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ESTIMATION OF THE DETERMINANTS
OF GROSS MIGRATION IN MANITOBA

by

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ABSTRACT

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by GERRARD MATHIESON

MAJOR ADVISOR: DR. MARTIN YEH

A number of regional development programs have been designed in Manitoba in part to promote or deter population redistribution, including the Agricultural and Rural Development Act, 1967 (ARDA), decentralization of provincial government offices to regional centres, and subsidiary programs such as STEP and PEP. The various programs have unique elements and represent approaches taken to resolve the problem of population redistribution. However, models of the migration process which permit an analysis of the determinants of migration to evaluate existing and future programs are not available.

In this study an intraprovincial out-migration model disaggregated by level of urbanization is developed. The model utilizing data the records from the Manitoba Hospital Commission covered population includes all the known migrants over the years 1969-73 within the Province of Manitoba. Using cross-sectional multiple regression analysis an econometric model of out-migration is enumerated.

The model specification relates out-migration among urban and rural classifications by region to economic and population characteristics of both sending and receiving classifications.

Results of the analysis show that migration in Manitoba is primarily a response to economic factors. The results validate income differentials, employment differentials, distance and ethnic background as significant determinants in the decision to migrate in Manitoba. Results suggest that policies and programs relating to population redistribution should take into consideration the estimated effects of these variables on the decision to migrate and the differing strength of the effect between different levels of urbanization and region.

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TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS.....	iii
LIST OF TABLES.....	vii
LIST OF FIGURES.....	viii
CHAPTER I.....	1
INTRODUCTION.....	1
MIGRATION TRENDS IN MANITOBA.....	3
POPULATION REDISTRIBUTION.....	7
THE PROBLEM.....	9
OBJECTIVES.....	11
POLICY.....	12
OUTLINE OF THE STUDY.....	13
CHAPTER II.....	14
MIGRATION MODELING.....	14
ALTERNATIVE DEFINITIONS OF MIGRATION.....	14
THEORIES OF MIGRATION.....	16
Human Capital Theory.....	17
Push-Pull Theory.....	19
Selectivity Theory.....	20
PRIOR RESEARCH INTO THE MIGRATION PROCESS.....	21
MODELS OF GROSS MIGRATION.....	21
Distance-Gravity Model.....	22
Modified Gravity Model.....	25

	Page
Wage and Income Differentials.....	26
Unemployment Rate.....	28
Personal Characteristics.....	30
Models of Net Migration.....	32
CHAPTER III.....	35
FRAMEWORK FOR THE STUDY.....	35
DEVELOPMENT OF THE MODEL.....	35
MODEL SPECIFICATION.....	38
DESCRIPTION OF VARIABLES.....	41
Migration ($\frac{M_{ij}}{P_i}$).....	41
Distance (D).....	41
Income (I).....	42
Unemployment Rate (U).....	43
Ethnic Background (E).....	43
Age (A).....	44
Education (ED).....	45
Capital Stock (C).....	45
Primary and Secondary Employment (P _i) (P _j) (S _i) (S _j)..	46
Model Specification Summary.....	47
CHAPTER IV.....	49
ANALYSIS AND RESULTS.....	49
RESULTS.....	62
Distance.....	63
Income.....	63

	Page
Unemployment Rates.....	64
Ethnic Background.....	64
Age.....	65
Capital Stock.....	66
Primary Industry Employment.....	66
Secondary Industry Employment.....	67
LIMITATIONS OF THE STUDY.....	68
THE MODEL.....	68
THE DATA.....	68
CHAPTER V.....	70
IMPLICATIONS AND CONCLUSIONS.....	70
IMPLICATIONS.....	70
Policy Makers.....	70
Future Research.....	72
CONCLUSIONS.....	72
BIBLIOGRAPHY.....	74
APPENDICIES.....	79
APPENDIX A.....	80
RURAL AND URBAN AGGREGATIONS DEVELOPED FOR THE MODEL....	81
APPENDIX B.....	91
MIGRATION FLOWS IN MANITOBA BY SPECIFIED AREAS.....	92
APPENDIX C.....	115
SUMMARY OF REGRESSION RESULTS.....	116
APPENDIX D.....	118
DATA SOURCES.....	119

