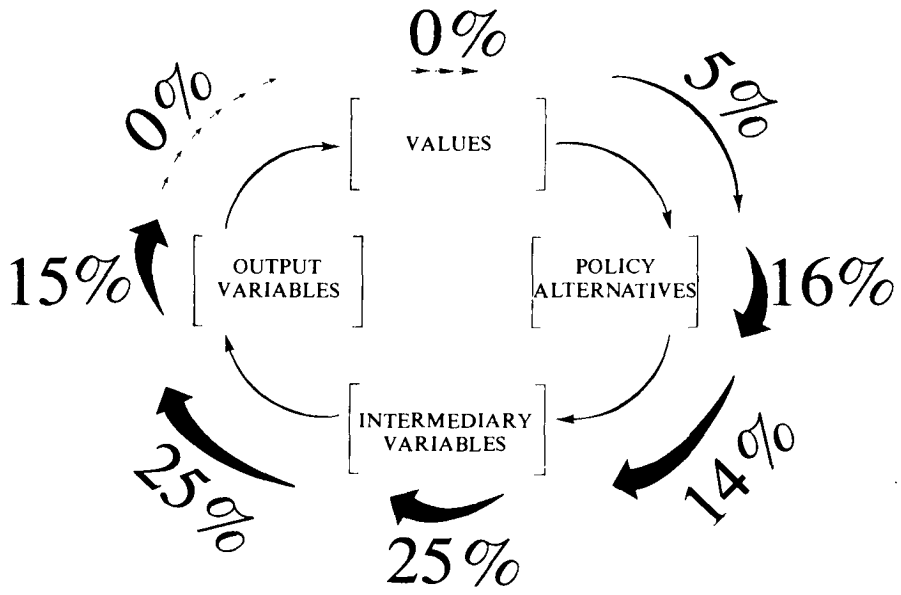
As can be seen in Chart II, nearly 95 per cent of the analysis has focused on policies, the impact of policies on socio-economic structural variables and their impact on output variables. This observation points to the fact that our research is not questioning broader statements of objectives on which all policies are founded. This is not altogether unexpected, since we normally assume that the translation, or aggregation, of "level of living" and "quality of life" variables, and their associated personal values, into political statements of social values and government objectives are properly the domain of politicians and the subject of study of their personal advisors.[5]

[4] This classification is approximate in three senses. First, all analytical projects contain some discussion of peripheral issues. A project designed to investigate relations between transportation changes and output indicators will undoubtedly address policy concerns. Even if it does not do so explicitly, it was in all probability designed to do so, and therefore implied some initial work in that area. Second, while the project may have had the study of relations as its principal aim, depending on the availability of data, more work could have been expended in the quantification of concepts than in researching their linkages. Third, the survey reported here includes analysts, but does not mention support staff, and is therefore only a very crude indicator of the resources expended.

[5] Furthermore, the sort of problem implied by the social aggregation of individual preferences is not easily subjected to research. In Arrow's words, such aggregations are not possible without violating the so-called "non-dictatorship" condition because the complete ordering of a necessarily partial order of social states is impossible without weighting individual preferences. The residual power to make such weightings clearly rests on the elected representatives. In addition to such technical conundrums, the subject matter often requires a phenomenist's approach, which is inherently inimical to our disciplines and training.

Chart II

Approximate Expenditures of Staff Resources in Different Modes of Policy Research



Following the chart clockwise we find that 5 per cent of the analytical resources were expended in the examination of the relationships between socio-political values and policy alternatives. Questions asked in this domain may flow in either direction: Which policy alternatives should be pursued, given a new priority ranking (or a new understanding) of political values? Or, given the suggestion of a new policy initiative, determine its relationships to stated government objectives. Chart III is only one example of this type of work; it is instructive to note that not much accepted methodology exists at this level of discourse beyond standard taxonomical and classificatory devices. One attempt to introduce quantitative techniques in this important link is presented in the next section, which deals with project CANGO.[6] Chart III will aid the reader to situate DREE and its policies within the complex array of governmental objectives.

Also in Chart II we find that 16 per cent of staff resources have been involved in the study and elaboration of policies and another 14 per cent in the study of their implications for socio-economic structural variables. It is under these two categories that we may list the widest diversity of projects; examples might include:

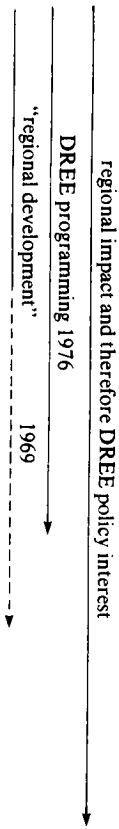
- locational choices and their community impacts,
- sectoral policies and their distributional effects,
- industrial structure impact of present DREE initiatives (retrospective),
- projected impacts of proposed policy alternatives (prospective),
- employment generation requirements and proposed measures, and so forth.

[6] This 5 per cent figure also raises some interesting and difficult questions. Does it reflect the existence of a good correspondence between policies and programs in place and current government priorities? Is there, in other words, not much more to be said about the subject past the 1973 policy review? Are government priorities not changing sufficiently to call into question the appropriateness and completeness of the DREE response? Does it reflect a bias of the staff toward the quantitative, away from the essentially verbal discussion of correspondence? Does it reflect the decentralized decision-making system of DREE whereby the program choices are made away from Ottawa? Or, does it reflect an inherent conservatism and responsive posture of the bureaucracy vis-à-vis the policy? Certainly some of the answers are (at least partially), yes; an in-depth analysis of these issues, however, is beyond the scope of this paper.

Chart III

Typology for Illustrating How "Regional Development" Fits into the Context of Total Government Activity

Policy Area	*Government Activity*	*Examples of Program Outputs*	*Departments Responsible*
ECONOMIC DEVELOPMENT	INDUSTRIAL DEVELOPMENT	actual production of marketable goods and services	DREE ITC
	RESOURCE MANAGEMENT	research, surveying, control, resource renewal	DREE DOE EMR AGR
SOCIAL DEVELOPMENT	INFRASTRUCTURE (INDUSTRIAL AND/OR SOCIAL)	industrial parks, electricity, oil, gas, transport & communications, sewer & water housing, educational, medical, recreation facilities	DREE MOT CMHC EMR
	HUMAN CAPITAL	education, occupational training	M&I
SOCIAL WELFARE	SOCIAL SERVICES	medical, counselling, mobility, housing assistance	NH&W CMHC M&I
	INCOME TRANSFERS	cheques, direct employment	M&I UIC NH&W
OTHER GOVERNMENT ACTIVITY	LOCAL SERVICES	mail, police, fire, recreation etc., local inputs to national services	CPO RCMP DND
	NATIONAL SERVICES	defence, justice, prisons, culture, market regulation, basic research, etc.	DND JUSTICE SEC ST COM CCA



This type of study is generally a quantitative exercise which best fits the stereotype of simulation models in policy research, and generally assumes the presence of analytical tools developed for this purpose (theory, data, and software) — that is econometric models (CANDIDE-R), input-output models, community structure models, and the like. Such research tools, of course, are developed in the study of socio-economic structural and output variables which, as the chart indicates, have involved 65 per cent of analytical resources during the sample period. This distinction is useful to make, for it shows how much basic analytical work is required in policy-impact study.[7] Section V of this paper will outline some examples of current activities in these categories and attempt to derive some general propositions regarding their characteristics.

This brief review serves the purpose of giving us a context; listing all projects undertaken would be as tedious as it would be inappropriate: it is probably more instructive to examine a few cases through which we can address the "concepts and methods" title of the paper.

IV. An Experiment in the Quantification of Values: CANGO[8]

Many decision-making situations require the simultaneous achievement of a set of objectives which are often incommensurate; trade-offs between them cannot be specified. Two approaches can be used in such circumstances: the optimizing and the satisfying.

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[7] Although we cannot generalize, the ratio of 65/30, or roughly 2 to 1, between basic analysis and policy-impact analysis is indicative of magnitude. It is likely that a similar ratio has been maintained through the period following the departmental policy review (1973-1977). The main reasons a policy analysis group cannot by-pass basic research are: (a) Theory developed elesewhere is based on concepts too abstract to be of direct relevance to policy-impact evaluation; concepts require more concrete interpretations. (b) Available theory is too general for the same purposes; its tenets often require translation to higher specificity. (c) Research conducted elsewhere is generally based on small samples; policy-impact analysis requires replication with larger data sets (often complete national data sets). (d) Available research is often based on obsolete data; replication is required using the latest available data files.

[8] Much of the thought behind this section was developed in conjunction with Richard Zuker, Elizabeth Harman, Carl Taylor, and Brian Near of the Analysis and Liaison Branch, DREE. CANGO is an acronym for five concepts which played a major role in the original project for which the tool was developed: capacity to grow, attractiveness, need, government designation, and opportunity.

Several major problems arise when one applies optimizing techniques to multi-objective situations. First their use assumes that theories about the impact of public policy on society can be well specified; in fact, only very partial theories exist. Second, they generally involve attempts on the part of analysts to convert incommensurate observations to unidimensional scales or common denominators. Such manipulations are based on implicit value judgments (often with no consensus) and their aggregation fails to note the major trade-offs between them. This is equivalent to assuming away the essence of the problem, as the multiple objectives are reduced to one. Third, in practice, the calculations performed are usually so elaborate as to preclude the possibil- with their own.

In contrast, the satisfying approach usually requires the specification of an explicit set of value judgments. Provided the model utilized is not excessively complex from a technical point of view, this provides decision-makers with the ability to modify these value judgments in conformity with their own. *CANGO is a model for decision-making in locational choice problems; it differs from most analytical activities in that it utilizes the mix of value judgments as the primary variable input data; its output is a rank-ordering of locations (or matching of locations) accompanied by a score for each location determined by the extent to which all given objectives can or cannot be satisfied by the choice of that location.* Looking back at Chart I, we can place CANGO in the upper right-hand quadrant; the questions it addresses are: What policy is to be followed to best satisfy a weighted set of objectives? And, as we change the weights given to different objectives, how is the solution of the location problem affected? A quantitative model in the upper right-hand quadrant represents such an unusual departure in the current decision-making environment as to require further explanation.

The CANGO model consists of the following five elements:

1. *Alternatives* — This is the set of locations under consideration.

2. *Attributes* — These are the characteristics which describe the alternatives which make up the set of locations and on which the selection will be based. Attributes are defined in two stages:

   (a) *Criteria Sets* — In any specific location problem, it will be possible to identify a set of conceptual relations between objectives and characteristics of locations. These relocations will constitute the partial theory referred to before. Such theory as may exist to approach the problem is made explicit by the identification of nodal concepts, which we refer to here as criteria sets.

(b) *Variables* — For each of the above concepts, a series of measurable variables can be identified (the key role of theory is to relate these measurements to variables and criteria sets). For each alternative location, these data will be known and will constitute the data matrix for the locational choice problem.

3. *Thresholds* — Locations are ordered along each variable within criteria sets in the direction that fulfils the meaning of the concept being measured. For each variable two thresholds or cut-offs are specified, which divide the range of the variable into three regions. The region "above" the upper threshold is the area of "preference" on the variable, the region between the thresholds is the area of "indifference" and the region "below" the lower threshold is the area of "rejection".

4. *Weights* — These are measures of the relative importance of the criteria sets and variables. The weights are assigned in a two-step process – first, to criteria sets and then to variables within criteria sets. The following conditions must be satisfied by the weights: at all times during the procedure, the weights of the criteria sets must sum to unity and the weights of the variables within a criteria set must sum to the weight of that criteria set. With all models of choice or decision-making, there is either an implicit or explicit weighting of characteristics on which the decision is to be made. In the simpler models, a single characteristic is chosen as the basis of the decision and is, therefore, given the greatest weight, while the rest receive zero weight. The complexity increases as the attempt is made to weight more and more of the characteristics in relation to each other. With this model, users are asked to give weights to both the criteria sets and variables and, therefore, are free to make the values they place on the characteristics of the problem to be solved quite *explicit*.

5. *Solution Algorithm* — The solution algorithm is a procedure which ranks the alternatives in order of preference based upon the variables selected and the weights and thresholds chosen.

A solution is a rank-ordered set of locations and is derived in the following way:

a) All locations which satisfy the conditions above the upper thresholds for all variables are tested. These are the preferred locations in the solution since no requirement has been violated and the locations have all the characteristics demanded.

b) If no solution exists, that is, if there is no location above all upper thresholds, then a systematic search is carried out to find a solution on the basis of the relaxation of certain constraints or requirements, starting with the least important. It is during this process that the user comes to appreciate the effects which value judgments have on the outcome.

A full description of the algorithm is perhaps unnecessary at this stage but can be made available. What it produces is an ordered ranking of locations, each accompanied by a score that indicates the extent to which each location satisfies the weighted conditions given.

The system can be seen to operate like a series of sieves through which locations pass on the basis of their characteristics and the technical specifications of the sieves. Most successful locations are those which satisfy all requirements specified.

Chart IV diagrams the steps followed in the utilization of CANGO for the solution of locational choice problems. Table I, immediately following, is a sample output for a multi-objective problem on development opportunities in the Western Region. These may aid the reader to visualize the operation of the model.

We have gone to some effort to describe this particular methodology because it represents a significant departure from quantitative techniques commonly utilized in policy analysis. Since DREE and others found the technique to be useful in an increasing variety of problem situations, it is necessary to outline its advantages and, as much as possible to identify its weaknesses.

From a technical perspective, the main advantage offered by CANGO is the provision of a framework for the selection and organization of disparate and very large data sets. Depending on the problem, these data sets can contain as many as 50 variables over more than 1 000 communities in Canada. It can be easily seen that bringing this information to bear on a problem of selection of, for example, twenty preferred locations is a formidable task indeed. The method brings much that is new and refreshing to decision-making:

a) CANGO permits the decision-maker to render his value judgments explicit through weighting of criteria sets and variables, and through the setting of thresholds. It does so in inter-action with a computing device, producing immediate feedback to the policy-maker regarding the consequences of his judgments; iteration and experimentation are therefore possible and tempting.

Chart IV

Diagramatic Representation of the Operation of CANGO Locational Model

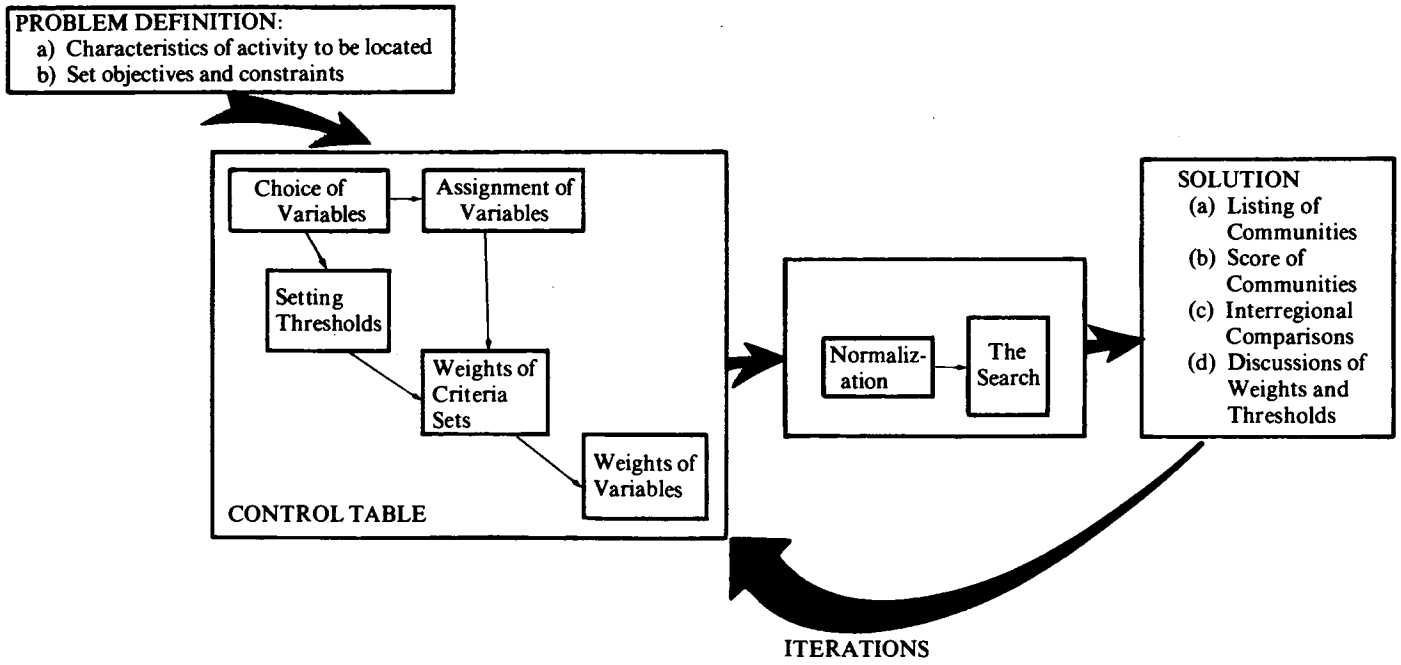


Table I

Solution Phase of CANGO Program

SOLUTION	#	1	IS	REGINA	WITH SCORE	(.0000, .6350, 27)
SOLUTION	#	2	IS	SASKATOON	WITH SCORE	(.0000, .6350, 29)
SOLUTION	#	3	IS	MOOSE JAW	WITH SCORE	(.0465, .4081, 1)
SOLUTION	#	4	IS	BRANDON	WITH SCORE	(.0465, .6172, 28)
SOLUTION	#	5	IS	SWIFT CURRENT	WITH SCORE	(.0635, .6103, 19)
SOLUTION	#	6	IS	RED DEER	WITH SCORE	(.2508, .5128, 12)
SOLUTION	#	7	IS	LETHBRIDGE	WITH SCORE	(.2508, .5128, 25)
SOLUTION	#	8	IS	VERNON	WITH SCORE	(.3809, .2940, 8)
SOLUTION	#	9	IS	KAMLOOPS	WITH SCORE	(.3809, .4105, 20)
SOLUTION	#	10	IS	NORTH BATTLEFORD	WITH SCORE	(.4933, .0000, 0)
SOLUTION	#	11	IS	COURTNAY	WITH SCORE	(.4933, .1372, 10)
SOLUTION	#	12	IS	CHILLIWACK	WITH SCORE	(.4933, .2796, 1)
SOLUTION	#	13	IS	YORKTON	WITH SCORE	(.4933, .2796, 15)
SOLUTION	#	14	IS	TRAIL	WITH SCORE	(.4933, .2796, 22)
SOLUTION	#	15	IS	DAUPHIN	WITH SCORE	(.5629, .0000, 0)
SOLUTION	#	16	IS	PORTAGE LA PRAIRIE	WITH SCORE	(.5629, .0000, 0)
SOLUTION	#	17	IS	DAWSON CREEK	WITH SCORE	(.5629, .1650, 3)
SOLUTION	#	18	IS	ESTEVAN	WITH SCORE	(.5629, .1650, 5)
SOLUTION	#	19	IS	CAMROSE	WITH SCORE	(.5629, .7363, 1)
SOLUTION	#	20	IS	DRUMHELLER	WITH SCORE	(.5629, .7363, 1)
SOLUTION	#	21	IS	SELKIRK	WITH SCORE	(.5629, .7363, 1)
SOLUTION	#	22	IS	WETASKIWIN	WITH SCORE	(.5629, .7363, 1)
SOLUTION	#	23	IS	WEYBURN	WITH SCORE	(.5629, .7363, 1)
SOLUTION	#	24	IS	PRINCE ALBERT	WITH SCORE	(.6350, .0000, 0)
SOLUTION	#	25	IS	KELOWNA	WITH SCORE	(.6350, .0000, 0)
SOLUTION	#	26	IS	MEDICINE HAT	WITH SCORE	(.6350, .0000, 2)
SOLUTION	#	27	IS	NANAIMO	WITH SCORE	(.6350, .0000, 7)
SOLUTION	#	28	IS	PENTICTON	WITH SCORE	(.6350, .0000, 9)
SOLUTION	#	29	IS	CRANBROOK	WITH SCORE	(.6350, .0000, 13)
SOLUTION	#	30	IS	PRINCE GEORGE	WITH SCORE	(.6350, .0000, 14)
SOLUTION	#	31	IS	GRANDE PRAIRIE	WITH SCORE	(.6350, .0000, 26)
SOLUTION	#	32	IS	NELSON	WITH SCORE	(.6350, .6842, 1)
SOLUTION	#	33	IS	PRINCE RUPERT	WITH SCORE	(.7104, .0000, 0)
SOLUTION	#	34	IS	THOMPSON	WITH SCORE	(.7104, .0000, 0)
SOLUTION	#	35	IS	WINNIPEG	WITH SCORE	(.7104, .0000, 0)
SOLUTION	#	36	IS	FORT McMURRAY	WITH SCORE	(.7925, .0000, 0)
SOLUTION	#	37	IS	FLIN FLON	WITH SCORE	(.7925, .0000, 0)
SOLUTION	#	38	IS	WILLIAMS LAKE	WITH SCORE	(.7925, .0000, 0)
SOLUTION	#	39	IS	KITIMAT	WITH SCORE	(.7925, .0000, 0)
SOLUTION	#	40	IS	POWELL RIVER	WITH SCORE	(.7925, .0000, 0)
SOLUTION	#	41	IS	TERRACE	WITH SCORE	(.7925, .0000, 0)
SOLUTION	#	42	IS	PORT ALBERNI	WITH SCORE	(.7925, .0000, 0)
SOLUTION	#	43	IS	FORT ST. JOHN	WITH SCORE	(.7925, .4446, 1)
SOLUTION	#	44	IS	KIMBERLEY	WITH SCORE	(.7925, .4446, 1)
SOLUTION	#	45	IS	THE PAS	WITH SCORE	(.7925, .4446, 1)

THE FINAL VARIABLE HAS NOW BEEN DROPPED;
CANGO PROGRAM TERMINATED.

b) A framework is provided for the reconciliation of conflicting objectives. The system has the capacity to present alternative solutions on the basis of:

   i) the satisfaction of a series of single objectives which can be compared with each other; and

   ii) the satisfaction of equally weighted or differentially weighted objectives. The trade-offs among objectives are represented.

c) Concerns that are not easily quantified can be introduced into the system.

d) Perhaps most importantly the system provides a focus for discussion and compromise among policy-makers in the process of choosing and setting weights and thresholds and observing the outputs generated by their preferences.

