# A SHIFT AND SHARE ANALYSIS APPLIED TO THE NEWFOUNDLAND RESOURCE POTENTIAL REGION



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# A SHIFT AND SHARE ANALYSIS

# APPLIED TO THE NEWFOUNDLAND RESOURCE POTENTIAL REGION

by

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This thesis has been examined and approved by

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To Pauline

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## ABSTRACT

The shift and share technique is applied to analyze the resource development of Newfoundland, and as well, the effectiveness of the technique in formulating a policy for the resource development of Newfoundland and similar resource potential regions has been investigated. The shift and share technique is useful in analyzing the weaknesses and strengths of the economy by enabling the comparison of a region's resources with a benchmark. Moreover, it seperates the effect of location factors (that is, factors affecting the access to inputs and markets) on a region's growth from the effect of the overall composition of the resource mix peculiar to a region.

The study is composed of three parts. Part I deals with Newfoundland and its resource potential in the context of regional economic development. Part II critically examines the shift and share technique, its calculation and significance as an analytical tool, as well as its theoretical framework. Part III presents an application of the shift and share technique. The technique is applied to total population, urban population, rural farm population, total income, employment and the fishing and mining industries presented in Chapters V, VI, VII, VIII, IX and X respectively. In Chapter XI, the helpfulness of the technique is discussed, while pointing out that it should be applied cautiously if misleading results are to be avoided.

The usefulness of the shift and share technique is enhanced by its careful application. If applied mechanically it may not only provide misleading results, but the implication of the results for policy purposes may

also be unsound at times. This is mainly because the technique cannot take into account all of the variables involved. The accuracy of the results derived from the technique should therefore be tested with information derived from the practical experience, with results obtained from other techniques or by using logic.

# PREFACE

I wish to thank many persons for their assistance in the preparation of this thesis. My task was greatly reduced because of the substantial intellectual, technical, and financial help which I received.

Since my list of those who have assisted, often unknowingly, in the formation of the thesis is too large to present here, I will mention only a few. I am obviously indebted to the many economists whose works I have read and whose ideas I have borrowed freely. I also owe a great debt to my teachers at Memorial University of Newfoundland. My greatest debt is to my thesis supervisor, teacher, and very good friend, Professor Bhagwant Singh. Professor Singh not only suggested the topic to me, but also aroused my interest in regional economics. He read the drafts and made suggestions for improving the clarity and accuracy of the material, pointed out errors, raised questions and debated interpretations - all while skillfully encouraging independent and scholarly thinking on my part.

I must also thank the staff of the Memorial University Library for their invaluable assistance. The people in the Department of Mines, Agriculture and Resources of the Government of Newfoundland and Labrador must also be thanked for their help.

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My list of obligations will be incomplete unless I mention my father and mother. They encouraged me to attend college and graduate school and provided financial and moral support.

To complete my list of obligations, I turn my attention to the person to whom I dedicate this thesis - Pauline. By providing friendship, giving encouragement and remaining patient while I studied, she made this work possible and life enjoyable.

None of the above mentioned can be held responsible for the shortcomings of the final product. For their pains and patience I thank them. However, because I did not take all the advice that was offered, I alone accept full responsibility for errors.

D.J.W.

St. John's, Newfoundland.

# INTRODUCTION

The omnipresent problems characteristic of less developed, natural resource potential regions have influenced the economic development of Newfoundland. These problems are disclosed by the phenomena of unemployment, migration, and low income, which are ubiquitous to Newfoundland. Their enormity, however, may vary depending upon the frame of reference adopted. They are less, for example, when Newfoundland's performance is examined in isolation, without regard to the Canadian context. On the other hand, when the growth of other provinces is considered, it is obvious that Newfoundland's growth is lagging.

A few brief illustrations will elucidate this issue. In 1970 Newfoundland's unemployment rate was 11 per cent, compared with only 5.9 per cent for Canada.[1] Although it is usually two or three times the Canadian average, the seasonal variations in unemployment make the disparity even greater. A concomitant problem is Newfoundland's low income. While personal income per capita increased more than two and one-half times between 1951 and 1970, it is still below every other province of Canada, with the exception of Prince Edward Island.[2]

The inequalities between Newfoundland's personal disposable income and that of Canada as a whole were not reduced in the years from 1951 to 1970.[3] Newfoundland's personal disposable income increased by

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[1] Statistics Canada, Facts about the Unemployed 1960-1971 (Ottawa: Information Canada), Cat. No. 71-520, p. 35.

[2] The Financial Post, Survey of Markets (Toronto: Maclean-Hunt, 1974), p. 45.

[3] See Table 19.

$975, from $545 in 1951 to $1,520 in 1970. The corresponding information for Canada shows an increase of $1,446, from $1,054 in 1951 to $2,500 in 1970. The actual increase was greater for Canada than for Newfoundland with the result that personal disposable income per person remained greater for Canada than for Newfoundland. Measured in terms of percentage changes, however, Newfoundland's growth was greater than the Canadian average. Personal disposable income in Canada increased by 137 per cent while that of Newfoundland increased by 179 per cent from 1951 to 1971. These percentage changes are misleading by themselves since the Canadian percentage was calculated from a base of larger magnitude than the Newfoundland percentage.

Output as represented by employment increased in Newfoundland less than the Canadian average, in terms of the actual numbers of persons employed from 1951 to 1970. However, the percentage increase in employment during the same period was also less than the Canadian average. Newfoundland's employment increased from 90,375 in 1951 to 120,602 in 1970 for an absolute increase of 30,227 and a percentage increase of 33. Canada's employment increased from 4,089,640 in 1951 to 6,779,321 in 1970 for an absolute increase of 2,689,681 and a percentage increase of 66.[1]

Regardless of the frame of reference adopted, the significant conclusion is that although great advances have been made in recent years, there are clearly uncured ills which plague the Newfoundland economy. Fortunately, Newfoundland has vast natural resources, locational and other advantages which provide the basis for a solution. With that in mind, the aims of this inquiry are to provide for a structured analysis of Newfoundland's past performance, accurate diagnosis of present problems and their

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[1] See Appendix II, Table 1 and Table 2.

possible solutions. To achieve this objective, input-output access and shift and share analysis have been considered a helpful step in diagnosing the structural constraints of a less developed natural resource potential region like Newfoundland.

# PART I

## NEWFOUNDLAND AND ITS RESOURCE POTENTIAL IN THE CONTEXT OF REGIONAL ECONOMIC DEVELOPMENT

# CHAPTER I

## REGIONAL ECONOMIC ANALYSIS

The term economic development is difficult to define concisely since it connotes a variety of meanings. Most people though, know it only by its manifestations of paved highways, new schools, shopping centers, factories, and so on. Yet, the essence of the true meaning of economic development must be sought at a more subtle level. The Royal Commission on the Economic State and Prospects of Newfoundland and Labrador declared that "economic development embraces the whole socio-economic process, whereby an economy's real income increases at a rate faster than its population growth".[1] In other words, when a country experiences economic development, the people benefit from a rising standard of living in real terms.

Although raising the living standards is a necessary concomitant of development, the emphasis placed on it has been shifted in recent years. Now, relatively more importance is given to solving the social welfare problems such as growth for whom, and for which location. More stress is also placed on attaining a high and satisfactory level of employment. In addition, conditions must also exist to foster self-sustaining and self-reinforcing growth. That is, growth must be perpetual in order to have economic development in the true sense. It is essential, therefore, that this study incorporate all of these parameters in the examination of economic

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[1] Report of the Royal Commission on the Economic State and Prospects of Newfoundland and Labrador, St. John's: Creative Printers and Publishers, Ltd., (December, 1967) p. 2.

development in Newfoundland.

## Necessity of Regional Development in Newfoundland

Regional development efforts are necessary to reduce the inequalities between the provinces and within the provinces. Newfoundland has not been sharing in Canada's growth to the same extent as some rich provinces. Within the province of Newfoundland, also, some subregions are growing at a rate faster than others. This phenomenon, in itself, is a sufficient catalyst for action on the part of the concerned analyst.

Generally speaking, regional development efforts have emerged as a result of rapid economic evolution and spatial inequalities. They have arisen as a result of the increasing concentration of economic activity on the one hand, and the difficulty to develop less developed regions with potential, on the other. Concentrated regions, when uncontrolled have problems with management, congestion, pollution and public services. These diseconomies are subsidized by the public authorities in the form of pollution control, road construction, public services, etc., which in turn, are paid for by the taxpayers. The country as a whole, therefore, shares the burden of the diseconomies of congested areas. In this way the individual living in the congested growing areas does not contribute to the full extent of the burden of these diseconomies. On the other hand, he benefits from the economies of the large city in the form of skilled labour, marketing and banking facilities, and from the infrastructure. In such a situation, the individual continues crowding into the congested areas, because he receives the economies of the growing areas, while the nation subsidizes the diseconomies.

A more pressing cause for concern in Newfoundland is the other side of the regional problem of inequalities: the difficulty to develop even though there is potential. Development does not occur automatically in a less developed region - even if it has the potential. Economies result only after a certain minimum concentration of economic activity. Consequently, the economist is concerned with economic development through a deliberate effort. Concern arises also because resources are not everywhere distributed equally, and the process of economic development does not affect all regions or subregions in the same manner. Further, patterns of output and other conditions that exist in a region like Newfoundland are unique, necessitating a unique regional growth policy. There is no doubt therefore, that the regional development problem in Newfoundland will not be solved automatically. A close, premeditated study is imperative and deliberate action is necessary if the regional problem in Newfoundland is to be solved.

The type of analysis necessary - regional economic analysis - is a relatively new subject. Yet, it is very much in use today, as evidenced by the many scientific studies that have been devoted to it. Even the published bibliographies are voluminous! In recent years, "no observer of the Canadian scene could fail to be struck by the surge of interest and concern with regional economic problems..."[1]. Nowhere is the interest and concern more essential than in Newfoundland.

## Limitations to Development Efforts

Regional development efforts may become more difficult in certain

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[1] T.N. Brewis, "Regional Economic Disparities and Policies", in Canadian Economic Problems and Policies, L.H. Officer and L.B. Smith, eds., (Toronto: McGraw-Hill, 1970), p. 335.

situations than in others. For example, the growth of the region may be tied to foreign export markets. The case of Northeast Brazil indicates how the external factors play a critical role. A hard analysis of available data suggests that the relative income gains and losses of Northeast Brazil were related to years of favorable and unfavorable conditions in the international markets for several of the key export crops of the region.[1]

The benefits accruing from new investment in a region, vary with the kind of project and the region's stage of development. For example, there is an issue in Newfoundland as to whether or not it would be more beneficial to use the power to be generated at Churchill Falls in attracting industries to the province, instead of merely exporting the power.[2]

Regional development efforts are limited when there is difficulty in analyzing the regional problem. In many cases regional data are deficient or inaccurate, and in others the tools of analysis are not perfect or suitable to the particular conditions. This imposes serious limitations on the capacity to analyze, which in turn, handicaps the formulation of the regional policy.

In spite of the limitations of the impact of regional development efforts, framing the policy or analyzing the problem, the efforts employed toward regional development are as rewarding as they are challenging.

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[1] A similar idea was expressed by Stefan Robock, "Strategies for Regional Economic Development", The Regional Science Association Papers, XVII (1966), p. 134.

[2] For a discussion of whether or not it pays a country to specialize in the export of resource products, see C.P. Kindleberger, "International Trade and Investment and Resource Use in Economic Growth", in Natural Resources and Economic Growth, Joseph J. Spengler, ed., Resources for the Future, Inc., 1961, pp. 151-190.

# CHAPTER II

## THE NEWFOUNDLAND REGION

Many analysts have devoted a great deal of effort to discussing the various methods of regional delimitation.[1] To date, however, there is still no universally agreed system of demarkation of regions which is suitable for all purposes. Since this necessarily involves a subjective judgement, it is open to individual discretion. "It is an intellectual concept, an entity for the purposes of thought, created by the selection of certain features that are relevant to a real interest or problem, and by the disregard of all features that are considered to be irrelevant."[2]

The traditional and simplest conception of a region refers to areas which are geographically contiguous, having some homogeneous characteristics or complementary traits. More recently though, the idea of polarization, which involves the notions of interdependence and hierachy, has been used to set the boundaries of regions.[3] Nevertheless, the homogeneity concept of a region is implicit in the division of Canada into

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[1] Walter Isard, "Regional Science, the Concept of Region and Regional Structure", Papers and Proceedings of the Regional Science Association, Vol. 2, 1966, pp. 13-26. John Meyer, "Regional Economics: A Survey", American Economic Review, March, 1963, pp. 19-54. J.R. Boudeville, "A Survey of Recent Techniques for Regional Analysis", Regional Economic Planning: Techniques of Analysis, Walter Isard and J.H. Cumberland, eds., Organization for Economic Co-Operation and Development, Paris, 1961.

[2] Boudeville, "A Survey", p. 379.

[3] For a more complete discussion of polarization and how it relates to France, see J.R. Boudeville, Problems of Regional Economic Planning, Edinburgh, University Press, 1968.

regions and subregions. By convention, Canada has been divided into six broad regions: the Atlantic region, Quebec, Ontario, the Prairie region, British Columbia, and the Yukon and the Northwest Territories.[1] The classification developed by the Canadian Department of Defence Production divides Newfoundland into four subregions: Southeastern Newfoundland (census divisions I, II, III and VII), Central Newfoundland (census divisions VI and VIII), Western Newfoundland (census divisions IV, V and IX) and Labrador (census division X).[2] This system of examining the subregions of Newfoundland, as well as the component census divisions, will be used throughout this inquiry to reduce the errors due to a too rigid treatment of regions.

## Newfoundland as a Resource Potential Region

The prescription for solving a region's problems may vary, depending upon the type of region. Basically, there are five types of regions: (1) traditionally less developed regions, (2) pressured regions, (3) sparcely populated regions, (4) distressed regions, and (5) natural resource potential regions.[3] Each classification of region has unique problems requiring specially tailored solutions. The efficacy of regional development efforts will be improved, therefore, if the type of region to be analyzed is identified and classified according to the nature of its problems.

This section discusses Newfoundland's classification as a natural

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[1] For a visual presentation of Canada's regions, see Appendix I, Map 1.

[2] For a visual presentation of Newfoundland's subregions, see Appendix I, Map 2.

[3] See European Free Trade Association, Regional Policy in EFTA: An Examination of the Growth Center Idea; University of Glasgow Social and Economic Studies Occasional Papers, No. 10, 1968; p. 21 and John Friedmann Regional Development Policy: A Case Study of Venezuela (Cambridge, Mass.: M.I.T. Press, 1966), p. 41.

resource potential region, while the following section examines the problems arising from this classification.

Newfoundland is located at the Eastern extremity of Canada, between the parallels of 46° 35' and 51° 39' North, and the meridians of 52° 36' and 59° 25' West. It has a total land mass of 156,000 square miles. The province is divided into two geographic areas - insular Newfoundland and continental Labrador.[1] Insular Newfoundland, the smaller of the two, has an area of 43,000 square miles. Although this is only one-quarter of the total size of the province, it is inhabited by 95 per cent of the population. It is about twice the size of Nova Scotia, almost the same size as Pennsylvania and is the twelfth largest island in the world.

The island roughly resembles an equilateral triangle in shape, and lies directly across the mouth of the St. Lawrence River.

The configuration of the landscape resembles that of an uptilted plateau - tilting that is, toward the East. Consequently, most of the drainage, with the exception of the Humber River, flows in that direction. Approximately 80 per cent of the island's surface is covered with shallow soils, barrens or bare rock! Most of the fertile soil is found on the North-Central and the Western areas. There are some other areas that are fertile, although they are widely scattered. Much of Newfoundland and even more of Labrador is covered with forests.

Insular Newfoundland experiences a moderate and maritime climate. The temperature varies from approximately 70 degrees in July to 24 degrees

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[1] For convenience, 'Newfoundland' will refer to the whole province - insular Newfoundland and Labrador, unless otherwise designated.

Farenheit in February. Precipitation is heavy, comprising 46 inches of rainfall and 100 inches of snow.

Labrador is the only part of the province continguous to the mainland of Canada, forming the whole of the Atlantic section of the Canadian Shield. It is a huge plateau, indented with fiords, lakes and rivers and fringed with spectacular mountain peaks. Although its summers are warm, the winters are extremely cold. Labrador has vast hydro-electric power potential, immense coniferous forests and large mineral deposits, making it a rich resource base.

Resource potential

Newfoundland has a vast natural resource potential. Minerals, forests, hydro-power and fish comprise the bulk of its natural wealth.

Mining

Table 1 shows that the mining industry in Newfoundland has been growing at quite a remarkable rate. For instance, the net value of mineral production grew from $25 million in 1951, to $135.2 million in 1969! The mineral potential within the province suggests that it will continue to play a dynamic role in Newfoundland's economic life, for some time to come.[1]

The net value of production in forestry has declined in recent years, from $26.6 million in 1951 to $14.8 million in 1969, as shown in Table 1. However, its contribution to the Newfoundland economy, which is still substantial, will likely continue. It is estimated that Newfoundland has a potential of 6,964 million cubic feet of timber, while Labrador has

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[1] See W.D. Fogwill, Mines and Mineral Occurrences Map of the Island of Newfoundland, Information Circular No. 11, Department of Mines, Agriculture and Resources, Mineral Division, St. John's, Newfoundland, 1965.

a potential of 7,332 million cubic feet.[1]

TABLE 1

NET VALUE OF PRODUCTION IN SELECTED INDUSTRIES
NEWFOUNDLAND, 1951, 1961, 1969
(Millions of 1951 Dollars)

| Year | Total | Forestry | Fishing | Mining | Hydro |
|---|---|---|---|---|---|
| 1951 | 68.4 | 26.6 | 13.5 | 25.3 | 3.0 |
| 1961 | 103.3 | 20.9 | 15.4 | 55.6 | 11.3 |
| 1969 | 204.1 | 14.8 | 26.9 | 135.2 | 25.6 |

Source: Dominion Bureau of Statistics, Survey of Production, 1969 (Ottawa: Queen's Printer), Cat. No. 61-202; and Ibid., Indexes of Real Domestic Product by Industry, Cat. No. 61-506 and 61-510.

Fishery

The net value of fish production has doubled in less than 20 years, from $13.5 million in 1951, to $26.9 million in 1969. Yet, this prosperity can be expected to continue only if full advantage is taken of the industry's potential. The fishery has potential in two important respects. Newfoundland has an obvious natural comparative locational advantage over the nations who fish just off the province's shores. Utilizing this advantage of location, it is possible for Newfoundland to increase its share of the fish harvest through comparative cost advantages. Newfoundland also has the good fortune of being in proximity to the United States and the Canadian markets. The united States, which probably enjoys the world's highest

[1] Dominion Bureau of Statistics, Canada Year Book, 1970-71 (Ottawa: Queen's Printer, 1971), p. 613.

standard of living, is an expanding market for fish products. Consequently, there is no doubt that the fishing industry would make a greater contribution to the Newfoundland economy if Newfoundland increased its share of this large market.

Hydro-power

Newfoundland has enormous hydro-electric power reserves. The full capacity of Bay D'Espoir is approximately 600 thousand horsepower, while the capacity of Churchill Falls is estimated at 10 million horsepower. This power may be used to provide electricity for pulp and paper production, smelting and refining of ore, and manufacturing - as well as domestic consumption. Cheap electric power in abundant supply may induce power-intensive industrial users to locate in Newfoundland.

The experience of Norway provides an actual example of industrial success based on electric power. Cheap hydro-electric power, from such gigantic sources as the one near Oslo, has been a key factor in the rapid expansion of Norway's manufacturing industries.[1] By the same token, there is little doubt that Newfoundland's huge hydro-electric power potential could be of great importance to the future development of the province.

## Problems of Resource Potential Regions

The problems of resource potential regions are partially contingent upon the nature of the resources found there. Basically the problems fall into two broad categories. The first category consists of problems unique to agriculture, fishing and forestry, while the latter category

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[1] For further discussion of Norway's industrial success, see Bela Balassa, "Industrial Development in an Open Economy: the Case of Norway", Finance and Development, Vol. 7, No. 1, March 1970, pp. 28-33.

consists of problems associated with mining.

The slow growth of the agriculture and fishery sectors is to a great extent, due to technological change, low income elasticity and the inelasticity of supply. Advances in the state of technology reduce the number of people required to grow a given amount of vegetables or catch a given amount of fish. Combined with this, people's tastes change as their incomes increase, for they do not expand their consumption of these food items by as much as their consumption of some of the other items.[1] To further add to the problem, the supply of agricultural and fish products is relatively inelastic with regard to price. The relative inelasticity of the demand and supply curves for the produce of the farmer and the fisherman leaves them in a very untenable position. Small changes in either curve will cause price fluctuations and drastically alter their incomes.

In addition to these problems, which are inherent in the agricultural and fishing industries, there are also problems arising from the Newfoundland situation.

The cost of agricultural and livestock produce is generally high in Newfoundland. This is partly explained by the high production cost and unorganized markets. Farming is carried on in Newfoundland on a small scale when compared to that of the Prairie provinces, for example. The

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[1] For further discussion of this topic see, Roland Artle, "Urbanization and Economic Growth in Venezuela", The Regional Science Association Papers, Vol. 27, 1971, p.65.

soil is generally poor and the crop growing season is short. The farms are widely scattered in small pockets throughout the Island. The markets are unorganized; consequently, the supply of local produce is often inadequate and irregular. coupled with this, the consumers' buying habits are becoming more and more sophisticated, partly because they are now accustomed to the modern, dependable service provided at the supermarkets by imported products. Hence, the shopper has come to demand this high quality of service from the local suppliers - which the local suppliers do not provide.

There are also factors which provide problems. For instance, there has been a stigma associated with farming (and fishing) in Newfoundland in recent years. Government development efforts up to recently have also been aimed at encouraging the expansion of the industrial and service sectors, with the consequent neglect of the agriculture and fishing sectors.