LIST OF TABLES

Table	Page
1. Classifications by Level of Urbanization.....	36
2. Model Specification Summary.....	40
3. Regression Results.....	50

LIST OF FIGURES

Figure	Page
1. Incorporated Centers and their Rates of Population Change.....	5
2. Manitoba Regions and their Rates of Population Change.....	6
3. Alternative Migration Definitions.....	15

CHAPTER I

INTRODUCTION

The existence of regional disparities in economic and social development are not unique to either developed or underdeveloped nations. Changes in the structure of economic activity within a region result from the relative decline in agriculture, changing technology, the new dimensions of resource development, growing demand for manufactured products and the phenomena of urban growth. Regional adjustment to such forces is not homogenous and while some regional differences are inevitable in a dynamic economy, disparities in economic and social development not only exist and persist, but in some cases increase over time.¹ It is within this framework that population change takes place.

The process of migration and its consequences has been the object of study of several disciplines, among them geographers, demographers, and economists.

¹Province of Manitoba, Department of Industry and Commerce, Regional Analysis Program Southern Manitoba, "General Economic Characteristics", (Working Paper 1. Winnipeg, 1974), (unpublished). See also, J.R. Barnard et al "Evaluation Models for Regional Development Planning", Papers of the Regional Science Association, Vol. 23, p 117, 1969.

All three disciplines deal with the measurement of human populations and to some extent their inter-relationships with the environment. Generally the economists interest in migration has followed economic theory in which migration has been regarded as a means for promoting efficient resource allocation in a changing economy. Derived from neo-classical general equilibrium theory, it views migration as a response to unfavourable economic conditions or the perception of conditions elsewhere superior to those in the place of residence. Viewed in this manner, population should flow from regions with less favourable to those with more favourable economic circumstances until the situation in both regions is equal.² The underlying assumption basic to the theory is that wage differentials reflect productivity differentials between regions or areas and migration will result until an optimal level is reached. However, concern about observed trends in migration suggest that, in practice the migration process has not always kept pace with the theoretical concept that it will equalize economic disparities.

Given the framework assessment of the role of migration as the adjustment mechanism requires information concerning the determinants, in order to facilitate the formulation of appropriate policies.

²A discussion of this concept is found in D.S. Watson, Price Theory and Its Uses, (Boston: Houghton Mifflin Company, 1963), pp 411-412.

MIGRATION TRENDS IN MANITOBA

The Province of Manitoba is comprised of eight officially designated regions,³ of which six are considered predominantly rural,⁴ with the seventh being the northern resource region, and the eighth being the major urban centre of Winnipeg.

The six predominantly rural regions are characterized by low levels of income and high levels of unemployment, to different degrees, relative to the major urban centre of Winnipeg.⁵ For the Province of Manitoba recent population trends⁶ are marked by growth in Winnipeg and the principal urban centres of the province and general decline in areas dominated by rural and small urban centre population groups. The declining areas are, in general, located beyond a convenient commuting distance from a principal urban centre, their population resides in towns of less than 1,000 people or in open country engaged largely in farming or farm related business activities.

³As delineated by the Manitoba Provincial Government for data collection purposes.

⁴In these regions the population classified as rural exceeded the urban populations.

⁵Province of Manitoba, Department of Industry and Commerce, Regional Analysis Program Southern Manitoba, "General Economic Characteristics", Working Paper 1, Winnipeg 1974, (unpublished).

⁶W.R. Maki, C.F. Framingham and D.J. Sandell, "Population Projections for Manitoba by Region and Town Size - Some Alternatives 1971-1990". Research Bulletin 73-2 (September 1973), Winnipeg: Department of Agricultural Economics, University of Manitoba, pp 11-16.

The tendency to greater urbanization is illustrated by the fact that while the population of Manitoba increased by 66,561 people over the 1961-71 interval, the rural population declined by 16,864 over the same period. In 1961, 51 per cent of Manitoba's population was located in Winnipeg, and this rose to 54 per cent by 1971 showing the dominance of the urban environment in terms of population.⁷ In the eight designated regions, although principal urban centres generally increases in population, five of the eight suffered net population losses ranging between -.3 per cent and -10. per cent.