The disadvantages we have been able to identify in the operation of the system lie mainly in its possible misapplications. No matter how carefully criteria sets and variables are chosen initially by means of theoretical discussion and empirical observation, it is always possible for the user of the model to exclude variables at will by simply attaching a weight of zero to them.[9] Other analogous manipulations, equally anti-theoretical, might be to include variables whimsically, to raise or lower thresholds so they are no longer discriminatory, or to set high weights and low weights on bases other than true judgment of their significance.

CANGO has opened the door to further use of systematic decision models. It has shown that some receptivity exists in the government for improved methodologies to deal with that upper-right quadrant. If the original location problem had been submitted to standard maximizing or optimizing analysis, based on two or three objective functions, a solution would have been found; but we can say with almost total confidence that the solution would not have been the one which was later implemented. Too many other factors would become important. The multi-objective satisfying model, by contrast, produced locational configurations which corresponded very closely to the final

[9] This is a controversial point; we may believe in "user sovereignty", in which case there is no mis-application of what is essentially an "idiot-box"; on the other hand, there is a human proclivity to interpret hard-copy results as meaningful regardless of initial assumptions, which leads us to caution against the misrepresentation of findings.

ministerial decisions. In addition to the advantages already mentioned, and at a very general level, we may conclude that: a) in the context of regional planning and development, systematic methodologies for dealing with the upper-right quadrant of Chart I are urgently needed; b) policy research models that closely approximate value issues and can properly address mutually conflicting objectives, are of prime importance to an activity field as plagued by internal riddles as regional planning and programming; and c) that much more work is required in the development of such methods.

Let us now turn to examples of analytical activities in the lower half of the diagram, that is, those relating policies, structures and outcomes. In the last section of this paper, we will return to speculate on further implications of the upper half of Chart I.

V. Policy Impact Studies

If the upper portion of Chart I is the Cinderella of policy analysis, the lower portion is its pampered child.

The diversity and scope of work undertaken in this domain offers a rich experience for examination. Among the most interesting cases, we can discuss the construction of an interprovincial input-output table, a model designed to test the credibility and consistency of predictions and projections on the future of Canada's regions, and the development of community structure research as it applies to regional problems. A classification of recent and current analysis activities shows these topics represent three categories from among seventeen, leaving, therefore, fourteen other avenues of work unmentioned in this paper – the choice was rather arbitrary.

The construction of an interprovincial input-output model is perhaps the most orthodox of the three examples, and is mentioned briefly here at least partially for that reason. The rationale for embarking on such a massive effort as the construction of income and employment input-output matrices for each province and for their interactions is simple: DREE requires a simulation tool which will permit computations of income and employment impacts of suggested policy alternatives, taking into account leakages between provinces. Clearly, this is a useful tool which can aid in the evaluation of policies for regional development planning.

The reasons why such a model did not exist elsewhere are less clear. Although some previous attempts were made, they were rather inadequate not because theory is lacking, for a static input-output theory is well developed elsewhere, but largely because of data limitations. The problem

tackled here was to modify methodologies for construction of the tables in order to maximize the use of available data, also taking into consideration its non-optimal form, to allow for potential applications of interest to regional development planning. A major analytical effort was expended to obtain a parsimonious but useful level of disaggregation; some innovation was required in the software. In theoretical terms, however, the input-output effort does not significantly break new ground: it is simply a good example of the routine analyses which have characterized government work on the bottom half of Chart I. Precision, completeness, validity, and methodological innovation are at a premium; conceptual breakthroughs are few and far between.

The second analytical project mentioned is considerably less elaborate than input-output tables in that it is more aggregated, involves less precision, less computation, and in general makes fewer pretenses of accurate forecasting. It is, nevertheless, novel and interesting in its conception — less orthodox, as it were. The project is named Regional Futures: it deals with the interactions of 96 data series projected 25 years into the future for each one of four Canadian regions as well as for all of them taken together. Unlike most projections, this one does not pretend to discover one scenario which is more likely than any other. *Regional Futures is designed to uncover the implications for ninety-five important data series when the ninety-sixth is altered at will, no matter how unfounded the assumption might be.* More than one input series may be manipulated at the same time, provided consistency checks are made. This is an unusual model: while most models are like boxes where one side is clearly labelled "inputs" and the opposite one labelled "outputs", this one is more like a 96-faced polyhedron where the analyst chooses at will any one face to label "inputs", turning all others into "outputs". Regional Futures is more like a ball than like a box. The model is designed to answer questions of the general type: If variable X is to attain the value "xij" in region "i" and year "j" what must happen, to be consistent, in all regions for all other variables?

This model, like CANGO, is unusual enough to require some further explanation.

Demographic and economic variables are projected within an accounting framework which renders them all compatible. The structure of the model is, in fact, a series of identities and numerous consistency checks. The initial input data consists of best guesses on the following principal variables: base population (by age, sex, and province), death rates, fertility rates, immigration, provincial distribution of net immigration, labour force projections, participation rates, unemployment rates, sector shares of employment, productivity by sector, and the regional share of output by sector. All other variables are derived by following the accounting

relationships. This initial set of mutually consistent time series consitutes a "base case", not because it has any particular merit as a best guess, but because such a foundation is necessary to examine later the sensitivity of the projections as one or more variables are manipulated.

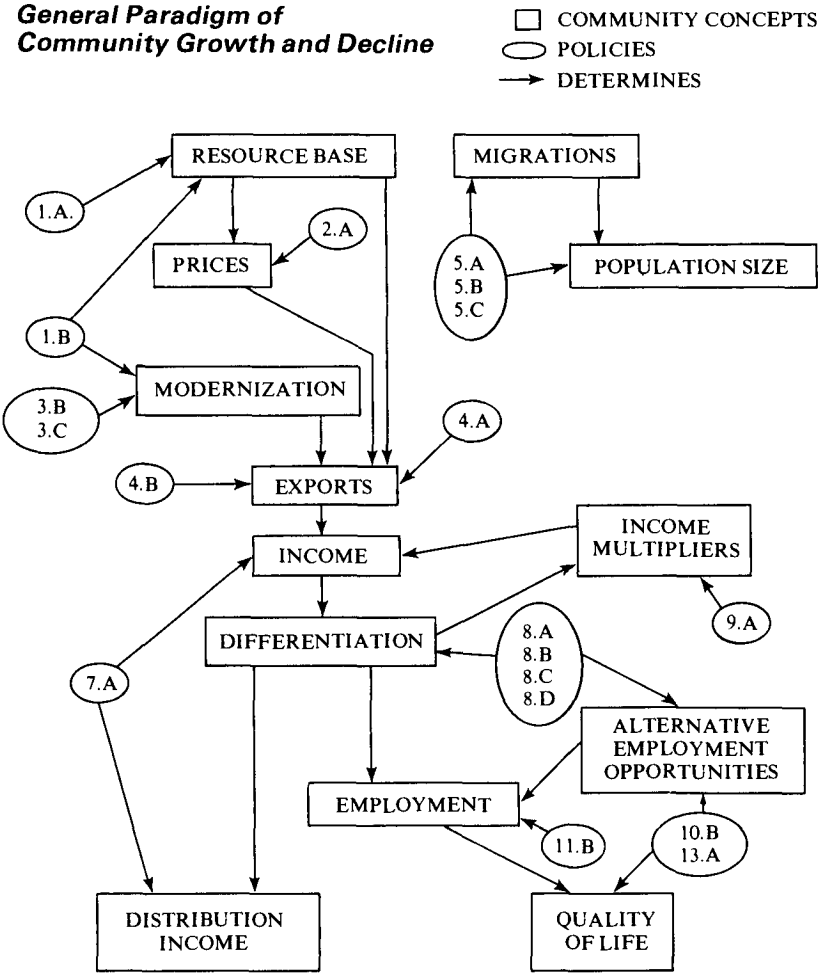
For the purpose of illustration, one assumption fed into the model was that each region would re-obtain a population share equivalent to the 1971 distribution, by the year 2001 – not a far-fetched proposition at first sight. The algorithm computes that, other things being equal, in order to maintain constant unemployment rates at current levels, such a population distribution would require, in addition to the expected employment generation in each region, the generation of a number of jobs equivalent to the total relocation of every employment opportunity in Toronto to the slow-growth areas. This figure is almost equal to the number of jobs currently existing in the entire Atlantic Region: thus a new light is shed on the federal-provincial demographic discussion.

One cannot help noticing the similarities between the Regional Futures and CANGO models. Although they clearly belong to different quadrants of the paradigm (Regional Futures being on the lower-left), neither pretends to be able to produce a "best answer" because they recognize only the interdependence of phenomena, leaving to others the identification of values and objectives associated with the phenomena. On the other hand, both models provide the policy-maker with a reasonably rigorous framework within which value assumptions can be discussed: a checklist, a weighting scheme, a set of consistency checks.

A third example is the development of community analysis techniques which can be traced through a stream of projects rather than labelled as a single project. Initially the challenge was to provide a framework for the discussion of community impacts of a large set of policy proposals regarding the restructuring of the Atlantic fishery. As many as 66 separate policy alternatives had been proposed in early studies; most were meant to impact either the bio-mass of various species, the income of fishermen, or the economic structure of the fish-processing industry. These impacts could be studied in reasonable isolation from each other but the overall community impact remained somewhat of a mystery for most involved. Chart V depicts a general framework of community growth and decline, when the major socio-economic variables of the community are subjected to analysis. Policy alternatives were classified according to their intended impact variable; their major interrelations are shown in Chart V. In terms of the initial chart, this one may be considered as a map of some routes in the lower right-hand quadrant: it creates an ordered set out of a number of unrelated policies and community structure variables.

Chart V

General Paradigm of Community Growth and Decline



The next step is more difficult; each community must obtain a score for each variable: data reduction begins.

Without repeating the stream of projects that led to each and every measurement in the community analysis (CANGO was one), let us look at some of the currently utilized instruments.

The first consists of the identification of 1 061 urban nodes each with a rural hinterland, which, taken together, approximately cover the map of Canada (90 per cent population coverage). This information is correlated with major geographic referencing systems used in the government: the census code, the SGC code, and the postal code. These constitute the disaggregate community units of analysis; aggregation upwards is routinely performed. Another instrument is a readout of the distances between all these nodes. This provides answers to such questions as: Given loss of employment in one industry in one community, what are the comparable opportunities within X miles? Or, what is the differential juvenile crime rate as a function of distance to the higher eduation infrastructure? A third is a file of hundreds of infrastructure-related variables and indicators for each node, and many for each rural fringe as well. A fourth tool, provides quality of life indicators (system output variables) which have been derived by various scaling techniques, for each node and node aggregation.[10]

Fifth are a number of devices for the measurement of community structure concepts. Among them we can make special note of Guttman Scales. Table 2 is an example of such a scale. It is intended to measure the extent of differentiation of cultural facilities in communities, and is particularly well-suited to the analysis of gaps and population thresholds. Although museums might be considered a somewhat esoteric analysis subject for a regional development agency (and some would strongly disagree), similar scales have been constructed for virtually all institutional sectors, including the private tertiary complex.[11] The scale rank-orders all communities (791 in this experiment, although only the first few are shown) and all cultural facility items, showing the statistical regularity with which they occur. In the diagram, X indicates the presence, and a dot the absence, of an item in a community. The stepladder line shows visually the score each community attains in such a scale; the first five digits are a community code, and the next column indicates the score

[10] See: C. Taylor, *Social Conditions Report (SCORE),* 1975. Report available through DREE.

[11] Primary and most secondary industries cannot be treated in this fashion, however, because their location depends on factors other than settlement pattern.

attained by each. The statistics printed show how one-dimensional the phenomenal studies can be. The following policy hypotheses can be tentatively drawn from such scales:

- Dots to the left of the line indicate gaps; should they be filled?
- Xs to the right of the line indicate unusually advanced steps; are these to indicate potential for development? Will the remaining dots fill in?
- Is building the next item which is missing in a community akin to a balanced-growth strategy?
- Is building far to the right of the line and expecting the gaps to be filled somewhat like unbalanced strategies? Does a concept of Backward Institutional Linkages make sense?
- Tall rungs in the ladder indicate difficult thresholds to pass; should these be the target of subsidies? Would further steps be taken by communities that are aided to jump these thresholds?

It is not difficult to see from an intuitive viewpoint what the relevance of such instruments can be for planning developmental interventions. It is more difficult to provide a sound theoretical base for the detailed interpretation of such results; certain conceptual advances are required in this area.

Three examples are indicative of methods used. Applications abound and flow in all directions: from proposed or existing policies to structural phenomena; from perceived problems in structure to policy alternatives; and from output indicators to structural condition and proposed policies. Various models can also be used in sequence, in almost modular fashion: scales and hierarchical groupings into CANGO; CANDIDE-R with the interprovincial input-output model; those results can then be fed into Regional Futures, and so forth, as the imagination of analysts permits. Onwards! But in the heat of battle, the sight of objectives is easily lost; let us therefore return to re-examine the context and the goals of our work.

Table II

Statistics and Partial Display of a Guttman Scale of Cultural Infrastructure in 791 Canadian Communities

TOTAL ERRORS = 277
NONMODALS ACROSS = 2165
NONMODALS DOWN = 1081
COEFFICIENT OF SCALABILITY = 0.7438
COEFFICIENT OF REPRODUCIBILITY = 0.9682
MINIMUM MARGINAL REPRODUCIBILITY = 0.8758
PERCENTAGE IMPROVEMENT = 4.24%

GUTTMAN MUSEUM 2

IDENTER	SCALE	3	1	2	7	8	10	11	5	4	9	6
40012	11	X	X	X	X	X	X	X	X	X	X	X
40020	11	X	X	X	X	.	X	.	X	X	X	X
60010	11	X	X	X	X	X	X	X	X	X	X	X
80010	11	X	X	X	X	X	X	X	.	X	X	X
00010	10	X	X	X	X	X	.	.	X	X	X	.
20010	10	X	X	X	X	X	.	.	X	X	X	.
50010	10	X	X	X	X	X	X	X	X	X	X	.
50032	10	X	X	X	X	X	X	X	X	X	X	.
50141	10	X	X	X	X	X	.	X	X	X	X	.
70010	10	X	X	X	X	X	.	X	.	X	X	.
70020	10	X	X	X	X	X	X	X	.	X	X	.
80020	10	X	X	X	.	X	X	.	X	X	X	.
90010	10	X	X	X	X	X	X	.	X	X	X	.
90020	10	X	X	X	X	X	X	.	X	X	X	.
50020	9	X	X	X	X	X	X	X	.	X	.	.
50072	9	X	X	X	X	X	X	.	X	X	.	.
50130	9	X	X	X	X	X	.	X	.	X	.	.
30031	8	X	X	X	X	X	X	X	X	.	.	.
50341	8	X	X	X	X	.	X	.	X	.	.	X
70252	8	X	X	X	X	.	.	X	X	.	.	.
30072	7	X	X	X	.	X	.	X	.	.	.	.
50101	7	X	X	X	X	X	.	X	.	.	.	.
50110	7	X	X	X	X	.	X	X	.	.	.	.
50182	7	X	X	X	X	.	X	X	.	.	.	.
70042	7	X	X	X	.	X	X	X	.	.	.	.
70072	7	X	X	X	.	X	.	X	.	.	.	.
80052	7	X	X	X	X	X	X	X	.	.	.	.
90152	7	X	X	X	X	X	X	X	.	.	.	.
40222	6	X	X	X	.	X	X	.	.	.	.	.
42553	6	X	.	X	X	.	X	.	.	.	.	.
50532	6	X	.	X	.	X	X	.	.	.	.	.
50642	6	X	X	X	X	X	X	.	.	.	.	.
50783	6	X	X	X	X	.	X	.	.	.	.	.
70052	6	X	X	X	.	X	X	.	.	.	.	.
70332	6	X	X	X	.	X	X	.	.	.	.	.
80903	6	X	X	X	X	X	X	.	.	.	.	.
90041	6	X	X	X	X	.	X	.	.	.	.	.
00022	5	X	X	X	.	X	.	.	.	.	.	.
10011	5	X	X	X	X	X	.	.	.	.	.	.
20182	5	X	X	X	X	X	.	.	.	.	.	.
30021	5	X	X	X	X	X	.	.	.	X	.	.
30061	5	X	X	X	.	X	.	.	.	.	.	.
30162	5	X	X	X	.	X	.	.	.	.	.	.
30292	5	X	X	.	X	X	.	.	X	.	.	.
40061	5	X	X	X	X	X	.	.	.	X	.	.
40071	5	X	X	X	.	X	.	.	.	.	.	X
40052	5	X	X	X	.	X	.	.	.	.	.	.
40092	5	X	X	X	X	X	.	.	.	.	.	X
40122	5	X	X	X	.	X	.	.	.	.	.	.

VI. A Technocratic Vision

A wave of recent literature on the subject of policy analysis, largely spawned by an increasing concern for environmental impact, has tended to emphasize the interrelation of everything with everything else, and thus proposes a wider utilization of systems analysis (macro-systems analysis), and macro-models, to solve the macro-problem. Much of this writing contends that without systematic understanding of all interrelated socio-political-environmental factors, humanity will continue in what amounts to an inevitable path to self-destruction. The Four Horsemen of the Apocalypse will visit all at once.