The fishing industry in Newfoumdland belongs to the traditional sector. Fishing in Newfoumdland has been considered a way of life, rather than an industry or profession. In some cases, when employment opportunities were unavailable in other sectors, the growing labor force resorted to fishing. Although it is changing, the industry has been characterized by its high labor intensity and its overdependence upon inshore operations. Because the fishing communities are widely scattered in small isolated areas, it is impossible to create external economies.

Production inefficiency is partly explained by the declining resource, which in turn, is due to uneconomic exploitation of the resource by other nations through deep sea fishing. Another reason for production inefficiency is the small scale of operations. It is difficult to create

economies of scale and external economies with small scale operations, high labor intensity and over-dependence upon inshore operations.

Inefficiencies exist in the marketing institutions as well. The fish buyers use their monopolistic power against the interest of the fishermen, who were completely unorganized until recently.[1]

The forests of Newfoundland are not contributing as much to the economy as they could be, partly as a result of the system of land tenure. Large timber stands are leased very cheaply for long periods of up to ninety-nine years, to a few large firms. The forests are therefore not utilized in a manner which will maximize the returns to the province. In addition, there appears to be no systematic schemata of distributing the concessions, so as to minimize the harvesting company's transportation costs.

Problems also arise from the fact that some of the timber is located in very small patches, while some other is located in rough terrain - with the result that harvesting costs are increased. Some forests are almost inaccessable because of geographic isolation, and until recently, inadequate development of the means of access, such as resource access roads. There are also the problems of low density of stands, small size of trees and long growing cycles. These factors are important since wood products are sold in a highly competitive export market - so any increase in costs serves to reduce the competitive advantage of Newfoundland products.

Technology is also affecting the number of people employed in the

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[1] A similar conclusion was reached after an indepth study of a Newfoundland fish processing plant, undertaken by Edward Henley, Gordon Power, Bruce Sheppard, David Smith, and Donald Wheeler in Ocean Harvesters Ltd., (unpublished B. Comm. thesis, Memorial University of Newfoundland, 1970).

forestry industry. Technological advances are reducing the number of people required to harvest and process a given quantity of wood.

In contrast to the first category of resources, that is agriculture, fishing and forestry, the problems of the other class of natural resources (e.g. minerals) are slightly different. The typical growth curve of regions rich in mineral resource potential is rather different from those regions with an abundance of agricultural, forestry or fishery resources. In the case of a mining region, there is an initial period of rising economic activity, which usually lasts only for a short period. This is followed by a period of levelling off, where population growth and economic activity tend to reach their maximum size. As occurred in Newfoundland at Bell Island, Tilt Cove, and more recently at Gull Bridge, further exploitation becomes uneconomical, leading to a period of decline - ending in a 'ghost town'.

In Newfoundland and Labrador the problems of the mining industry have been intensified. The people of the province have derived little benefit from the industry due to the fact that exploration and processing rights were often sold to inactive firms at a very cheap rate.

As elaborated above, the development of a resource potential region is affected by the problems arising from the special characteristics of particular natural resources, and the manner in which they are exploited. Regional economic development may also be influenced by the circumstances catalytic to the development process itself and the nature of the location in which the resources are found.

Circumstances catalytic to development

Natural resource potential regions owe their existence to the

discovery of a major natural resource such as iron ore, copper, uranium, diamonds, petroleum and possibly, fishery or forestry resources. This has been true, for example, of mineral discoveries in Africa and oil in the Middle East. In Newfoundland, the commercial opportunities for pulp and paper operations at Grand Falls and Corner Brook, fish production at Harbour Grace and Burgeo, and mining at Bell Island, Wabush, Buchans, Springdale and Baie Verte have attracted both foreign and domestic capital.

However, "even substantial inflows of capital do not give any assurance that economic development will take place".[1] This is partly true if such investment is concentrated only in agriculture or mineral exploitation, because they provide a poor training ground for work in other sectors once the operation becomes uneconomical.[2] More important though, if the capital comes from outside, the profits are more likely to be taken away instead of being re-invested in the region. The implication is that when further exploitation becomes no longer profitable, the company moves away leaving behind a profusion of unemployed resources.

Implications of the characteristics and nature of location

The peculiar characteristics of less developed resource potential regions give rise to many problems. Newfoundland is no exception to this

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[1] John H. Adler, "Changes in the Role of Resources at Different Stages of Economic Development", in Natural Resources and Economic Growth, Joseph J. Spengler, ed., Resources for the future, Inc., 1961, p. 97.

[2] F.W. Schultz, "Economic Prospects of Primary Products", presented at the Round Table Conference of the International Economic Association, Rio de Janeiro, 1957, 17. (Mimeographed)

general rule. It is distant from established centers of economic activity and access to the region is generally difficult and expensive. Its remoteness and uninviting terrain result in a poor investment atmosphere and a lack of external economies. This creates a vicious circle because the lack of external economies makes Newfoundland less attractive to private business.

"There are unutilized resources in the less developed regions with potential to develop because private enterprise attempts to settle in more developed regions in order to accumulate the external economies...infrastructure, trained labour and technical assistance".[1]

To provide attraction to industry and to create external economies and economies of scale, in a remote location, special efforts are necessary to create essential urban matrixes of a certain minimum size. In Newfoundland and Labrador, as is true of other places, development is usually centered in a city or town. This is especially true of Wabush, Labrador. Before exploitation of iron ore resources could commence at Wabush, it had to be transformed into a place with a suitable industrial atmosphere. A similar situation occurred in Newfoundland before the mine opened at Buchans and to a lesser degree when the pulp and paper mills located at Grand Falls and Corner Brook.

However, these towns in Newfoundland do not generate growth to the fullest extent possible. They perform highly specialized activities and their function is to extract the resources of the area. They perform in John Friedman's terminology, 'only limited central place functions'.[2]

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[1]Bhagwant Singh, "A propos des outils d'analyse du development economique regional", L'Actualite Economique, (July-September, 1966), p. 272.

[2]Friedman, Regional Development Policy.

Besides the specialized nature of these towns, there are big leakages: profit and wages go out, while the infrastructure and everything else is imported. Unless there is a concentrated effort to encourage diversification and establishment of secondary manufacturing and service industries during the upswing in activity, the growth of these towns and areas will be limited in scope and time. . .

These towns will usually have a peculiar social structure. Single men will comprise most of the population. In this situation, there is likely to be a high turnover of workers, resulting in a community of transients. Few people come with the intention of settling for life, since they are only interested in the temporary high benefits. The result is a consequent lack of interest in furthering permanent development.

Two classes of people inhabit a remote region - management and workers. The result is a highly stratified, top-heavy society with little or no interaction between the two groups. In Newfoundland, this phenomenon manifests itself in the form of the 'local' versus the 'foreign' worker. Antagonism often arises between the two groups, especially when foreign top-management directs local laborers.[1] The resultant situation is one where there is no unity of effort.

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[1] The developmental consequences of a similar situation have been documented by Cohen, in his study of the elite conflict in the community of Springdale, between the old established leadership and the incoming new breed of businessmen and professionals. Anthony P. Cohen, The Managers of Myths: A Study of Elite Conflict and Political Development in a Newfoundland Community, Department of Sociology, Queens University, Kingston, Ontario, 1971 (Mimeographed)

# PART II

# THEORETICAL FRAMEWORK

# AND

# ANALYTICAL TOOLS

# CHAPTER III

## APPROACHES TO EXPLAINING REGIONAL ECONOMIC GROWTH

In spite of the obstacles to sustained economic development of resource potential regions, they still have some key advantages. The natural resources of a region attract capital more easily than manufacturing industries or infrastructure. A region need not have capital shortage problems if it wants to exploit its natural resources, especially if it intends to export them in an unprocessed form. The same region may have a hard time finding capital for the development of non-resource based industries. However, the attraction of capital to some natural resources such as oil and minerals may be more than the others.

The requirements of the development strategy should be based on maximization of the advantages and minimization of the disadvantages arising from the resources of the regions. For instance, the various phenomens of migration, unemployment and low income may be common in all types of less developed regions. Nevertheless, the cause of the problem may be different, and therefore, requires special treatment in each case. Newfoundland, for example, is suffering from the regional development problems of less developed regions. Yet, a special approach in accordance with its potential and the cause of underdevelopment is essential.

How can a resource potential region utilize its advantages and minimize its disadvantages, and so reduce the problem of underdevelopment? In order to achieve this goal, it is essential to make the region a place of permanent, diversified settlement; while at the same time integrating the

region with the national and international economy to bring about self-sustained growth. In attempting to explain how regions grow, three theories will now be examined.

## Export Base Theory

The export base theory offers a possible explanation of the growth of natural resource potential regions. The studies conducted by Harold Innis concluded that exports were of crucial significance to the growth of Canada, while their importance in the United States was stressed by Douglas C. North.[1]

The export base is formed by those activities which produce for export. It is this factor which determines the extent of a region's growth. A high export base implies that its income and employment are closely linked with its volume of exports. According to North, this in turn, influences the volume of residentiary activity. A decline in the export base may be caused by the following factors: depletion of the natural resource, decline in the demand for the export, technological changes and comparative costs. These factors will set the ultimate limit on the region's growth rate and "may at any time choke off growth and leave behind unemployed resources and economic stagnation".[2] The amount of income that is actually generated is dependent upon the size of the multiplier,

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[1] Harold A. Innis, Problems of Staple Production in Canada (Toronto: The Ryerson Press, 1933). Douglas C. North, "Location Theory and Regional Economic Growth", Journal of Political Economy, LXIII (June 1955).

[2] Harvey S. Perloff and Vera Dodds, How a Region Grows: Area Development in the U.S. Economy, Supplementary Paper No. 17, (New York: Committee for Economic Development, 1963), p. 43.

which is the ratio of residentiary activities to the export base.

The export base theory is a partial theory. It is true in certain regions under certain circumstances. This theory has some relevance for an export base, resource potential region, such as Newfoundland. Newfoundland is import and export oriented. Specialization is based on exploiting a single natural resource for export. Some of the subregions are mainly dependant upon a single resource and have a small multiplier. Consequently, they are hypersensitive to outside markets - both national and international. For example, one of the reasons given for the recent closing of the Gull Bridge copper mine, in addition to poor quality of the ore, was declining copper prices in the international market!

Nevertheless, the export base theory cannot explain regional growth at all places and times. This is so because development may result from the growth of domestic industries and the increased domestic income and employment. In other words, the export base theory ignores the internal forces that generate growth potential.

## Sector Theory

Allen Fisher and Colin Clarke observed that development is usually in accordance with the following activities: (1) a rise in per capita income, (2) a decline in the share of the labor force engaged in agricultural activity, (3) followed by a rise in manufacturing and other secondary activity, (4) followed in turn by an increase in tertiary activity.[1] This

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[1] Allen Fisher, "Capital and the Growth of Knowledge", Economic Journal, Vol. 43 (September 1933), pp. 379-89. Colin Clarke, The Conditions of Economic Progress, (London: Macmillan, 1940).

sequence of economic growth is due to changing productivity of labor and different income elasticities of demand for the products. Thus, because of technology, the proportion of the labor force engaged in agriculture is declining while the demand for agricultural products is increasing - at a lesser rate than personal income per capita.

A natural extension of sector theory is the theory of development stages, in which growth follows a sequence from subsistence to an advanced stage of economic development.

Another extension of sector theory is the concept of 'growth industries'. In this theory, the way to growth is seen as a result of encouraging rapidly expanding sectors, such as some kinds of manufacturing and tertiary activities, to locate in the lagging region. However, all regions have not gone through the stages in the sequence suggested by the sector theory during their process of growth. In some countries, such as the United States and the Soviety Union, the sequence of stages did not occur in accordance with the stage theory. Again, growth can result from agricultural and natural resource development and not necessarily from the manufacturing industry as in Denmark or Canada, for example.

Both the sector theory and the export based theory are partial in scope, focussing upon certain aspects, while ignoring others. A more satisfying approach, and one which will be used throughout the analysis in this inquiry is input-output access.

## Input-Output Access

The input-output access model, as introduced by Harvey S. Perloff and his associates is a useful tool in the examination of a region's growth

potential.[1] Whereas traditional theory said that regional growth is directly related to the cost of access to inputs of production and the access to markets for the output of production, input-output access nets out the relative advantages and disadvantages for each industry in the region. While there have been many explanations of the role of resources and markets in economic growth, this is one of the most sophisticated.

The essence of the input-output approach is synthesized into Table 2, showing variations in the prospects for growth in each of sixteen conceptual regions. The Roman numerals in Table 2 indicate the number of 'good' access dimensions that each region has. Region 4 does not have even one good access dimension; which suggests that it has the poorest overall locational advantages. Consequently, if a region's general access characteristics are taken as an index of its growth potential, then region 4 has the least potential. Regions 2, 3, 8 and 12 have been assigned the Roman numeral I. They are only slightly better off than region 4. While region 3 has good access to home inputs, region 2 has good access to external inputs. Regions 8 and 12, on the other hand, have poor access to inputs from the region as well as externally. However, region 8 has good access to regional markets, while region 12 has good access to external markets.

On the other hand, region 13 is in the most advantageous position. It has been assigned the highest Roman numeral - IV. Region 13 has good access to markets and inputs within the region, as well as externally.

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[1] Harvey S. Perloff, et al., Regions, Resources and Economic Growth (Baltimore, Maryland: John Hopkins Press, 1960).

TABLE 2

The Input-Output Access Model

| | | Good access to basic inputs[a] from external regional and national sources | | Poor access to basic inputs[a] from external regional and national sources | |
|---|---|---|---|---|---|
| | | Good access to basic inputs in home region | Poor access to basic inputs in home region | Good access to basic inputs in home region | Poor access to basic inputs in home region |
| Poor access to external regional and national markets | Poor access to markets in home region | #1 II | #2 I | #3 I | #4 0 |
| | Good access to markets in home region | #5 III | #6 II | #7 II | #8 I |
| Good access to external regional and national markets | Poor access to markets in home region | #9 III | #10 II | #11 II | #12 I |
| | Good access to markets in home region | #13 IV | #14 III | #15 III | #16 II |

[a] Not only basic resources but important intermediate sources need to be considered.

Note: Roman numerals indicate number of 'good' access dimensions, and suggest relative over-all locational advantages or disadvantages.

Source: Adapted from Perloff, et al., Economic Growth P. 91.

Relative to the other regions, it has the best overall locational advantages.

A region's general access characteristics may change as a result of either or all of the following:[1]

1. Changing markets brought about by shifting population and industry.
2. Changing distribution of the sources of inputs, resulting from exhaustion, discovery and migration of intermediate suppliers.
3. Changing relationships between inputs and outputs as a result of changing technology and polarization.

Input-output access analysis can be operationalized effectively by the use of a special concept, called shift and share analysis. The latter analysis helps in separating growth into two additive components: (1) growth due to industrial composition and polarization, and (2) growth due to access to markets and inputs. The next chapter, therefore, explains the shift and share technique, its merits and limitations.

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[1] For a more detailed discussion on this point, see Edgar S. Dunn, Jr., Recent Southern Economic Development: as Revealed by the Changing Structure of Employment, University of Florida Monographs Social Science, No. 14 (Gainesville, Florida, 1962), p. 48.

# CHAPTER IV

## THE SHIFT AND SHARE ANALYTICAL TECHNIQUE

After a detailed study of the literature available on the subject, it is concluded that the technique was first used, in a crude form, by Daniel Creamer as early as 1942.[1] Creamer, in his study, identified what he referred to as 'locational shifts' in the manufacturing industries of the United States. Unfortunately, he did not fully comprehend the analytical potential of the device. That is, he did not use the shift and share technique to identify the impact of the mix of industries upon regional development. Although it is not generally acknowledged, Tsyznyski identifed the two forces of structure and competition, in his model of world trade patterns - clearly falling into the tradition of shift and share![2] The mainstream of effort, however, ignored Tsyzynski's model. Most tried to improve upon Creamer's innovation, although not all were successful.[3] The task was left for Edgar S. Dunn, Jr., who successfully did elaborate upon the work started by Creamer.

In 1958 Dunn, supported by the Resources for the Future, Inc., of the United States, identified, measured and separated the effect of a

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[1] Daniel Creamer, "Shifts of Manufacturing Industries", Industrial Location and National Resources, (Washington, D.C.: U.S. National Resources Planning Board, 1943).

[2] H. Tsyzynski, "World Trade in Manufactured Commodities, 1899-1951", Manchester School of Economics and Social Studies, (September, 1951), pp. 272-304.

[3] Wilbur Zelinsky, "A Method of Measuring Change in the Distribution of Manufacturing Activity: The United States, 1939-1947", Economic Geography, Vol. 34 (April 1958), pp. 95-126.

region's industry composition from the effect of the location of a specific industry on regional growth.[1] Shortly afterward, the technique was utilized by Perloff, et al., in their comprehensive study of differential economic growth in the United States.[2] Since then the technique has been used frequently. By 1965, it had reached what may be termed its 'golden age', with the publication of the Office of Business Economics shift and share analysis of 32 industrial sectors in 4,102 counties in the United States.[3] A further indication of the popularity of the technique is the Dominion Bureau of Statistics shift and share study of growth patterns in manufacturing in the subregions of Canada.[4]

Tracing the origin and consequent development of shift and share analysis, it has been shown that over twenty-five years were to pass after its inception in the early 1940's, before it became a widely accepted analytical tool. Although it had an inauspicious and inadequate beginning, it has left lasting impressions!

## Fundamentals of Shift and Share Analysis

The shift and share technique is erected upon a foundation consisting of inter-temporal shifts in economic activity. Whatever economic

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[1] Edgar S. Dunn, Jr., "A Statistical and Analytical Technique for Regional Analysis", The Regional Science Association Papers, Vol. VI, 1960.

[2] Perloff, et al., Economic Growth.

[3] Lowell D. Ashby, Growth Patterns in Employment by County, 1940-50 and 1950-60, (Washington, D.C.: U.S. Government Printing Office, 1965).

[4] Dominion Bureau of Statistics, Growth Patterns in Manufacturing Employment by Counties and Census Divisions, 1961-1967, Cat. No. 31-505.

variable is selected for analysis - employment, income or output - the first step is to measure the changes that have occurred between two points in time.

A basic premise of the technique is couched in the concept of 'context'. Not only is a region's absolute performance considered, but its relative performance is examined also. There are three approaches:

1. Compare the specific region with the national benchmark, as introduced by Steed in examining manufacturing shifts in Northern Ireland.[1]
2. Compare all regions and subregions with the national benchmark. This was the approach taken by Perloff.[2]
3. Compare one specific region with multi-benchmarks - not just the national benchmark, as proposed by Krumme.[3]

The scheme adopted in this study is a combination of the first and third approaches. Specifically, Newfoundland's performance is compared with that of each of the other provinces of Canada, as well as with the accomplishments of Canada as a whole. Then, the data for Newfoundland where possible, are broken down by census divisions and grouped into subregions. In this manner, the changes that have occurred in the economic activity of Newfoundland are examined, not in isolation, but in the Canadian

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[1] Guy P.F. Steed, "Locational Changes: A 'Shift and Share' Analysis of Northern Ireland's Manufacturing-Mix, 1950-64", Tijdschrift Voor Economie En Sociale Geografie, (September/October, 1967), pp. 265-70.

[2] Perloff, et al., Economic Growth.

[3] Gunter Krumme, "Identifying Regional Economic Change: A Variation of the Theme 'Shift and Share'", Canadian Geographier, Vol. XII, I, (Spring, 1969).

context. This in essence, is the object of shift and share analysis: to provide "a convenient framework to facilitate comparisons among areas",[1] in order to ascertain the reasons for slow or fast relative growth.

The Three Shifts

The framework provided, classifies all indicators of economic change into three components - net shift, differential shift and proportionality shift - each with differing analytical implications. The net shift applies to an aggregate measure, while differential and proportionality shifts apply to components of the net shift. The net employment shift (using employment data) shows the number of jobs that each region gained or lost in relation to what it would have gained or lost, if it had grown at the same rate as the benchmark (often the nation). A positive net shift indicates that the region grew faster than the benchmark region. The converse is, of course, also true. While the net shift identifies and measures the changing regional structure of the economy, the net shift alone will yield at best, only superficial results. Consequently, the research design is greatly enhanced by breaking the net shift into two additive components - the differential and proportionality shifts - in order to classify the sources of the change.

The differential shift (sometimes referred to as the local-factor effect or the competition effect) occurs because in some regions, an industry grows faster than the same industry in another region. On balance, when the industries of a region grow faster than the national rate of growth in the corresponding industrial sectors, the differential shift is positive (or upward). Alternatively, when the industries of a region grow

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[1] Dominion Bureau of Statistics, Growth Patterns, p. 3.

less than the national average 'anticipated', the differential shift becomes negative (or downward).

A positive differential shift is due to a region's advantage over other regions in terms of its access to inputs or markets for each of one or more specific activities. The region may be gaining new markets, intensifying its relative access to the inputs of production, or augmenting relative access to both inputs and markets.

The proportionality shift (also called the composition effect or the industry-mix effect) on the other hand, occurs because the composition of certain industries in a region is more conducive to growth than in another region. It is based upon the economies resulting from the economic mixture or complex peculiar to a region. If a region's industrial composition provides fast growth, it is said to have a positive proportionality effect. In contrast, those regions that have a slowly growing mixture of industries will have a poor industrial structure and will, therefore, have a negative proportionality shift.

An Illustrative Example

A simple illustration of the net, differential and proportionality shifts is calculated with the use of employment data to enhance the reader's comprehension of the shift and share technique. The net shift is calculated first; the differential and proportionality shifts are derived from the net shift.

There are four steps necessary to find the net shift. The first step is the calculation of the rate of change in national employment between two points in time (1951 and 1961 in this example). Table 3 shows that Canada's total employment increased by 1,185,601, or 29 per cent (1,185,601/4,089,604) in that ten-year time period.