Of the three gaining in net population, the increase in the Northlands of 40.1 per cent is directly related to Thompson's growth as a result of its resource base. The trend to rural depopulation is reflected in Figure 1⁸ and 2. Figure 1 displays the relative change in population of the seven classifications of urban centres in Manitoba. Figure 2 shows the relative decline in rural population by regional classification for the 1961-71 period. All regions displayed a relative decline ranging from 8.5 per cent in the Winnipeg trading area to 24.5 per cent in the West Central Region.

⁷Province of Manitoba, Department of Industry and Commerce, Regional Analysis Program Southern Manitoba, Analysis of Population Change 1951-71, (Working Paper 4, Winnipeg 1974), p 14.

⁸W.R. Maki (et al) op. cit. p 13.

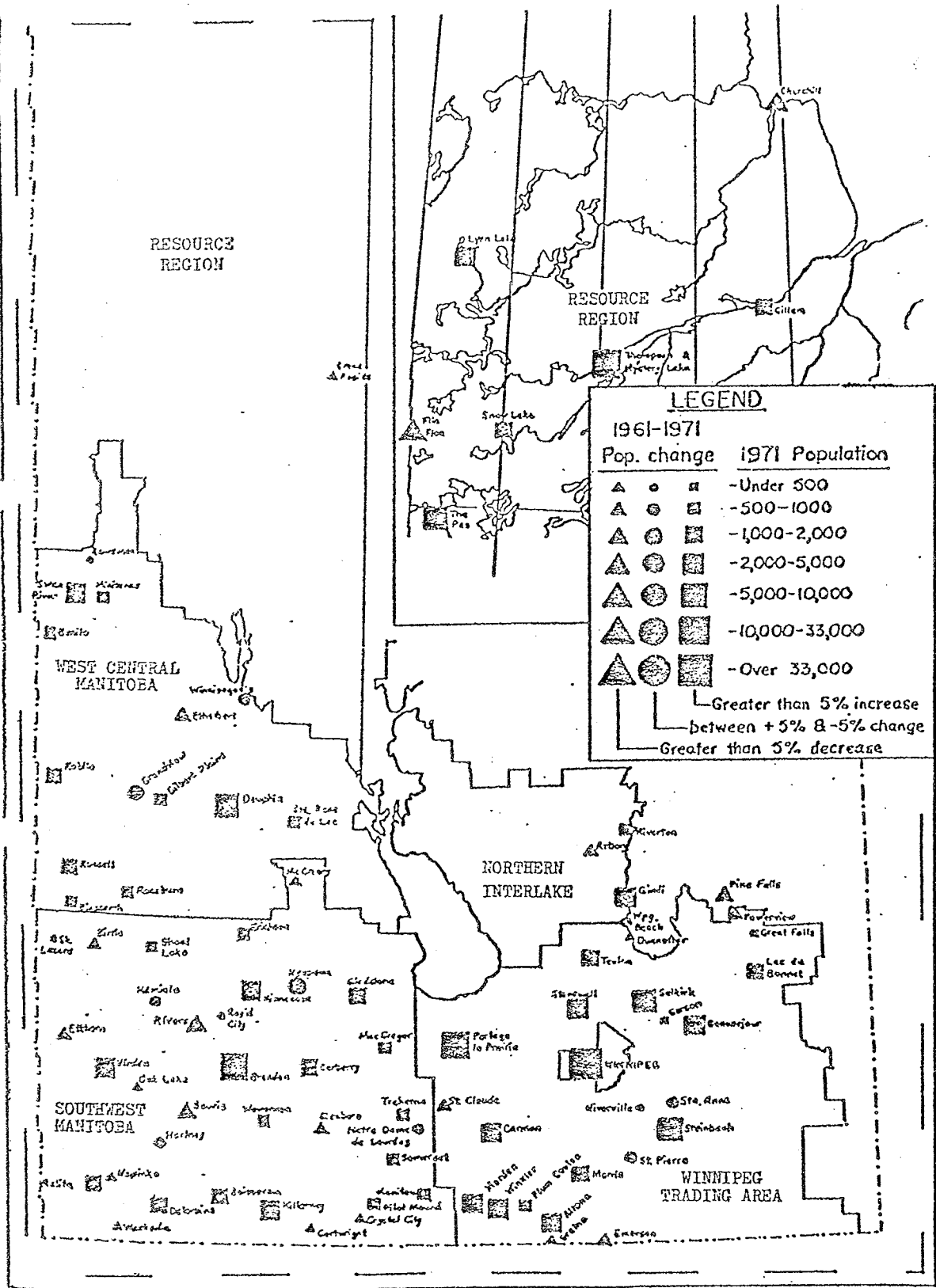


Figure 1

Incorporated Centers and Their Rates of Population Change

Source - W.R. Maki, C.F. Framingham, and D.J. Sandell
 "Population Projections For Manitoba By Region
 And Town Size - Some Alternatives, 1971-1990."