We are capable of a response to the vision of policy research implied in such writings. The scope of subject matter in regional development is very wide; the effort would be considerable. Basically, it would consist of expansion and coordination of the type of modelling activity described in the previous section. We can estimate, for the sake of argument, that fifty scientific man-years of analytical work comparable to the above would produce an integrated socio-economic-environmental-regional model with some dynamic features. Its excellence, from a strictly technical point of view, would largely depend on the investment one were willing to make in data collection. Furthermore, the system could accept refinement as new information became available.

Three fundamental and related problems can be foreseen: (a) the system would be static in its interpretation of the structural equations that relate variables to each other; the operator of the system would be like the driver of a giant machine, pulling levers and pushing buttons, trying to bring the machine under his comprehension and control, as the machine changes its pattern of response to the very stimuli which he offers; (b) the system would be unwieldy in its complexity; lack of comprehension would rapidly lead to incredulity, and consequently to indifference; the policy-maker would not risk his reputation by relying on masses of information which he could not disentangle; and (c) regardless of the degree of precision built into the system, it would not solve policy problems, but merely illustrate them. The matter of setting, evaluating, and compromising objectives would not be simplified but complicated by the new interrelations and constraints (of empirical validity, to be sure, but of unclear significance to the horizons of political action). We do not wish to argue that such a proposition would not contain some heuristic value – it certainly would. But its context is problematic; it may better belong to a decentralized and autonomous investigative institution, which could add the weight of its simulations and projections to the political forces in the larger arena of public debate.

VII. Conclusion

A political environment which could fully incorporate the technocratic vision is as unlikely as it would be inimical to the democratic values of our society. Even if we were able to cover the upper-right quadrant of the chart by investing another fifty man-years in the development of decision tools such as CANGO, the technocratic vision of policy-making remains essentially a short-circuiting of the democratic process as we know it. We can envisage, however, the evolution of the political process in various directions.

One possible direction is toward a state that would welcome more and better predictive models of the "policy-to-structure-to-output" variety. In a directional sense, this evaluation is almost inevitable with the increasing complexity of the social system and an increasing public awareness of the very same factors that bring to mind the Four Horsemen. A first diagnosis of this paper is that we should be prepared to contribute to improved products of this type, *but that we should do so in the awareness that what science can contribute is nothing more than illustration; we must temper our enthusiasm for prediction with an assessment of the limitations of our methodology.* CANGO and Regional Futures offer two examples of models which were devised with an explicit awareness of their limitations. Their strength lies precisely in what they do not attempt to do, and in the self-consciousness with which they do not do it. Their usefulness in the policy environment is their flexibility to incorporate value judgments or best thinking other than those of the analysts who devised them.

A second possible evolutionary direction deals with the forgotten upper-left quadrant of the paradigm in Chart I. As the repercussions of past and present policies become more evident and better understood by larger segments of the population, we should expect governments to face more complex feedback from individuals and organizations. It could be hypothesized that an increasing amount of interpretation of such feedback will become the responsibility of policy analysis in government bureaucracies. A second diagnosis, therefore, is that *we must begin to compile methods and experiences in the most complex area of social science, namely, the social aggregation of individual preferences and its representation in terms of policy objectives.* In concrete terms this means to learn how to analyze contexts which give rise to changing values, the interrelations between such values and the societal implications of their configurations.

Comments by Maurice Yeates

It is the political process that sets values and priorities: everything follows from that. You have the policy alternatives that might result in your achieving those priorities in one way or another. You have the programs developing from the various policy alternatives that might be put into effect. And you have the impact, the out. Is that what you want?

When we monitor anything, we want to put a fair amount of effort into knowing about the impact – whether we have done the right thing or not. The questions are: At what level should we measure this? What should be the best tool to measure this? Mr. Sismondo suggests input-output models, etc., in his paper. I suggest that the level at which the federal government should be employing the interregional input-output model is a reasonable simulation of what might happen if you could minipulate certain variables through certain programs.

The second tool that he talks about, Regional Futures, is essentially a great interrelated matrix of variables at the national level and then at the regional level; you manipulate one of them, you keep your accounting straight across the columns and you see the impact on the others. The problem with that tool is that it does not have what we really want in an impact-analysis tool, which is to get at the interactions between regions and the flows between regions. It is a time-series tool that does not have interactions between the regions of a space economy built into it. It is essentially a closed tool because unlike an interregional input-output model which has exterior accounting mechanisms involving trade and so forth, you cannot build the effect on the economy of changing tariff policies into it, for example. It is vital in an assessment of the impact of anything in this country that you have interaction in a framework which involves a system open to the rest of the world. After all, most of our economy is driven from outside. That leads me to the next point that I want to make concerning values.

One of the things that we have not come to in talking about regional development is what we actually mean by the term regional development. If we have an open economy with interactions between regions and interactions between those regions and the rest of the world, one of the things that we want to know is what we are trying to develop. Are we simply trying to reduce inequalities between regions and reduce the rate of unemployment? You can suggest policies to accomplish that. But what else might you be trying to do with development that is of great national and regional concern? You might, at the same time that you have one set of policies, be increasing the flow of capital, the flow of labour, and so forth. You might, therefore, also be increasing the takeover of your economy by regions, first of all by central Canada and then (more importantly) by foreign concerns. So you must decide what you really want when you set up your value system in terms of regional develop-

ment. Do you want to go blindly in the direction of maximizing income or reducing inequalities? Do you want to do that at the expense of increasing foreign control or the extent of domination of the various regions by central Canada? It is precisely because we have not faced these questions that, at this very moment, parts of the country are questioning whether we should keep the country together. They are questioning to what extent they are being allowed to determine their own destiny. You can see what is going on, when you get to the community section of the DREE analysis. People at the local level are getting very concerned with Ottawa's sense of values. They are saying: What are you doing coming along counting our museums? Why are you counting our barber shops, and our haberdasheries, when these decisions really involve only local or regional cultural aspirations? They are not federally measurable aspirations. It is the insensitivity to regional aspirations revealed in this type of analysis that results in the situation we have at the moment. And at some time today, the conference will have to face up to that.

Comments by Peter Harrison

Mr. Sismondo's paper is at once informative and comprehensive. It presents the non-government observer with a clear view of policy research as conceived within the Analysis and Liaison Branch of the Department of Regional Economic Expansion. And it highlights the salient features of the types of models of regional analysis currently in use by the branch. At times, however, a certain poetic license can be discerned within the text, as can a modicum of unnecessary complexity.

The world of regional analysis is replete with models of varying kinds, and the advantages and disadvantages of one over another are by now well known and well discussed. This is the situation, for example, in interregional input-output analysis, and Mr. Sismondo duly notes the fact, but only after stressing the growing importance and usefulness of another genre of model — the "decision" model. If this commentator were allowed a comparable level of hyperbole he would classify the process now under observation as being an academic (or bureaucratic) medicine show. There are cures for most ailments – and some cures are presented as being valuable for all ailments. Simple location quotient analysis gave way to the more complex shift-share approach, and input-output analysis has since provided (apart from a Nobel prize) a high level of sophistication and respectability for the field. The cure-all now seems to lie in certain types of "satisfying" and/or "behavioural" models. But do these provide decisions – or do they provide only the bases on which decisions can be made? If the latter is the case, as it seems to be, then the new cure-all has still to be found.

"CANGO" and "Regional Futures" are extremely useful tools, but they can be seen to incorporate certain rather debatable features. First, it is perfectly clear that the "desirability" of a particular centre, no matter how defined, may well be a function of size and relative location. Economic activities with stringent and complex requirements (value judgments) would thus end up being assigned only to those few centres capable of fulfilling these requirements. Relatively "footloose" activities would enjoy a rather wider location set, but with the obvious result that the prediction of a *specific* location becomes more difficult. It is not clear from Sismondo's presentation how in fact "CANGO" avoids choosing larger centres rather than small. This is felt to be an important criticism since if it is found (as we knew all along) that Toronto is a more attractive location for many activities than is Moose Jaw, then DREE may be placed in a compromising situation concerning its expressed mandate. What of the economically depressed areas of the country, and what of small towns?

The second debatable feature concerns the problem of empirical regularity versus desired objectives. "Regional Futures" contains much of the flexibility of a gaming model. But it is striking how some of the output, and in particular the Guttman Scalograms, are reminiscent of earlier work in Central Place Theory. Hierarchies and rank-size rules seem to pop out unasked from many of Sismondo's statements. Few would argue today that because one particular community has a certain set of services (social infrastructure) then so should all communities of similar or higher rank. And even fewer would see empirical regularities as embodying or as providing the goals of intervention. If economic and cultural diversity can be allowed to give rise to *different* hierarchical patterns and to *different* "social infrastructure", then the simple "filling out" of a seemingly skewed pattern of opportunities seems to be a non-starter.

A final point which is of concern to this commentator is the seeming stress on finding communities which fulfill the requirements of certain economic factors. What if a particular community simply doesn't want them? Can "CANGO" and "Regional Futures" be turned around and used as "community-based decision models"? The answer seems to be yes, but the hidden mechanics are difficult to decipher.

Sergio Sismondo's Response to the Comments

The method that we have adopted for compromising national and local feelings is one called democracy or representative democracy. We have generally tended to rely on Members of Parliament and Ministers to reflect to some

extent the values of their constituents. Thus, traditionally, it is not clear that the role of any analyst, especially of one in government, should be to do that social aggregation of values.

However, my own reflections are that people, particularly people's organizations at the grassroots level, are getting so good at reading output indicators and creating their own policy recommendations that the volume of feedback from an increasingly complex society has become so great that Ministers and Members of Parliament do not have the time to keep up with it. Now I do not want to suggest that the role of a policy analyst, a researcher in the federal government, should be to analyze local values: rather it should be to illustrate for the Ministers the meaning of some of those grassroots policy recommendations that we read in the newspapers or we hear at conferences. We should think their meaning through but should not shortcircuit the intent.

Regarding the comment made on the CANGO output indicating that larger places offer the greatest choice, I might point out that if one of the criteria with weight were smallness the table would be turned completely around. In general, I think that it is very important not to arrive at the conclusion that policy at DREE is made on the basis of the models that we have made. I wrote in the paper that we are dealing with science and with methodology of science as we advance with these models. And science provides only illustrations: it does not forecast human behavior. Nor has science in any way been able to produce a useful social aggregation. Science merely provides a set of illustrations with which policy-makers at DREE may be somewhat enlightened. Science does not provide the means for policy-making at DREE.

The last issue that I want to address is the issue of spreading versus aggregating. I submit to you that this is a matter of deciding what unit of analysis you want to comprise the major objectives of regional development. If you want to maximize the growth of product in the Atlantic Region and if that is the unit of analysis with which you are going to evaluate it both technically and politically, then it may very well be that you have to aggregate activity in larger towns. If you wish instead to maximize the output indicators for a very small place, you will have to disaggregate your industrial and other infrastructure. So whether to do something in Regina or in a "lower loose tooth" is merely a matter of deciding what unit of analysis you are going to evaluate and use to judge your program. And that will almost certainly depend on the issues you are considering.

A FINANCIAL AND ECONOMIC FRAMEWORK FOR INVESTMENT APPRAISAL[1]

by John C. Evans, York University

1. Introduction

Over the past few years the Government of Canada has endeavoured to develop a methodology generally applicable to the analysis of large-scale investment projects for which public sector assistance is sought. Although some research has been carried out at the Treasury Board, a better-defined analytical framework has emerged from the specific projects examined by the Program Evaluation Group at the Department of Industry, Trade and Commerce, and more recently by the Program Evaluation Division at the Department of Regional Economic Expansion (DREE).[2] This paper draws heavily from the experience of these two groups.

The two themes of efficiency and equity appear continously in the literature on project evaluation and regional development. We shall address ourselves to these topics by describing thorough project appraisal and by demonstrating its usefulness for regional development.

2. An Overview of Project Appraisal

Most large-scale investment projects in which governments participate are complicated undertakings requiring considerable engineering and technical analysis. Whether the project is a new highway to a remote community, the modernization of equipment for a declining industry, or a new regional steel complex, some method must be found to assemble and to organize the large volume of detailed technical data which industry experts generate. These data should provide estimates of incremental capital and operating expenditures with a separate breakdown for:

(a) the construction and operating labour requirements, by skill group,

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[1] A paper prepared for the Colloquium on Canadian Regional Planning and Development in Transition, Queen's University, February 16, 1977.

[2] Messrs. James Howe and Don Tate, currently Director General and Director at DREE, are the two individuals who have contributed most to the development and application of the methodology described in this paper. They have been assisted in this task by Professor Glenn Jenkins and a loyal crew of well-trained and competent analysts. This paper serves to review, in part, the analytical process currently used by the Program Evaluation Division at DREE, but the procedures outlined do not represent government policy. The opinions expressed are those of the author who bears full responsibility for any errors and omissions.

(b) the foreign or domestic sourcing of raw materials, machinery and equipment,

(c) the on-site and off-site infrastructure (which necessitates site selection),[3] and

(d) any special equipment necessary to meet existing or potential environmental controls.

In addition, a thorough marketing study should identify domestic and export markets and the quantities likely to be sold at any given relative price. These data should be used as the basis for forecasting incremental domestic and export sales revenue rather than econometric demand estimates or crude projections of past sales performance. A good marketing analysis will use the standard primary and secondary research sources, but it will also take into account the feasibility of substituting or complementing the product with other commodities, the technological innovations in this or competing industries, and the likely market developments abroad.

The engineering, technical, and marketing data form the empirical basis for project evaluation. Conducted from both a private and public perspective to determine the commercial and economic viability of the project, it is summarized in Chart 1.

2.A. *The Private Sector Analysis*

Commercial viability is a crucial factor in the appraisal of an investment project. Governments have often been attracted by the lure of creating new employment opportunities, especially in slow-growth regions, only to find that their capital and incentive grants have spawned a troublesome infant unable to stand without continued financial support. If operating subsidies are refused or withdrawn, the infant industry collapses, thereby destroying jobs, raising unemployment and forcing workers and families to migrate. Immovable capital stock is often simply abandoned. Since these alternatives are socially and politically undesirable, there is an inherent government bias towards giving financial assistance to declining industries, which allows economic inefficiency to perpetuate itself and deplete the country's wealth. At the other extreme, a project may be so commercially attractive that it requires no

[3] Both on-site and off-site infrastructure are included in the assessment of the total capital requirements of the project. There should be no immediate presumption that the government is going to provide off-site infrastructure.

government financial incentive; any capital assistance would just represent an unnecessary transfer of money to private investors with no accompanying benefit for the country as a whole.

Although the projected rate of return on the shareholders' equity investment is a key determinant in the assessment of the viability of a project, the heart of the private sector evaluation is the analysis of the discounted cash flow to total capital. This analysis translates incremental sales revenues and expenses into incremental cash receipts and disbursements; the net cash flow to total capital is estimated before depreciation and interest expense, but after corporation income taxes have been deducted, and before dividends have been declared. The nominal dollar cash flows are deflated to constant dollars in order to remove the effects of inflation.[4] It should be noted that the term "constant dollars" does not necessarily mean constant relative prices; any changes in the latter as a result of some new technological process, for example, should be foreseen in the marketing study.

The constant dollar net cash flow is then discounted by the private discount rate in order to estimate the net present value of the net cash flow. A discount rate measures the time value of the cash flow to reflect the fact that one dollar today is worth more than one dollar in the future. This basic concept is frequently referred to as "the time value of money". The Program Evaluation Division at DREE is currently using a real private discount rate equal to the real rate of return net of taxes received by investors in the Canadian economy. This real (net of inflation) discount rate is consistent with the constant dollar net cash flow whose net present value is being calculated.[5]

If the net present value of the net cash flow discounted by the private discount rate is equal to or greater than zero, the project is considered to be commercially viable. The private investor is getting back his invested capital and earning at least a normal real (net of inflation) rate of return. That is to say, he is getting a return at least equal to an investment in any one of a broad range of Canadian industries, with full allowance for normal risks.

[4] To remove the effects of inflation from projected nominal dollar cash flows is a complicated process; special attention must be given, for example, to the interest expense and capital cost allowance, in order to calculate constant dollar taxable income and income taxes.

[5] A current dollar net cash flow, which has less economic meaning, would have to be discounted at a much higher rate.

2.B. *The Public Sector Analysis*

Whereas the private sector analysis is concerned with the commercial viability of a project and its profitability, the public sector analysis is concerned with the social costs and benefits to Canada. To achieve this perspective, the accounting conventions of private sector analysis have to be modified to convert all private costs and revenues to the firm into social costs and benefits to the Canadian economy.

The differences between the valuation of costs and revenues in the private sector analysis and the corresponding costs and benefits in the public one are called economic externalities. Gross economic externalities are often associated with (a) the generation of tax revenue, (b) the incremental net receipts of foreign exchange earned by export sales from the project, (c) the reduction in unemployment experienced by construction and operating labour and any induced migration as a result of the newly created employment opportunities, (d) the indirect effects of secondary employment creation, (e) the use of domestic raw materials and material inputs, and (f) the use of foreign debt and equity capital. Determining the precise nature and estimation of these externalities constitues the economic analysis of a project.

The purpose of the economic analysis is to quantify the gain or loss to the Canadian economy as a result of employing real resources in this project rather than in another. Projects are thus examined from the viewpoint of efficient resource allocation.

The objective of the public sector analysis is the maximization of the present value of social benefits minus the present value of social costs, or more simply, the maximization of the project's net present value (NPV) from Canada's point of view. The starting point for this analysis is the constant dollar net cash flow to total capital prepared for the financial analysis.

2.B. (a) *Estimation of the Net Economic Cash Flow*

Measurement of value in both the financial and economic analyses is represented by the flow of cash and not by the actual transfer of ownership of physical resources. The constant dollar net cash flow to total capital estimated for the financial analysis has been adjusted already for the effects of inflation, so that all entries reflect the real value of cash receipts and disbursements from a private sector point of view.

In the financial analysis, the net cash flow to total capital is estimated before depreciation and interest expenses, but after corporation income taxes have been deducted, and before dividends have been declared. To estimate the net economic cash flow we must first add back property taxes as well as pro-

vincial and federal corporation income tax revenues generated by the project, because Canadians can benefit from the increased provision of public goods and services made possible by this additional tax revenue.

Second, adjustments must be made to the prices paid or received by the private investor whenever these prices do not represent the social valuation of the cash disbursement or receipt items. The prices used in the financial analysis represent the value of purchases and sales to the firm and thus measure the private resource flows. These prices reflect, however, the effects of market distortions such as sales taxes, tariffs, subsidies, personal income taxes, and unemployment insurance compensation and may not reflect the real value to society of the resources used or produced by the project. The economic adjustments allow us to move from the private resource flows to a measure of social costs and benefits, which are the basic ingredients for the economic analysis. The appropriate economic adjustments are discussed in detail in a separate section.

The net economic cash flow, with its associated economic adjustments, is discounted to a present value by a social discount rate which reflects the average value to the Canadian economy of alternative investments or consumption foregone as a result of undertaking the project. This social discount rate will differ in a number of ways from the private discount rate used to discount the net cash flow to total capital in the private sector analysis. These differences are discussed in the next section, before we turn our attention to a detailed examination of the economic externalities.

2.B. (b) *The Social Discount Rate*

The *social* discount rate used in this study is the opportunity cost of public funds, where it is assumed that the marginal source of funds for public sector support or participation in the project is government borrowing.[6] The funds borrowed are drawn from various sectors of the economy according to their sensitivity to interest rates. The social discount rate is thus defined as a weighted average of the social real rates of return to capital in sectors from which government borrowing diverts funds, the weights being the proportion of funds diverted from each sector.