TABLE 3

EMPLOYMENT DATA AND COMPUTATION OF NET SHIFT FOR SELECTED PROVINCES

| | Newfound-land | Ontario | British Columbia | Canada |
|---|---|---|---|---|
| 1. Employment 1961 | 109,412 | 2,012,423 | 499,427 | 5,275,241 |
| 2. Employment 1951 | 90,375 | 1,549,785 | 379,088 | 4,089,640 |
| 3. Actual change | 19,037 | 462,638 | 120,339 | 1,185,601 |
| 4. Change based on the national rate | 26,200 | 449,288 | 109,899 | - |
| 5. Net shift (3-4) | - 7,163 | + 13,350 | + 10,440 | - |

Source: Calculated from Dominion Bureau of Statistics, Census of Canada, 1951 (Ottawa: Queen's Printer), Vol. IX, Part II, General Review, Table 76, and Dominion Bureau of Statistics, Census of Canada, 1961 (Ottawa: Queen's Printer), Cat. No. 94-542, Vol. III, Part III, Table 31.

Step two is to find each region's actual change in total employment, by subtracting its employment in the initial period from that in the terminal period. Table 3 indicates that Newfoundland's total employment increased by 19,037 workers.

The third step is to determine each region's change in employment, if its employment were to have grown at the Canadian average rate. This is accomplished by multiplying each region's employment in the initial period, 1951, by the Canadian rate of change (found in step one to be 29 per cent). Looking once more at Table 3, one can see that Newfoundland's change in employment, based on the national rate, to be 26,200 (90,375 x 0.29).

The net shift is computed directly in step four, by subtracting the change in employment, based upon the national rate (found in step three), from the actual change (found in step two). In this manner, Newfoundland's net shift in employment from 1951 to 1961, is found to be -7,163 (19,037 - 26,200). This means that employment in Newfoundland grew less than it would have grown at the national rate. In other words, there would have been 7,163 more workers employed in Newfoundland. Newfoundland, therefore, experienced a decline in its share of total Canadian employment during the decade under investigation. In contrast to Newfoundland, Ontario experienced an increase in its share of total employment in the same period, as evidenced by its net shift of +13,350.

The net shifts calculated above are composed of two separate occurrences - the differential and proportionality effects.

The differential shift is found by applying the same four steps used in the foregoing analysis of net shift. This time however, the method is applied to each industry in a region instead of to total employment. The result is found in Table 4.

Table 4 reveals that six of the ten industries in Newfoundland displayed a greater increase in employment, than if they had grown at the national rate. The negative shifts in the other four industries overwhelmed the positive shifts in the six industries, resulting in an overall negative shift of 3,357. In British Columbia, on the other hand, most of the industries grew more than the national average causing a positive differential shift (+7,572) to occur.

Not only did most of the industries in British Columbia grow more than the national average, but also, that province's industrial mix or composition was such that the number of workers employed in fast growing

TABLE 4

ILLUSTRATION OF THE DIFFERENTIAL SHIFT FOR SELECTED PROVINCES, 1951-61

| Major Sectors | Newfoundland | Ontario | British Columbia |
|---|---|---|---|
| Agriculture | + 47 | + 4,286 | + 1,664 |
| Forestry | - 2,216 | - 1,973 | - 774 |
| Fishing | + 4,528 | - 771 | + 3,773 |
| Mining | + 54 | + 7,382 | - 4,888 |
| Manufacturing | - 2,798 | + 302 | + 6,732 |
| Construction | + 623 | - 1,104 | - 2,654 |
| Transportation | + 1,672 | -11,483 | + 3,087 |
| Trade | - 1,136 | - 2,636 | - 337 |
| Finance | + 454 | + 559 | + 142 |
| Service and Administration | - 4,585 | +28,387 | + 825 |
| Total Differential Shift | - 3,357 | +22,949 | + 7,572 |

Source: Calculated from Dominion Bureau of Statistics, Census of Canada, 1951 (Ottawa: Queen's Printer), Vol. IX, Part II, General Review, Table 76, and Dominion Bureau of Statistics, Census of Canada, 1961 (Ottawa: Queen's Printer), Cat. No. 94-542, Vol. III, Part III, Table 31.

industries exceeded the national average by 2,868. The increase in employment as a result of the relative advantage in industrial composition is revealed by the proportionality shift. The proportionality shift is found by subtracting the differential shift from the net shift. Table 5 elucidates this result for Newfoundland, Ontario and British Columbia.

Newfoundland experienced a negative proportionality shift and, as mentioned earlier, there was also a negative differential shift. The

TABLE 5

ILLUSTRATION OF NET EMPLOYMENT SHIFTS RESULTING FROM THE DIFFERENTIAL SHIFT AND THE PROPORTIONALITY SHIFT FOR SELECTED PROVINCES 1951-1961

| Employment Shift | Newfoundland | Ontario | British Columbia |
|---|---|---|---|
| Net shift | - 7,163 | + 13,350 | + 10,440 |
| Differential shift | - 3,357 | + 22,949 | + 7,572 |
| Proportionality shift | - 3,806 | - 9,599 | + 2,868 |

Source: Calculated from Dominion Bureau of Statistics, Census of Canada, 1951 (Ottawa: Queen's Printer), Vol. IX, Part II, General Review, Table 76, and Dominion Bureau of Statistics, Census of Canada, 1961 (Ottawa: Queen's Printer), Cat. No. 94-542, Vol. III, Part III, Table 31.

differential and proportionality effects reinforce each other to generate a negative net shift in employment. The negative proportionality shift indicates that the industrial composition in Newfoundland was relatively inferior to the Canadian average in inducing growth. The negative differential shift indicates that Newfoundland had a relative disadvantage in terms of inputs and markets in specific industries.

Ontario had a positive net shift, because the positive differential shift was large enough to overcome the negative proportionality shift. This suggests that between 1951 and 1961, Ontario grew because some industries had a greater advantage than the same industries in other provinces with regard to their specific inputs and markets. However, the composition of the industries in Ontario was such that there were no economies of interrelatedness among them.

In the above examples, three combinations of differential and

proportionality shifts have been illustrated. In all there are six possible combinations of differential and proportionality shifts. They are revealed in Table 6.

TABLE 6

POSSIBLE COMBINATIONS OF DIFFERENTIAL AND PROPORTIONALITY SHIFTS

| Number | Differential | Proportionality |
|---|---|---|
| 1 | + | + |
| 2 | + | - (+ dominant) |
| 3 | + | - (- dominant) |
| 4 | - | + (+ dominant) |
| 5 | - | + (- dominant) |
| 6 | - | - |

The foregoing pages were devoted to the calculation of shift and share, and its significance. The next section is devoted to a critical analysis.

## Merits and Limitation

### Merits

The merits of shift and share analysis converge aroung the following:

1. The analytical framework.
2. Measurement.
3. Flexibility.
4. Industry orientation.
5. Economies of Concentration.

They are all important and deserve closer scrutiny.

The analytical framework

The shift and share method provides a useful framework for organized research, which is conducive to scientific analysis of results. The framework permits the organization of an otherwise unmanageable mass of statistical data into a comprehensible form. The data are then easily interpreted using the concepts of net, differential and proportionality shifts. These, in turn, are capable of being subjected to a more sophisticated type of investigation using input-output access.

Measurement

"No fully satisfactory way of combining percentage and absolute changes has yet been devised to measure differential economic growth."[1] When percentage changes are used alone, a possible misrepresentation of the facts may arise because the percentages are not always calculated from the same base. For instance, a 50 per cent increase in Region A's annual income of $100 million in the base year is far larger than a 50 per cent increase in Region B's income of $7 million. The absolute changes of $50 million and $3.5 million for Region A and B respectively, must be compared to the changes in a benchmark, (sometimes the nation) before they become meaningful. The shift and share method of presenting data, on the other hand, reduces the possibility of distortion by clearly setting forth the relative size of the changes, and thus permitting them to be compared directly. "This kind of statistic has the attribute that it provides a dimension for comparing the gains and losses of each region."[2]

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[1] Perloff and Dodds, Region Grows, p. 57.

[2] Dunn, "Technique for Regional Analysis", p. 99.

Flexibility

The flexibility of the technique is also a merit. It has flexibility in two ways: (1) It is easily applied to any economic dimension, such as employment, population, income, etc. (2) The analysis can vary from a general to a more detailed study, depending upon the purpose or pattern of investigation. Industries or regions can be studied at any level of disaggregation, and the results will be the same, when summed, as those calculated for the aggregate totals. The results can be added directly, industry by industry or region by region. The real advantage of direct additivity is due to the fact that it makes possible numerous groupings of regional data - depending upon the researcher's purposes.

Industry orientation

The industry orientation of the methodology reduces the degree of abstraction, usually characteristic of other theories. Shift and share analysis is more practical in that it brings out the impact of each industry on a region's economy. It is "less abstract and formal with all statements subject to confirmation by empirical observation, much less precise about its predictions, but with greater operational value".[1]

Economies of concentration

A very important merit of the method is that it brings into strong relief the effect of economies of concentration upon regional growth. Economies of concentration influence a region's performance in terms of external economies and economies of scale. The shift and share method

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[1] Harry W. Richardson, Regional Economies: Location Theory, Urban Structure and Regional Change (New York: Praeger, 1969), p. 347.

further, brings to attention the importance of a particular industrial mixture in eliciting regional growth.

Limitations

The limitations of the method are centered around six considerations, the last three of which are of major importance:

1. The level of industrial disaggregation.
2. The length of time interval.
3. Predicting ability.
4. Understated proportionality shift.
5. Unemployment bias.
6. Economic meaning.

Each of these limitations is explained and answered in the discussion which follows.

The level of industrial disaggregation

Some difficulties with disaggregation of data have been recognized by the users of the shift and share technique.[1] The problem, which has been described as an "empirical failing of shift and share analysis"[2] is due to the fact that the net, differential and proportionality shifts are dependent upon the arbitrary manner and the frequency with which the data are disaggregated. It occurs when the data for an industrial sector, such

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[1]For example, see Perloff, et al., Economic Growth, p. 298 fn., and Lowell D. Ashby, "The Geographical Redistribution of Employment: An Examination of the Elements of Change", Survey of Current Business, (October, 1964), p. 9.

[2]David B. Houston, "The Shift and Share Analysis of Regional Growth: A Critique, "The Southern Economic Journal, Vol. 33, (April, 1967), p. 579.

as manufacturing, can be further broken down into two or more components The differential shift, as a result, includes an element of the subsector proportionality shift. To further illustrate: if one-digit manufacturing employment data are used, the differential shift will contain "a certain amount of proportionality effect based upon the spatial distribution of rapid growth and slow growth sectors at the 2-digit level".[1] The implication is that the shift dimension will change if the number of industrial sectors in a region is increased, or if they are re-classified.

There are two answers to this criticism. (1) In analyzing the shifts, since they remain definite and quite unambiguous, it is but a simple matter to merely realize that the differential shift at the 1-digit level contains the proportionality shift arising from the 2-digit level. Once the researcher is aware of the possibility of a small error, he can adjust his results accordingly. (2) More important still, the problem is often exaggerated, for "most of the total-ultimate-digit proportionality effect is washed out at the 1st and 2nd digit levels".[2]

Length of time interval

The fact that the analysis takes into account a discrete time interval is also a source of criticism. Schwartz and Graham have argued that the analysis implicitly assumes that all regions are on the same phase of the business cycle.[3]

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[1] Dunn, "Technique for Regional Analysis", p. 108.

[2] Ibid.

[3] Charles F. Schwartz and Robert E. Graham, Jr., Personal Income by State Since 1929, U.S. Office of Business Economics, (New York: Greenwood Press Publishers, 1969).

That any inter-regional variations in the business cycle may give rise to distortions in data was acknowledged by Perloff, et al.[1] However, the possibility of error is minimized if employment data are correlated with population, and/or the calculations carried out for a series of time periods.

Because of the necessity of choosing a discrete time interval, a bias in the proportionality shifts results. Professor Dunn explains it:[2]

> The proportionality effect is based upon the spatial distribution of the rapid-growth and slow-growth sectors at the beginning of the period. Therefore, the larger the time period the more distortion that results from the fact that differential changes throughout the period have altered the spatial distribution of the rapid-slow-growth sectors.

The converse, is also true however. The shorter the time period, the less distortion that results. So, for short time periods of ten to fifteen years, the distortion should not be a significant factor.

Further criticism has arisen because the shifts are calculated over a discrete time interval, making the results susceptible to a kind of index number problem. Care should therefore be taken in selecting a base year, when deciding upon the period of analysis. A too rigid treatment of the time element may give rise to misleading results.[3] Although this problem cannot be eliminated, it can be minimized by changing the base years and end points where possible. There is of course, a practical

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[1] Perloff, et al., Economic Growth, p. 296 fn.

[2] Dunn, "Technique for Regional Analysis", p. 108.

[3] For an example of the significant impact that a change of one year can have, see Perloff, et al., Economic Growth, p. 8.

limit to the number of times that this procedure can be followed, so a sensible, practical balance must be reached.

Predicting ability

The predicting ability of the method has been criticized and severely challenged.[1] Basing their criticism upon the inclusion of a discrete time interval, Schwartz and Graham have argued that an examination of a region's performance at two points in time tells only whether or not a decline or an increase occurred, and tells nothing of the performance in the intervening period.[2] Growth may have been regular or erratic, yet it is undisclosed. Albeit, this is not a problem unique to shift and share analysis. It is inadvisable and even unscientific under any circumstances, to project past trends without relying upon further analysis and personal judgement. In contradistinction to the mild criticism issued by Schwartz and Graham, James Henderson levied an attack on the grounds that the technique cannot project or forecast.[3] This is rather unfortunate, for nowhere do its proponents claim it to be a growth model with predictive capabilities in and of itself - although one can predict more scientifically on the basis of shift and share analysis. Therefore, "it is merely confusing and far wide of the mark to criticize it as if it were..."[4]

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[1] See Howard James Brown, "Employment Shift Analysis of Regional Economic Growth - A Critique", (unpublished Ph.D. dissertation, Indiana University, 1967).

[2] Schwartz and Graham, Personal Income.

[3] James Henderson, "Regional Planning For Economic Growth", in Regional Planning: Challenge and Prospect, ed. by Maynard M. Hufshmidt (New York: Praeger, 1969).

[4] Lowell D. Ashby, "Shift and Share Analysis: A Reply", Southern Economic Journal, Vol. 34, No. 3 (January 1968) p. 423.

Understated Proportionality Shift

The proportionality shift has been criticized for minimizing the effect of industrial structure, since the latter is always larger than the technique reveals. This results from the fact that there is a high degree of interdependence among industries in a regional economy. Consequently, a good or a poor industrial composition effect for one industry will determine the performance of other industries, through multiplied effects on service industries and industries supplying inputs.

Richardson, however, believes this attack to be misconceived.[1] If the linkages and multiplier effect are national, he argues, they will be accounted for in the proportionality shift, when the disaggregation is fine enough. On the other hand, if they are local, "their impact should be included in the residual, since a high residual simply draws our attention to growth influences specific to the region".[2]

Unemployment bias

Choguill and Cohen have argued that the shift and share technique "yields biased results when unemployment patterns are neglected".[3] If full employment is not assumed the differential and proportionality shifts do not accurately reflect economic factors. However, this handicap may be overcome if employment data are inflated to full capacity levels. In any case, as Choguill and Cohen confess, their objection is only theoretical, for in actual practice unemployment rates by industry, by region are difficult to collect.

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[1] Harry W. Richardson, Elements of Regional Economics (England: Penguin Books, 1969).

[2] Richardson, Elements of Regional Economics, p. 47.

[3] Charles L. Choguill and Bruce C. Cohen, "Unemployment Bias and Employment-Shift Analysis", Land Economics, Vol. 42 (May, 1966), p. 233.

Economic Meaning

It has been argued that the economic meaning of the differential and proportionality shifts have not been well developed. David Houston, for example, maintains that "economically, we have very little basis for distinguishing between the competitive and mix effects".[1] This criticism is based upon the argument that changes in any or all of supply, demand, technology and locational shifts may result from changes in either component. It is conceded, even by Houston, that Perloff, et al., have made a near perfect attempt at distinguishing between the two components.

After having critically examined the shift and share technique, its calculation and significance as an analytical tool, as well as its theoretical framework, the study now turns to an application of the shift and share technique. The technique is applied to population, income, employment and to specific industries as well.

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[1] Houston, "Analysis of Regional Growth", p. 579.

# PART III

# AN APPLICATION OF THE SHIFT AND SHARE ANALYTICAL TECHNIQUE

# CHAPTER V

## APPLICATION OF THE SHIFT AND SHARE TECHNIQUE TO NEWFOUNDLAND IN TERMS OF TOTAL POPULATION

The chapter is devoted to the shift and share technique in terms of total population. First, however, actual and percentage changes in the total population are discussed so that the reader may better appreciate the results of an application of the shift and share technique. These actual and percentage changes that have occurred for the last twenty years will be investigated by concentrating upon the period from 1951 to 1971.

As clearly revealed in Table 7, Quebec experienced the same percentage increase as the Canadian average from 1951 to 1961. The percentage increase in Newfoundland was slightly less, while Prince Edward Island had the lowest percentage increase. On the other hand, Alberta and British Columbia had the highest percentage increases in population. During the period 1961 to 1971, all provinces showed an increase in population, although all provinces experienced lower percentage increases than in the 1951-61 period. This was especially noticeable in Saskatchewan which had an increase in population of 11 per cent in the 1951-61 period as compared to .2 per cent in the 1961-71 period.

The net shift, which is discussed in the following section, reveals the relative changes in actual population, upward or downward depending upon the sign. Note that a province with a net downward (negative) shift may not necessarily have an actual decrease in population - population may have either increased or decreased. The net downward shift shows a relative

decrease in population in relation to Canada.

TABLE 7

ACTUAL AND PERCENTAGE CHANGES IN POPULATION, CANADA, PROVINCES, 1951 to 1961; 1961 to 1971

| Province | From 1951 to 1961 | | From 1961 to 1971 | |
|---|---|---|---|---|
| | Actual Change | Per Cent Change | Actual Change | Per Cent Change |
| Newfoundland | 96,437 | 27 | 65,147 | 14 |
| Prince Edward Island | 6,200 | 6 | 6,371 | 6 |
| Nova Scotia | 94,423 | 15 | 32,993 | 4 |
| New Brunswick | 82,239 | 16 | 31,064 | 5 |
| Quebec | 1,203,530 | 30 | 770,789 | 15 |
| Ontario | 1,638,550 | 36 | 1,558,908 | 25 |
| Manitoba | 145,145 | 19 | 63,314 | 7 |
| Saskatchewan | 93,453 | 11 | 1,819 | * |
| Alberta | 391,946 | 42 | 296,553 | 22 |
| British Columbia | 463,872 | 40 | 560,918 | 34 |
| Canada | 4,215,795 | 30 | 3,387,776 | 19 |

* 0.20 per cent

Source: Calculated from Dominion Bureau of Statistics, Census of Canada, 1961 (Ottawa: Queen's Printer), Cat. No. 92-530, Vol. I, Part I, and The Financial Post, Survey of Markets (Toronto: Maclean Hunter, 1971), p. 55.

## Shift and Share of the Total Population in the Provinces

The results of an application of the shift and share technique to population data are presented in Table 8. The net upward population shifts were confined to three provinces - Ontario, Alberta and British Columbia - while the other provinces experienced a downward shift from 1951 to 1961 as well as from 1961 to 1971. The former three provinces shared more in the relative population gains, while the remaining seven provinces, that

is, Newfoundland, Nova Scotia, Prince Edward Island, New Brunswick, Quebec, Manitoba, and Saskatchewan shared less. For instance, if Ontario's popula- were to have increased at the Canadian average percentage its population

TABLE 8

SHIFTS IN POPULATION, PROVINCES
1951 to 1961, 1961 to 1971

| | From 1951 to 1961 | | From 1961 to 1971 | |
|---|---|---|---|---|
| Province | Net Shift | Share* | Net Shift | Share* |
| Newfoundland | - 12,517 | 2.60 | - 20,080 | 2.85 |
| Prince Edward Island | - 23,472 | 5.00 | - 13,105 | 1.86 |
| Nova Scotia | - 99,293 | 21.00 | -104,197 | 14.79 |
| New Brunswick | - 73,225 | 15.50 | - 80,293 | 11.39 |
| Quebec | - 19,118 | 4.00 | -208,191 | 29.55 |
| Ontario | +252,550 | 53.30 | +398,086 | 56.51 |
| Manitoba | - 88,955 | 18.80 | -108,254 | 15.37 |
| Saskatchewan | -157,184 | 33.20 | -170,399 | 24.19 |
| Alberta | +108,719 | 23.00 | + 48,710 | 6.91 |
| British Columbia | +112,602 | 23.80 | +257,672 | 36.58 |

* Net share is the percentage of the total downward shifts, if the particular province's net shift is downward; net share may also be the percentage of the total upward shifts if the particular province's net shift is upward. For example, Newfoundland's net shift was downward (-12,517) from 1951 to 1961. Its net share, therefore, is 2.6 of all of the Canadian negative shifts.

$$\frac{-12,517}{-473,764} \times 100 = 2.6$$

Source: Calculated from Dominion Bureau of Statistics, Census of Canada, 1961 (Ottawa: Queen's Printer), Cat. No. 92-530, Vol. I, Part I, and The Financial Post, Survey of Markets (Toronto: Maclean-Hunter, 1971), p. 55.

would have grown by 252,550 less from 1951 to 1961 and by 398,086 less from 1961 to 1971. Ontario's relative population gain increased slightly from 1961 to 1971 as compared with 1951 to 1961. British Columbia on the other

hand, increased its relative share significantly in the second period (36.58 per cent) as compared with the first period (23.80 per cent). Alberta's share of the positive net shifts was much less in the second period as compared with the first.

If Newfoundland's population had increased at the national average, its population would have increased by 12,517 more from 1951 to 1961 and by 20,080 more from 1961 to 1971. That is, Newfoundland's share in the downward net shifts was 2.6 per cent in the first period and 2.85 per cent in the second period. Compared with Newfoundland, Quebec's negative shift increased greatly from -19,118 to -208,191 from the former to the latter period.