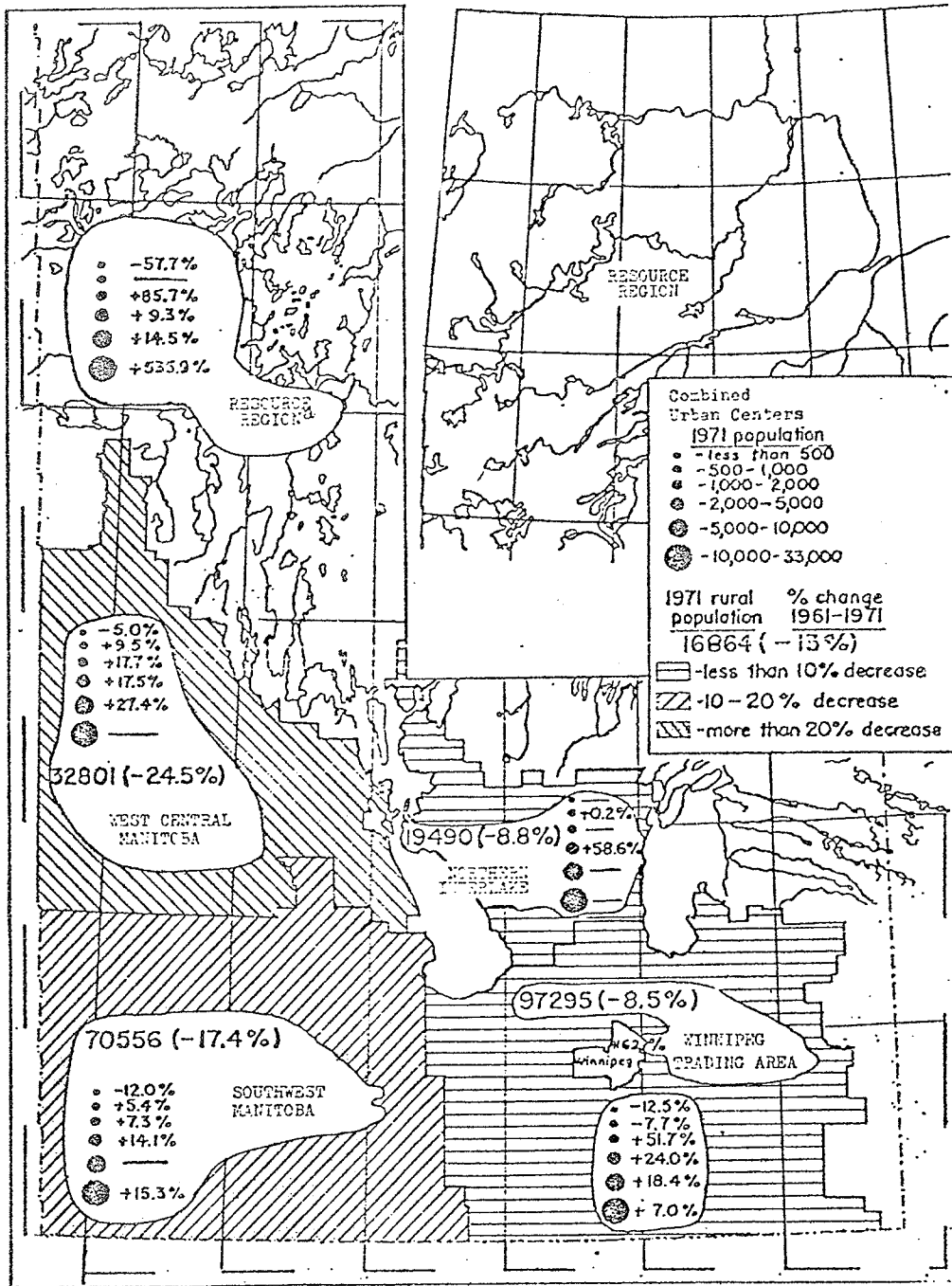


Figure 2

Manitoba Regions and Their Rates of Population Change

^aLimited rural population included in urban statistics.