The social rate of return of capital in any sector of the Canadian economy is the social value of the income stream divided by the real value of the capital stock. On the income side, debt charges, taxes and charitable donations are

[6] A. C. Harberger, "On Measuring the Social Opportunity Cost of Public Funds", *Project Evaluation* (London, 1972), Chapter 4.

included as part of the return to domestic capital, despite the fact that from the investor's point of view they are expenses. Revenues from financial assets are excluded from the income stream, while capital gains, based on the relative price changes of the capital stock between industries, are included to the extent that they are expected. These estimated social rates of return are thus consistent with the net economic cash flow of the project.

The value of the private capital stock, which is the denominator of the social rate of return, is estimated using capital stock and taxation data disaggregated at the two- and three-digit Standard Industrial Classification (S.I.C.) levels. In order to determine the appropriate asset base on which to calculate rates of return, the fixed capital is adjusted to its current replacement value; this eliminates the upward bias inflation imparts to a book-valued-asset-base rate of return. Since our concern lies with the rates of return on the capital required for the operation of the business (this includes working capital), all financial assets held solely for income are removed from the asset base. This procedure is consistent with the exclusion of revenues from financial assets in the income stream. An adjustment is also made to reflect the fact that true economic depreciation will differ from the book-value-based "accounting" depreciation which appears in the taxation data.

The social rates of return by sector have been estimated by Glenn P. Jenkins.[7] On the basis of an estimated equation, Jenkins also determines the effect of government borrowing on three- to five-year interest rates. The sectors which release funds according to their interest-rate sensitivities are the domestic savings sector, the housing market, foreign sources, and the industrial sector. The interest elasticity of saving is probably quite low.[8] The extent to which the housing market in Canada responds to interest-rate changes has been measured by Lawrence Smith.[9] Historically, foreign borrowing has been about 10 per cent of the total; it is assumed that this will continue in the future. The agricultural sector has been excluded as a possible source of funds, because most of its financing tends to come from the federal government at subsidized rates; hence the amount of agricultural investment is assumed to be unaffected by the rise in interest rates which results from additional govern-

[7] Glenn P. Jenkins, "Analysis of Rates of Return from Capital in Canada", Table 5, pp. 39-40.

[8] Colin Wright, "Saving and the Rate of Interest", in A. C. Harberger and J. J. Bailey (ed.), *The Taxation of Income from Capital* (Brookings Institution, 1969), pp. 275-300.

[9] Lawrence Smith, *Housing Mortgage Markets in Canada,* Bank of Canada Staff Research Studies, No. 6, 1970.

ment borrowing. The portion of government borrowing not diverted from any of these other sectors or sourced from abroad, is assumed to come from the industrial sectors in proportion to the relative size of the capital stock of that sector. A summary of the social rates of return and the weights applied to them is presented in the following table.

*Table 1**

Sector	Social Cost of Funds from the Sector	Proportion of Government Funds Derived from the Sector
All activities excluding housing and agriculture	11.92	0.64
Housing	7.41	0.16
Agriculture	4.47	0.00
Domestic consumption	4.00	0.10
Non-resident consumption	3.15	0.10

* Glenn P. Jenkins, "Analysis of Rates of Return from Capital in Canada", unpublished PhD dissertation, University of Chicago (Chicago, 1972), Table 27.

The social discount rate, calculated as the weighted average of the social cost of funds from each sector, is estimated by Jenkins as 9.53 per cent. Two factors, however, are omitted from this estimate. First, labour is priced at its private cost to the employer, not at its social opportunity cost. This omission introduces a downward bias to Jenkins's estimate and suggests that a 10 per cent discount rate might be more appropriate. Second, the foreign exchange revenue earned by sectors producing tradeable goods is valued at the market exchange rate, not at the social opportunity cost of foreign exchange, which is higher than the market rate. This procedure may introduce another downward bias to Jenkins's estimate of 9.53 per cent. The Program Evaluation Division of DREE has been using 10 per cent as a social discount rate.

Since cost-benefit analysis attempts to isolate the benefits and costs realized by a specific project over and above those realized by a representative project which is displaced, the magnitude of the social discount rate, which implicitly captures the opportunity cost of the funds, is very important. If instead of

being used for a specific project funds had been allowed to remain in the capital market, consumption and other investments would have increased. Alternative investments would have yielded a stream of tax revenues in addition to the private rate of return normally earned by investors. Both of these are captured by the 10 per cent discount rate.

As we can see in Chart 1, the net cash flow to total capital is discounted by the private discount rate, while the net social benefits are discounted by the social discount rate (10 per cent). The difference between the two discount rates is the stream of tax revenues which alternative investments would normally have yielded. When we discount the net social benefits by 10 per cent, therefore, we are implicitly charging the project for the normal tax revenues which would have been generated by these funds if they had been invested elsewhere at the rate of return normally earned by private investors. The taxes lost because of the displacement of an alternative investment appear as a negative economic externality in Chart 1.[10] Offsetting this negative amount, of course, are the tax revenues generated by our project. Projects initiated in sectors which are charged below-normal taxes represent a net social cost to Canada from this perspective because their tax revenues amount to less than alternative investments would have generated; conversely, heavily taxed projects generate a positive net economic externality.

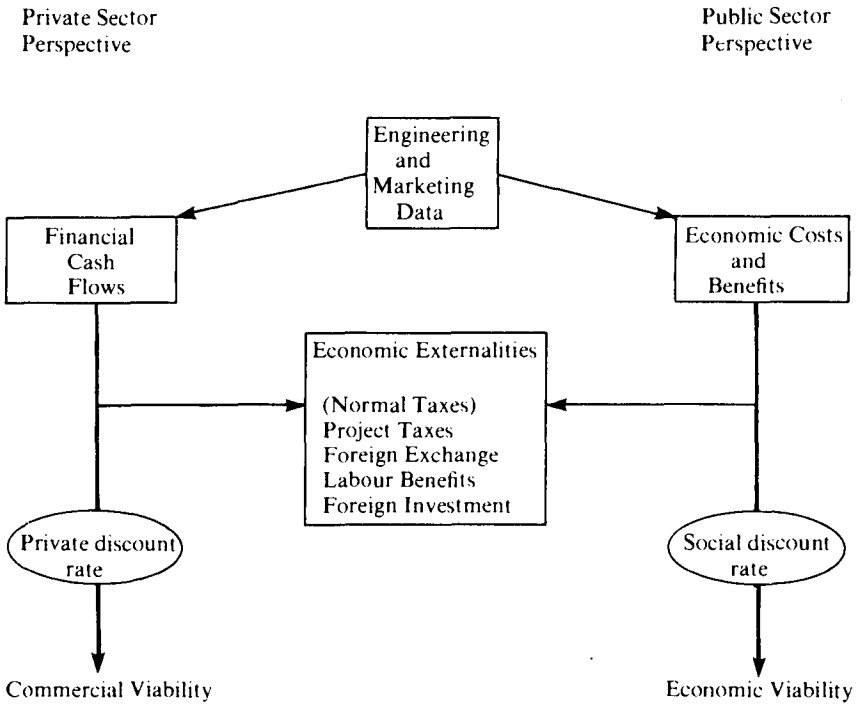
A project is considered to be economically viable if the net present value (NPV) of the net social benefits is equal to or greater than zero. If this condition is satisfied, we know that the funds invested in the project are earning an average return at least equal to one from alternative investments in the Canadian economy. If a choice must be made between two commercially viable projects, the one with the highest NPV of net social benefits should be selected.

We shall now turn our attention to the actual estimation of social benefits and social costs. Adjustments must be made to the prices paid or received by the private investor whenever these prices do not represent the social valuation of the cash disbursement or receipt item.

[10] In fact, "normal" tax revenues are those which would have been generated by a "normal" project; a "normal" project is defined as one whose net present value of the net cash flow discounted by the private discount rate is equal to zero. If the net present value of the net cash flow is positive, then the project is earning above-normal returns, and our methodology requires these above-normal returns to also generate "normal" taxes. I am grateful to Glenn Jenkins for this point.

Chart 1

Project Appraisal Overview

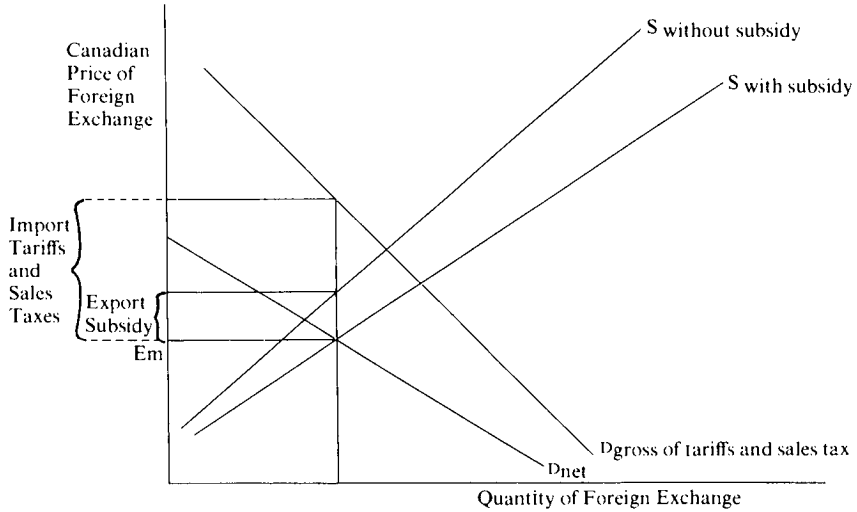


3. Economic Adjustments to the Private Resource Flows

3.A. *Foreign Exchange Adjustments*

A project results in a net economic benefit to Canada if it has a net positive impact on our foreign exchange earnings. This benefit arises because the social opportunity cost of foreign exchange is greater than the market exchange rate used to translate foreign cash receipts and disbursements into Canadian dollars. The extent to which the social cost of foreign exchange exceeds the free-market foreign exchange rate depends on tariffs, sales taxes and export subsidies as they are depicted in Figure 1, which shows the demand and supply of foreign exchange.

Figure 1

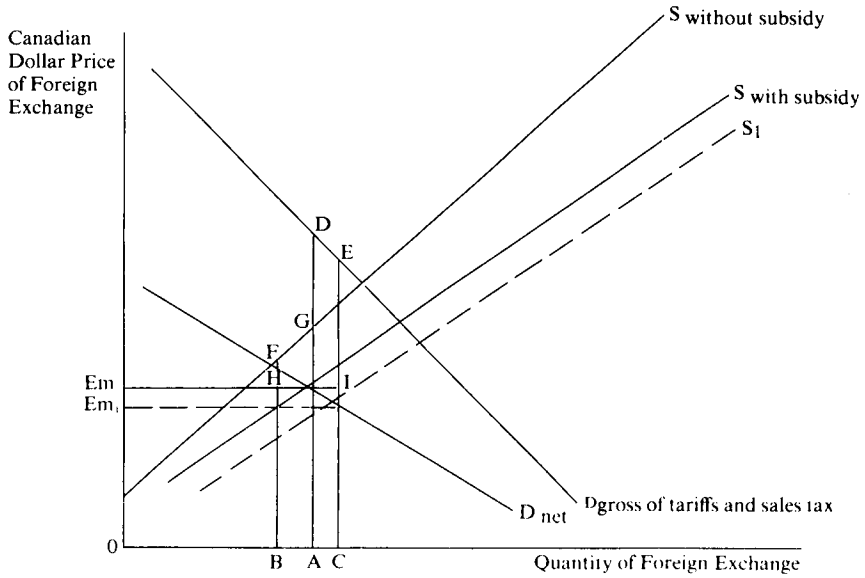


The free-market exchange rate (Em) is determined by the net of the tariff and sales tax demand curve and by the supply of foreign exchange – this includes any export subsidies. However, the social value of imports is measured by the gross tariff and sales tax demand, because of the "willingness to pay" principle implicit in the demand for foreign exchange. Similarly, the real resource cost of producing exports and foreign exchange is measured by the supply curve minus any export subsidies.

If an export-oriented project generates net positive foreign exchange earnings,[11] the supply curve for foreign exchange (S) shifts to the right (S_1) (Figure 2). The free-market exchange rate declines slightly to Em_1, thus increasing the quantity (demanded) of foreign exchange for imports by AC and decreasing the quantity (supplied) of foreign exchange from other exports by AB.

[11] It should not be assumed that all export-oriented projects have positive net foreign exchange earnings. The project's use of imported raw materials, machinery and equipment, for example, may require more foreign exchange than is earned by its export sales. In this case net foreign exchange earnings would be negative.

Figure 2



The increased demand for imports by society is represented by the area ADEC below the demand curve gross of tariffs and sales taxes. The decreased supply of other exports releases valued resources which are represented by the area ABFG below the supply curve (excluding any export subsidies). The total social value attached to the incremental foreign exchange earnings (BC) is clearly greater than its market valuation of Em $\times$ (BC), or the area BHIC, measured at the initial exchange rate.

At the now lower exchange rate Em_1, tradeable goods in general are more attractive to the consumer; at the same time his real income has increased. For these reasons domestic consumption of tradeable goods should increase, while domestic consumption of non-tradeables will likely decline. Domestic production of tradeable goods (other than the project's output) and non-tradeable goods will also probably decline. To the extent that sales taxes distort the consumption and production of non-tradeable goods, additional economic adjustments must be included.

The social opportunity cost of foreign exchange has been estimated at 13 to 15 per cent above the free-market foreign exchange rate, in a paper by Glenn P. Jenkins.[12] Jenkins assumes that Canadian trade restrictions and any market distortion will remain in place for the lifetime of the project. A wide variety of domestic distortions in addition to the usual trade restrictions is taken into account, namely: The differential rates of sales taxes levied on the domestic consumption of importable, exportable, and non-tradeable goods; the preferential corporation income tax treatment of the mineral industry; the various subsidies given to agricultural products; and the subsidies given in the form of capital grants to firms located in certain low-income regions.

The premium on incremental foreign exchange earnings must be applied systematically throughout the economic analysis of a project. This adjustment results in a gross economic benefit being associated with export sales and an economic cost being attached to all imported raw materials, purchases of foreign-made plants and equipment, and purchases of domestically produced tradeable goods.

3.B. *The Cost of Labour Adjustment*

The private, financial cost of labour is measured by the wage bill, but the social opportunity cost of labour may rise above or fall below the private cost depending on whether the economic externality to labour is negative or positive. Since the social opportunity cost varies from one labour-market area to another, we shall discuss the estimation procedure for a particular region: Cape Breton Island.

[12] Glenn P. Jenkins, "The Social Cost of Foreign Exchange in an Economy with Trade Distortions and Differential Rates of Domestic Taxation", a paper prepared for the departments of Industry, Trade and Commerce and Regional Economic Expansion, Government of Canada (March 1975).

Cape Breton Island is a slow-growth region characterized by high unemployment and considerable migration of labour.[13] Typically, there has been migration both into and out of Cape Breton, with out-migration slightly ahead; and while this has tended to offset the natural increase in the population and labour force, it has not significantly reduced the unemployment rates. In general, the migrants are young men in search of better employment opportunities; but despite their considerable degree of mobility, Cape Bretoners have displayed a strong affinity for living and working on the Island. Given the prospect of additional jobs created as a result of constructing and operating a new project in Cape Breton, potential out-migrants would undoubtedly stay; in fact a sizeable return migration could be expected.

Various programs over the last few years have provided additional employment opportunities in Cape Breton Island. Projects have included a number of large-scale construction undertakings in the Strait of Canso area and in Glace Bay as well as some manufacturing operations. Both permanent and temporary jobs have been created. Although a sizeable amount of federal and provincial financial assistance has helped to foster this increased level of activity, no integrated framework has been developed within which to evaluate the economic benefits realized by Canadians as a result of similar regional job creation.[14] The economic analysis of projects in Cape Breton focuses considerable attention on developing and applying a model of the effects of job creation in a slow-growth region.

To measure the economic benefits we need to estimate the social opportunity cost of labour for permanent and temporary jobs created in a regional setting characterized by labour migration. The social opportunity cost of labour is the value society attaches to the activities given up as a result of using labour in a specific project. These activities depend upon the labour markets affected both directly and indirectly by the incremental demand for construction and operating workers.

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[13] Chun-Yan Kuo, "Labour Mobility and Unemployment", a paper prepared for the Program Evaluation Division, Department of Regional Economic Expansion (May 1975).

[14] Some of the important elements of this evaluation were captured in an earlier paper by James Howe, Ken Monds and John C. Evans, "On Measuring the Social Opportunity Cost of Labour to the Gull Island Hydro Project in Newfoundland", a paper prepared for the Program Evaluation Group, Department of Industry, Trade and Commerce (1974).

The immediate effect would, of course, be felt in Cape Breton, where the amount of unemployment would fall. The social cost of hiring an unemployed worker is the value he attaches to the non-labour market activities he could otherwise undertake. During part of the year he would have been employed, but since he is working on the project, the temporary job he would otherwise have occupied remains vacant. It can now be filled either by another unemployed worker or by a worker who is induced to migrate back to Cape Breton. Some workers will have to be brought in from elsewhere in Nova Scotia or from other parts of Canada if all the jobs cannot be filled by local labour. The social opportunity cost of migrant labour must take into account not only what the labour produces in Cape Breton, but also what it would have been able to produce elsewhere.

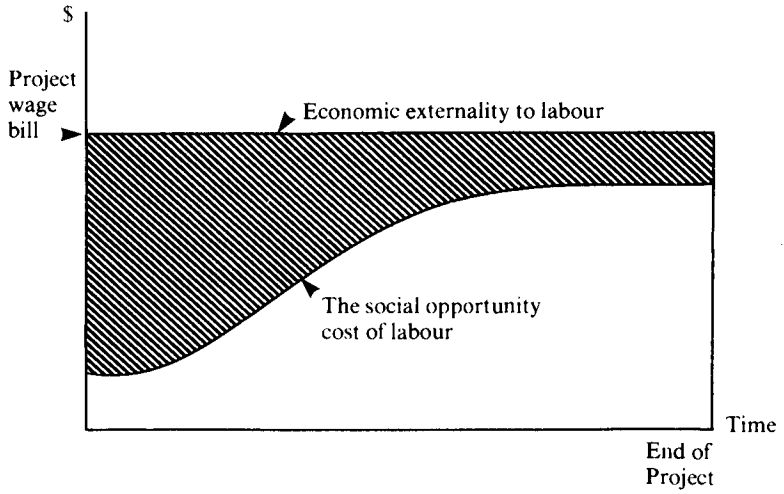
The estimation of the social opportunity cost of labour for a project on Cape Breton Island is the subject of a special study by Glenn P. Jenkins and Chun-Yan Kuo.[15] The model they develop allows not only for the project's effect on unemployment and induced migration, but also for the indirect employment effects created by the additional spending in Cape Breton.

The immediate effect of the new jobs is to reduce unemployment in Cape Breton. The induced migration occurs later over a number of years. Since the opportunity cost of an unemployed worker is relatively low compared to that of a migrant, the social opportunity cost of labour to the project is correspondingly low at first, but rises over time. Whether the opportunity cost ever rises to equality with the wage bill paid by the project depends on a number of factors: the most important of these is the wage rate paid by the project in relation to the supply price of migrants. If Cape Bretoners are happy to remain on or return to the Island for less than the wage paid by the project, the rents they pay out of their earnings, for example, must be counted as a positive externality generated by the project. The labour externality is the present value of the excess of the wages bill over the social opportunity cost of labour discounted by the social discount rate. It is depicted as the shaded area in Figure 3.