## Shift and Share of the Total Population in Newfoundland's Sub-regions and Census Divisions

Just as in the previous section dealing with the provinces, before discussing the results of an application of the shift and share technique, a brief description is given of the actual and percentage changes in the population of Newfoundland's subregions and census divisions. Newfoundland's population increased by 96,437, that is 27 per cent, during the period from 1951 to 1961 and by 65,147, that is 14 per cent from 1961 to 1971. (Table 9) The population increased in all subregions and census divisions during both periods, with the single exception of Census Division VII in the second period, where population actually declined by 3 per cent. The actual increase in population was largest in Census Division I, although in the second period the increase was smaller than in the first. These increases in population were not reflected in the percentage changes since Census Division I includes the larger base of the capital city's population. On the other hand, Labrador showed the highest percentage increase in

population amongst the Newfoundland subregions, although in the second period it had a higher percentage increase of 109 per cent as compared with 72 per cent in the first period. These percentage increases were not revealed in the actual increases because Labrador is sparsely populated.

TABLE 9

ACTUAL AND PERCENTAGE CHANGES IN POPULATION, NEWFOUNDLAND, SUBREGIONS, CENSUS DIVISIONS, 1951 to 1961; 1961 to 1971

| Census Division | From 1951 to 1961 Actual Change | From 1951 to 1961 Per Cent Change | From 1961 to 1971 Actual Change | From 1961 to 1971 Per Cent Change |
|---|---|---|---|---|
| Southeast | | | | |
| C.D. I | 39,361 | 26 | 17,196 | 9 |
| C.D. II | 2,413 | 11 | 1,621 | 7 |
| C.D. III | 2,865 | 14 | 4,101 | 18 |
| C.D. VII | 4,358 | 12 | - 1,252 | - 3 |
| Central | | | | |
| C.D. VI | 10,077 | 36 | 7,755 | 20 |
| C.D. VIII | 7,860 | 21 | 9,141 | 21 |
| West | | | | |
| C.D. IV | 8,203 | 51 | 2,015 | 8 |
| C.D. V | 10,997 | 39 | 5,814 | 15 |
| C.D. IX | 4,659 | 27 | 3,890 | 18 |
| Labrador | | | | |
| C.D. X | 5,644 | 72 | 14,766 | 109 |
| Newfoundland | 96,437 | 27 | 65,147 | 14 |

Source: Based upon data from Dominion Bureau of Statistics, Census of Canada 1951 (Ottawa: Queen's Printer), General Characteristics, Vol. I, Part I, Table 6, Dominion Bureau of Statistics, Census of Canada 1961 (Ottawa: Queen's Printer), Cat. No. 92-531, Vol. I, Part I, Table 7, and The Financial Post, Survey of Markets (Toronto: Maclean-Hunter, 1971), p. 290.

The net shift and gross share, as presented in Table 10 show that all of the Southeast subregion, which includes Census Divisions I, II, III,

VII, as well as Census Division IX of the West subregion experienced negative shifts from 1951 to 1961 and from 1961 to 1971.[1] That is, the increase in the population of these census divisions was less than the national average. Census Division VIII of the Central subregion experienced a negative shift in the first period and a positive shift in the second. Conversely, Census Divisions IV and V of the West subregion experienced a positive net shift in the first period and a negative net shift in the second period. Census Division VI of the Central subregion and Census Division X, Labrador, experienced positive net shifts in both periods. This indicates that these two census divisions increased their population by a greater amount than if they had grown at the national rate. The increase in the population of Labrador was indeed significant.

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[1] The gross share is calculated for a subregion as against a net share for a region (province). The exact difference in the method of calculating net share and gross share is contained in Table 10. The reason for using net share for the region and gross share for the subregion is one of technical calculation.

Since the shifts of the regions are related to the national benchmark and the shifts of the subregions are disaggregated and related also to the national benchmark, the direct relationship between the regions and subregions gives incorrect results if the plus and minus signs are taken into account. The absolute values of the regional shifts are taken into account as a benchmark for subregional shares. For example, if we calculate the net share for Census Division VII, that is, we consider the minus sign, the share of Census Division VII would be 50 per cent of Newfoundland. Actually, this is false. A better result in terms of percentage is obtained if the absolute values are used. Using this methodology the more accurate result of 18 per cent is obtained.

This method, in the opinion of the author, is not a perfect solution since the per cent gross share calculated in this method does not show whether the contribution in terms of share is positive (upward) or negative (downward). For instance, as in the above example the percentage gross shifts is correct, but one cannot tell if the contribution is positive or negative.

TABLE 10

POPULATION NET SHIFTS AND GROSS SHARE, NEWFOUNDLAND, SUBREGIONS, CENSUS DIVISIONS, 1951 to 1961; 1961 to 1971

| Census Division | From 1951 to 1961 Net Shift | From 1951 to 1961 Gross Share* | From 1961 to 1971 Net Shift | From 1961 to 1971 Gross Share* |
|---|---|---|---|---|
| Southeast | | | | |
| C.D. I | - 5,721 | 16.74 | -17,966 | 37.69 |
| C.D. II | - 4,329 | 12.67 | - 2,991 | 6.27 |
| C.D. III | - 3,295 | 9.65 | - 235 | 0.50 |
| C.D. VII | - 6,281 | 18.38 | - 8,632 | 18.11 |
| Central | | | | |
| C.D. VI | + 1,646 | 4,82 | + 674 | 1.41 |
| C.D. VIII | - 3,233 | 9.46 | + 829 | 1.74 |
| West | | | | |
| C.D. IV | + 3,385 | 9.91 | - 2,486 | 5.22 |
| C.D. V | + 2,530 | 7.41 | - 1,461 | 3.10 |
| C.D. IX | - 481 | 1.41 | - 151 | 0.32 |
| Labrador | | | | |
| C.D. X | + 3,266 | 9.56 | +12,247 | 25.70 |
| Newfoundland | -12,517 | * | -20,080 | * |

* The gross share is in terms of percentage and is calculated by taking into account the absolute values of the net shift of a particular census division in relation to the sum total of the net shifts.

Source: Calculated from Dominion Bureau of Statistics, Census of Canada, 1951 (Ottawa: Queen's Printer), General Characteristics, Vol. I, Table 6, Dominion Bureau of Statistics, Census of Canada, 1961 (Ottawa: Queen's Printer), Cat. No. 92-531, Vol. I, Part I, Table 7, and The Financial Post, Survey of Markets (Toronto: Maclean-Hunter, 1971), p. 290.

# CHAPTER VI

## APPLICATION OF THE SHIFT AND SHARE TECHNIQUE TO NEWFOUNDLAND IN TERMS OF URBAN POPULATION

There has been an increase in urbanization in Newfoundland just as there has been in the other provinces. In other words, there has been a movement from rural to urban areas. As shown in Table 11, the Canadian urban population has increased from 63 per cent of the total population in 1961 to 76 per cent in 1971. That is, within a period of only twenty years, the proportion of the population of Canada living in cities, towns and villages of 1,000 or more people has increased by 13 per cent. This trend of urbanization was present even before 1951. "In 1941, one in every two (Canadian) persons lived in an urban centre greater than 1,000. Today, one in every two persons resides in a city of more than 100,000."[1]

Urbanization in Canada is not to the same extent in all provinces. Ontario, Quebec and British Columbia are highly urbanized. In 1971, urbanization in these provinces was 82, 81 and 77 per cent, respectively. The maritime provinces were relatively less urbanized, although the percentage of their population which was urbanized increased over time. Newfoundland also experienced increased urbanization. In 1951, 43 per cent of the population was living in urban centers; 51 per cent in 1961; 57 per cent in 1971.

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[1] T.R. Weir, "Population Changes in Canada, 1867-1967", in Geographical Approaches to Canadian Problems, ed. by R. Louis Gentilcore (Scarborough, Ontario: Prentice-Hall, 1971), p. 17.

TABLE 11

URBAN POPULATION AS A PERCENTAGE OF TOTAL POPULATION, CANADA, REGIONS, 1951, 1961, 1971

| | 1951 | 1961 | 1971 |
|---|---|---|---|
| Newfoundland | 43 | 51 | 57 |
| Maritimes | 47 | 50 | 56 |
| Quebec | 68 | 74 | 81 |
| Ontario | 73 | 77 | 82 |
| Prairies | 45 | 58 | 67 |
| British Columbia | 71 | 73 | 77 |
| Canada | 63 | 70 | 76 |

Source: Calculated from Canadian Council on Rural Development, Rural Canada 1970: Prospects and Problems, Third Report and Review (Ottawa: Canadian Council on Rural Development, 1969), p. iii.

## Shift and Share of the Urban Population in the Provinces

The relative increase in the urbanization of the provinces in relation to the national average as revealed by shift and share analysis is presented in Table 12. From Table 12 it is disclosed that three Maritime provinces - Prince Edward Island, Nova Scotia and New Brunswick - experienced a negative net shift. This implies that the increase in urbanization in these provinces was less than the national average. Newfoundland, on the other hand, had a small positive shift in the first period and a small negative shift in the second period. In Newfoundland, therefore, the increase in urbanization was approximately the same as the Canadian average - a little more or a little less.

Quebec had a negative net shift in both periods, although in the

TABLE 12

SHIFTS IN URBAN POPULATION, PROVINCES,
1951 to 1961; 1961 to 1971

| Provinces | From 1951 to 1961 | | From 1961 to 1971 | |
|---|---|---|---|---|
| | Shift | Share | Shift | Share |
| Newfoundland | + 9,696 | 4 | - 2,795 | 3 |
| Maritimes | -141,361 | 62 | -78,982 | 84 |
| Prince Edward Island | - 1,646 | 1 | n.a. | |
| Nova Scotia | -111,309 | 45 | n.a. | |
| New Brunswick | - 38,096 | 16 | n.a. | |
| Quebec | - 4,608 | 2 | - 8,138 | 9 |
| Ontario | - 38,804 | 16 | - 3,975 | 4 |
| Prairies | +184,452 | 79 | +20,804 | 24 |
| Manitoba | - 44,337 | 18 | n.a. | |
| Saskatchewan | + 34,449 | 15 | n.a. | |
| Alberta | +194,340 | 82 | n.a. | |
| British Columbia | - 5,986 | 3 | +65,958 | 76 |

Note: n.a. means not available.

Source: Calculated from Dominion Bureau of Statistics, Census of Canada, 1961 (Ottawa: Queen's Printer), Cat. No. 92-530, Vol. I, Part I, The Financial Post, Survey of Markets (Toronto: Maclean-Hunter, 1971), p. 55, and Canadian Council on Rural Development, Rural Canada 1970: Prospects and Problems, Third Report and Review (Ottawa: Canadian Council on Rural Development, 1969), p. iii.

second period the negative shift was considerably larger than in the first, which was very small. Ontario also experienced negative shifts in population - in the first period the shift was much larger than in the second. British Columbia, on the other hand, had a small negative shift from 1951 to 1961, implying that the speed of urbanization was very rapid in the period from 1961 onward. The actual number of people who were urbanized was 65,958 persons more than there would have been if British Columbia had urbanized at the national average. The Prairie provinces, as a whole, had positive shifts in both periods, although in the first period the shift was significantly higher than in the second period. Looking individually at the Prairie provinces, Alberta showed the highest increase in urbanization. Saskatchewan had a positive shift, while Manitoba had a negative shift.

## Shift and Share of the Urban Population in Newfoundland's Sub-Regions and Census Divisions

The trend of increased urbanization of Newfoundland is reflected in all its subregions and census divisions. However, the magnitude of increase in urbanization was not the same. (Table 13)

As mentioned in the previous section, Newfoundland had a small positive net shift in the 1951-1961 interval and a small negative shift in the period from 1961 to 1966. However, the subregions and census divisions of Newfoundland experienced a variety in increased urbanization. Census Division I of the Southeast subregion and Census Division V of the West subregion had a negative net shift in both periods, since urbanization in these subregions increased less than the national average. On the other hand, Census Division III of the Southeast subregion, Census Division VIII of the Central subregion, Census Division IX of the West subregion

TABLE 13

ACTUAL AND PERCENTAGE CHANGES IN URBAN POPULATION, NEWFOUNDLAND SUBREGIONS, CENSUS DIVISIONS, 1951 to 1961; 1961 to 1966

| Census Division | From 1951 to 1961 Actual Change | From 1951 to 1961 Per Cent Change | From 1961 to 1971 Actual Change | From 1961 to 1971 Per Cent Change |
|---|---|---|---|---|
| Southeast | | | | |
| C.D. I | 28,771 | 32 | 5,547 | 5 |
| C.D. II | 4,188 | 87 | 1,044 | 12 |
| C.D. III | 5,584 | 12 | 4,537 | 55 |
| C.D. VII | 4,671 | 76 | 202 | 2 |
| Central | | | | |
| C.D. VI | 6,997 | 31 | 6,012 | 21 |
| C.D. VIII | 4,831 | 144 | 5,267 | 65 |
| West | | | | |
| C.D. IV | 6,450 | 159 | 963 | 9 |
| C.D. V | 8,643 | 42 | 2,222 | 8 |
| C.D. IX | 1,625 | 118 | 491 | 16 |
| Labrador | | | | |
| C.D. X | 5,901 | . | 8,384 | 142 |
| Newfoundland | 77,661 | 50 | 34,669 | 15 |

Source: Based upon data from Dominion Bureau of Statistics, Census of Canada 1961 (Ottawa: Queen's Printer), Cat. No. 92-536, Table 13, and Dominion Bureau of Statistics Census of Canada 1966 (Ottawa: Queen's Printer), Cat. No. 92-608, Table 13.

and the Labrador subregion experienced urbanization more than the national average as indicated by positive shifts in both periods. Census Divisions II, VII and IV of the Southeast and West subregions respectively, had a positive shift in the first period and a negative shift in the second. Conversely, Census Division VI of the Central subregion had a negative shift in the first and a positive shift in the second period. (Table 14)

TABLE 14

URBAN POPULATION NET SHIFTS AND GROSS SHARE, NEWFOUNDLAND, FROM 1951 to 1961; FROM 1961 to 1966

| Census Division | From 1951 to 1961 Net Shift | From 1951 to 1961 Gross Share* | From 1961 to 1966 Net Shift | From 1961 to 1966 Gross Share* |
|---|---|---|---|---|
| Southeast | | | | |
| C.D. I | -10,479 | 28.29 | -13,265 | 38.68 |
| C.D. II | + 2,043 | 5.52 | - 391 | 1.14 |
| C.D. III | + 4,425 | 11.95 | + 3,225 | 9.40 |
| C.D. VII | + 1,979 | 5.30 | - 1,518 | 4.43 |
| Central | | | | |
| C.D. VI | - 2,833 | 7.65 | + 1,334 | 3.89 |
| C.D. VIII | + 3,351 | 9.05 | + 3,960 | 11.55 |
| West | | | | |
| C.D. IV | + 4,662 | 12.59 | - 714 | 2.08 |
| C.D. V | - 401 | 1.08 | - 2,434 | 7.10 |
| C.D. IX | + 1,018 | 2.75 | + 12 | 0.03 |
| Labrador | | | | |
| C.D. X | + 5,901 | 15.93 | + 7,442 | 21.70 |
| Newfoundland | + 9,696 | * | - 2,350 | * |

* See footnote to Table 10.

Source: Calculated from Dominion Bureau of Statistics, Census of Canada, 1961 (Ottawa: Queen's Printer), Cat. No. 92-536, Table 13, and Dominion Bureau of Statistics, Census of Canada, 1966 (Ottawa: Queen's Printer), Cat. No. 92-608, Table 13.

# CHAPTER VII

## APPLICATION OF THE SHIFT AND SHARE TECHNIQUE TO NEWFOUNDLAND IN TERMS OF RURAL FARM POPULATION

This chapter focuses upon the rural farm population in order to provide a more complete understanding of population change.[1]

The rural farm population declined in Canada as a whole, as well as in all the individual provinces from 1951 to 1966. (Table 15) In British Columbia the rural farm population showed a decline of 32,379 or 29 per cent from 1951 to 1961, and a slight increase of 7,657 or 10 per cent from 1961 to 1966. However, the farm population had a decline of 24,722 or 23 per cent from 1951 to 1966. In other words the long-term trend in British Columbia's rural farm population indicates an overall decline.

In the Atlantic provinces, Newfoundland's decline in rural farm population was 41 per cent from 1951 to 1961 and 7 per cent from 1961 to 1966. New Brunswick, Nova Scotia and Prince Edward Island had declines of 57 per cent, 49 per cent and 26 per cent from 1951 to 1961 and 17 per cent, 20 per cent and 11 per cent from 1961 to 1966, respectively. In Quebec 202,084 persons, that is 26 per cent of the farm population moved off the farms during the earlier years as against 71,229 persons, or a 13

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[1] The chapter on rural farm population is used to represent the rural people. The rural farm population seems to be most representative in terms of their rural association both by profession and in time spent in the rural areas. For example, if a miner moves, he moves to find a job and is not associated with the real problems of rural areas. This is also true of the fisherman and the logger but to a lesser extent.

TABLE 15

ACTUAL AND PERCENTAGE CHANGES IN RURAL FARM POPULATION, CANADA, PROVINCES, 1951 to 1961; 1961 to 1966

| Province | Rural Farm Population | | | From 1951 to 1961 | | From 1961 to 1966 | |
|---|---|---|---|---|---|---|---|
| | 1951 | 1961 | 1966 | Actual Change | Per Cent Change | Actual Change | Per Cent Change |
| Newfoundland | 15,509 | 9,077 | 8,455 | - 6,432 | -41 | - 622 | - 7 |
| Prince Edward Island | 46,757 | 34,514 | 30,841 | - 12,243 | -26 | - 3,673 | -11 |
| Nova Scotia | 112,135 | 56,832 | 45,251 | - 55,303 | -49 | - 11,581 | -20 |
| New Brunswick | 145,771 | 62,265 | 51,504 | - 83,506 | -57 | - 10,761 | -17 |
| Quebec | 766,910 | 564,826 | 493,567 | -202,084 | -26 | - 71,229 | -13 |
| Ontario | 678,043 | 505,699 | 481,695 | -172,344 | -25 | - 24,004 | - 5 |
| Manitoba | 214,435 | 171,472 | 159,872 | - 42,963 | -20 | - 11,600 | - 7 |
| Saskatchewan | 398,279 | 304,672 | 279,642 | - 93,607 | -24 | - 25,030 | - 8 |
| Alberta | 339,955 | 285,823 | 277,598 | - 54,102 | -16 | - 8,225 | - 3 |
| British Columbia | 109,919 | 77,540 | 85,197 | - 32,379 | -29 | 7,657 | 10 |
| Canada | 2,827,683 | 2,072,720 | 1,913,652 | -754,963 | -27 | -159,068 | - 8 |

Source: Based upon data from Dominion Bureau of Statistics, Census of Canada, 1961 (Ottawa: Queen's Printer), Cat. No. 92-536, Table 13, and Dominion Bureau of Statistics, Census of Canada, 1966 (Ottawa: Queen's Printer), Cat. No. 92-608, Table 13.

per cent change in the later years. The farm population in Ontario declined by 172,344 persons, that is by 25 per cent from 1951 to 1961 and by 24,004 persons, that is by 5 per cent from 1961 to 1966.

## Shift and Share of Rural Farm Population in the Provinces

The results of an application of shift and share analysis to rural farm population data are presented in Table 16. Only two provinces, Nova Scotia and New Brunswick, had negative net shifts from 1951 to 1961 as well as from 1961 to 1966 - although their share of the negative shifts was much smaller in the latter years. This implies that the rural farm population in these provinces declined more than the national average. However, the relative decline in the earlier years was greater than in the more recent years. Newfoundland and British Columbia had negative shifts from 1951 to 1961 and positive shifts from 1961 to 1966. Newfoundland generally reflected the national average. It had a small negative shift (2,292, for a share of 3.04) in the earlier years and a very small positive shift (74, for a share of 0.17) in the latter years. Quebec, Prince Edward Island and Saskatchewan had positive net shifts in the earlier years and a negative net shift in the later years. On the contrary, the rural farm population of Ontario, Manitoba and Alberta declined less than the national average - they had a positive net shift.

## Shift and Share of the Rural Farm Population in Newfoundland's Subregions and Census Divisions

The relative changes in the rural farm population of Newfoundland's subregions and census divisions, as revealed by shift and share analysis, is preceeded by a brief discussion of the actual and percentage changes.

TABLE 16

SHIFTS IN RURAL FARM POPULATION PROVINCES,

1951 to 1961, 1961 to 1966

| Province | From 1951 to 1961 Net Shift | From 1951 to 1961 Share | From 1961 to 1966 Net Shift | From 1961 to 1966 Share |
|---|---|---|---|---|
| Newfoundland | - 2,292 | 3.04 | + 74 | 0.17 |
| Prince Edward Island | + 240 | 0.32 | - 1,025 | 2.34 |
| Nova Scotia | -25,365 | 33.70 | - 7,220 | 16.50 |
| New Brunswick | -44,587 | 59.23 | - 5,983 | 13.67 |
| Quebec | + 2,673 | 3.55 | -27,883 | 63.72 |
| Ontario | + 8,686 | 11.54 | +14,805 | 33.84 |
| Manitoba | +14,288 | 18.98 | + 1,559 | 3.56 |
| Saskatchewan | +12,729 | 16.91 | - 1,649 | 3.77 |
| Alberta | +36,654 | 48.70 | +13,710 | 31.33 |
| British Columbia | - 3,032 | 4.03 | +13,607 | 31.10 |

Source: Calculated from information provided in Table 15.

As shown in Table 17, in Newfoundland there has been an actual decline of 6,432 (41 per cent) in rural farm population from 1951 to 1961 and by 622 (7 per cent) from 1961 to 1966. There has been an actual decline in rural farm population in Census Divisions III, IV, V and VIII. In Census Divisions II, VII, IX, and X, the rural farm population increased from 1951 to 1961 and declined from 1961 to 1966. On the contrary, Census Divisions I and VI declined in the earlier years and increased in the later years.