Source - W.R. Maki, C.F. Framingham, and D.F. Sandell
 "Population Projections For Manitoba By Region
 And Town Size - Some Alternatives, 1971-1990."

A similar study, Analysis of Population Change⁹ by the Manitoba Department of Industry and Commerce, although confined to the southern portion of Manitoba reported identical trends for the same time period. This trend from the rural environment in favor of the urban setting has major implications for both sending and receiving regions.

POPULATION REDISTRIBUTION

Basic to any redistribution of population are the economic and social changes associated with the redistribution. The rural-urban shift in population has extensive effects on the region experiencing the decline. Riew¹⁰ in formulating a conceptual framework to evaluate migration decisions from a social viewpoint, points out three areas in which migration from a declining region created costs to society. The first relates to the existence of underutilized capacity in the form of capital goods left behind as members of the community migrate. The second area considers the increased costs associated with a shrinking tax base, borne by the remaining member of the community, and thirdly, there is a decline in expenditures to residuary industries.

Another aspect of population redistribution is that many Manitobans are relatively isolated from public services and economic opportunities.

⁹Province of Manitoba, op. cit.

¹⁰J. Riew, "Migration and Public Policy," Journal of Regional Science, Vol. 3, (1973), p. 70.

The changing structure of economic activity within and among Manitoba's eight regions suggests that the composition and size of a region's population will, at any point in time, be in a state of transition. Decision-makers in planning today to meet future demands for public services, require information concerning future populations in order that the services offered coincide with the demand for same.

The cost incurred by population redistribution are not limited to the area of out-migration but also occur in the area of in-migration. The increased costs associated with continued urban growth are becoming increasingly apparent,¹¹ with increases in congestion (density), crime, pollution, suburban sprawl and the fiscal squeeze on public expenditures and revenues all creating a burden on society.

There is an additional area in which the costs of population redistribution are subjective. Should an individual feel coerced, through economic forces beyond his control, to reside in an environment not of his choice?¹²

¹¹Numerous studies and articles can be found related to the social costs associated with urban growth. Among these are, Chinitz, B. (ed.) "City and Suburb", (Englewood Cliffs. Prentice-Hall Inc.) 1964 and Alonso, W., The "Economics of Urban Size", Regional Science Association Papers 26: 1971, pp. 67,84.

¹²Province of Manitoba, Guidelines For The Seventies, (Vol. 1,2,3) 1973 p. 251.

This psychic individual cost, although not quantifiable, may be reflected through the increasing willingness of people to commute distances up to 60 miles from their place of residence to place of employment.¹³ This could be taken as an expression for a desire to enjoy a rural environment and urban economic returns.

THE PROBLEM

Decision-makers in the past have relied on ad hoc responses to immediate problems or based decisions on a worst first criteria for the allocation of particular programs or public services. The lack of knowledge concerning the determinants of migration, and paucity of information concerning future developments within a region and of population response to such developments has contributed to the inability of planners to clearly define the types of policies and programs conducive to attaining their stated objectives.

The Government of Manitoba in "Guidelines for the Seventies"¹⁴ adopted a set of goals which outlines the desire of the government to attain a position of balanced growth in economic and social development among the eight regions within Manitoba.

¹³Mario Carvalho, "Exurbia" Research Bulletin 16 (December 1973). Winnipeg: Department of City Planning, University of Manitoba, p. 43.

¹⁴Province of Manitoba, Guidelines for the Seventies, (Vol. 1,2,3) Queens Printer, 1973, p. 255.

Stated by Premier Schreyer at the 1973 Conference on Rural Development,¹⁵ these included:

1. implementation of a viable stay option, i.e. reduce or stop the trend to rural depopulation;
 2. greater equality in social and economic opportunities;
- and
3. insure that government programs meet the needs of local communities in a more responsive manner.