As indicated in the previous section, resources for a project with incremental net foreign exchange earnings will ultimately be drawn from other tradeable and non-tradeable goods activities. That is to say, labour and capital will be attracted to the project and away from the production of other goods and

[15] Glenn P. Jenkins and Chun-Yan Kuo, "The Social Cost of Filling Temporary and Permanent Jobs: A Regional Analysis", a paper prepared for the Program Evaluation Division, Department of Regional Economic Expansion (1976).

Figure 3



services. If such labour had been employed in other tradeable goods production, additional foreign exchange benefits would have resulted. If the workers had been used in non-tradeable goods production, the economy might have reaped incremental sales tax revenue. The fact that Canada does without the benefits of the foreign exchange and sales tax revenue by employing labour in this project rather than in another ought to be counted as an economic cost to the project.[16]

The foreign exchange and sales tax adjustment on construction and operating labour for the project is made in the following way. Induced migration into Cape Breton generates a loss of foreign exchange and sales tax on the wages the migrants would have been earning elsewhere. However, induced migration into Cape Breton leads to an expansion in secondary sector production. Here the social value of labour productivity exceeds the market rate by the amount of the foreign exchange-sales tax externality. The net present value of these two streams of externalities, discounted by the social discount rate, is the appropriate adjustment for sales taxes and the foreign exchange premium lost as a result of hiring labour for a project in Cape Breton. Note

[16] Harvey Schwartz and C.Y. Kuo, "The Social Cost of Foreign Exchange and Indirect Taxes Associated with Labour in Nova Scotia and Ontario", a paper prepared for the Program Evaluation Division, Department of Regional Economic Expansion (November 1976).

that since there is no adjustment necessary on the valuation of time spent in non-labour market activities, there is no additional cost for hiring unemployed workers.

The net present value of the foreign exchange-sales tax adjustment on migrant labour must be added to Jenkins and Kuo's estimation of the net present value of the wage bill excess at the new plant, over the social opportunity cost of labour to the project. This total labour externality is included as the economic adjustment to the private sector cash flows.

Since the markets for construction workers and operating labour differ considerably, the total labour externality is estimated separately for each group.

3.B. (a) *Construction Labour*

The sizeable requirements of most capital-intensive projects for skilled construction labour will undoubtely surpass the potential supply from the available indigenous labour force in some trades. This gap can be filled by construction labour brought in from other parts of Canada. The degree to which the project relies on "imported" skilled construction workers can be determined in a residual fashion after we estimate the amount of project work which can be accomplished by the Cape Breton labour force.

The social opportunity cost of importing skilled workers from elsewhere in Canada to work on a project in Cape Breton is measured by the net tax construction wage they are paid on the project, plus the income tax revenue they would have generated from employment elsewhere, minus any reduction in net-of-tax unemployment elsewhere.[17] The extent to which migrant construction workers in Cape Breton were unemployed at their previous location has been examined by Chun-Yan Kuo in his analysis of construction workers at the Glace Bay Heavy Water Plant.[18] In this fashion a new project in Cape Breton receives credit for reducing unemployment elsewhere in Canada.

[17] The theoretical underpinning for this estimate of the social opportunity cost of directly imported construction workers into Cape Breton is discussed in detail in Jenkins and Kuo, "The Social Opportunity Cost of Filling Temporary and Permanent Jobs: A Regional Analysis".

[18] Chun-Yan Kuo, "An Analysis of the Construction Workers at the Glace Bay Heavy Water Plant, Cape Breton Island", a paper prepared for the Program Evaluation Division, Department of Regional Economic Expansion (1976).

To the extent that a project uses Cape Breton construction workers, some additional benefits may be derived in the short-run. The increase in employment will reduce the period of unemployment for local construction workers, which currently averages about thirty weeks annually. The project should therefore be credited with the resultant positive externalities of a saving in unemployment insurance compensation payments and an increase in income taxes paid.

In the longer run, however, the potential for economic benefits depends largely on the degree of permanence in the construction jobs created. If, on one hand, all the construction jobs filled by Cape Breton workers were permanent, we would expect the net in-migration of workers to equal the number of man-years of work created by the jobs. The project would then earn a net economic benefit equal to the amount by which the project's construction wages exceeded the supply price of induced migrants to Cape Breton, minus the unemployment compensation which no longer has to be paid, plus the lost income tax revenue.

If, on the other hand, the construction jobs filled by the Cape Breton labour were temporary, we would expect the net in-migration of workers to exceed the number of man-years of work contained in the jobs. As these migrants are added to the partially employed labour force of Cape Breton, the increase in unemployment insurance payments and decrease in income taxes would swamp any previous benefits and might even result in a net social cost.

When construction workers are released from employment as the project nears the completion of its construction phase, the whole process works in reverse. The positive externalities resulting from job creation are offset by the negative externalities of job destruction; there is a gain to society in terms of present value, however, because the negative externalities occur later in the project's lifetime.

3.B. (b) *Operating Labour*

One of the strongest economic arguments in favour of locating a new project in Cape Breton is based on the availability of a highly skilled labour force accustomed to heavy manufacturing work. The presence of this labour force makes it possible to rely almost completely on indigenous workers to fill the operating positions and the project gets more credit for reducing unemployment than might a similar one elsewhere. The benefits are equal to the decrease in unemployment insurance payments plus the increase in income taxes paid. In the longer run, however, the benefits can be expected to fall as additional migrants respond to the improved employment opportunities. The

social opportunity cost of the induced migrants would likely not exceed the union wages paid by a new plant, so that a net benefit can be expected to continue for the project's lifetime, as was depicted in Figure 3.

An examination of the detailed economic analysis for projects in this area will reveal that in many cases the largest incremental economic adjustment is on the operating wages and salaries. This total labour externality measures the net benefit to Canada of encouraging additional permanent employment in a slow-growth region.

3.C. *Indirect Employment Effects*

Creating additional employment in Cape Breton on a new project results in additional spending and an increased demand for other goods and services in the area. Local firms expand their capacity to meet the additional demand; new employment opportunities are thus indirectly created. The presence of job vacancies induces workers to postpone migrating out or to move to Cape Breton in search of a job. Even if these migrants are unemployed in Cape Breton, they still add to total spending in the Island by virtue of the unemployment insurance benefits and similar transfer payments which accompany them. In this fashion labour migration also leads to indirect employment creation.

To measure the indirect employment effects we require an estimate of a regional employment multiplier for Cape Breton. Harvey Schwartz has developed the methodology for estimating a base-sector employment multiplier.[19] To include the multiplier effects in the calculation of the social opportunity cost of labour (and hence in the labour externality), Jenkins and Kuo used Schwartz's work as the basis for estimating an employment income multiplier. Under the conditions in Cape Breton, Jenkins and Kuo have estimated a multiplier equal to 1.54:[20] that is, for every incremental dollar of employment income generated by the project directly, employment income in the secondary sector increases by $0.54. This does not necessarily represent a net social benefit, however, because the social opportunity cost of labour could be less than, equal to, or greater than the gross increase in income.

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[19] Harvey Schwartz, "The Long Run Employment Multiplier for Cape Breton Island", a paper prepared for the Program Evaluation Division, Department of Regional Economic Expansion (January 1976).

[20] Jenkins and Kuo, "The Social Opportunity Cost of Filling Temporary and Permanent Jobs: A Regional Analysis", a paper prepared for the Program Evaluation Division, Department of Regional Economic Expansion (1976).

3.D. *Other Economic Externalities*

The economic analysis of any project also requires the opportunity cost pricing of raw materials inputs. Thus if domestic raw materials could have been exported instead of being used in the project, we must include the foreign exchange premium on the lost foreign exchange earnings (calculated using f.o.b. prices) as a cost. As another example, fuel consumed by a project in eastern Canada may be purchased at a subsidized price; if the project's fuel consumption results in additional imports of fuel to Canada, however, its opportunity cost is the world (c.i.f.) price gross of the 13 per cent foreign exchange premium. Similar arguments apply to the purchase of domestic machinery and equipment.

There should also be an economic adjustment made to the project if it is financed with foreign debt or equity capital. If, on one hand, the foreign investment is truly incremental to the country, in the sense that the project could not have taken place without the foreign financing, the whole net present value of the social benefits received by Canadians is the result of foreign investment, and the net cash flow (discounted at 10 per cent) should be adjusted accordingly. If, on the other hand, the foreign investment is truly non-incremental in the sense that the project would have proceeded in any case, our only concern should be whether it is less expensive to have foreign, as opposed to domestic, financing for the project. Private capital with an average debt-equity ratio has a Canadian opportunity cost equal to the normal real (net of inflation) rate of return which could otherwise be earned.[21] If foreign investment is earning more than a normal real rate of return, we can conclude that it is costing Canada more to finance the project from foreign than from domestic sources, and the appropriate economic cost must be incorporated into the analysis. Most projects lie somewhere in between the two extremes of truly incremental and non-incremental foreign investment; the appropriate adjustment is accordingly more complicated.

4. Determining the Magnitude of Direct Government Financial Assistance

The methodology for the economic analysis of a project has been outlined in the previous sections. The accuracy and reliability of the estimates of social costs and benefits depend largely on the quality of the economic research and on the accuracy of the financial data, which in turn are based on the engineering and marketing estimates as well as on the technical studies. Keeping this caveat in mind, we can proceed to demonstrate how the economic analysis

[21] See the discussion of the private discount rate in section 2.A. of this paper.

lends itself to determining the appropriate magnitude of government assistance for a project; our discussion is intended only to illustrate how the methodology can be employed, and not to prejudge the question of government assistance, its form, or its magnitude.

Let us consider the "Decision Tree" in Chart 2. The objective of the economic analysis is the best social benefit value minus the present value of social costs; or more simply, the project's greatest net present value (NPV), where present values are calculated using the social discount rate. First we want to ensure that the NPV of any project is positive; that is to say, any Canadian project should yield a real return (which takes into account the value of the alternative investments and as well as consumption given up to undertake the project) of over 10 per cent. If the NPV of the social benefits and costs is positive, therefore, the project gives back to the Canadian economy more real value than it takes out, and the well-being of Canadians is increased.

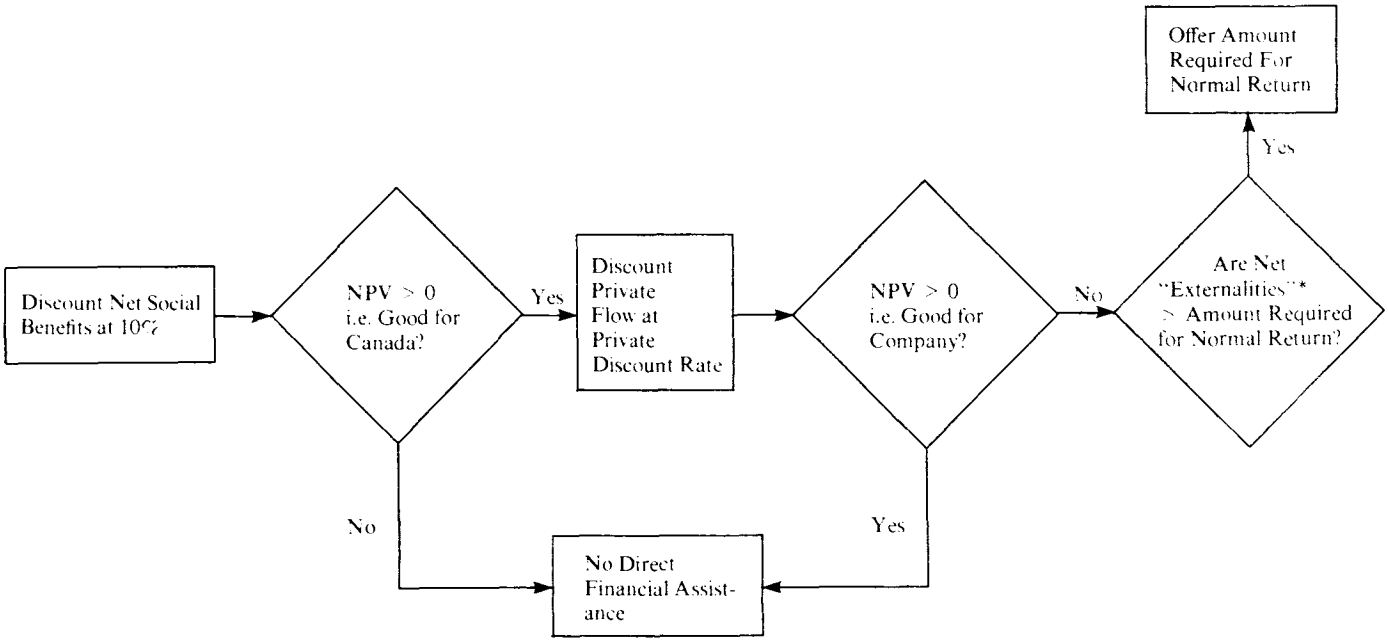
Once we have ascertained that the project is economically viable, we must determine whether it requires any direct government financial assistance. At this point we return to the privately valued cash flows to see if the net present value discounted by the private discount rate is positive. We argue that since the private discount rate is the average real rate of return actually earned by Canadian industries, it ought to be a sufficient return to any prospective investor in a project. Therefore, if the constant dollar net cash flow discounted by the private discount rate is positive, according to our equity rule no direct government financial assistance need be offered.

If the private discounted cash flow is negative, however, the government may want to assist the project, since its positive social NPV will increase the well-being of all Canadians. Indeed, without such assistance the investor may be unwilling to undertake a project which yields less than a normal real return to total capital. On the other hand, according to our equity rule, there is no reason for the government to offer the investor an amount greater than the sum of the net economic externalities generated by the project, if they are positive. The net economic externalities are defined as those over and above the normal externalities generated by a normal project, and are measured by the difference between the net present value of the net social benefits (discounted at 10 per cent) and the net present value of the private net cash flow to total capital (discounted by the private discount rate). It follows that the government should offer the private sector project the smaller amount required for the project to be undertaken (up to a normal real return), or the value of the positive net economic externalities generated by the project.

When the NPV of the net social benefits and the net economic externalities of a project are positive, Canadians (other than those investing in the project)

Chart 2

"Decision Tree" – Determining the Magnitude of Direct Government Financial Assistance



* Net Economic Externalities are over and above the normal externalities generated by a normal investment project

benefit more than if the capital were invested into the economy at large. If the net economic externalities are negative, however, the private investors are receiving a larger proportion of the total net benefits than is normal for investment in Canada and government assistance for the investor would not be to the advantage of other Canadians.

5. *Regional Project Appraisal*

The first few sections of this paper provided an outline of how project appraisal can be applied to measure both commercial and economic viability. We also showed, in general terms, how the methodology can be used to determine the magnitude of direct government financial assistance. In this last section we wish to turn our attention to a brief look at a broader range of regional development issues. Efficiency and equity are two themes which appear in the literature on both project appraisal and regional development so we shall address each in turn.

5.A. *Economic Efficiency*

The methodology of project appraisal has a number of implications for economic efficiency. First, project appraisal provides an orderly and coherent framework within which to structure an evaluation and to organize data. It encourages a rational and purposeful analysis of investment opportunities and militates against an illogical, overly enthusiasic, and unrealistic assessment of the possible net social benefits.

Second, the criterion of economic viability insists that if Canadian resources (e.g. labour, capital, raw materials) are to be employed in a specific project, the project must generate a social return to Canadians at least as great as one from some other Canadian investment. Furthermore, if two mutually exclusive investment opportunities are examined according to this criterion, we ought to choose the project with the highest net present value of net social benefits.

It is not always possible to examine all the possible regional investment alternatives, however. For example, it is neither practical nor especially informative to take a major industrial plant and move it hypothetically across the country in order to see whether the net present value of the net social benefits would be larger if the plant were located in some other region. Think of all the variables that would change: markets, transportation costs, wage rates, land costs, environmental effects, infrastructure, labour-market impact, costs of congestion, etc. The Program Evaluation Division at DREE would need a small army of analysts just to collect the data, let alone analyze it!

The criterion of economic viability provides, at the very least, a test for minimum economic efficiency. The project appraisal methodology cannot guarantee the optimum solution to all public sector regional investment decisions, but it can nonetheless provide the analytical framework for determining whether Canadians are generally better off as a result of the undertaking of a particular project.

5.B. *Regional Equity*

The primary aim of project appraisal is to determine whether public sector investment opportunities are commercially and economically viable, not whether Canada has an optimal distribution of income. There is no question, however, that much of the net income from a project benefits those living and working in the region where it is located: the additional labour income is clearly beneficial to them; the additional tax revenue enables their provincial government either to increase its provision of public goods and services, or to maintain the current level and reduce taxes; and if migrants are attracted to the area, they may bring transfer payments which serve to further stimulate the local economy.

The allocation of government financial assistance to the regions is largely a socio-political decision, but our project appraisal methodology can offer some insight into the basis for the decision. If the economic analysis of the Cape Breton labour market, which we outlined in section 3.B., is an accurate depiction of the impact of new jobs in eastern Canada in general, then the differences in regional unemployment rates are not necessarily a good indicator of regional inequities. In our analysis, new jobs induced a net flow of migrants to the region up to the point where the same equilibrating unemployment rate was restored. The fact that the project may not cause a permanent reduction in the unemployment rate does not mean that the project is without merit. By the same token, the fact that the difference in regional unemployment rates is not reduced does not signify that individuals living and working in the region are not potentially better off.

Persistent differences in unemployment rates between regions in Canada do not in themselves argue for "moving jobs to workers" or "moving workers to jobs". High regional unemployment rates may reflect the attractiveness of areas for living, the economic effects of minimum-wage legislation, industry-wide collective bargaining, a preponderance of low-wage jobs with their high turnover rates, the seasonal nature of employment, or the labour response to unemployment insurance compensation. Regional unemployment is just one factor to be included in an overall project appraisal.

Without adequate project appraisal, regional development can occur only in a haphazard or arbitrary fashion. As project appraisal techniques become more widely accepted and employed by both federal and provincial governments, they will serve the useful function of defining more clearly the nature and magnitude of the benefits and costs to Canada and the regions from investment projects which receive public financial assistance.

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Comments by J. Ross Millar

I have two classes of comments that I would like to make. I do have a couple of questions of a fairly straight-forward type, and then a couple of comments with a wider perspective. Due to my own background in labour economics, I have been more attracted to some of the studies you have done on the opportunity costs of labour. I too, have wrestled with the problem of determining the opportunity cost of the returning Cape Breton coal miner who had gone to central Canada or Alberta or wherever.

It seems to me that over a fairly long business cycle the opportunity cost of a semi-skilled worker from Cape Breton in central Canada might vary quite considerably. Would the calculations not have to account for the rate of skill deterioration, and the point in a business cycle at which the departure or return occurs? Second, if I correctly understand the way you have done this, after a project is in place, after all the return migration has occurred, a certain equilibrium sets in: now you basically have a population augmented by essentially the number of workers required to man the project on a long-term basis. Now the question as to who is employed, and who is not, is to be determined by the local market. That is not to say that the people who were there first did not get any jobs; there is presumably some market process there determining who gets the jobs. The question I have concerns the opportunity cost (which, presumably, has to be determined on some mix of work given up in Toronto or wherever) of the returning migrants. In a large market, such as "the rest of Canada", particularly in view of unemployment rates that we have seen in the last three or four years, one would wonder whether there is any opportunity cost at all (other than the most specialized skills being focused upon a particular project). Your paper suggested that the opportunity cost, at least from the kind of diagram you presented, approaches 80 per cent in equilibrium, 80 per cent of, say, the real wage rate.