The relative decline in the rural farm population indicated by shift and share analysis is presented in Table 18. Newfoundland indicated

TABLE 17

ACTUAL AND PERCENTAGE CHANGES IN RURAL FARM POPULATION, NEWFOUNDLAND, SUBREGIONS, CENSUS DIVISIONS, 1951 to 1961, 1961 to 1966

| Census Division | From 1951 to 1961 Actual Change | From 1951 to 1961 Per Cent Change | From 1961 to 1966 Actual Change | From 1961 to 1966 Per Cent Change |
|---|---|---|---|---|
| Southeast | | | | |
| C.D. I | - 2,976 | - 42 | 794 | 19.0 |
| C.D. II | 473 | 195 | - 118 | -16.0 |
| C.D. III | - 51 | - 55 | - 7 | -17.0 |
| C.D. VII | 334 | 72 | - 284 | -36.0 |
| Central | | | | |
| C.D. VI | - 11 | - 23 | 24 | 65.0 |
| C.D. VIII | - 43 | - 7 | - 4 | - 0.7 |
| West | | | | |
| C.D. IV | - 3,901 | - 71 | - 220 | -14.0 |
| C.D. V | - 474 | - 43 | - 358 | -57.0 |
| C.D. IX | 179 | 52 | - 413 | -79.0 |
| Labrador | | | | |
| C.D. X | 38 | . | - 36 | -95.0 |
| Newfoundland | - 6,432 | - 41 | - 622 | - 7.0 |

Source: Based upon data from Dominion Bureau of Statistics, Census of Canada, 1961 (Ottawa: Queen's Printer), Cat. No. 92-536, Table 13, and Dominion Bureau of Statistics, Census of Canada, 1966 (Ottawa: Queen's Printer), Cat. No. 92-608.

the national trend in the relative decline of the rural farm population, as indicated by a small negative net shift in the earlier years and a small positive shift in the latter years. On the other hand, Census Divisions VI and VIII had a positive net shift throughout the years under discussion. On the contrary, Census Divisions III, IV and V had negative net shifts implying that in these census divisions the farm population declined more than the national average. Census Divisions II, VII, IX and X had a positive net shift in the earlier years and a negative net shift in the latter

years. Conversely, Census Division I had a negative net shift in the former years and a positive net shift in the latter years.

TABLE 18

RURAL FARM POPULATION NET SHIFTS AND GROSS SHIFTS, NEWFOUNDLAND, SUBREGIONS, CENSUS DIVISIONS, 1951 to 1961; 1961 to 1966

| Census Division | From 1951 to 1961 | | From 1961 to 1966 | |
|---|---|---|---|---|
| | Net Shift | Gross Share | Net Shift | Gross Share |
| Southeast | | | | |
| C.D. I | - 1,070 | 20.81 | + 1,113 | 48.67 |
| C.D. II | + 537 | 10.44 | - 64 | 2.80 |
| C.D. III | - 27 | 0.51 | - 4 | 0.17 |
| C.D. VII | + 458 | 8.91 | - 223 | 9.75 |
| Central | | | | |
| C.D. VI | + 1 | 0.02 | + 26 | 1.14 |
| C.D. VIII | + 119 | 2.31 | + 39 | 1.71 |
| West | | | | |
| C.D. IV | - 2,442 | 47.49 | - 100 | 4.38 |
| C.D. V | - 180 | 3.50 | - 310 | 13.55 |
| C.D. IX | + 270 | 5.25 | - 374 | 16.35 |
| Labrador | | | | |
| C.D. X | + 38 | 0.74 | - 34 | 1.49 |

Source: Calculated from information in Table 17.

# CHAPTER VIII

## APPLICATION OF THE SHIFT AND SHARE TECHNIQUE TO NEWFOUNDLAND IN TERMS OF TOTAL INCOME

In order to obtain a more complete and indicative appraisal of Canadian differential growth in general, and the magnitude of growth within Newfoundland in particular, this chapter undertakes a study of income. It provides an understanding of the disparity in growth in terms of income, especially when provincial or regional growth is compared with the Canadian average. Such an examination is helpful in order to identify the sections of the country that have grown less than the Canadian average and those that have grown more. While knowledge of disparate incomes in Canada may create a feeling of discontent among the lower income areas, such information is essential for policy formulation and action to reduce the disparity. It is clear that substantial divergencies in incomes and in economic activity exist in the Canadian nation. The inequalities as indicated by per capita income are shown in Table 19. These disparaties that exist "at a time when the bulk of Canadian enjoy one of the highest standards of living in the world is a disgrace".[1]

During the last twenty years, in terms of actual disposable income, Ontario, Quebec, Alberta and British Columbia have recorded the largest increases amongst the Canadian Provinces. (Table 20)

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[1] The Economic Council of Canada, "The Problem of Poverty", in Economics: Contemporary Issues in Canada, ed, by D.A.L. Auld (Toronto: Holt, Rinehart and Winston, 1972), p. 41.

TABLE 19.

PERSONAL DISPOSABLE INCOME PER PERSON, CANADA, PROVINCES, CURRENT DOLLARS 1951, 1961, 1970

| Province | Actual 1951 | Actual 1961 | Actual 1970 |
|---|---|---|---|
| Newfoundland | 545 | 887 | 1,520 |
| Prince Edward Island | 589 | 918 | 1,710 |
| Nova Scotia | 765 | 1,129 | 2,070 |
| New Brunswick | 709 | 998 | 1,920 |
| Quebec | 872 | 1,272 | 2,330 |
| Ontario | 1,223 | 1,654 | 2,820 |
| Manitoba | 1,074 | 1,381 | 2,490 |
| Saskatchewan | 1,279 | 1,124 | 2,020 |
| Alberta | 1,241 | 1,474 | 2,520 |
| British Columbia | 1,234 | 1,656 | 2,630 |
| Canada | 1,054 | 1,429 | 2,500 |

Source: Dominion Bureau of Statistics, National Accounts Income and Expenditures 1927-61 (Ottawa: Queen's Printer), Cat. No. 13-201, Dominion Bureau of Statistics, Census of Canada, 1961 (Ottawa: Queen's Printer), Cat. No. 92-530; Vol. II, Part I, and The Financial Post, Survey of Markets (Toronto: Maclean-Hunter, 1971), p. 55.

The largest increase occurred in Ontario, followed by Quebec, British Columbia and Alberta. The smallest increase in income occurred in Prince Edward Island, during the period from 1961 to 1970. However, in the 1951 to 1961 period, Saskatchewan actually recorded a decrease in income. The next higher increase in income, after Prince Edward Island, occurred in Newfoundland.

The picture is not similar though, when the percentage changes in income are considered. In the 1951 to 1961 period, Newfoundland recorded the highest percentage increase, followed by Quebec, British Columbia, Nova

TABLE 20

ACTUAL AND PERCENTAGE CHANGES IN PERSONAL DISPOSABLE INCOME, CANADA, PROVINCES, 1951 to 1961; 1961 to 1970
(Income in Millions of Current Dollars)

| Province | From 1951 to 1961 | | From 1961 to 1970 | |
|---|---|---|---|---|
| | Actual Change | Per Cent Change | Actual Change | Per Cent Change |
| Newfoundland | 209 | 106 | 381 | 94 |
| Prince Edward Island | 38 | 66 | 92 | 96 |
| Nova Scotia | 410 | 86 | 758 | 91 |
| New Brunswick | 231 | 63 | 604 | 101 |
| Quebec | 3,154 | 89 | 7,352 | 110 |
| Ontario | 4,691 | 83 | 11,260 | 109 |
| Manitoba | 439 | 53 | 1,171 | 92 |
| Saskatchewan | - 24 | - 2 | 863 | 83 |
| Alberta | 797 | 68 | 2,085 | 106 |
| British Columbia | 1,260 | 88 | 2,943 | 109 |
| Canada | 11,149 | 76 | 27,689 | 107 |

Source: 1951 and 1961 data taken from Dominion Bureau of Statistics, National Accounts, Income and Expenditures, 1927-67 (Ottawa: Queen's Printer), Cat. No. 13-201.

1970 data taken from The Financial Post, Survey of Markets (Toronto: Maclean-Hunter, 1971), p. 55.

Scotia and Ontario. In the 1961 to 1970 period, the highest percentage increases were in Quebec, Ontario, British Columbia and Alberta. The lowest percentage increase occurred in Saskatchewan, followed by Nova Scotia, Manitoba and Newfoundland.

## Shift and Share of Income in the Provinces

When the shift and share technique is applied to disposable income

the results are as obtained in Table 21.

TABLE 21

SHIFTS IN PERSONAL DISPOSABLE INCOME, PROVINCES
1951 to 1961; 1961 to 1970
(Shifts in Millions of Current Dollars)

| | From 1951 to 1961 | | From 1961 to 1970 | |
|---|---|---|---|---|
| Provinces | Net Shift | Share | Net Shift | Share |
| Newfoundland | + 60.17 | 4.97 | - 52.54 | 7.74 |
| Prince Edward Island | - 5.82 | 0.53 | - 10.61 | 1.56 |
| Nova Scotia | + 48.87 | 4.04 | -131.26 | 19.34 |
| New Brunswick | - 45.52 | 4.10 | - 34.09 | 5.02 |
| Quebec | +483.29 | 39.94 | +202.62 | 40.51 |
| Ontario | +444.30 | 36.72 | +238.54 | 47.61 |
| Manitoba | -191.10 | 17.28 | -188.54 | 27.78 |
| Saskatchewan | -779.86 | 70.51 | -248.58 | 36.62 |
| Alberta | - 83.92 | 7.59 | - 13.11 | 1.93 |
| British Columbia | +173.58 | 14.35 | + 59.30 | 11.86 |

Source: Calculated from information in Table 19.

From Table 21, the preponderant role of Quebec and Ontario in the net upward income shifts (i.e. income growth greater than the Canadian average) is rather clear in both period one and period two. In period one their share of the positive net shifts was 40 per cent and 37 per cent respectively. In the following period, Ontario had 48 per cent of the positive net shifts while Quebec accounted for 41 per cent. Most of the downward shifts in total income went to Saskatchewan in both period one and period two - the downward shift being greater in the first period than in the second. It shared in 71 per cent of the negative net shifts in period one as compared with 37 per cent in period two.

Newfoundland had a positive net shift in income of $60.17 million in period one. This was only 5 per cent of the positive net shifts in income experienced in all of Canada. Newfoundland's income was $60.17 million more than it would have been if it had increased at the national average. This relative growth, however, was not sustained in the second period. From 1961 to 1970, Newfoundland had a negative net income shift of $52.24 million. This accounted for almost 8 per cent of the Canadian negative net income shifts. Newfoundland's performance was below the Canadian average, but it was not as adverse as the performance of Saskatchewan, Manitoba or Nova Scotia.

## Shift and Share of Income in Newfoundland's Subregions and Census Divisions

The actual disposable income of Newfoundland increased by $381 million, that is, an increase of 94 per cent from 1961 to 1971. (Table 22)[1] The per capita income increased by $633, that is by 71 per cent from $887 in 1961 to $1,520 in 1970. (Table 23) While total income in all subregions and census divisions of Newfoundland did not grow uniformly, all areas experienced an increase. The largest actual increase occurred in Census Division I - $143.4 million; the largest percentage increase occurred in Census Division X - 318 per cent. In contrast, the smallest increase, $15.4 million, together with the smallest percentage increase, 67 per cent, occurred in Census Division IV.

There is diversity in the average levels of living among the various subregions and census divisions of Newfoundland as revealed by per capita income in Table 23.

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[1] Information was unavailable for an earlier period.

TABLE 22

ACTUAL AND PERCENTAGE CHANGES IN PERSONAL DISPOSABLE INCOME, NEWFOUNDLAND, SUBREGIONS, CENSUS DIVISIONS, 1961 to 1970
(Millions of Current Dollars)

| Census Division | | Actual Change | Per Cent Change |
|---|---|---|---|
| Southeast | | | |
| C.D. | I | 143.4 | 86 |
| C.D. | II | 17.7 | 143 |
| C.D. | III | 17.8 | 145 |
| C.D. | VII | 26.4 | 151 |
| Central | | | |
| C.D. | VI | 47.8 | 99 |
| C.D. | VIII | 40.5 | 215 |
| West | | | |
| C.D. | IV | 15.4 | 67 |
| C.D. | V | 36.6 | 77 |
| C.D. | IX | 19.3 | 208 |
| Labrador | | | |
| C.D. | X | 51.5 | 318 |
| Newfoundland | | 381.0 | 94 |

Source: Calculated from The Financial Post, Survey of Markets (Toronto: Mclean-Hunter, 1962), p. 32, and Ibid., 1971, p. 290.

TABLE 23

PERSONAL DISPOSABLE INCOME PER CAPITA, ACTUAL AND PERCENTAGE CHANGES, NEWFOUNDLAND, SUBREGIONS, CENSUS DIVISIONS, 1961 to 1970, IN CURRENT DOLLARS

| Census Division | Per Capita Income 1961 | 1970 | Actual Change | Per Cent Change |
|---|---|---|---|---|
| Southeast | | | | |
| C.D. I | 880 | 1,510 | 630 | 72 |
| C.D. II | 500 | 1,140 | 640 | 128 |
| C.D. III | 530 | 1,110 | 580 | 109 |
| C.D. VII | 440 | 1,130 | 690 | 157 |
| Central | | | | |
| C.D. VI | 1,270 | 2,120 | 850 | 67 |
| C.D. VIII | 420 | 1,110 | 690 | 164 |
| West | | | | |
| C.D. IV | 950 | 1,470 | 520 | 55 |
| C.D. V | 1,220 | 1,870 | 650 | 53 |
| C.D. IX | 430 | 1,130 | 700 | 163 |
| Labrador | | | | |
| C.D. X | 1,200 | 2,490 | 1,290 | 108 |
| Newfoundland | 887 | 1,520 | 633 | 71 |

Source: The Financial Post, Survey of Markets (Toronto: Maclean-Hunter, 1961), p. 32 and Ibid., 1971, p. 290.

While Newfoundland experienced an increase in actual income from 1961 to 1970, the province's relative increase was less than the Canadian average as indicated by an application of the shift and share technique. (Table 24) Newfoundland had a negative income net shift of $52.54 million. However, while Newfoundland's income increased less than the Canadian average, six of the ten census divisions had positive net shifts. They had, in other words, a relative increase in income greater than the Newfoundland (and Canadian) average. All of the Southeast subregion, with the exception of Census Division I had positive net income shifts. Census Division I had

the greatest negative shift, accounting for a gross share of 24 per cent of Newfoundland's negative income net shifts. In the Central subregion, Census Division VI experienced a negative shift, while Census Division VIII had a positive shift. Census Division IX had the only positive shift in the West subregion, whilst Census Divisions IV and V had negative shifts. Census Division X experienced the greatest relative increase in income as compared to all the other census divisions. It had the largest positive net shift ($34.2 million) with a gross share of 24 per cent of Newfoundland's positive shifts.

TABLE 24

SHIFTS IN PERSONAL DISPOSABLE INCOME, NEWFOUNDLAND, CENSUS DIVISIONS, SUBREGIONS, 1961 to 1970
(Shifts in Millions of Current Dollars)

| Census Division | | Net Shift | Share |
|---|---|---|---|
| Southeast | | | |
| C.D. | I | -34.20 | 24.07 |
| C.D. | II | + 4.40 | 3.10 |
| C.D. | III | + 4.60 | 3.24 |
| C.D. | VII | + 7.70 | 5.42 |
| Central | | | |
| C.D. | VI | - 3.80 | 2.67 |
| C.D. | VIII | +20.40 | 14.36 |
| West | | | |
| C.D. | IV | - 9.10 | 6.40 |
| C.D. | V | -14.40 | 10.13 |
| C.D. | IX | + 9.30 | 6.50 |
| Labrador | | | |
| C.D. | X | +34.20 | 24.07 |
| Newfoundland | | -52.54 | 100.00 |

Source: Calculated from The Financial Post, Survey of Markets (Toronto: Maclean-Hunter, 1962), p. 32, and Ibid., 1971, p. 290.

# CHAPTER IX

## APPLICATION OF THE SHIFT AND SHARE TECHNIQUE TO NEWFOUNDLAND IN TERMS OF EMPLOYMENT

Employment by sectors in Canada as a whole, and in Newfoundland in particular, is discussed in the first few pages of the chapter. This is followed by Newfoundland's situation in comparison to the national performance, through the application of the shift and share technique.

Canada's overall employment growth has been approximately 30 per cent from 1951 to 1961, as well as from 1961 to 1970. Of the ten industrial sectors in Appendix II, Table 1, only three sectors, that is agriculture, forestry and fishing have experienced a nationwide actual decline in employment. Moreover, each of these three sectors had a greater actual decline from 1961 to 1970 than from 1951 to 1961. During the former years, the largest actual decline was felt by agriculture with an employment decline of 17,113. In the latter years, however, the greatest actual drop in employment was displayed by forestry - a decline of 38,728 forestry workers. On the other hand, the largest increase occurred in the service and administration sector: a gain of 594,919 workers from 1951 to 1961 and 773,349 workers from 1961 to 1970. Large increases also occurred in employment in the trade and manufacturing sectors.

There has been an overall increase in employment in Newfoundland, just as there has been in Canada. (Compare Appendix II, Table 1 and Table 2) However, the percentage increase in employment in Newfoundland has been less than the Canadian average. Newfoundland's employment increased by 21 per cent from 1951 to 1961, as compared with a 29 per cent increase in

Canadian employment during the same years. In the more recent years, Newfoundland's performance was less promising. The province's employment increase was 10 per cent as against the national increase of 30 per cent.

Forestry and agriculture experienced a decrease in employment in Newfoundland similar to the national experience. Employment in construction and fishing increased from 1951 to 1961, but experienced a slight decline in recent years. This is in comparison with the decline in construction and the increase in fishing on the national level. Manufacturing experienced a decline in employment during the fifties, while a small increase occurred during the sixties. Similar to Canada, there has been an increase in employment both during the fifties and sixties in service and administration, trade, finance, transportation, and mining.

## Shift and Share in Employment From 1951 to 1961

### Net Shift, Differential Shift, Proportionality Shift

It is clear from the net shifts in Table 25 that all provinces have not shared to the same extent in the nation's increased employment. All of the relative increases in employment have been confined to Ontario, Alberta, British Columbia and to a much lesser extent to Saskatchewan. On the other hand, eastern Canada - Quebec and the Atlantic provinces, together with Manitoba in the Prairie region had negative net employment shifts. In other words, although all provinces without exception, had increases in employment, four provinces had relatively greater increases in employment than the Canadian average, while the others had increases less than the national average.

The net shifts in employment were generated by the differential and the proportionality effects.[1] Newfoundland and New Brunswick had a negative

[1] The detailed explanation, theoretical background and relationships of net shift to the differential and proportionality shifts are discussed on pages 30 to 47 inclusive.

net employment shift resulting from both a negative differential shift and a negative proportionality shift. The differential shift resulting from unfavorable access to inputs and markets of these provinces reinforced their proportionality effect derived from unfavorable mix effects.

TABLE 25

NET SHIFTS, PROPORTIONALITY SHIFTS AND DIFFERENTIAL SHIFTS IN EMPLOYMENT, PROVINCES, 1951 to 1961

| Provinces | Net Shift | Share | Proportionality Shift | Differential Shift |
|---|---|---|---|---|
| Newfoundland | - 7,163 | 8 | - 3,806 | - 3,367 |
| Prince Edward Island | - 2,226 | 3 | + 192 | - 2,418 |
| Nova Scotia | -29,765 | 34 | + 2,450 | -32,215 |
| New Brunswick | -21,001 | 24 | - 6,067 | -14,934 |
| Quebec | -13,605 | 16 | -15,259 | + 1,654 |
| Ontario | +13,350 | 11 | - 9,599 | +22,949 |
| Manitoba | -13,663 | 16 | -35,488 | +21,825 |
| Saskatchewan | + 2,285 | 3 | + 9,123 | - 6,838 |
| Alberta | +63,783 | 52 | + 9,835 | +53,948 |
| British Columbia | +10,440 | 8 | + 2,868 | + 7,572 |

Source: Calculated from Dominion Bureau of Statistics, Census of Canada, 1951 (Ottawa: Queen's Printer), Vol. X, Part II, General Review, Table 76, and Dominion Bureau of Statistics, Census of Canada, 1961 (Ottawa: Queen's Printer), Cat. No. 94-542, Vol. III, Part III, Table 31.

The opposite of the Newfoundland and New Brunswick situation was exemplified by Alberta and British Columbia. Their positive net shifts were derived from positive differential shifts, as well as positive proportionality shifts. Their favorable access characteristics and favorable industry mix combined to give them increased employment, greater than the Canadian average.

Ontario's net shift was positive with a positive differential shift and a negative proportionality shift - the positive differential shift overwhelmed the negative proportionality shift.

Quebec and Manitoba both had positive differential shifts which were not large enough to out-weigh the negative proportionality shifts. That is, although they have favorable access characteristics, their industrial composition is dominated by slow-growth sectors so that their increase in employment was less than the national average. In other words, they had a negative net shift.

Prince Edward Island and Nova Scotia have a negative net shift. Their positive proportionality effects are less than their negative differential effects.

Saskatchewan, on the other hand, had a small positive proportionality shift large enough to out-weigh the negative differential shift - hence it had a small positive net shift.

Newfoundland had a negative proportionality shift as well as a negative differential shift. The province had a poor industry mix as well as poor access attributes.