In general terms, the haunting question that arises is why what appears on the surface to be so much well-known benefit-cost analysis is so topical at a seminar such as this. Why are we still trying to put across the fairly simple, straight-forward precepts of project analysis and why is it still important? That there were benefits associated with projects which favoured labour-surplus areas and exports or projects that do not pollute the atmosphere was uncontestable. But even with the sophistication of project analysis that has been with us for the past decade, how many times has the decision come down to a checklist? You added up the pluses and the minuses: if there were six pluses and four minuses, the pluses won. What Mr. Evans is describing, I think, in this paper is that, in fact, when you take a hard look at some of those pluses and minuses, while some can be quite important, others are pretty insignificant.

My last comment concerns what I think is a slight omission in Chart I: the resource pricing question. It is one of the most valuable products of this kind of analysis in the last couple of years. He talks about it in his paper but does not have it listed in his chart. In his discussion of economic externalities, resources are priced in a way different from their true market value, or should I say their true social cost. The most obvious example in the last two or three years has been energy pricing, electrical energy pricing for instance. One of the real values in having the project appraisal methodology has been that it has allowed a structure in which the energy pricing question could be seen in its fullest consequences. One continues to see proposals using "old" prices based, presumably, on average prices. Now energy installations are becoming very expensive, which means that the marginal costs of adding new energy capacity is very high; and it is the marginal energy cost which is relevant when you are looking at a marginal energy investment, not the average energy prices. Yet the utilities in almost all jurisdictions still price on an average basis, so that in a sense, the historical prices still dominate the average price. Thus, this kind of overview has tended to focus on the resource pricing, or the energy pricing. Interestingly enough, in many projects, resource pricing dominates all the rest of these considerations; they become the rounding errors of the resource allocation issue in energy.

Comments by Dan Usher

I have really three points to make, one small one, one very small one, and one rather large one.

The overall criterion for evaluating proposed projects, with which I am in general agreement, is that when you do the project, you maximize or you increase the material income in some sense. In the process, you have to compare the benefits and costs at different times. For that purpose you need a discount rate, and much of the paper was concerned with how this discount rate was derived.

The first point I want to make, the relatively small one, is that there are two rules that can be applied in evaluating public projects, either exclusively or together. On one hand, you can evaluate projects by using a social discount rate; with this I am in complete agreement. On the other, you can evaluate projects using a social cost of funds in the public sector. Bringing a dollar into the public sector necessarily involves certain costs. There are quite simply the costs of tax collection, the overall administrative cost, the costs incurred by the Treasury Board, the overheads of DREE, etc. There is a certain dead weight loss in anything less than a perfect tax system and no tax system is perfect. It will involve you in some rearrangement of consumption investment, the cost of which can perhaps be estimated. And there is the loss of alternative

taxes that would be levied if the money were not brought through the tax system into the public sector, or if the money were not to be used for a particular project. Thus there is a cost of public funds. The cost of public funds is independent of, or can be independent of what we choose to do with the funds once it is in the public sector, so that, for example, if the cost of public funds is 25¢ on the dollar, we can say that 25¢ is the value lost to the private sector in bringing a dollar into the public sector.

The reason I emphasize the distinction between social cost of funds in the public sector and the social rate of discount is that this very much concerns the timing of an investment. Consider a project which yields, shall we say, $1.05 of benefits, however computed. It yields it instantly and that's all there is to it. If you are using the social rate of discount, then that project is an advantageous project almost regardless of the rate of discount that you use, because transforming a dollar in the public sector into a dollar and five cents in the private sector is necessarily a gain at virtually any discount rate if this occurs instantaneously, because the discount rate has to do with timing. However, if you have a social cost of public funds calculation, and if the social cost of public funds is in excess of five cents on the dollar, you will not do the project; of course, if it is less than five cents on the dollar you will. Thus, I think it might be worthwhile to make that distinction while working out the rules for project evaluation in the public sector.

The very small point that I want to make concerns the valuation of the social cost of hiring unemployed labour. I was going to be a little bit hard on Mr. Evans, but after listening to the other discussant I am rather inclined to switch sides on the debate. I would have thought that with a large number of ongoing projects in a region, it would be extremely difficult to determine the social cost of hiring unemployed labour because you would have to work through all of the ramifications. Indeed, it may well be that the social cost, all things considered, is the wage. But it is very difficult to determine and surely I am closer to Mr. Evans on this issue than I am to his critic. That is why I say the point is minuscule. I merely want to say that it is extremely difficult to determine what the social wage really is, and that the presumption that it is very much less than the actual wage is very difficult to establish.

The big point that I wanted to make is that there is no distinction that I can discern in the paper between public projects in what we normally consider to be the public sector and public projects in what we normally consider to be the private sector. As an example, the building of rural roads would be an example of the former and the building of a new clothing factory somewhere would be an example of the latter. Now, traditionally in economics, a rather careful distinction has been made between public and private sectors and people have debated at great lengths as to what is and what is not, as it were, on

the agenda of the public sector. What kinds of things does the public sector traditionally do? What does the private sector traditionally do? Suppose that we have some division, which is arrived at in some way. Suppose, too, that you encounter a project for which social costs appear to exceed social benefits and for which private benefits are not sufficient to interest an entrepreneur. What happens, then, when the government proceeds to enter an environment where private firms are already operating? It adds an extra clothing factory. It adds a fish canning plant or something like that, in a world already containing clothing factories or fish canning plants or whatever. You see, if you are going to enter a market where the private sector would not, you are doing so on the basis of calculations using shadow prices. And, of course, these shadow prices reflect values different from market prices.

If the private sector does not use these shadow prices (it uses market prices), it may well be in the public interest to have an extra clothing factory somewhere. That does not necessarily imply, however, that the public sector ought to produce one, or even ought to subsidize an extra private firm, because we do not always know the full ramifications of public activity where there is already a private sector. This is the general problem that often goes under the heading of incrementality, and DREE has recognized it.

The DREE people have discussed in detail the question of the proportion of incremental DREE projects (in the sense that they add to the sum total of DREE investment) as opposed to the proportion that is not incremental. There have been a number of studies which have shown that a large proportion are not incremental. The most common estimate is about 50 per cent, but this is "pulled out of the air" and I cannot produce a better one. Now it should be recognized that a project can fail to be incremental for two reasons: first, because the DREE people made a mistake; and second, because with the best will in the world and the best of calculations, it was thought necessary to provide a subsidy when it was, in fact, not necessary. This may be termed the Type I failure to be incremental. It happens often, but not because people are incompetent. It happens simply because the problem cannot be avoided, no matter how competent people are within the normal range of human abilities.

The second type of incrementality is one which I wish to highlight. For example, suppose the firm or project which is being subsidized is genuinely incremental, in the sense that it would not go into place without a subsidy; and suppose its social value exceeds its cost. The effect of the addition of this firm to a market may well be to cut out some investment somewhere else. The ultimate effects of putting a project into Cape Breton Island may well be that the wage structure adjusts, that migration takes place and that prices change in such a way that there is one less project in Smiths Falls, or one less project

for some region in Saskatchewan which is no more prosperous than Cape Breton Island. These are very serious problems and in practice you are going to run into them.

These types of incrementality involve various types of possibilities or I should say, have various kinds of costs. The Type I error, where you subsidize a firm which would have gone into place anyway, has two kinds of costs. The first consists of the redistribution of income from the poor to the rich, because the owners of the firm are rich – richer than the taxpayers as a general rule. Thus, you are transferring money from poor people to rich people which is not the official object of Canadian regional policy. The second sort of cost associated with Type I incrementality is that you alter the whole climate of business in the region; at least there is some risk of this. You create situations where the way to make money is to convince someone that you need a subsidy. And DREE is by no means the big subsidy-giver in the Canadian government. DREE is a small subsidy-giver and although some of us may think it is less open than we would like, I want to emphasize that it is a lot more open than almost any government agency in the subsidy business that I know. Nonetheless, the Type I failure of incrementality can complicate a market situation regardless of the source of the subsidy. It can result in the situation where firms become clients of the government; where the way to make money is to persuade somebody, in one way or another, that you need a subsidy, and to put your resources into the process of persuasion. I leave it to you to work out what are the likely consequences of that.

Type II error involves a different sort of cost. If the project is genuinely incremental, then it is not necessarily a trend. The subsidy will not be a transfer from the poor to the rich. On the other hand, if the new project pushes out an existing firm, the danger arises that you are substituting good projects with bad. What can happen is that the process of subsidizing firms eventually leads to the replacement of a number of firms which do not need subsidies with firms that do.

This is a very dangerous game. Suppose, for example, that there is a tax on the output of fish hooks. Because there is a high tax on the output of fish hooks, the social value of having more fish hooks is greater than the private value. Suppose too, that there are ten firms in the industry. It would be correctly inferred that an extra firm would be in the public interest, so you subsidize an extra firm. But this firm knocks out, indirectly, a firm that is already in the industry, so that there are now nine private firms and one public firm. Of course the process continues. It is still in the public interest to have extra firms because of the tax on the output of fish hooks. Accordingly, you could actually set off a chain in which the public sector gradually subsidizes one firm

after another in the private sector, until the whole industry is subsidized and no more fish hooks are being produced than were being produced before the public sector moved in.

Thus, there are two types of projects which fail to be incremental: in the first, the firm itself may not be incremental and yet get subsidized simply because it is difficult to determine incrementality; in the second, the firm is genuinely incremental and would not be there but for the subsidy: its establishment, however, can knock out another. My general point is that in project analysis it is very important to distinguish between the public and private sectors. It is also important to be cautious before subsidizing a project in what we normally think of as the private sector, unless the case for doing so is overwhelming and far more persuasive than I think it need be on the basis of the criteria suggested.

John Evans' Response to the Comments

The last point that Professor Usher raised is absolutely crucial. In my discussion today I probably glossed over some of these issues and perhaps omitted this particular discussion from my paper; but let me assure him and you that this topic is one with which we are very much concerned. As I indicated earlier, when you have been looking at foreign exchange earnings, you want to place the premium only on incremental foreign earnings. If you are looking at employment creation, you want to look at net employment creation, not just the gross number of jobs created. And by the same token, if you are looking at the benefits of, let us say, having the public sector subsidize a private firm, you will have to be very concerned with any resulting loss in rents to another firm in the private sector. Certainly in the work that we have done, we have subtracted any lost rent as a cost against the introduction of the new project. In many cases, as I have said before, economics has oversold itself and oversold itself on a rather flimsy basis. The real gain, the real economic benefit from many of these projects, is much smaller than one would think.

As for DREE making a mistake in subsidizing firms unnecessarily, the decision tree that we have developed is intended to prevent that sort of error.

With regard to your earlier discussion about the differentiation between the cost of funds and the discount rate: I would like to point out that in your example the social discount rate would not have come into effect. I have assumed that public sector financing is all done by borrowing; and if the $1.05 were immediately received as a result of a dollar investment, no borrowing would be required. Therefore, neither would there be an opportunity cost of

funds, nor a discounting problem. The assumption is that the marginal source of public sector funds is from increased borrowing. This assumption is made because it limits the distortions that you have to take into account to only the capital market distortions. In this way, we get away from having to estimate the distortion that would apply to the dead weight loss from income taxes, sales taxes, etc.

As for the other issues which came up, risk is something that is taken into account. It is not generally advisable to take account of risk in your discount rate. You should be taking account of the risk in terms of the covariance of the returns of the project vis-à-vis the general income stream that can be expected. That risk is a cost that you want to include like any other cost. If you are looking at a risky project which has a social cost attached to it, then you want to subtract that extra cost from the net present value before you determine whether the project is beneficial.

THE CHALLENGE OF RURAL DEVELOPMENT AND THE PUBLIC RESPONSE IN CANADA

by Mohammad A. Qadeer, Queen's University

In North America and Europe, the industrialized world, there is resurgence of popular interest in rural living. The urbanized countries are rediscovering their rural communities. Spurred by urban problems and conscious of energy and environmental crises, city dwellers are expressing preference for living in small towns and villages. There is a growing appreciation of the good life in rural areas. This appreciation is, now, more evident in attitudes and preferences than in migratory behaviour, although since 1970 the trend of migration out of rural areas seems to have been reversed in many countries.[1] Rural communities have almost captured people's imagination. Demko reports that Ontarians preferred to live in medium and small towns [Demko 1974, 2]. A national opinion poll in the U.S. revealed that 50 per cent of metropolitan residents would prefer to live in rural and small communities if jobs were available there [Hanson 1973, 10]. If this shift in residential preference turns out to be the harbinger of a new migratory movement, then a new urgency will be lent to rural development and even redevelopment.

Presently, the term rural development implies a commitment to seeking economic growth through the development of natural resources and by attracting new productive activities to rural areas. With increased production, it is assumed rural residents' incomes will rise and the promised improvement in their welfare will follow.

This approach has worked to the benefit of the progressive, upwardly-mobile and relatively prosperous rural communities. It leaves the hard-core rural poverty intact. This realization has prompted an explicit introduction of equity as a goal of rural development. The World Bank now defines rural development to be the strategy of 'extending benefits of development to the poorest among those who seek a livelihood in the rural areas' [World Bank 1975, 3]. It might be argued that this position has arisen essentially as a response to the experiences of rural development in the Third World. But a close examination of rural problems in advanced countries reveals that equity is also the basic issue there. In advanced countries, the issue is that of fair distribution of economic opportunities, public services and political power between urban and rural communities. The Canadian Council on Rural Development (CCRD) states this problem very explicitly:

> Development policies and programs continue to be urban-oriented, and development decisions continue to be based, by and large, on the traditional assumption that economic growth through the application of advanced technology and large-scale enterprise would create new and gainful employment for all Canadians. The benefits of development would then be equitably distributed through the entire population — rural and urban. A careful scrutiny of the Canadian development scene during the last decade will clearly show that these assumptions have proven incorrect. (CCRD *Commitment to Rural Canada,* Fifth Report and Review, 1973, p. 1)

The persistence of economic and social disparities between urban and rural areas calls for focusing on rural problems individually and requires special public action. If the benefits of development were spread uniformly over a national territory, there would be no speciality called rural development. This is as true for developed countries as for the developing.

Development is a composite process incorporating economic growth, social development, cultural change and institution building. Spatially, it is regarded as a process of progressive equalization arising from the dialectic of centre-periphery interaction [Friedmann 1966, 34-37]. Even the proponents of polarized and unbalanced growth concede the necessity of equalized development to obliterate centre-periphery dichotomy and postulate the emergence of centripetal forces within a centre as a result of agglomerative diseconomies.[2] The continual growth of centres (read cities) in advanced countries is partially attributed to the failures of the informational and social accounting mechanisms to register the diseconomies and social costs. Rural development as a public policy is justified to counteract these market failures. There seems to be little disagreement about the desirability of public intervention in the development of rural areas whatever the original position from which this issue is approached.

Given that rural development is a matter of public concern, we may ask what, specifically, is the scope of this activity in Canada. To answer this question, we must first determine the nature of rural problems and the bases of their existence. This paper is addressed to these two questions. It is an attempt to examine systematically the social and economic bases of contemporary rural community life in Canada and to outline ideas about the approach that might be taken in evolving a rural development strategy. It will also review the current programs of rural development. This paper is exploratory in intent and integrative in approach.

Problems of Contemporary Rural Canada

Perceptions of rural problems vary with the definitions of rural areas. If we were to limit the term "rural" to the farm population, the scope of developmental problems and issues would be much different than if the term were to encompass the whole non-metropolitan sector of a national settlement system. It is now customary to include villages and small towns in the rural sectors of a country. Otherwise, the term "rural" becomes a synonym for an occupation, i.e. farming. The Canadian Council on Rural Development has consistently defined its concern in terms of farm as well as non-farm populations living in open country, villages and small towns. Ball defines rural areas as being comprised of 'non-metropolitan geographic area' [Ball 1974, 1]. I will take a mid-

dle position and refer to rural as farm and non-farm census categories, and villages and towns with a population of less than 10 000. By this definition, there were 7.3 million people living in rural areas of Canada in 1971, or 35 per cent of the national population. The community problems of this population are the subject of this paper.

Unlike Third World rural areas, rural Canada's problems arise from its technological success and productive efficiency. With the mechanization of agricultural production, the self-contained rural economy broke apart. Rural industrial and commercial enterprises could not compete with urban mass-producing organizations. With mechanization, the agricultural sector's links with village workshops and farm labour were weakened and its dependence on urban industries and banks was greatly increased. These processes have brought both prosperity and peril to rural communities. While agriculture has prospered, farmers have languished with below-average (national) incomes. Whereas chain stores, fast-food outlets and supermarkets have filtered down into rural communities, local businesses have had to fold up. The country doctor has become a legend of the past: today thousands of rural residents remain unattended by a qualified physician.

These are the paradoxes of contemporary rural Canada. They have arisen with the emergence of vertically integrated production and distribution processes and are due to the weakening of horizontal linkages at a community level. Inevitably, vertically integrated social and economic institutions are centred in cities; essentially, decision-making rests there. This creates the much talked-about 'dualism' between metropolitan and rural communities. Rural problems in advanced countries are essentially issues of unfulfilled expectations for higher incomes, greater opportunities and adequate public services which are heightened by the contrast with conditions in cities. Rural development is as much an economic as a social and political problem. Fundamentally, rural underdevelopment is an issue of the urban-rural disparity which has arisen primarily because of the successful permeation of modern technology and institutions to rural areas. As one observer has put it, 'the rural development problem flowed in large measure from the urbanization of rural society' [Warley 1973, 38].

Almost every account of living conditions in rural Canada mentions low incomes, absence of job opportunities, inefficient use of natural resources, low educational and vocational attainment, demographic imbalance and inadequate public services, as problems demanding attention.[3] These problems become issues of regional disparities wherever areas of rural impoverishment embrace large parts of a province, as in, for example, Newfoundland, Prince Edward Island, New Brunswick and Saskatchewan. Apart from these common problems, there are special issues in specific rural regions. Recently the

issue of conserving agricultural land and environmental resources has been precipitated: it is particularly urgent for rural areas lying in urban shadows. Poor revenues and the politics of indifference hamper the development of many rural communities. Depopulation on one hand and inundation with newcomers on the other affect life in many villages and towns.

Abundance plagues agriculture by depressing prices of produce and keeping farmers' incomes low. Yet rising food prices are not palatable to urban consumers. Within the agricultural sector, there has been a consistent tendency towards the enlargement of farms but a decrease in their numbers. This tendency is suggestive of an emerging domination of the agricultural sector by large-scale enterprises — a phenomenon that has become suspect in the days of disenchantment with big corporations. The other side of this picture is that small family farms are being squeezed out of the business. Without getting drawn too far into the complex problems of the agricultural sector, I want to point out that the farm segment of rural Canada is plagued with many structural and economic difficulties.

A complex pattern of spatial interdependence has come to characterize urban-rural relationships, a pattern which is manifested in the form of spreading of cottages, country homes, generating stations, quarries and garbage dumping grounds in the countryside and a concentration of hospitals, colleges and offices in cities. These interlinkages work to the benefit as well as to the detriment of rural areas. New activities appear in rural areas but many old ones disappear. Rural areas acquire a new regional role but the decision-making powers are concentrated in cities. The erstwhile notion of balanced development has become all the more relevant to contemporary regional planning.

The preceding brief review of rural problems adds up to an impressive catalogue. Yet it can be asked whether these are problems of rural communities or functional and sectoral problems which manifest themselves in rural areas. This conceptual issue might not be neatly resolved, but considering it will certainly help define the scope of rural development.

Whether the above-described problems are of or in rural communities depends on the degree of their horizontal linkages with other local sectors. Applying Warren's postulate of horizontal and vertical axes of interest integration and looking along the horizontal axis as the basis of local community, we can state that issues which are highly inter-linked with other local problems and decisions constitute the central focus of the rural development effort [Warren 1966, 70-71]. Thus while problems of agricultural marketing and technology may be sectoral, the loss of jobs, the changes in local commercial activity or the requirements for roads and warehouses to service this sector are its horizontal repercussions, which fall within the purview of rural development.

Whatever factor or issue affects the continuation, growth and viability of a rural community, it is a concern of rural development; and the final arbiter of a community's viability is its resident members. If they feel that their earnings are inadequate compared to the opportunities available by moving somewhere else, albeit to cities; or if they begin to experience the necessity of relocating because of the closing of a county hospital or the abandonment of a passenger line, then obviously these are rural community issues. When the externalities of a sectoral activity (or policy) outweigh its internal costs and benefits, the issue then is community-wide. The quality of life expected and obtainable by rural residents is the primary basis of defining the scope of rural development. Factors affecting residents' opportunities and a community's quality of life may be adequate incomes, diversity of jobs, availability of services or a process of participation in decision-making and a freedom from feelings of dependence. Whether sociological, economic or physical, such factors constitute the parameters of rural development disciplines. Ball articulates rural development in more or less the same terms: "Rural development is most of all for people, for their well-being, self-realization and what they can become." [Ball 1974, 2]. Having defined the boundaries of the concept of rural development, we must now specifically focus on Canadian rural communities: what they are and how they came to have their problems.

Communities of Rural Canada

Social Structure

Our images of rural Canada are conditioned by the folklore. The popularity of 'The Little House on the Prairie' and 'The Waltons' is evidence of how nostalgia shapes these images. Contemporary rural Canada bears little resemblance to these fond memories. It is not populated with idyllic, pastoral communities. Agriculture may be the most visible activity but it is not the most significant. Only about seven per cen cent of the Canadian population lived on farms in 1971. The non-farm, village and town population outnumbered farm residents by a ratio of 4 to 1 in 1971.

Rural Canada is comprised of farming communities, milltowns, railtowns and minetowns, retirement and leisure villages, commuters' sub-divisions and country estates. There were 8 000 hamlets, villages and towns in Canada in 1971 and among them could be found communities of almost every economic and cultural stripe. This diversity of community life is only one of many facts contradicting nostalgic beliefs about rural Canada.

Another misconception is one about rural-urban differences. Modern technology, the nation state, national TV and press, the standardization of laws,

work procedures and education, and the dominations of markets by highly-integrated national corporations are some of the forces which have produced the mass society where the rural-urban cleavage has been gradually bridged. Thus, there emerges a tendency toward the norrowing down of rural-urban differences and of the convergence of respective social structures into a common form. This phenomenon calls for a re-examination of conventional theories of rural-urban polarities and continuums.

Empirically, the rural-urban convergence has become evident in industrialized countries, including Canada, from the 1971 census data. Theoretically, this has led to a greater exploration of the interrelations between ruralism and urbanism, particularly from a dynamic point of view as to how the obliteration of conventional differences gives way to new behavioural and attitudinal variations induced by the differential diffusion of inovations between rural and urban areas [Fischer 1975, 1319-41]. Rural Canada also exhibits a high degree of convergence on social structural indices towards urban norms; or, to put it more accurately, both urban and rural social structures are converging towards common societal institutional forms. This is evident from Table 1, which summarizes the findings of a recent study about the social and economic characteristics of small towns in Canada.

The indices reported in Table 1 are widely accepted measures of demographic, economic and social structures. Behind each index stands a long tradition of empirical observations which have been used to differentiate communities by size and function. For example, it is a long-established norm that North American rural communities have more males than females, because of the relatively greater out-migration of young females. Thus this observation has become a criterion to differentiate between urban and rural communities. Similar empirical norms have emerged around other indices. Yet the results obtained for 1971 census data, as reported in Table 1, show a certain degree of demolition of these norms. Rural areas do not have especially high household sizes, or peculiar sex and dependency ratios and the urban areas do not reflect substantial differences from the rural areas, particularly from the non-farm segments. A similar tendency of convergence is evident for measures of occupation, education, housing, etc. Only incomes vary directly with the size of a community. Rural farm areas are the only exception, showing weak tendencies of conforming to the expected patterns.

Our conclusion about the convergence of the social structural indices to a narrow range of variation between the rural and urban sectors of Canadian society is borne out by numerous community studies. Elkin concludes that the Canadian rural family is "no longer very different in its material and social life from the urban" [Elkin 1968, 70]. Similarly, Tremblay found increasing homegeneity of family structures and consumption patterns among wage-earning urban as well as rural French Canadians [Tremblay 1973, 15].

Table 1

Social Structural Indices

Index	Rural-Urban Community Characteristics
Household Size	Rural farm households are noticeably larger. There is little variation between cities, towns and villages in household sizes.
Sex Ratio	Males predominate in the open country; the villages and towns are equi-proportioned; the cities are slightly female-dominated.
Dependency Ratio	There is an inverse relationship between size of a community and the proportion of children in population. The proportion of elderly in small towns and villages is high; metropolises as well as rural farm areas have lower ratios.
Income	This is directly related to the size of a community.
Occupational Distribution	With the exception of the rural farm sector which, obviously, is mainly agricultural, there is little variation in labour-force occupations for villages, towns and cities. Primary, secondary and tertiary sectors are relatively equally represented in each type of community.
Educational Attainments	There is a uniformity in the educational profiles of the populations in villages, towns and cities. Only the rural farm sector shows lower levels of educational attainments.
Housing Quality	Generally, the housing quality, as indicated by plumbing facilities, is uniformly high among villages, towns and cities. Only rural farms and hamlets exhibit a lower housing quality.

Source: Hodge and Qadeer, *Villages and Towns in Urban Canada,* pp. 15-41.

The preceding two major findings might appear paradoxical, even contradictory. On one hand, we find great diversity among rural communities and on the other, a tendency toward homogeneity of social structure across the whole Canadian social fabric. How do these two observations square with each other? Essentially they refer to two different levels of abstraction. The diversity is an attribute of the intra-rural sector distribution and the homogeneity is the tendency of societal institutions which envelop both rural and urban community structures. Both of these observations point towards a common theme: physical and numerical dimensions, as reflected in the notions of rural and urban, are becoming less important as determinants of community characteristics. The 'mix' of activities and institutions is the major differentiating attribute. A village might resemble a city if it replicates the city's mix of social strata, power structure, and economic activity; and it may be very different indeed, from another village of the same size which varies in terms of its social 'mix.'

In Canada, individual social institutions, such as family, government, church, work, recreation, etc. have been standardized and homogenized under the influence of national forces. A community's social structure is derived from the relative proportions to which each of these institutions is locally represented. Thus, one community might be organized around the church; another around leisure or productive work. It is, therefore, not a surprise that as a collectivity, the rural sector bears a resemblance to urban areas, because at that level most institutions are represented; where individual rural communities might still be very diverse from each other and from urban areas. Thus, the uniqueness of individual rural communities becomes an overriding consideration in dealing with them. This conclusion is supported by Glenn and Hill's inquiry about rural-urban differences in attitudes and behaviour in the U.S. Although they found some differences in attitudes and behaviour, their overall finding was: "For most attitudinal and behavioural variables, the predictive utility of rural-urban variables is modest at best; 'overinterpretation' of rather small differences between percentages has often obscured the fact that on most issues both the rural and urban populations have almost as much internal differentiation in attitudes as does the total population" [Glenn and Hill 1977, 50].

Economy

The economic bases of individual rural communities vary widely. Some depend on farming as their main source of income; others process raw materials into industrial products; a sizeable number exist on the earnings of their commuting residents; and so on. Yet the rural sector as a whole has a special role in the national economic system. To describe this role, we will follow an empirical route.

The first striking fact about the rural sector, as a whole, is that the average incomes of its resident population are lower than the national, as well as the urban, averages. Table 2 shows that the residents of rural farm communities had the lowest incomes: they were about 30 per cent behind the national average in 1971. The problems of low farm incomes are a legend.

Table 2

Average Income of Individuals 15 Years and Over, 1971

Area	Average Income ($)	As a Percentage of National Average
Rural Farm	3 561	70
Rural Non-Farm	4 090	81
Urban 1 000 - 4 999	4 540	90
Urban 5 000 - 9 999	4 847	96
Urban 10 000 - 29 999	5 052	100
Urban 30 000 - 99 999	5 012	99
Urban 100 000 - 499 999	5 382	106
Metropolitan 500 000 +	5 691	112

Source: Statistics Canada Cat. 94-709, Table 29, 1971.

It is a paradoxical situation: agriculture is highly productive but the farmers' incomes remain very low. We will discuss the agriculture sector later in this section; for now we observe the almost direct correlation between the size of the community and its average income (Table 2). As we mentioned earlier, this relationship is the only one which conforms to the rural-urban continuum hypothesis among the seven indices reported in Table 1.

The low income of rural residents has been a persistent reality for many decades in Canada. Relatively low incomes of rural residents could arise from a number of factors. The most common causes of variations in income are the occupational and educational differences of the labour force. It has already been reported that the differences in these two measures between rural and urban sectors were almost insignificant, rural farm areas being an exception. Table 3 gives further evidence of almost equi-proportional distribution of labour force by industry for non-farm rural areas and villages and towns on one hand, and cities and metropolises on the other. It can be observed that each column has more or less similar values in every cell, except for the first row, which refers to rural farm areas. The evidence shows a relatively uniform industrial distribution of the resident labour force for both the non-farm rural and urban sectors. Obviously the rural communities are not inhabited by

farmers and workers alone: almost every occupational group is to be found there. The rural labour force is not engaged predominantly in agriculture and mining. This can be observed from the fact that the rural sector had 19 per cent of the national labour force in 1971, but it had 25 per cent of the total manufacturing labour force and 36 per cent of the national labour force working in construction industries.

Apart from census data, there is evidence from many community studies that various secondary and tertiary activities have filtered down to rural areas. Lucas found 636 single-industry communities [Lucas 1971, 17]. Such villages and towns are not necessarily old milltowns and minetowns left over from 'main street' days. There are many new communities which have been built to serve specifically as industrial sites in rural areas [Pressman 1977]. A large segment of rural Canada serves as the metropolitan periphery, drawing spun-off manufacturing and service activities. In the same vein, federal and provincial agencies have fanned out to the rural areas to distribute pensions, control traffic, monitor weather, build housing for the elderly, collect taxes, run ferries, etc. Such government operations bring service activities to rural areas and diversify their economic bases. Commercial activities have also been highly standardized and centralized across the national space. Chain stores have filtered down to every main street. Woolworth's, MacDonald's, Esso, and Shell are familiar names everywhere in Canada. With this standardization and integration of the commercial market, it was inevitable that a certain degree of homogenization of the labour-force distribution should take place. My point is that there are so many national and regional forces contributing to the filtering down and spreading out of standardized activities in every sector, that rural areas can no longer be regarded as specializing in primary production. Sectorally, they support the whole range of activities to be found in Canada. This a manifestation of spreading urbanism. It obliterates conventional rural-urban differences but introduces differentiation by economic power and social class. Rural Canada is now to be differentiated on the basis of level and autonomy of economic activities, not in terms of sectoral specialization. Even the agricultural sector manifests such a differentiation, despite the fact that it is exclusively based in rural areas.

In 1971, the output of Canadian farms was worth $4.14 billion. About 30 per cent of the farms produced 77 per cent of this value. Farming is now agribusiness. It has become a processing operation obtaining inputs from industrial sectors in the form of fertilizers, seed and machinery and producing outputs which must be milled, refined and packaged before delivery to consumers. This means that value added by farmers to the agricultural output has become relatively low. [Clawson 1971, 301]. This change in the production technology and organization has worked to the disadvantage of small farmers. In 1971, output of 46 per cent of the farms

Table 3

Percentage of Labour Force 15 Years and Over by Industry Divisions, Canada, 1971

Place of Residence	Agriculture, Forestry, Fishing & Trapping	Mines, Quarries, Oil Wells	Manufacturing	Construction	Transportation & Communications	Trade, Finance, Insurance, Real Estate	Community, Business & Personal Services Industries	Public Administration	Industry Unspecified	Total
	%	%	%	%	%	%	%	%	%	%
Canada										
Rural Farm	63.1	0.9	6.9	3.9	3.0	5.2	8.9	2.4	3.8	100
Rural Non-Farm	9.3	2.6	17.7	9.3	8.3	15.6	20.0	7.0	10.3	100
Under 5 000	4.7	4.5	18.4	6.9	7.9	17.8	24.1	7.4	8.2	100
5 000-9 999	2.8	3.9	20.0	6.0	7.9	18.0	24.8	8.9	7.7	100
10 000-29 999	2.8	3.6	21.6	5.7	7.8	18.5	24.8	7.8	7.4	100
30 000-99 999	1.0	1.7	24.1	5.8	7.6	18.9	26.3	7.2	7.4	100
100 000-499 999	0.8	1.3	19.4	6.5	7.3	20.7	27.4	9.4	7.2	100
500 000 +	0.5	0.3	22.1	5.6	8.8	22.1	25.2	7.5	7.9	100

Source: Census Canada 1971, Vol. III, Part 4, Bulletin 3.4-4, Table 3A.

(170 047) in Canada was less than $5 000 per year. This puts them very close to, or slightly below the poverty line. Thus, even agriculture has been affected by the specialization and scale economies, with the usual results. Its productive and management functions have been separated. Productive functions have remained in rural communities, but managerial functions have floated up to towns and cities: A new kind of dualism which has come to characterize rural and urban economic relations.

From the preceding analysis, four conclusions emerge; they are presented below as propositions:

Proposition I	The major social institutions in Canada have been standardized and centralized: This has resulted in a narrowing of the rural-urban differences at the macro-level.
Proposition II	The uniqueness of an individual rural community arises from the mix and level of social institutions represented in it.
Proposition III	The rural economy is sectorally diversified, but in terms of its level of operations (for each sector), it is fairly uniform.
Proposition IV	The economic base of a rural community is usually comprised of low-level productive or distributional activities.

Taken together, these four propositions provide a systematic account of the functional role of rural communities in the national settlement system. Rural communities are the working-class segment of the national system. They are the lower strata of highly centralized and vertically integrated social institutions and economic sectors. They are comparable to the working-class neighbourhoods of cities, except that they are free-standing and therefore devoid of the symbiotic advantages normally obtained by an urban neighbourhood.

Rural Settlements as Truncated Communities

Rural communities lack higher order activities, managerial functions and middle and upper social class groups. They are diverse in terms of the type of activities and institutions, but this diversity is confined within a flat socio-economic plane. These conditions make them truncated communities. Absence of higher social and economic echelons leaves their social organizations incom-

plete. They lack the full cast of actors which is required to make a community a microcosm of the society. Arensberg and Kimball stress the necessity of having "a minimal set of roles a society is heir to" as a necessary condition for a community's temporal continuity and completeness [Arensberg and Kimball]. In this sense, Canadian rural communities are, by and large, incomplete and truncated. This was not always the case. This situation has arisen as a result of the breakdown of the self-contained rural communities and their incorporation in the regional settlement system. It is a result of the dependency relationship with which rural communities have come to be tied to cities: a manifestation of their status as periphery.

The smallness of rural communities further reinforces their social incompleteness, but it is not the primary reason for their truncated quality. The latter condition arises from the vertical division of functions among cities, villages and towns. Many rural developmental problems are attributable to this truncated nature of rural communities: the absence of vigorous leadership, the lack of interlinkages between economic activities at the community level, the inability to sustain groups and associations, etc. Under the contemporary Canadian social set-up, the absence of middle- and upper-class groups in a community deprives it of momentum for change and development. It is even a handicap in the presently popular processes of citizen participation. I have personally observed the difficulties experienced by some eastern Ontario villages which attempted to mount a citizens' participatory process. Often there were not enough skilled persons who could decipher government documents, do committee work and be able to reply to official jargon.

Normally, rural development should aim at rounding off the rural social organizations. A wholesome and balanced community must be the primary social objective in rural development. Obviously, the strategy of social 'completeness' or 'wholesomeness' will require paying attention to the unique features of a rural community and necessitate a close examination of the specific social structures of individual settlements. These are the policy implications of the 'truncated' community hypotheses. How have public approaches measured up to this norm? This question will be addressed in the following section.

Public Response

There is not a single, comprehensive program which might be taken as the primary expression of the Canadian rural development approach. The Agricultural and Rural Development Act (ARDA) comes nearest to being one; yet so many rural development activities have taken place outside the act's jurisdiction, that it would be inappropriate to assume ARDA to be represent-

ative of the national intentions and philosophy. To give an overview of rural development efforts undertaken so far, and to outline how they have evolved, Chart I has been drawn up. It categorizes various programs under five major strategies and briefly describes their program objectives. The chart is merely indicative of the major public initiatives in rural development: it is not a comprehensive catalogue of all rural development programs. The programs included in the chart are explicity intended to answer problems of rural communities. Obviously there are many public policies and programs (e.g. those operated by post offices, programs for the housing of the elderly, pension plans, etc.) which are territorially neutral but have a significant influence on the viability of rural communities. They operate in both rural and urban communities, but are not necessarily programs of rural development. These have not been included in this chart.

The array of programs described in Chart I is impressive. An examination of program objectives reveals five themes underlying to varying degrees, most of the programs: (i) the rationalization of farming operations by consolidating farms and retiring uneconomical operations; (ii) the development and processing of local primary resources; (iii) the consolidation of viable centres by the resettling of people from smaller communities; (iv) the upgrading of people's skills to prepare them for the change; (v) the regulation of land use and, now, the preservation of agricultural land. These themes are the anchor points of Canadian rural development policies so far. An emphasis on agriculture and on the development of primary resources is evident. The envisaged secondary and tertiary activities often turn out to be slow-growing, standardized industries. These programs in general do not promote what Perroux calls dominant industries, which inject a new vigour and dynamism to a local economy. The thrust of these programs is to expand the subordinate role of rural areas. Whether by trying to increase the catch of fish or by bringing a new sawmill to a depressed rural area, these programs essentially reinforce the present interlinkages between urban and rural sectors. They react to the problems of yesterday; they are also piecemeal responses to the evolving problems.

Borrowing Dennis and Fish's phrase, they can appropriately be called programs in search of a policy [Dennis and Fish 1972]. All in all, these programs are not designed to promote wholesome rural communities as these were defined earlier.

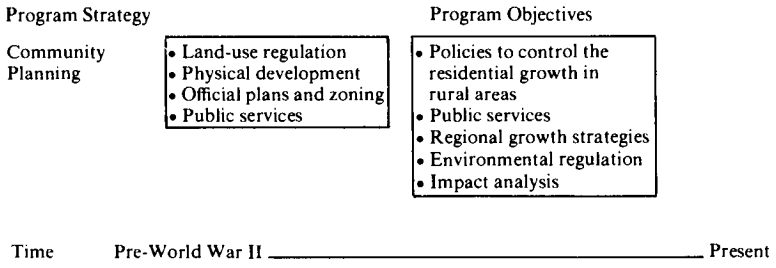
Although I disavow any pretense to an evaluation of the effectiveness of all these programs, I would not be amiss in citing judgements of more informed observers in support of the above conclusion. The emphasis on physical development projects (prompted by the desire to show tangible results) has been blamed by Buckley and Tihoranyi as the cause of ARDA's narrow view of

Chart 1

Rural Development Strategies

Program Strategy		Program Objectives	
Agricultural Development	Prairie Farm Rehabilitation Act (PFRA), Maritime Marshland Rehabilitation Administration (MMRA) 1930s • Water development • Conversion of marginal land to pastures • Marshland cultivation	ARDA Phase 1 (1962-65) • Land improvement • Soil and water resource development Phase 2 (1965-70) • Farm consolidation • Community Land Bank • Resettlement Phase 3 (1970-) • Farm consolidation • Community Land Bank • Training and advice	B.C. Land Commission • Preservation of farm land • Farm income stabilization
Delivery of Public Services		• Regionalization of education, health and local government	
		Local Initiatives Program (L.I.P.) and Opportunities for Youth (O.F.Y.)	
Rural Industrialization		ARDA (1970-75) • Development of small industries	
		Regional Development Incentives Act • Industrial Incentives • Infrastructure Development	
Comprehensive Settlement Planning	• Growth centres • Rural resource development	Fund for Rural Economic Development (FRED) (1965-) • Social Development • Manpower training • Resettlement assistance • Public services • Concentration of population • Resource development	

Chart 1 (continued)



rural development problems [Buckley and Tihoranyi 1967, 17-18]. The recent shift of the program toward manpower activities might partially counteract the land bias of the ARDA approach, but it may only accelerate the out-migration of youthful members of the labour force once they acquire skills saleable in urban markets. In another instance, the FRED-sponsored comprehensive rural development in northern New Brunswick had not alleviated the problem of rural unemployment by the end of the first federal-provincial agreement. Similarly, despite successes in education, the social adjustment strategy of this agreement failed to materialize due to the 'inadequacies in the design and implementation of a number of programs' [Department of Regional Economic Expansion, 1972, 21]. A similar conclusion emerges from a study of RDIA incentive grants. While conceding that RDIA might have helped to generate jobs and some economic activity, Dudley concludes that 'it has been much less successful in helping to develop those economies in the sense of inducing a significant amount of new secondary manufacturing activity in regions where it is a less common element' [Dudley 1975, 109]. Matthews passionately argues against the social costs of resettlement programs and against the 'growth centre' strategy [Matthews 1976, 120-139].