Components of the Newfoundland Differential Shift

The components of the differential shift help to explain which particular industries are suffering from unfavorable access. Table 26 provides the components at the one-digit level for the differential shift, as well as each sector's gross share. Of the ten sectors under discussion, six have positive differential shifts: agriculture, fishing, mining, construction, transportation and finance. The fishing sector had the highest differential shift of all the ten sectors indicating an increase in employment relative to the Newfoundland and Canadian average. The increased numbers

TABLE 26

EMPLOYMENT COMPONENTS OF THE DIFFERENTIAL SHIFT, PER CENT GROSS SHARE, NEWFOUNDLAND, 1951–1961

| Major Sectors | Differential Shift | Gross Share* |
|---|---|---|
| Agriculture | + 47 | 0.26 |
| Forestry | - 2,216 | 12.23 |
| Fishing | + 4,428 | 25.00 |
| Mining | + 54 | 0.30 |
| Manufacturing | - 2,798 | 15.54 |
| Construction | + 623 | 3.44 |
| Transportion | + 1,672 | 9.23 |
| Trade | - 1,136 | 6.27 |
| Finance | + 454 | 2.51 |
| Service & Administration | - 4,585 | 25.31 |
| Total Differential Shift | - 3,367 | * |

* The explanation of gross share is contained in the footnote to Table 10.

Source: Calculated from Dominion Bureau of Statistics, Census of Canada, 1951 (Ottawa: Queen's Printer), Vol. IX, Part II, General Review, Table 76, and Dominion Bureau of Statistics, Census of Canada, 1961 (Ottawa: Queen's Printer), Cat. No. 94-542, Vol. III, Part III, Table 31.

of employment in the fishery was caused by the high level of unemployment in the Newfoundland economy and the reverting of men to the fishery, even though these men remained seriously underemployed.[1] The underemployment in the fishery is apparent from the decline in the total quantity of fish

[1] Atlantic Development Council, A Strategy for the Economic Development of the Atlantic Region, 1971–1981, Fredericton, 1971, p. 57.

landings despite the increased employment.[1] Thus, although the fishery increased in employment relative to other industries, the industry itself did not improve as indicated by the positive differential shift in employment.

The combined positive differential shifts in fishing, mining, construction and agriculture were smaller than the overall negative shifts in service and administration, manufacturing, forestry and trade. The positive differential shifts were less than the negative differential shifts, resulting in a negative overall differential shift of 3,357 in Newfoundland's employment.

The Components of the Newfoundland Proportionality Shift

In addition to the differential shift discussed above, the residual of the negative net shift in Newfoundland was the result of a negative proportionality shift. In other words, besides locational disadvantages in some industries, Newfoundland's relatively slow increase in employment was also due to a poor industrial mix. Newfoundland had a negative proportionality shift of 3,806, in addition to a negative differential shift of 3,367. The nature and details of the poor composition of the industrial mix resulting from concentration in slowly growing industries is analyzed in this section with the help of the components of the proportionality shift presented in Table 27. There has been heavy dependence on the slowly growing sectors of fishing and forestry as compared with Canada. In Newfoundland the fishing and forestry sectors formed 19 per cent and 21 per cent of the components of the proportionality shift as against 3 and 5 per cent respectively, in Canada.

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[1] Landings declined from 551,960 thousand pounds in 1952 to 503,079 thousand pounds in 1961. Source: Dominion Bureau of Statistics, Fisheries Statistics of Canada, No. 24-201.

TABLE 27

COMPONENTS OF EMPLOYMENT PROPORTIONALITY SHIFT, PER CENT GROSS SHARE, CANADA, NEWFOUNDLAND, 1951 to 1961

| | Canada | | Newfoundland | |
|---|---|---|---|---|
| Major Sectors | Shift | Gross Share | Shift | Gross Share |
| Agriculture | - 55,890 | 6.26 | - 263 | 1.24 |
| Forestry | - 45,131 | 5.05 | - 3,936 | 18.60 |
| Fishing | - 24,016 | 2.69 | - 4,380 | 20.70 |
| Mining | - 13,594 | 1.52 | - 487 | 2.30 |
| Manufacturing | -295,059 | 33.03 | - 3,114 | 14.72 |
| Construction | - 12,981 | 1.45 | - 301 | 1.42 |
| Transportation | + 12,901 | 1.44 | + 289 | 1.37 |
| Trade | + 78,975 | 8.84 | + 1,532 | 7.24 |
| Finance | + 39,592 | 4.43 | + 169 | 0.80 |
| Service and Administration | +315,210 | 35.28 | + 6,687 | 31.61 |
| Rapid-Growth | +446,678 | 50.00 | + 8,677 | 41.02 |
| Slow-Growth | -446,671 | 49.99 | -12,481 | 58.98 |
| | | = 1.00 | | = 0.6952 |
| Rapid-Growth - Slow-Growth Difference | + 7 | | - 3,804 | |

Source: Adapted from Appendix II, Table 3.

Besides the fishery and forestry sectors, even manufacturing in Newfoundland was composed of slowly growing industries. The extent of heavy dependence on the above mentioned industries and others can be realized by the ratio of the rapid growing to the slowly growing industries - 0.695.

A Note on Methodology

It has already been suggested that the simplest way to determine the magnitude of the proportionality shift is to find the algebraic difference between the net shift and the differential shift. However this method, while very useful, does not disclose the components of the proportionality effect. Yet, this can be accomplished by employing a weighing system "based upon the degree of specialization in each sector by each (province) and the rate of employment growth for each sector".[1]

The details of the calculation of the components are given in Appendix II, Table 3, and a summary of the calculations is shown in Table 27. The methodology to arrive at these findings is as follows:
Step one is to find Canada's percentage change in employment for each industry by simply finding the algebraic difference between the percentage change in total employment and the percentage change in each sector. From there, one can proceed directly to calculating each industry's contribution to the differential shift. To do this, multiply each sector's employment in the base year by the differential Canadian percentage change for that sector. The result is that sector's positive or negative contribution to the proportionality shift. For example, from Appendix II, Table 3, multiply Canada's differential percentage change in agriculture (-0.4178) by agricultural employment in Newfoundland in 1951 (629), to get (-263), or agriculture's contribution to the province's proportionality shift.

Shift and Share in Employment from 1961 to 1970

Net Shift, Differential Shift, Proportionality Shift

Although all provinces shared in the increased employment, the

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[1] Dunn, Southern Economic Development, p. 55. Word in brackets is mine.

relative share in the increased employment was significantly greater in Ontario, and to a lesser extent in British Columbia from 1961 to 1970 as compared with the previous years. (Compare Tables 25 and 28) This implies

TABLE 28

NET SHIFT, PROPORTIONALITY SHIFT, DIFFERENTIAL SHIFT IN EMPLOYMENT, PROVINCES, 1961 to 1970

| Provinces | Net Shift | Share | Proportionality Shift | Differential Shift |
|---|---|---|---|---|
| Newfoundland | - 20,005 | 9 | -11,452 | - 8,553 |
| Prince Edward Island | - 4,460 | 2 | - 1,315 | - 3,145 |
| Nova Scotia | - 53,016 | 23 | - 656 | - 52,360 |
| New Brunswick | - 29,647 | 13 | - 5,238 | - 24,409 |
| Quebec | - 56,310 | 24 | - 3,731 | - 52,579 |
| Ontario | +172,553 | 72 | +26,589 | +145,964 |
| Manitoba | - 27,707 | 12 | + 2,679 | - 30,386 |
| Saskatchewan | - 41,303 | 18 | + 1,458 | - 42,761 |
| Alberta | + 28,372 | 12 | + 318 | + 28,045 |
| British Columbia | + 39,918 | 17 | - 5,150 | + 45,068 |

Source: Calculated from Dominion Bureau of Statistics, Census of Canada, 1961 (Ottawa: Queen's Printer), Cat. No. 94,542, Vol. III, Part III, and Dominion Bureau of Statistics, Cat. No. 72-008, Vol. VII, No. II, February, 1971.

that the share in the growth and prosperity of the growing provinces has increased. Three provinces: Ontario, British Columbia and Alberta, had positive net employment shifts. The dominant role of Ontario with 72 per cent of the positive net shifts can be seen in Table 28. Of the remaining positive net shifts Alberta had 12 per cent and British Columbia had 17 per cent. Eastern Canada, from Quebec to Newfoundland and also two Prairie provinces, Manitoba and Saskatchewan, had negative net shifts. Quebec had a

negative shift of 56,310; Nova Scotia, -53,016; Saskatchewan, -41,303; New Brunswick, -29,647, and Manitoba, -27,707. While the negative net shifts were small in Newfoundland and especially so in Prince Edward Island, the significance of these shifts cannot be appreciated unless they are compared with each province's respective population. The smaller negative shifts of Newfoundland and Prince Edward Island, which have a smaller population, therefore had the effect of a greater negative shift as compared with other provinces with larger negative shifts and larger populations.

Newfoundland's negative net shift in employment from 1951 to 1961 was less than from 1961 to 1970. In the former years the negative net shift was 7,163, while its negative shift in the latter years was 20,005. Both of the negative net shifts were due to a negative proportionality and a negative differential shift. From 1961 to 1970, the proportionality shift was -11,452 and the differential shift was -8,554, while in the years from 1951 to 1961 the shifts were -3,806 and -3,367 respectively. This implies that the good industrial mix due to concentration in industries which are fast growing and the favorable access characteristics in terms of locational advantages to particular industries were relatively enhanced in Canada as compared with Newfoundland in the latter years.

Components of the Newfoundland Differential Shift

Examination of the components of the differential shift will establish which industries had unfavorable access characteristics. Table 29 elucidates the predominant role of the service and administration sector in the negative differential shift, with a share of 22 per cent in the component differential shifts. In addition to the service and administration sector, Newfoundland had negative differential shifts in transportation and trade, forestry, manufacturing and construction. The largest positive

TABLE 29

EMPLOYMENT COMPONENTS OF THE DIFFERENTIAL SHIFT, PER CENT GROSS SHARE, NEWFOUNDLAND, 1961 to 1970

| Major Sectors | Differential Shift | Gross Share* |
|---|---|---|
| Agriculture | + 72 | 0.44 |
| Forestry | - 1,844 | 11.15 |
| Fishing | + 2,235 | 13.51 |
| Mining | + 1,353 | 8.18 |
| Manufacturing | - 1,561 | 9.44 |
| Construction | - 1,549 | 9.37 |
| Transportation | - 2,367 | 12.31 |
| Trade | - 1,492 | 9.02 |
| Finance | + 333 | 2.01 |
| Service & Administration | - 3,773 | 22.57 |
| Total Differential Shift | - 8,553 | * |

* The explanation of gross share is contained in the footnote to Table 10.

Source: Calculated from Dominion Bureau of Statistics, Census of Canada, 1961 (Ottawa: Queen's Printer), Cat. No. 94-542, Vol. III, Part III, and Dominion Bureau of Statistics, Cat. No. 72-008, Vol. VII, No. II, February, 1971.

differential shift was recorded by the fishing sector with 13.5 per cent of the gross shifts.[1] Newfoundland also had relative growth in mining and finance with differential shifts of +1,353 and +333 respectively.

[1] The explanation of the reason for the high differential shift is similar to that for the years from 1951 to 1961. For details see pages 79 and 80.

Components of the Newfoundland Proportionality Shift

The overall proportionality shift in Newfoundland was negative (-11,452) resulting from a relatively poor industrial mix in Newfoundland as compared with Canada. The components of the proportionality shift are presented in Table 30. Fishing had a large negative proportionality shift

TABLE 30

COMPONENTS OF EMPLOYMENT PROPORTIONALITY SHIFT, PER CENT GROSS SHARE, CANADA, NEWFOUNDLAND, 1961 to 1970

| Major Sectors | Canada | | Newfoundland | |
|---|---|---|---|---|
| | Shift | Gross Share | Shift | Gross Share |
| Agriculture | - 59,916 | 7.15 | - 306 | 1.18 |
| Forestry | - 67,447 | 8.04 | - 4,399 | 16.99 |
| Fishing | - 35,639 | 4.25 | - 8,568 | 33.08 |
| Mining | - 26,536 | 3.16 | - 963 | 3.72 |
| Manufacturing | - 80,086 | 9.55 | - 680 | 2.63 |
| Construction | - 91,438 | 10.91 | - 2,280 | 8.80 |
| Transportation | - 58,202 | 6.94 | - 1,476 | 5.70 |
| Trade | + 55,113 | 6.57 | + 992 | 3.83 |
| Finance | + 35,531 | 4.24 | + 228 | 0.88 |
| Service and Administration | +328,624 | 39.19 | + 6,005 | 23.19 |
| Rapid-Growth | +419,286 | = 50.00 | + 7,225 | = 27.90 |
| Slow-Growth | -419,246 | 50.00 | -18,672 | 72.10 |
| | | = 1.00 | | = 0.38696 |
| Rapid-Growth - Show-Growth Difference | + 40 | | -11,447 | |

Source: Adapted from Appendix II, Table 4.

resulting from specialization in relatively inferior components of the fishing industry (e.g. cod). There was also a negative proportionality shift in forestry and to a lesser extent in construction, transportation, mining,

manufacturing and agriculture. A positive proportionality shift occurred in service and administration, trade and finance. On balance, the predominance of the slow growing industries over the fast growing industries indicated by the ratio of the latter to the former is 0.387. (Table 30)

Newfoundland's overall negative proportionality shift was either due to dependence on slow growing industries, or slow growing components of the fast growing industries, resulting in a poor industrial mix.

The next chapter is devoted to further examination of the question as to which components are slow growing and which are fast growing. The industries studied are fishing and mining.[1]

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[1]The scope of the research design has acted as a constraint upon the number of sectors to be studied in this manner.

# CHAPTER X

## APPLICATION OF THE SHIFT AND SHARE TECHNIQUE TO NEWFOUNDLAND IN TERMS OF THE PERFORMANCE OF THE COMPONENTS OF THE FISHING AND MINING INDUSTRIES

An attempt was made to ascertain the performance of various components of the fishing and mining industries in Newfoundland as compared to the other provinces of Canada. The analysis was undertaken in terms of the landed value of fish and the value of mineral production, since this data was available for the components of the two industries under discussion. Employment and income data, on the other hand, were only available for the broad aggregates of the fishing and mining industries.

Although the shift and share technique was applied to the various components of the fishing industry of Newfoundland in terms of the landed value of fish, it may lead to considerable interpretative errors. According to the results of the shift and share technique derived from the crude landed value figures, presented in Table 31, Table 32 and Table 33, the large positive net shift in Newfoundland was due mainly to a large positive differential shift in the pelagic group. Further investigations in addition to the analysis through the shift and share technique, reveals that the pelagic catch consists mostly of herring landed in Newfoundland, but largely by fishing operations domiciled in Nova Scotia and elsewhere.[1] The results of the shift and share analysis using the landed value of the catch, therefore,

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[1] Parzival Copes, The Role of the Fishing Industry in the Economic Development of Newfoundland, Department of Economics and Commerce: Discussion Paper Series, No. 69-3-3 (Simon Frazer University, Burnaby, British Columbia), p. 23.

TABLE 31

SHIFTS IN THE LANDED VALUE OF FISH BY PRINCIPLE SECTORS, PROVINCES, 1961-1970
($000)

| Province | Net Shift | Proportionality Shift | Differential Shift | 1-Digit Components of Differential Shift | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Groundfish | Pelagic | Molluscs | Freshwater | Other |
| Newfoundland | +3,548 | + 396 | +3,152 | + 412 | +2,987 | - 506 | 0 | + 768 |
| Prince Edward Island | +3,038 | +1,296 | +1,742 | + 367 | + 650 | - 139 | 0 | + 864 |
| Nova Scotia | +4,883 | +3,958 | + 925 | -1,866 | +1,019 | +1,103 | 0 | + 669 |
| New Brunswick | +3,544 | +1,368 | +2,176 | - 746 | +4,236 | -1,244 | 0 | - 70 |
| Quebec | +2,814 | + 538 | +2,276 | +1,312 | + 563 | +1,547 | 0 | -1,146 |
| Ontario | -4,451 | -4,492 | + 41 | 0 | 0 | 0 | +41 | 0 |
| Manitoba | -2,480 | -2,481 | + 1 | 0 | 0 | 0 | + 1 | 0 |
| Saskatchewan | -1,129 | -1,082 | - 47 | 0 | 0 | 0 | -47 | 0 |
| Alberta | - 684 | - 690 | + 6 | 0 | 0 | 0 | + 6 | 0 |
| British Columbia | -9,075 | +1,170 | -10,245 | + 527 | -9,449 | - 754 | 0 | - 569 |

Source: Calculated from Canada Department of Fisheries, Annual Review of Canadian Fisheries (Ottawa: Queen's Printer), Vol. 2, 1954-1969, and Dominion Bureau of Statistics, Monthly Review of Canadian Fisheries Statistics (Ottawa: Queen's Printer), Cat. No. 24-002.

TABLE 32

COMPONENTS OF THE PROPORTIONALITY SHIFT, LANDED VALUE OF FISH, PER CENT GROSS WEIGHTS, CANADA, NEWFOUNDLAND, 1961-1970

| | Canada | | Newfoundland | |
|---|---|---|---|---|
| Major Sectors | Shift | Per Cent Gross | Shift | Per Cent Gross |
| Groundfish | - 1,320 | 6.56 | - 434 | 35.52 |
| Pelagic | + 1,179 | 5.86 | + 35 | 2.86 |
| Molluscs | + 7,518 | 37.34 | + 546 | 44.68 |
| Freshwater | - 8,746 | 43.44 | 0 | 0 |
| Other | + 1,369 | 6.80 | + 207 | 16.94 |
| Rapid-Growth | +10,066 | = 50.00 | + 788 | = 64.48 |
| Slow-Growth | -10,066 | 50.00 | - 434 | 35.52 |
| | | = 1.00 | | = 1.8156 |
| Rapid-Growth - Slow Growth Difference | 0 | | + 354 | |

Source: Adapted from Appendix II, Table 5.

provide a misrepresentation of the facts available from reading the literature on the Newfoundland fishery.

## The Performance of the Mining Industry

The value of minerals in Newfoundland increased relatively more than the national average from 1951 to 1961 as well as from 1961 to 1970. Similarly, the performance of the mining industry in Alberta, Manitoba and New Brunswick was above average as indicated by their positive net shifts. However, Ontario, Saskatchewan and Prince Edward Island had a positive net shift in the former years and a negative net shift in the latter years. Conversely, British Columbia had a negative net shift in the earlier years and

TABLE 33

SHIFTS IN THE LANDED VALUE OF FISH, NEWFOUNDLAND, AREAS, 1961-1969
($000)

| Area | Net Shift | Proportionality Shift | Differential Shift | 1-Digit Components of Differential Shift | | | |
|---|---|---|---|---|---|---|---|
| | | | | Groundfish | Pelagic | Molluscs | Other |
| Southeast | | | | | | | |
| E F G | + 908 | + 20 | - 928 | - 752 | + 73 | - 381 | + 132 |
| H I | +3,258 | - 31 | +3,289 | +2,433 | +1,159 | - 214 | - 89 |
| J | +2,067 | + 26 | +2,041 | + 143 | +2,221 | - 70 | - 253 |
| C D | + 887 | + 99 | + 788 | + 558 | + 9 | - 177 | + 398 |
| Central | | | | | | | |
| B | - 248 | + 111 | - 359 | - 13 | - 220 | - 120 | - 6 |
| West | | | | | | | |
| K L | + 175 | + 71 | + 104 | + 238 | - 85 | + 425 | + 2 |
| M N A | - 129 | + 108 | - 237 | - 279 | - 119 | + 81 | + 130 |
| Labrador | | | | | | | |
| O | -1,554 | - 8 | -1,546 | -1,439 | - 51 | 0 | - 56 |
| Newfoundland | +3,548 | + 396 | +3,152 | + 412 | +2,987 | 506 | + 764 |

Source: Calculated from Dominion Bureau of Statistics, Fisheries Statistics of Newfoundland (Ottawa: Queen's Printer), Cat. No. 24-202.

a positive net shift in the later years. There was a negative shift throughout the period under discussion, in Quebec and Nova Scotia. (Appendix II, Table 6, Table 7)

In Newfoundland, the positive net shift from 1951 to 1961 was associated with a positive differential shift and a small positive proportionality shift. From 1961 to 1970, the positive net shift was accompanied by a positive differential shift and a small negative proportionality shift. This implies that the favorable locational factors, in terms of access to resources and markets, were the contributing factors to the above average performance of the Newfoundland mining industry.

In order to examine which components of the mining industry contributed to the relative growth in the value of mining production, the shift and share technique is applied to the components of the industry.

Metals made the largest contribution to the positive differential shift in the mining industry. (Table 34) As well as a large positive differential shift in metallics there was also a positive proportionality shift, implying favorable locational advantages and a good industrial mix. (Table 34 and Appendix II, Table 9, Table 10)

The relative gain in the value of metallics production was mainly due to the advantages of iron in terms of resource and market access, as well as the proportionality shift for iron which was large and positive. (Table 35, Table 36) Newfoundland was the only province in Canada to record a positive differential shift in iron production from 1961 to 1970. (Appendix II, Table 9) The contribution of copper through the positive differential shift was significant in the earlier years, while its contribution through the proportionality shift was significant in the later years.

TABLE 34

DIFFERENTIAL SHIFT AND 1-DIGIT COMPONENTS OF MINERAL PRODUCTION, NEWFOUNDLAND, 1951-1961, 1961-1970 ($000)

| Major Components | Shift 1951-1961 | Shift 1961-1970 |
|---|---|---|
| Metals | +29,987 | +151,900 |
| Non-Metals | + 1,126 | + 13,168 |
| Other | + 2,619 | - 5,082 |
| Total Differential Shift | +32,480 | +151,986 |

Source: Adapted from Appendix II, Table 6 and Table 7.

TABLE 35

DIFFERENTIAL SHIFT AND 1-DIGIT COMPONENTS OF METALLICS PRODUCTION, NEWFOUNDLAND, 1951 to 1961; 1961 to 1970 ($000)

| Major Components | Shift 1951-1961 | Shift 1961-1970 |
|---|---|---|
| Copper | + 6,451 | - 10,011 |
| Gold | + 217 | 0 |
| Iron | + 4,694 | +109,011 |
| Lead | - 421 | - 4 |
| Silver | + 477 | - 1,829 |
| Zinc | + 35 | - 14,217 |

Source: Adapted from Appendix II, Table 8 and Table 9.