The picture emerging from the various critiques of Canadian rural development programs leaves mixed reactions. Undoubtedly, individual programs have had successes, such as the community land banks, the resettlement projects, the refurbished cheese factories or pulp plants. Adult education and social animation have also become features of public programs. Now legislation has been put on the books to preserve agricultural land and prevent urban sprawl in rural areas. The instrumental objectives of these programs have been realized, but there remains much doubt about the degree to which rural problems have been solved. On various social indicators such as rural poverty, unemployment, etc., little progress has been registered even after a decade of extensive effort.

Canadian rural development programs remain steeped in agricultural issues. Even the thrust of manpower training and adult education is to prepare skilled labour for such primary industries. This is perpetuating the working-class status of rural communities. The sectoral diversity of rural communities has not been acknowledged. The changing production function of agriculture has not even been fully taken into account in formulating rural development programs. Rural development planning must move out of pre-industrial era and recognize the degree to which urbanism has permeated rural communities. The objective of rural development should be to encourage wholesomeness of rural communities, sociologically and economically.

Rural communities are individually unique and collectively immersed in urbanism. They are shaped by highly integrated (nation-wide) social institutions, and their differentiation arises from the mix and level of these institutions. They are truncated working-class communities. These are the parameters of rural development.

An overall goal of rural development should be to make rural communities sociologically wholesome, economically viable, a significant element of the regional settlement system, and politically self-reliant. The first priority in this matter might be given to social development by nurturing (or drawing) middle- and upper-class groups to complete rural social organization. This condition can be realized in many ways. Through education and social mobilization, the poor and the working-class might be prepared for middle- and upper-class roles. A planned migration of professional urbanites, particularly those who express a preference for small-town living, into rural communities, might be encouraged through reception and matching programs. Rural communities can be strung into the family life-cycle the same way as suburbia is now, i.e. young families might spend a few years in such locations; in this way an urban-to-rural circulation might be promoted.

The process of rural development has essentially been conceived from a national and regional perspective. It has worked from the top down. Given the small sizes of rural communities and their relative uniqueness, the national and regional priorities often turn out to be inappropriate and thus fatal for a fragile rural community.

The uniqueness of rural communities necessitates giving individual attention to each. One community may need housing for the elderly while another may require an infusion of young families. The planning process in rural areas should begin at the individual community level. It should work from the bottom up. A regional plan would, then, be a coordinating

mechanism or a trading ground to reconcile the externalities of individual proposals and objectives. Broad national policy goals such as the preservation of agricultural land can be laid before individual communities as norms to be followed in case they are confronted with such problems.

One is always tempted to extrapolate from the past. Rural development planning in Canada has been conceived to solve problems which have plagued rural areas in the recent past. The challenge of development lies in breaking out of past patterns which created these problems in the first place. There are stirrings of new expectations about the role and desirability of rural communities. The energy crisis is bringing home an awareness of the wasteful contemporary affluence. If this is not a passing fad, we might soon witness a resurgence in the fortunes of small communities. Rural development might ride on this social tide and turn what might be a fad into a movement.

The future of rural communities lies in their becoming wholesome and vibrant; communities which are not merely at the receiving end of urban innovations, but ones which nurture new lifestyles and are equal partners in the national system.

Notes

[1] Apparently in many advanced countries more people seem to have been moving into rural areas than out of them since 1970. For example, the American non-metropolitan population gained 1.5 million people through this type of migration between 1970 and 1975. See Gordon F. DeJong and Ralph R. Sell. "Population redistribution, migration, and residential preferences". *The Annals*, January 1977, vol. 429, p. 134.

[2] Behaviourally and normatively, the final stage in the evolution of a spatial system is to move from centre-periphery relations to complex interdependence and equalization among communities. See Friedmann, John [1966], *op. cit.*

[3] See Ball [1974], *op. cit.* and The Canadian Council of Rural Development[1973], *op. cit.*

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Comments by Allan J. Barry

The first point that I would make is that it seems to me very difficult to take an integrative approach to rural problems, because in Canada the nature of rural life, rural incomes and rural opportunities seems to vary considerably. There are worlds of difference between the communities, for example, of northeast New Brunswick and the farmers of the Regina plains. In that kind of comparison, I find it difficult to draw the similarities that are meaningful or helpful for policy analysis. Although I agreed with many of the points made in the paper, I think that there are risks which the author perhaps does not recognize in the use of national averages on, for example, rural-urban income differentials, which can obscure very significant differences. Appropriate policy response, I suggest, therefore, can vary very considerably, on one hand from policies aimed at income generation in low-income rural areas, to those aimed at income stabilization in the relatively high-income but inherently unstable wheat-farming areas, and on the other hand from policies aimed at the creation of basic employment opportunities to those aimed at diversification of the existing employment base; or to take another, perhaps a little more controversial example, from what the author refers to as policies aimed at the rationalization of farm size to a view I know shared by the Government of Saskatchewan, that an appropriate response may be measures designed to do the opposite, to slow down the increase in economic farm size.

If I may digress for a moment, I think that in some cases the continuation of policy based on the view that rural communities (farming areas) are essentially underpriviledged and that, therefore, the traditional and appropriate policy response is one of special treatment, may inhibit those areas from taking advantage of diversification and greater stability. I am thinking, in particular, of the Crow's Nest Pass freight rate on export grain from the west, which serves to keep the price of feed grains on the prairies high; this represents an uneconomic barrier to livestock production and rape-seed processing, and inhibits what could well be a greater trend towards diversification and income stability. It is not always clear to me that subsidies and special treatment have served to strengthen the local economy or encourage economic initiative. I am thinking, too, of the transportation subsidies in the Atlantic, which I think have held back development to some extent; and of the national income-maintenance policies which may be particularly perverse in their long-term effect in areas such as northeast New Brunswick or the Native communities in the north, in that they extend minimum-wage and welfare levels considered appropriate for higher-cost, more urban, metropolitan areas to low-income, rural areas with the result that the local economy is partially or totally destroyed.

The author's point about the limitations for upward social and income mobility within rural communities is, perhaps in part, true in the low-income communities. It must be remembered both that the opportunities are there,

provided individuals are prepared to move out of the community, and that it is very much (in many cases) a style of life which, to the people who enjoy it, is not necessarily regarded as working-class in any attractive sense. I do not necessarily agree, therefore, that it is the case in all rural communities that "the diversity of rural communities is confined within a flat, socio-economic plane", to quote the author, or to choose another quotation where he refers to "truncated, working-class communities". It is certainly not true in western Canada where the large wheat grower in southern Saskatchewan is in a very different socio-economic position from the small farmer in the northern part of that province or in the Interlake region of Manitoba. And certainly, the farm leaders that I have met in western Canada are not lacking in education, sophistication or skills and are very much managers and businessmen on their own terms. They provide vigorous leadership as as well as a continuation of the prairie agrarian tradition of citizen participation in the political process. When Professor Qadeer refers to what he perceives as a change in the character of Canadian rural communities, and a loss of managerial functions and ability to influence their own destinies, he is not thinking of that particular example of western Canada where, if anything, the trend has been in the opposite direction over the years. Certainly the predominance of Winnipeg and the Grain Exchange has long since been broken. The farmer remains very much his own political and economic leader, at least as much as any Canadian can control wheat prices, to the point where a group such as the Polister Wheat Growers on the prairies provides a very dynamic, very literate, alert, and I would almost say iconoclastic viewpoint; they have become, to coin a word, the "iconoclass" of prairie society.

I do certainly agree with the author that the problems of rural communities must be looked at in their individuality and uniqueness. The Native communities of the northern prairie provinces towards which the DREE Northlands project is directed require a sociological and human view at least as much as the skills of the economist. Thinking just on those income figures without trying to generalize from a couple of numbers, I am trying to show simply the scope of the change that I was talking about, which the aggregates can obscure, changes in income levels on the prairie provinces which are still to a relatively high extent rural, certainly in Saskatchewan. In the last fifteen years the net farm income per farm operator has gone up by something like eight times, as compared to an increase of perhaps three times in wages and salaries per employee in manufacturing, to the point where the prairie wheat grower is in an income position probably better than the average city dweller. The opposite is obviously the case in the northern and more disadvantaged parts of the province. Saskatchewan as a whole had per capita income of 95 per cent of the national average in 1974, and this is a province which is still nearly 50 per cent rural. Obviously, there are great differences in those aggregates.

I want to close with two words of caution for this kind of approach. One is that rural Canada, rural communities and certainly the single-industry communities to which the author has referred, run the full gamut from relatively high-income communities to low-income ones. I would be relatively cautious not to generalize for policy purposes without rather more disaggregated data and an attempt to categorize very different kinds of communities. My second comment, if I can be forgiven for commenting on the concept of "sociologically wholesome" for which I understand the author's content in terms of balance and opportunities, is an economist's footnote: what is the cost of equity or balanced wholesome development in that particular context?

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Mohammad Qadeer's Response to Allan Barry's Comments

Certainly there is a thread in my paper about the unique qualities of these communities. As I said, there is a problem of aggregation. If you look at the total sector then you find certain homogenization: but there is certainly quite a bit of variation. In that, I am ready to concede.

Comments by Allan Steeves

Analytically, the paper turns on the argument that rural areas have become structurally and functionally differentiated while becoming increasingly integrated into the extensions of urban influence. Virtually all social scientists would accept this. What they would not accept, and what Qadeer asserts, is that they have become the "working-class extensions" of urban areas. The sociological objection to this description is that such a description is unfortunate because it confuses the notions of "community" and "class". "Community" has to do with the integrative character of social structures. "Class" has to do with differentiation premised on market relationships and "perceived political interests".

The sociologist would argue that as a result of the structural and functional differentiation of rural communities which accommodate increased specialization and segregation of function, there has been a *qualitative* change in the character of rural communities of interest. Communal organization on the bases of occupational interest and the division of labour has largely displaced community organization on the basis of "territorial locality". In fact, as one gets increasing differentiation of activities, one finds a number of different bases of community organization, including "familial communities" ("traditional unions of gemeinschaft"); "local communities or neighbourhoods" (territorial communities of the sort described by Tennies as "associations of gemeinschaft"); occupational communities (farm organizations, lobbies, unions, agri-business corporations, etc.); special interest communities (farm heritage organizations, milk producers' organizations, etc.); political communities (farm vote, conservative blues, etc.); and leisure time communities (snowmobile clubs, community hockey teams, sports teams, etc.).

In general, this evolution of differentiated "special interest" communities corresponds to the decline in the "conscience collective", by which we mean the unit where all members of the community shared an adherence to all of the basic rules, norms, and sanctions of the community, the violation of which was punishable by "excommunication" or death. The legal system accompanying such "mechanically integrated" community systems tends to be highly "repressive" and insists on high degrees of conformity to the "conscience collective" (Durkheim, 1933). Growth of these social systems normally results in "segmentation" and "segregation" rather than "differentiation".

This type of "mechanical integration" has been traditionally used to characterize rural communities. Harvey Cox (1966, p. 10) has interestingly characterized this type of social organization as follows:

> Tribal man is hardly a personal 'self' in our modern sense of the word. He does not so much live in a tribe; the tribe lives in him. He is the tribe's subjective expression. He grasps himself within a closed system of compact meanings in which there is no room for any transcendent point of view or critical detachment. Man and nature, the animals and the gods, all form a continuous life process whose meaning courses through it....

By contrast, Durkheim argued, modern urban communities tend to be integrated on the basis of highly differentiated rational interests. That is, they tend to be integrated on the basis of "organic solidarity", such that there are highly integrated sub-systems coordinated and integrated into the larger system by other functionally coordinative sub-systems which may also be specialized. Under these conditions, one witnesses the erosion of the "conscience collective" and the rise of specialized bodies of "restitutive law" designed to govern each of the sub-systems; i.e. in addition to criminal law, one gets the rise of contract law, commercial law, procedural law, administrative law, constitutional law, corporate law, etc. One of the essential bases of "organic solidarity" for Durkeheim was, of course, the division of labour.

All this is by way of pointing out that in all industrial societies the general direction of community structuring has been from "mechanical" to "organic" forms of social solidarity. If this is true, what are the chief characteristics of these "organically integrated bases of community" and how do they inform Professor Qadeer's argument?

Essentially, these systems of social relations are characterized by high degrees of differentiation and specialization. Relations tend to be contractual and "rational". Individualism is valued over the collectivity; affective neutrality over affectivity; performance over quality; role specialization over highly diffuse role expectations; and universalism over particularism. This elaboration of the character of social relations by Parsons (1951, pp. 76-91) represents the culmination of a long tradition of theory-building which has been termed the "typological tradition". Analysts in the tradition of the "Chicago School" of urban sociology and geography which associated the notion of community with circumscribed "territory" made the unfortunate error of associating the latter qualities of role relation with "rural communities" and the former qualities with "urban communities". There is nothing in the European origins of these theoretical traditions to suggest that these role relationships ought to be circumscribed by territorial boundaries except insofar as social

communication is limited by territorial isolation in terms of roads, mails, mass media, etc., as was the traditional case in this country. Under these conditions, propinquity largely determined the parameters of social interaction. One would argue that such constraints have been largely removed in Canada in 1976. Thus the dimensions of community organizations have been opened up on a vast scale of "rational, personal and group interest", while the importance of the "territorial community" has perhaps declined, relatively speaking.

This is not to argue that "familial and kinship communities" or "territorial communities" must inevitably fade away. On the contrary, we know that they continue to function strongly and importantly in all kinds of situations in both rural and urban Canada. It does argue, however, that differentiated occupational interest, specialized personal interest, and leisure-time communities have gained an important ascendancy as bases of community organization in contemporary Canadian life. Individuals in rural and urban Canada may participate in any, all, or none of these types of communities but they all have the individual choice of doing so. The problem of "rural development", it seems to me, is to ensure that all people have equal opportunity to choose to participate in this rich matrix of community integration, rather than to emphasize "territorial community" to the exclusion of the other forms and types of community integration. Individual personal freedom and enrichment may increase as the restrictive features of the "conscience collective" erode, and the tolerance implicit in high degrees of community differentiation increases.

II. Empirical Naiveté

I find Qadeer's paper empirically naive in the sense that virtually all of his data are presented either to support the view of declining "rural-urban differentials", or to point out significant remaining differences. In my view, such efforts are not particularly worthwhile and may be positively misleading. Who says that significant social or political problems come wrapped up in the census definitions of "rural" and "urban"? On the contrary, these terms as defined have come to represent misleading "neologisms" (Steeves, 1967) which confound the important analytical dimensions of differentiations. It has increasingly been demonstrated that what differences remain between "rural" and "urban" can be largely explained on the basis of such simple population characteristics as age, sex, education, and ethnic composition. If these "additive" effects largely explain the remaining variance, why imply an "interactive effect" which accounts for the zero variance explained?

III. Political Embarrassment

Finally, I find Qadeer's suggestions essentially misinformed and in only a tangential way flowing out of the analytical features of his paper. Indeed, his political embarrassment flows out of his analytical confusion. Because of his analytical focus upon the "territorial community", he argues that the "institutional completeness" of the traditional isolated territorial community must be re-established. "The objective of rural development should be to encourage wholesomeness of rural communities, sociologically and economically" (p. 177). He envisions accomplishing this objective through (a) "education and social mobilization" of the poor and the working-class for middle-class roles; (b) "a planned migration of professional urbanites, particularly those who express a preference for small-town living, into rural communities"; and (c) a suggestion that, "Rural communities can be strung into the family life-cycle the same way as suburbia is now; i.e. young families might spend a few years in such locations" (p.177).

My own view is that such suggestions are premised upon the fiction that the territorial communities of yesteryear could be re-established if only the higher-quality personnel could be persuaded to return in order to give leadership in those institutional domains which have been moved into urban areas and left the rural areas in a state of institutional dependency. Such a policy, in addition to being unrealistic politically, is at least as "reactive" as the set of present policies on rural development he criticizes (p.173). My own view is that Qadeer is going up an abandoned "gemeinschaft" and has no place else to go. In many ways this type of conclusion reveals the political sterility of this type of argument.

By contrast, my own view is that functional differentiation, both of institutions and of activities, will continue. Increased specialization is both possible and profitable in many of the activities affecting both rural and urban areas. My general view is that policy ought to be devised to recognize this fact and alleviate the hardships and dislocation it may cause in rural areas, while at the same time ensuring that in those activities carried out in rural areas, equal accessibility is ensured to rural people. Additionally, my own concerns tend to reinforce the view that we could do much more to re-distribute, particularly the "service industrial sector" in rural areas, to avoid the "centralization of these activities, which are much less bound by the locational limits of "commodity production". Above all, it seems to me that policy-makers could make sure that rural areas pay for urban growth through unequal taxation structures, because highly disparate public service allocations should be rectified in the interests of overall regional and national communities.

Mohammad A. Qadeer's Response to Allan Steeves' Comments

About Professor Allan Steeves' comments, what can I say? It is a sociological cold war which has gone on for twenty years and he and I are not going to resolve it right away. Gemeinschaft, gessellschaft, European traditions of that kind, of Weber and others, were brought faithfully here by Talcott Parsons and the rest. And the sustenance of urban sociology came from those very concepts, such as Louis Wirth's and so on. They drew their very sustenance from these distinctions, the very urban-rural differentiation that he is rejecting as the product of the European tradition of the conception of the community. This is really a topic by itself, which has run as a full-flight debate and terminated into a book about two years ago, *The Death of Western Sociology.* What I am trying to say is that the points he has raised are points of fine debate. And I cannot answer them without really acknowledging those. Essentially, the point is that class is self-determining. It is of interest. We have today's concept of a community that consists of two dimensions, vertical and horizontal. Nobody suggests resurrecting it in modern terms. Again, reading into my paper what is not there, and reading out of it what is there, does not advance the debate. The point is that the community is a community of interest today. Nobody denies it. But the question is: What interest? What is the nature of that interest? It is the relationship between the various interest groups, the prairie farmers, the trappers and so on. If there is a national organization of trappers, there will be a convention of it in Winnipeg and he can come to it: that is, vertically. And nobody denies that it does not take place. But the trapper is also related to another trapper and a farmer, and a marginal farmer; and it is this horizontal direction discussed by Warren that we must analyze. It is a very real interest, too. That is what gives that entity (whether territorial or not) to a group of people, a colour, their way of life, their quality of life. And that is what we are talking about.

BIOGRAPHIES

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