TABLE 36

PROPORTIONALITY SHIFT AND 1-DIGIT COMPONENTS OF METALLICS PRODUCTION, NEWFOUNDLAND, 1951 to 1961; 1961 to 1970 ($000)

| Major Components | Shift 1951-1961 | Shift 1961-1970 |
|---|---|---|
| Copper | + 441 | + 5,853 |
| Gold | - 156 | - 961 |
| Iron | +42,085 | +44,605 |
| Lead | - 3,766 | - 4,359 |
| Silver | - 121 | + 792 |
| Zinc | - 7,563 | + 3,531 |

Source: Adapted from Appendix II, Table 10 and Table 11.

# CHAPTER XI

## RECAPITULATION

The shift and share technique, like most of the techniques, cannot be applied mechanically. The usefulness of the shift and share technique lies in its careful application. The accuracy of the results derived from the technique should be tested — with information from practical knowledge and experience, through other mathematical or/non-mathematical techniques or by simply using logic. Observations concerning the inaccuracy of the shift and share technique were made many times throughout the study and testing by other means had to be resorted to in order to avoid misleading results.

For instance, the application of the shift and share technique grossly over-stated the growth of the Newfoundland fishing industry in terms of landings during the sixties. Although there was a large positive shift in the quantity of landings, research in the available literature revealed that the increase in fish landings was chiefly due to an increase in the pelagic sector — mainly herring by non-Newfoundland vessels. Therefore, the increased landings in large amounts were not contributing to the growth of the Newfoundland fishing industry. This had to be confirmed by information from outside the shift and share technique.

Similarly, the positive differential shift in employment during the fifties revealed increased localization and locational advantages in the fishing industry — which was misleading. Actually there was no increased localization in the fishing industry and as a matter of fact,

landings declined during the fifties. The increased employment in the fisheries was the result of a high level of unemployment in other sectors of the Newfoundland economy and not an indication of increasing localization and locational advantages in the fishery.

Again, the smallness of the negative net employment shifts of Prince Edward Island and Newfoundland indicate that Newfoundland and especially Prince Edward Island were relatively less worse off in comparison to Provinces with larger negative net shifts, such as those of Nova Scotia, New Brunswick, Quebec, Manitoba (and Saskatchewan in the sixties only). The results of the technique, prima facie, did not provide the true picture. When population was taken into account, along with the shifts in employment, the relative employment situation of Newfoundland and Prince Edward Island worsened in comparison to the other provinces.

The mechanical application of the shift and share technique not only provides misleading results as suggested above, but the implication of these results for policy purposes could be unsound. The negative proportionality shift in the fishing industry indicated that the major components of the fishing industry, such as cod and herring, were largely slow growing ( and low valued). The implication of the results for policy would have been more concentration in the fast growing (and high valued) species, such as molluscs. However, a sound policy for the regulation of fishing would depend upon many bio-economic factors outside of the field of shift and share analysis e.g. the extent of unexploited stocks of molluscs and the possibility of the expansion of these stocks economically.

The limitations of the shift and share technique mentioned above and the need to use the technique cautiously are mainly due to the fact that the technique cannot take into account all the variables involved. For

example, institutional factors which may be significantly important in resource development policy formulation, cannot be included in shift and share analysis. In Newfoundland, there have been institutional barriers to resource development, particularly in forestry and mining, which make the results of shift and share analysis less complete and at times misleading.

The institutional barriers of land tenure, amongst other factors in Newfoundland forestry, have resulted in mismanagement of the forestry resource. The policy implication is to remove these institutional barriers before economic management of forestry from a social point of view can be conceived. Such institutional factors cannot be revealed through the shift and share technique and included in policy formulation. In Newfoundland concessions on a large scale were given during the first half of this century to a few large companies with little return to the Newfoundland economy. The forestry concessions were obtained mainly by the Anglo Newfoundland Development Company (now Price Brothers) and by Bowaters Limited. Price holds 3.28 million acres under licence for 99 years (renewable); 1.48 million acres under leasehold and 97 thousand acres freehold. Price pays $2 per square mile for lands held under licence, the leasehold land is taxable, although no tax has yet been paid, while the freehold land is not taxable. Bowaters holds 7.36 million acres of which approximately 75 per cent is held under licence for 99 years and 25 per cent is freehold.[1]

This tenure system means almost free forest land for private exploitation. Besides giving land almost free to the foreign firms, the institutional arrangement of land tenure encourages mismanagement of forest lands from a social point of view because maturity of the trees requires a

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[1] Report of the Newfoundland Federal-Provincial Task Force on Forestry, St. John's, (March, 1973) pp. 32-33.

long period and a large amount of capital, which is contrary to the short-term interest of maximizing profit of the private company from the almost free lease of forest land.

Similarly institutional barriers in mineral exploitation have hindered the development of this resource in Newfoundland and are unidentified by the shift and share technique. Mineral concessions were granted on a long-term basis to foreign firms who were not directly involved in the exploitation of mineral resources — absentee mineral landlords. Mineral concessions were made to Price, Brinco, Labrador Mining and Exploration and to Reid. Price holds the mineral rights to 3.28 million acres under a 99 year renewable licence at 5¢ per acre for 40 years and 39 thousand acres under lease at 50¢ per acre for 30 years. Both agreements are renewable. Reid acquired 2.5 million acres freehold in return for building the Newfoundland railway.[1] These absentee mineral landlords had very little interest in further exploration and development of minerals from a social long-term point of view. Furthermore the economy of Newfoundland does not receive the full benefits of even the present mineral exploitation. Most of these benefits are derived by the absentee mineral landlord since the contracts for actual exploitation are given by him.

In spite of the limitations of the shift and share technique, as mentioned above, the technique, if applied carefully is helpful for analysis in order to formulate a sound resource development policy. The technique helps in analysis by enabling the comparison of a region with a benchmark, thereby revealing the region's weaknesses and strengths. Moreoyer, it seperates the basis of a region's growth, in terms of its access to inputs and markets pertaining to a particular industry, from the effect of the

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[1] The exact details of the tenure agreements are contained in the Report of the Royal Commission on the Economic State and Prospects of Newfoundland and Labrador, St. John's: Creative Printers and Publishers, Ltd., (December, 1967).

economic mixture or complex peculiar to a region, as revealed by the differential and proportionality shifts respectively.

For example, the study revealed that the total population of Newfoundland has grown less rapidly than the national average during the fifties and sixties as indicated by the negative net shift in total population. Again, comparison of urbanization suggests that Newfoundland's increased urbanization was almost similar to the national average — a little more in the fifties; a little less in the sixties. On the other hand, rural farm population in Canada as a whole declined and Newfoundland followed a similar trend, particularly during the sixties.

With regard to aggregate income, Newfoundland followed the national trend — the increase being slightly more than the Canadian average in the fifties and slightly less in the sixties, as indicated by a small positive and a small negative shift in the respective years. However in comparison to Ontario, Quebec and British Columbia, the increase in Newfoundland's aggregate income was significantly less.

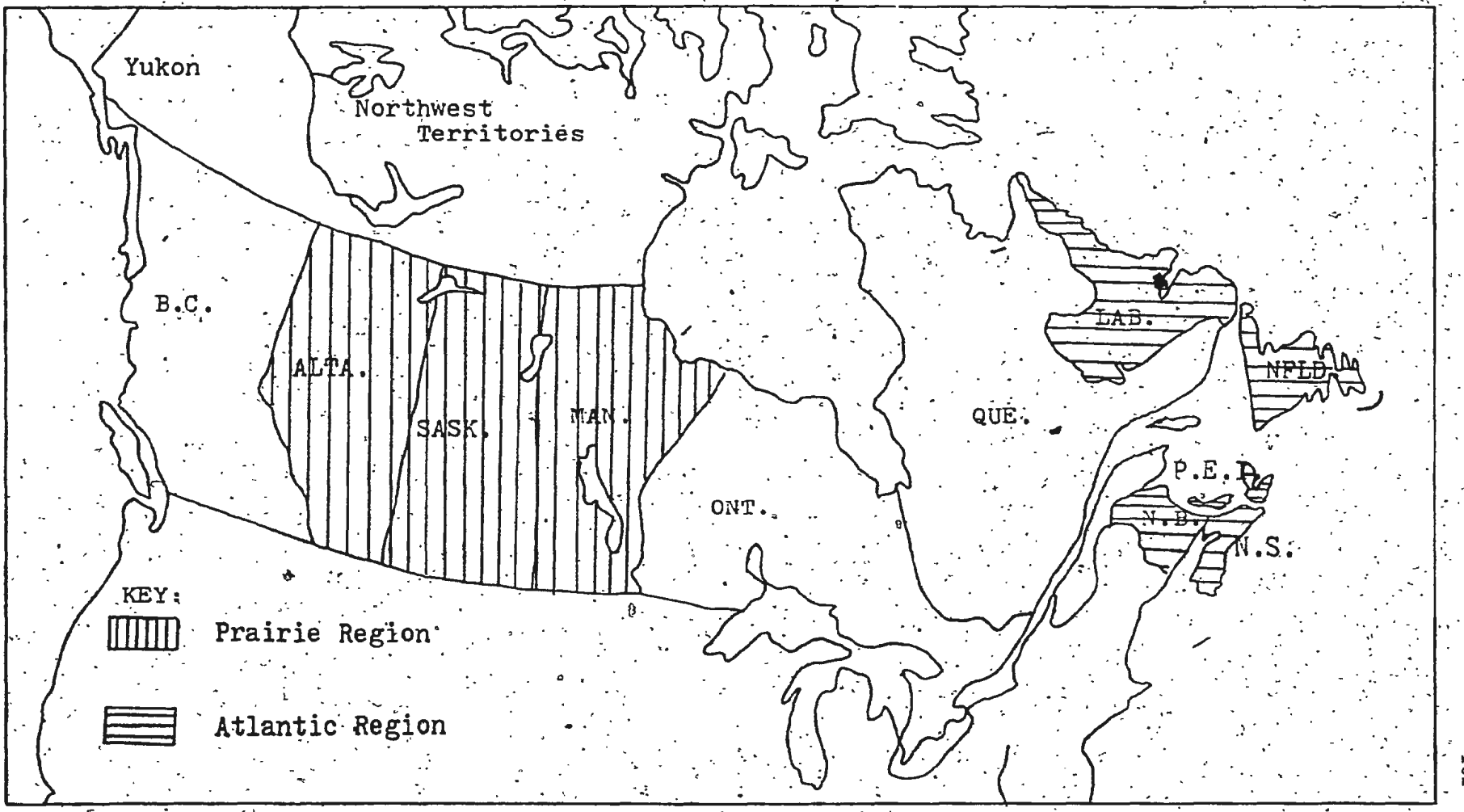
The increase in Newfoundland's employment has been less than the national average as indicated by a large negative shift in employment. Newfoundland experienced negative net employment shifts of seven thousand and twenty thousand workers during the fifties and the sixties respectively. The slow growth of employment in Newfoundland was generated by adverse locational factors in terms of access to inputs and markets in industries such as forestry and manufacturing, as revealed by their negative differential shifts. Also, the major components of industries were slow growing, particularly fishing, forestry, mining and manufacturing indicating a poor industrial mix, as revealed by the negative proportionality shifts in these industries.

# APPENDIX I

## MAPS

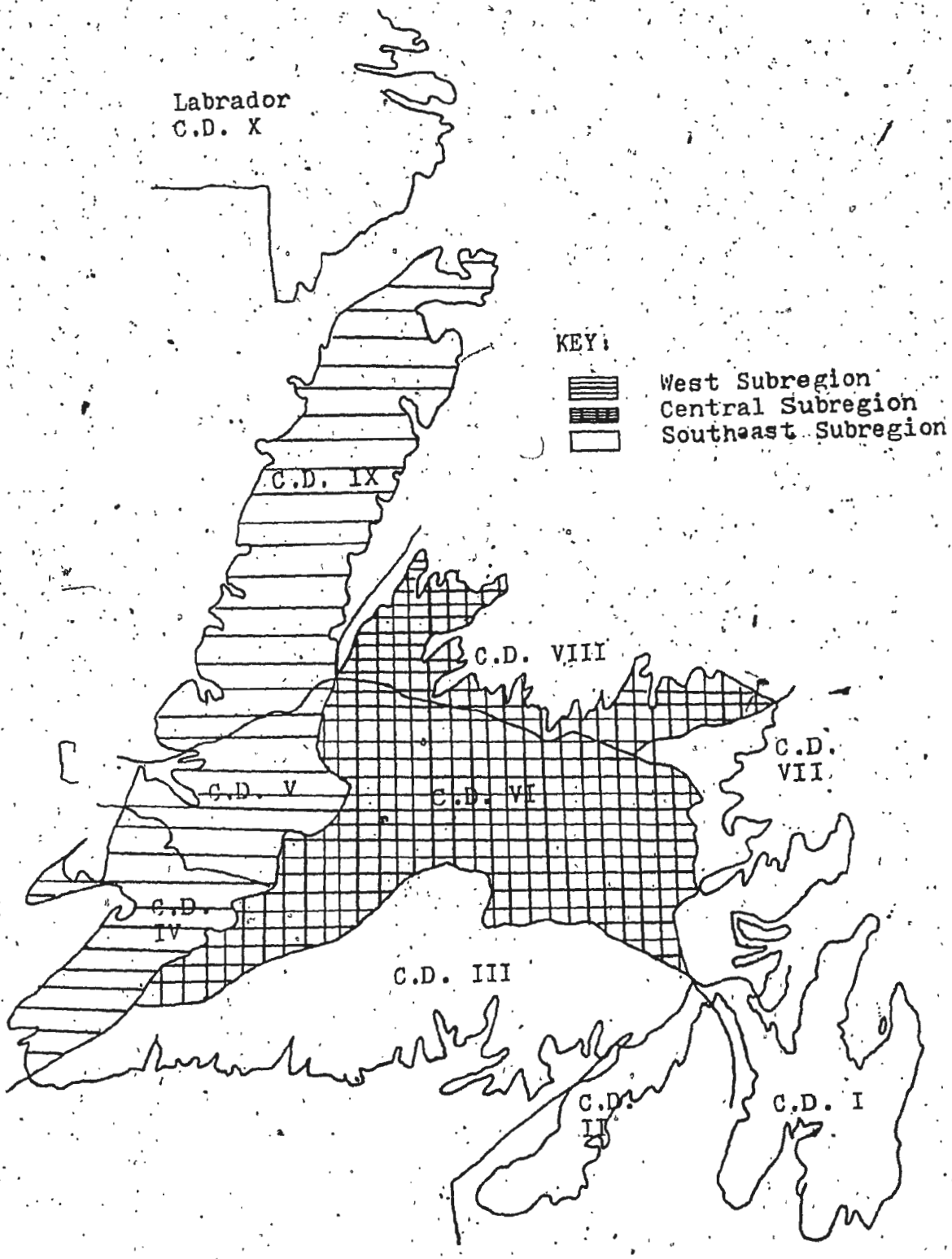
MAP 1

The Regions and Provinces of Canada



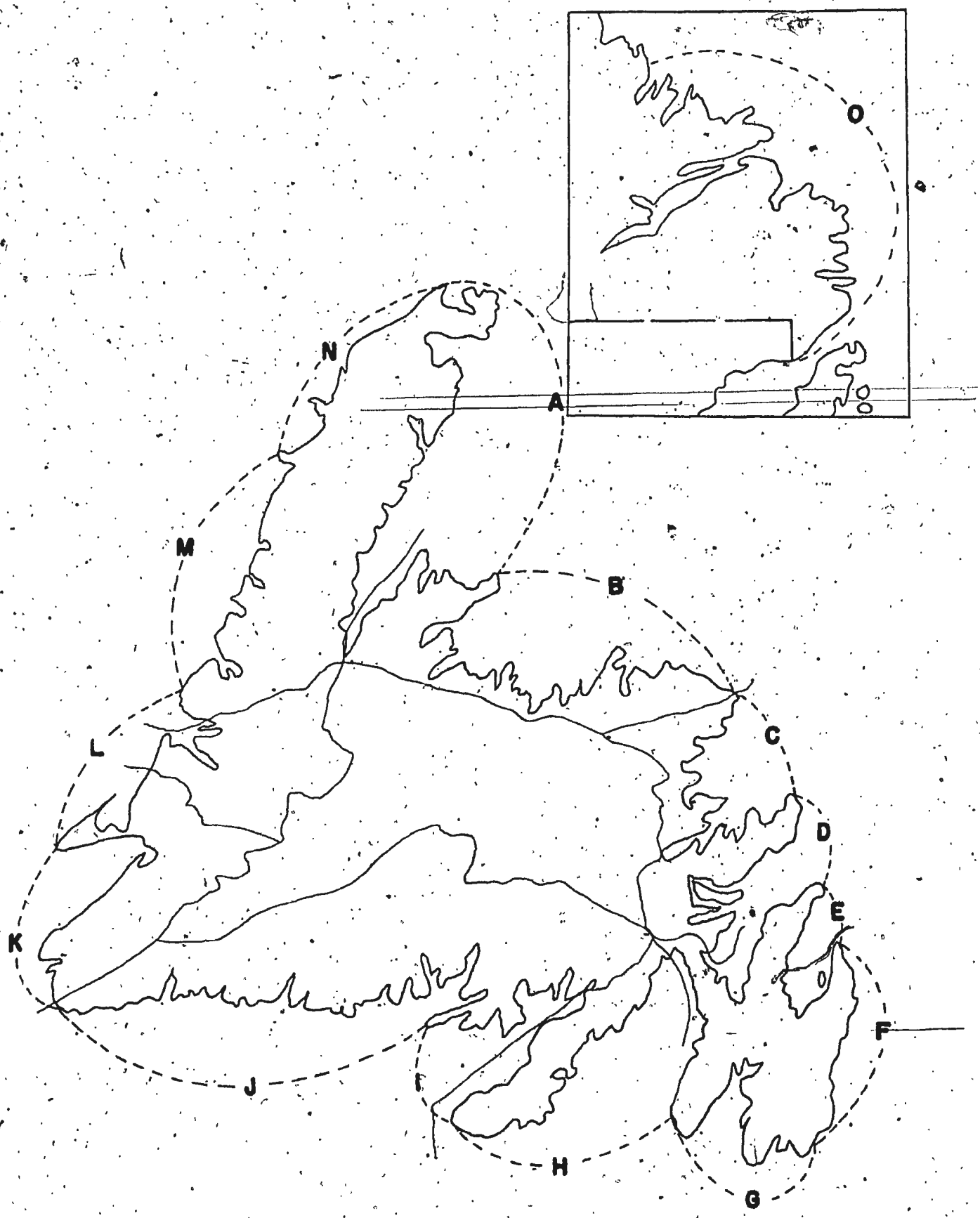
MAP 2

The Subregions
and Census Divisions of Newfoundland



MAP 3

Newfoundland Sea Fisheries Areas



# APPENDIX II

## TABLES

TABLE 1

Employment by Sector, Actual and Percentage Change, Canada, 1951 to 1961; 1961 to 1970

| Sector | Employment | | | 1951 to 1961 | | 1961 to 1970 | |
|---|---|---|---|---|---|---|---|
| | 1951 | 1961 | 1970 | Actual Change | Percent Change | Actual Change | Percent Change |
| Agriculture | 133,772 | 116,659 | 90,000 | - 17,113 | -13 | - 26,659 | -23 |
| Forestry | 113,081 | 100,728 | 62,000 | - 12,353 | -11 | - 38,728 | -38 |
| Fishing | 79,105 | 78,020 | 64,621 | - 1,085 | - 1 | - 13,399 | -17 |
| Mining | 102,132 | 118,150 | 125,300 | 16,018 | 16 | 7,150 | 6 |
| Manufacturing | 1,282,866 | 1,359,700 | 1,667,300 | 76,834 | 6 | 307,600 | 23 |
| Construction | 286,563 | 356,651 | 366,900 | 70,088 | 24 | 10,249 | 3 |
| Transportation | 428,618 | 565,788 | 668,900 | 137,170 | 32 | 103,112 | 18 |
| Trade | 565,723 | 808,710 | 1,094,400 | 242,987 | 43 | 285,690 | 35 |
| Finance | 132,948 | 211,084 | 306,800 | 78,136 | 59 | 95,716 | 45 |
| Service and Administration | 964,832 | 1,559,751 | 2,333,100 | 594,919 | 62 | 773,349 | 50 |
| Total | 4,089,640 | 5,275,241 | 6,779,321 | 1,185,601 | 29 | 1,504,080 | 29 |

Source: Dominion Bureau of Statistics, Census of Canada 1951 (Ottawa: Queen's Printer), General Tables, Vol. IX, Part II, Table 76, and Dominion Bureau of Statistics, Census of Canada 1961 (Ottawa: Queen's Printer), Cat. No. 94-542, Vol. III, Part 3, Table 31, Dominion Bureau of Statistics, (Ottawa: Queen's Printer), Cat. No. 72-008, Vol. 7, No. 2, February, 1971.

TABLE 2

Employment by Sector, Actual and Percentage Change,
Newfoundland, 1951 to 1961, 1961 to 1970

| Sector | Employment | | | From 1951 to 1961 | | From 1961 to 1970 | |
|---|---|---|---|---|---|---|---|
| | 1951 | 1961 | 1970 | Actual Change | Percent Change | Actual Change | Percent Change |
| Agriculture | 629 | 596 | 532 | - 33 | - 5 | - 64 | - 11 |
| Forestry | 9,862 | 6,569 | 2,200 | - 3,293 | -33 | - 4,369 | - 67 |
| Fishing | 14,426 | 18,756 | 17,770 | 4,330 | 30 | 986 | - 5 |
| Mining | 3,660 | 4,288 | 5,900 | 628 | 17 | 1,612 | 38 |
| Manufacturing | 13,537 | 11,549 | 12,600 | - 1,988 | -15 | 1,051 | 9 |
| Construction | 6,646 | 8,894 | 7,600 | 2,248 | 34 | - 1,294 | - 15 |
| Transportation | 9,606 | 14,352 | 14,600 | 4,746 | 49 | 248 | 2 |
| Trade | 10,975 | 14,552 | 18,200 | 3,577 | 33 | 3,648 | 25 |
| Finance | 567 | 1,354 | 2,300 | 787 | 39 | 946 | 70 |
| Service and Administration | 20,467 | 28,502 | 38,900 | 8,035 | 39 | 10,398 | 36 |
| Total | 90,375 | 109,412 | 120,602 | 19,037 | 21 | 11,190 | 10 |

Source: Dominion Bureau of Statistics, Census of Canada 1951 (Ottawa: Queen's Printer), General Tables, Vol. IX, Part II, Table 76, and Dominion Bureau of Statistics, Census of Canada 1961 (Ottawa: Queen's Printer), Cat. No. 94-542, Vol. III, Part 3, Table 31, Dominion Bureau of Statistics, (Ottawa: Queen's Printer), Cat. No. 72-008, Vol. 7, No. 2, February, 1971.

TABLE 3

Components of Employment Proportionality Shift for Canada and Newfoundland, 1951 to 1961

| Major Sectors | Canada growth rate | Differential growth rate | Canadian employment in each sector in 1951 1 | Each sector's contribution to proportionality shift 2 | Per Cent gross weights 3 |
|---|---|---|---|---|---|
| | | Canadian Comparison Base | | | |
| Agriculture | 0.8721 | -0.4178 | 133,722 | - 55,890 | - 6.26 |
| Forestry | 0.8908 | -0.3991 | 113,081 | - 45,131 | - 5.05 |
| Fishing | 0.9863 | -0.3036 | 79,105 | - 24,016 | - 2.69 |
| Mining | 1.1568 | -0.1331 | 102,132 | - 13,594 | - 1.52 |
| Manufacturing | 1.0559 | -0.2330 | 1,282,866 | -295,059 | -33.03 |
| Construction | 1.2446 | -0.0454 | 286,563 | - 12,981 | - 1.45 |
| Transportation | 1.3200 | +0.0301 | 428,618 | + 12,901 | + 1.44 |
| Trade | 1.4295 | +0.1396 | 565,723 | + 78,975 | + 8.84 |
| Finance | 1.5877 | +0.2978 | 132,948 | + 39,592 | + 4.43 |
| Service and administration | 1.6166 | +0.3267 | 964,832 | +315,210 | +35.28 |
| Total employment | 1.2899 | | 4,089,640 | . . | . . |
| Rapid-growth total / Slow-growth total | Ratio | | | +446,678 / -446,671 = | +50.00 / -49.99 = 1.00 |
| Rapid-growth — Slow-growth Difference | | | | +7 | |

Source: Dominion Bureau of Statistics, Census of Canada 1951 (Ottawa: Queen's Printer), General Tables, Vol. IX, Part II, Table 76, and Dominion Bureau of Statistics, Census of Canada 1961 (Ottawa: Queen's Printer), Cat. No. 94-542, Vol. III, Part 3, Table 31.

TABLE 3 — Continued

| Major Sectors | Newfoundland employment in each sector in 1951 1 | Each sector's contribution to proportionality shift 2 | | Per Cent gross weights 3 |
|---|---|---|---|---|
| | Newfoundland | | | |
| Agriculture | 629 | - 263 | | - 1.24 |
| Forestry | 9,862 | - 3,936 | | - 18.60 |
| Fishing | 14,426 | - 4,380 | | - 20.70 |
| Mining | 3,660 | - 487 | | - 2.30 |
| Manufacturing | 13,537 | - 3,114 | | - 14.72 |
| Construction | 6,646 | - 301 | | - 1.42 |
| Transportation | 9,606 | + 289 | | + 1.37 |
| Trade | 10,975 | + 1,532 | | + 7.24 |
| Finance | 567 | + 169 | | + 0.80 |
| Service and administration | 20,467 | + 6,687 | | + 31.61 |
| Total employment | 90,376 | | | |
| Rapid-growth total / Slow-growth total Ratio | | + 8,677 / -12,481 | = 0.6952 | + 41.02 / - 58.98 |
| Rapid-growth — Slow-growth Difference | | - 3,804 | | |

TABLE 4

Components of Employment Proportionality Shift for Canada and Newfoundland, 1961 to 1970

| Major Sectors | Canada growth rate | Differential growth rate | Canadian employment in each sector in 1961 1 | Each sector's contribution to proportionality shift 2 | | Per Cent gross weights 3 |
|---|---|---|---|---|---|---|
| | | | Canadian Comparison Base | | | |
| Agriculture | 0.7715 | -0.5136 | 116,659 | - 59,916 | | - 7.15 |
| Forestry | 0.6155 | -0.6696 | 100,728 | - 67,447 | | - 8.04 |
| Fishing | 0.8286 | -0.4568 | 78,020 | - 35,639 | | - 4.25 |
| Mining | 1.0605 | -0.2246 | 118,150 | - 26,536 | | - 3.16 |
| Manufacturing | 1.2262 | -0.0589 | 1,359,700 | - 80,086 | | - 9.55 |
| Construction | 1.0287 | -0.2564 | 356,651 | - 91,438 | | -10.91 |
| Transportation | 1.1822 | -0.1029 | 565,788 | - 58,202 | | - 6.94 |
| Trade | 1.3533 | +1.0683 | 808,710 | + 55,113 | | + 6.57 |
| Finance | 1.4534 | +1.1587 | 211,084 | + 35,531 | | + 4.24 |
| Service and administration | 1.4958 | +1.2107 | 1,559,751 | +328,624 | | +39.19 |
| Total employment | 1.2851 | . . | 5,275,241 | . . | | . . |
| Rapid-growth total / Slow-growth total | Ratio | | | +419,286 / -419,246 | = = | +50.00 / -49.99 = 1.00 |
| Rapid-growth — Slow-growth Difference | | | | +40 | | |

Source: Dominion Bureau of Statistics, Census of Canada 1961 (Ottawa: Queen's Printer), Cat. No. 94-542, Vol. III, Part 3, Table 31, and Dominion Bureau of Statistics, (Ottawa: Queen's Printer), Cat. No. 72-008, Vol. 7, No. 2, February, 1971.

TABLE 4 — Continued

| Major Sectors | Newfoundland: Newfoundland employment in each sector in 1961 (1) | Newfoundland: Each sector's contribution to proportionality shift (2) | | Newfoundland: Per Cent gross weights (3) |
|---|---|---|---|---|
| Agriculture | 596 | - 306 | | - 1.18 |
| Forestry | 6,569 | -4,399 | | -16.99 |
| Fishing | 18,756 | -8,568 | | -33.08 |
| Mining | 4,288 | - 963 | | - 3.72 |
| Manufacturing | 11,549 | - 680 | | - 2.63 |
| Construction | 8,894 | -2,280 | | - 8.80 |
| Transportation | 14,352 | -1,476 | | - 5.70 |
| Trade | 14,552 | + 992 | | + 3.83 |
| Finance | 1,354 | + 228 | | + 0.88 |
| Service and administration | 28,502 | +6,005 | | +23.19 |
| Total employment | 109,412 | . . | | . . |
| $\frac{\text{Rapid-growth total}}{\text{Slow-growth total}}$ Ratio | | $\frac{+7,225}{-18,672}$ | = | $\frac{+27.90}{-72.10}$ |
| | | | = 0.38696 | |
| Rapid-growth — Slow-growth Difference | | -11,447 | | |

TABLE 5

Components of Proportionality shifts for Landed Value of Fish for Canada and Newfoundland, 1961 to 1970

| | Canadian Comparison Base | | | | |
|---|---|---|---|---|---|
| Major Sectors | Canada Growth rate | Differential Growth rate | Canadian Landed Value of Fish in each sector in 1961 ($000) 1 | Each sector's contribution to proportionality shift ($000) 2 | Per Cent gross weights 3 |
| Groundfish | 1.7765 | -0.0372 | 35,499 | - 1,320 | 6.56 |
| Pelagic | 1.8457 | +0.0321 | 36,793 | + 1,179 | 5.86 |
| Molluscs | 2.1422 | +0.3286 | 22,880 | + 7,518 | 37.34 |
| Fresh Water | 1.0318 | -0.7818 | 11,187 | - 8,746 | 43.44 |
| Other | 2.3643 | +0.5506 | 2,487 | +.1,369 | 6.80 |
| Total | 1.8136 | | 108,846 | | |
| Rapid-growth total / Slow-growth total Ratio | | | | +10,066 / -10,066 = | 50.00 / 50.00 |
| | | | | = 1.00 | |
| Rapid-growth — Slow-growth Difference | | | | 0.0 | |

Source: Calculated from Canada Department of Fisheries, Annual Review of Canadian Fisheries (Ottawa: Queen's Printer), Vol. 2, 1954-1969, and Dominion Bureau of Statistics, Monthly Review of Canadian Fisheries Statistics (Ottawa: Queen's Printer), Cat. No. 24-002.

TABLE 5 — Continued

| Major Sectors | Newfoundland | | | |
|---|---|---|---|---|
| | Newfoundland Landed Value of Fish in each sector in 1961 ($000) 1 | Each sector's contribution to proportionality shift ($000) 2 | | Per Cent gross Weights 3 |
| Groundfish | 11,674 | -434 | | 35.52 |
| Pelagic | 1,077 | + 35 | | 2.86 |
| Molluscs | 1,662 | +546 | | 44.68 |
| Fresh Water | 0 | 0 | | 0 |
| Other | 376 | +207 | | 16.94 |
| Total | 14,789 | +354 | | |
| Rapid-growth total / Slow-growth total Ratio | | +788 / -434 | = | +64.48 / -35.52 |
| | | | = 1.8156 | |
| Rapid-growth — Slow-growth Difference | | 354 | | |

TABLE 6

Net, Proportionality and Differential Shifts
for Value of Mineral Production, for Provinces, 1951 to 1961
($000)

| Province | Net Shift | Proportionality Shift | Differential Shift | 1-Digit Components of Differential Shift | | |
|---|---|---|---|---|---|---|
| | | | | Metals | Non-Metals | Other |
| Nfld. | + 32,382 | + 902 | + 31,480 | + 29,987 | + 1,126 | + 2,619 |
| P.E.I. | + 606 | 0 | + 606 | 0 | 0 | + 606 |
| N.S. | -47,472 | -2,324 | - 45,148 | 0 | - 2,784 | - 42,364 |
| N.B. | + 1,324 | - 397 | + 1,721 | 0 | + 475 | + 1,246 |
| Que. | - 11,083 | +1,403 | - 12,486 | - 9,601 | -10,099 | + 7,214 |
| Ont. | +130,924 | +9,512 | +121,412 | + 97,997 | - 1,187 | + 24,602 |
| Man. | + 46,575 | + 397 | + 46,178 | + 32,972 | + 407 | + 12,799 |
| Sask. | +122,704 | + 938 | +121,766 | + 1,930 | - 177 | +120,013 |
| Alta. | +166,155 | -7,299 | +173,454 | + 1 | + 6,628 | +166,825 |
| B.C. | -442,109 | -3,138 | -438,971 | -153,283 | + 7,867 | -293,555 |

Source: Calculated from Dominion Bureau of Statistics, Canada Year Book (Ottawa: Queen's Printer, 1955), pp. 512-514, and Dominion Bureau of Statistics, Canada Year Book (Ottawa: Queen's Printer, 1966), pp. 522-524.

TABLE 7

Net, Proportionality and Differential Shifts
for Value of Mineral Production, for Provinces, 1961 to 1970
($000)

| Province | Net Shift | Proportionality Shift | Differential Shift | 1-Digit Components of Differential Shift | | |
|---|---|---|---|---|---|---|
| | | | | Metals | Non-Metals | Other |
| Nfld. | +158,433 | - 1,553 | +159,986 | +151,900 | + 13,168 | - 5,082 |
| P.E.I. | - 822 | + 4 | - 826 | 0 | 0 | - 826 |
| N.S. | - 76,061 | + 1,481 | - 77,542 | + 574 | - 4,098 | - 74,018 |
| N.B. | + 60,160 | + 273 | + 88,162 | - 692 | - 27,583 | - 27,583 |
| Que. | -196,388 | +11,557 | -207,945 | + 17,037 | -112,066 | -112,916 |
| Ont. | -427,201 | -13,731 | -413,470 | -294,346 | - 13,085 | -106,037 |
| Man. | +111,804 | - 1,212 | +113,016 | +135,548 | - 2,504 | - 20,028 |
| Sask. | - 78,774 | - 109 | - 78,665 | -125,135 | +114,272 | - 67,802 |
| Alta. | +360,321 | + 4,116 | +356,205 | - 10 | + 15,636 | +340,579 |
| B.C. | + 88,533 | - 837 | + 89,370 | + 26,275 | - 10,626 | + 73,721 |

Source: Calculated from Dominion Bureau of Statistics, Canada Year Book (Ottawa: Queen's Printer, 1962), pp. 522-524, and Dominion Bureau of Statistics, Preliminary Report of Mineral Production (Ottawa: Queen's Printer, 1970), Cat. No. 26-203.

TABLE 8

Net, Proportionality and Differential Shifts
for Value of Metallics Production, for Provinces, 1951 to 1961
($000)

| Province | Net Shift | Proportionality Shift | Differential Shift | 1-Digit Components of Differential Shift | | |
|---|---|---|---|---|---|---|
| | | | | Copper | Gold | Iron |
| Nfld. | +28,950 | +31,981 | +11,453 | + 6,451 | + 217 | + 4,694 |
| P.E.I. | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 0 | 0 | 0 | 0 | 0 | 0 |
| N.B. | 0 | 0 | 0 | 0 | 0 | 0 |
| Que. | +30,602 | -30,316 | +60,918 | + 21,804 | + 484 | +53,627 |
| Ont. | +38,509 | +77,888 | -39,379 | + 1,345 | +8,403 | -65,634 |
| Man. | - 7,533 | - 9,948 | - 3,584 | - 7,720 | -3,619 | 0 |
| Sask. | -24,881 | - 6,615 | -18,226 | -103,390 | -1,300 | 0 |
| Alta. | + 2 | - 1 | + 3 | 0 | + 3 | 0 |
| B.C. | -80,130 | -68,985 | -11,145 | - 11,486 | -4,192 | + 7,314 |

Source: Calculated from Dominion Bureau of Statistics, Canada Year Book (Ottawa: Queen's Printer, 1955), pp. 512-514, and Dominion Bureau of Statistics, Canada Year Book (Ottawa: Queen's Printer, 1966), pp. 522-524.

TABLE 8 – Continued

| | 1-Digit Components of Differential Shift | | |
|---|---|---|---|
| | Lead | Silver | Zinc |
| Nfld. | – 421 | + 477 | + 35 |
| P.E.I. | 0 | 0 | 0 |
| N.S. | 0 | 0 | 0 |
| N.B. | 0 | 0 | 0 |
| Que. | -1,622 | – 620 | -12,755 |
| Ont. | + 170 | +3,260 | +13,077 |
| Man. | + 623 | + 32 | + 7,099 |
| Sask. | 0 | -1,641 | – 4,935 |
| Alta. | 0 | 0 | 0 |
| B.C. | +1,249 | -1,506 | – 2,524 |

TABLE 9

Net, Proportionality and Differential Shifts
for Value of Metallics Production, for Provinces, 1961 to 1970
($000)

| Province | Net Shift | Proportionality Shift | Differential Shift | 1-Digit Components of Differential Shift | | |
|---|---|---|---|---|---|---|
| | | | | Copper | Gold | Iron |
| Nfld. | +126,545 | +43,595 | +82,950 | -10,011 | 0 | +109,011 |
| P.E.I. | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | + 574 | 0 | + 574 | + 31 | 0 | 0 |
| N.B. | + 87,275 | 0 | +87,275 | + 9,213 | + 179 | 0 |
| Que. | - 52,085 | +19,970 | -72,055 | -62,493 | +5,598 | - 36,775 |
| Ont. | - 68,658 | -59,672 | - 8,979 | -32,555 | -6,830 | - 51,158 |
| Man. | + 20,336 | + 4,027 | +16,309 | +37,679 | + 587 | 0 |
| Sask. | - 45,106 | + 8,762 | -53,868 | -41,265 | - 127 | 0 |
| Alta. | - 12 | - 10 | - 2 | 0 | - 2 | 0 |
| B.C. | - 68,865 | -16,671 | -52,194 | +99,404 | + 592 | - 21,077 |

Source: Calculated from Dominion Bureau of Statistics, Canada Year Book (Ottawa: Queen's Printer, 1962), pp. 522-524, and Dominion Bureau of Statistics, Preliminary Report of Mineral Production (Ottawa: Queen's Printer, 1970), Cat. No. 26-203.

TABLE 9 – Continued

| | 1-Digit Components of Differential Shift | | |
|---|---|---|---|
| | Lead | Silver | Zinc |
| Nfld. | – 4 | – 1,829 | -14,217 |
| P.E.I. | 0 | – 0 | 0 |
| N.S. | + 411 | + 132 | 0 |
| N.B. | -19,658 | + 8,369 | +49,856 |
| Que. | – 320 | – 3,015 | +24,950 |
| Ont. | + 3,004 | + 9,614 | +68,944 |
| Man. | – 717 | – 1,002 | -20,238 |
| Sask. | 0 | + 805 | -13,281 |
| Alta. | 0 | 0 | 0 |
| B.C. | -22,029 | -13,073 | -96,011 |

TABLE 10

Components of Proportionality Shifts for the Value of Metallics Production for Canada and Newfoundland, 1951 to 1961

| | Canadian Comparison Base | | | | |
|---|---|---|---|---|---|
| Major Sectors | Canada Growth Rate | Differential Growth Rate | Canadian value of Metallics production in each sector in 1951 ($000) 1 | Each sector's contribution to proportionality shift ($000) 2 | Per Cent gross Weights 3 |
| Copper | 1.7086 | +0.2745 | 149,022 | + 40,236 | 10.38 |
| Gold | 0.9380 | -0.4962 | 151,193 | - 75,022 | 19.35 |
| Iron | 6,0356 | +4.6014 | 31,140 | +143,287 | 36.96 |
| Lead | 0.8118 | -0.6223 | 55,922 | - 34,800 | 8.98 |
| Silver | 1.1938 | -0.2407 | 18,546 | - 4,464 | 1.15 |
| Zinc | 0.7667 | -0.6675 | 134,629 | - 89,865 | 23.18 |
| Total | 1.4342 | . . | 540,452 | . . | . . |
| Rapid-growth total / Slow-growth total Ratio | | | | +183,523 / -204,151 = 0.90 | |
| Rapid-growth — Slow-growth Difference | | | | - 10,628 | |

Source: Calculated from Dominion Bureau of Statistics, Canada Year Book (Ottawa: Queen's Printer, 1955), pp. 512-514, and Dominion Bureau of Statistics, Canada Year Book (Ottawa: Queen's Printer, 1966), pp. 522-524.

TABLE 10 — Continued

| Major Sectors | Newfoundland value of Metallics production in each sector in 1951 ($000) 1 | Newfoundland Each sector's contribution to proportionality shift ($000) 2 | Per Cent gross weights 3 |
|---|---|---|---|
| Copper | 1,606.23 | + 441 | 0.81 |
| Gold | 313.78 | - 156 | 0.28 |
| Iron | 9,145.96 | +42,085 | 77.74 |
| Lead | 6,051.43 | - 3,766 | 6.95 |
| Silver | 505.39 | - 121 | 0.22 |
| Zinc | 11,330.80 | - 7,563 | 13.97 |
| Total | | +30,920 | |
| Rapid-growth total / Slow-growth total Ratio | | +42,526 / -11,606 = 3.66 | |
| Rapid-growth — Slow-growth Difference | | +30,920 | |

TABLE 11

Components of Proportionality Shifts for the Value of Metallics Production for Canada and Newfoundland, 1961-1970

| | Canadian Comparison Base | | | | |
|---|---|---|---|---|---|
| Major Sectors | Canada Growth Rate | Differential Growth Rate | Canadian value of Metallics production in each sector in 1961 ($000) 1 | Each sector's contribution to proportionality shift ($000) 2 | Per Cent gross Weights 3 |
| Copper | 3.0352 | +0.6365 | 254,627 | +162,068 | 24.17 |
| Gold | 0.5203 | -1.8784 | 141,814 | -266,383 | 39.73 |
| Iron | 3.1435 | +0.7448 | 187,948 | +139,983 | 20.88 |
| Lead | 1.4269 | -0.9718 | 45,339 | - 44,060 | 6.57 |
| Silver | 3.1327 | +0.7340 | 22,140 | + 16,251 | 2.42 |
| Zinc | 2.8036 | +0.4049 | 103,219 | + 41,793 | 6.23 |
| Total | 2.3987 | . . | 775,087 | . . | . . |
| Rapid-growth total / Slow-growth total Ratio | | | | +360,095 / -310,443 = 1.15 | |
| Rapid-growth — Slow-growth Difference | | | | - 49,652 | |

Source: Calculated from Dominion Bureau of Statistics, Canada Year Book (Ottawa: Queen's Printer, 1962), pp. 522-524, and Dominion Bureau of Statistics, Preliminary Report of Mineral Production (Ottawa: Queen's Printer, 1970), Cat. No. 26-203.

TABLE 11 — Continued

| Major Sectors | Newfoundland value of Metallics production in each sector in 1961 ($000) 1 | Each sector's contribution to proportionality shift ($000) 2 | Per Cent gross weights 3 |
|---|---|---|---|
| | Newfoundland | | |
| Copper | 9,195.82 | + 5,853 | 10.78 |
| Gold | 511.65 | - 961 | 1.77 |
| Iron | 59,889.13 | +44,605 | 82.22 |
| Lead | 4,485.94 | - 4,359 | 8.03 |
| Silver | 1,079.38 | + 792 | 1.45 |
| Zinc | 8,722.02 | + 3,531 | 6.50 |
| Total | . . | +49,461 | . . |
| Rapid-growth total / Slow-growth total Ratio | | +54,781 / - 5,320 = 10.30 | |
| Rapid-growth — Slow-growth Difference | | +49,461 | |

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