These policy objectives can be viewed as a response to the fact that the differentials in economic and social conditions between rural and urban environments in Manitoba are increasing even with the levels of out-migration observed during the 1961-71 period. In a study by the Manitoba Department of Industry and Commerce¹⁶, although employment and incomes increased in rural Manitoba, incomes in principal urban centres increased at a faster rate. This would suggest that the process of rural depopulation will end when the rural setting is devoid of population, with the exception of those farm operators whose returns compensate for their presence in the rural environment.

¹⁵Economic Development Advisory Board of Manitoba, "Rural Manitoba Its Significance to Manitoba's Future." Proceedings Rural Development Conference, (February, 1973) pp. 44-45.

¹⁶Province of Manitoba, Department of Industry and Commerce, Regional Analysis Program Southern Manitoba, "General Economic Characteristics," (Working Paper 1, Winnipeg, 1974), (unpublished).

Given the stated policy, the relevant goals of equality in income distribution, public services, and balanced economic development over the Province of Manitoba, require the implementation of the appropriate programs and policies.* But what is appropriate? There is a specific need to study the determinants of migration so that the process may be more completely understood and programs can be directed to the identified area of need.

OBJECTIVES

This study of the migration process has three objectives:

1. to construct a model suitable for the estimation of gross migration flows in Manitoba, specified in terms of economic and social conditions;
2. to estimate the model using data derived from Working Papers¹⁷ developed for a manpower study of the Parklands region in Manitoba; and
3. to evaluate the applicability of the Manitoba model results to the migration process in general.

¹⁷Parklands Region Manpower Study, Vol. 2, Working Papers (unpublished) Department of Agricultural Economics, University of Manitoba.

*Programs in existence include the ARDA agreement between the Federal and Provincial governments, totalling 23 million, with 6.9 million allocated to the Farm Diversification Program, 1.9 million to the Farm Water Services Program, and 2.2 million to the Community Centres Program. Subsidiary Provincial programs include S.T.E.P. and P.E.P. directed primarily at creating employment opportunities. The decentralization of Manitoba Government public services into the regional centers of Arborg, Dauphin, Beausejour, and Steinbach, are directed primarily at achieving these goals.

POLICY

The factors determining changes in the distribution of population are a major concern of policy-makers. There are four areas of particular concern, those changes that take place among regions, and between farm, rural non-farm, and urban groups. These concerns have been classified by Tulloch and MacMillan¹⁸ according to five issues.

1. Gains in economic productivity will result if the length of time that job openings are vacant in growing centers can be reduced.

2. Movement by the unemployed and underemployed from low income regions to productive jobs in growing regions will reduce differentials in income among regions.

3. The increasing awareness that undesirable consequences are associated with unrestricted movement of people to major metropolitan centres (increasing costs of public services, congestion, pollution, crime, etc.)

4. Regional planning requires population projections and the projection of migration is subject to greater error than the fertility and mortality components.

5. Assessment and improvement of current mobility programs require knowledge relating to the process of migration. In all the instances outlined above analyses of the behavioral processes underlying migration would be extremely useful.

¹⁸J.R. Tulloch and J.A. MacMillan, "A Micro-Analytic Model of Migration Behavior", Regional Science Perspectives, (Vol. 3, 1973) p. 105.

OUTLINE OF THE STUDY

The purpose of this study is to construct a model suitable for the estimation of gross migration flows in Manitoba, and to determine the factors that influence the migration patterns of residents in Manitoba.

In Chapter II consideration is given to alternative definitions of migration and a review of prior research into the migration process is presented, with particular attention being paid to gross migration models. The implications for the research model are derived from the review.

Chapter III presents the framework for the study. At this point the model is specified, and cross-sectional regression is used to estimate the significance and degree of relationships between socio-economic variables.

Chapter IV presents the analysis and results arising from the estimation procedure and statistical criteria are used to determine the significance of the results. Limitations of both the model and the data are also presented.

The fifth chapter discusses the implications of the results of policy makers and planners concerned with questions related to population redistribution and its determinants. A suggested direction for further research is also discussed along with the conclusions derived from the study.

CHAPTER 11

MIGRATION MODELING

The purpose of this chapter is to review the theoretical and research work into the migration process.

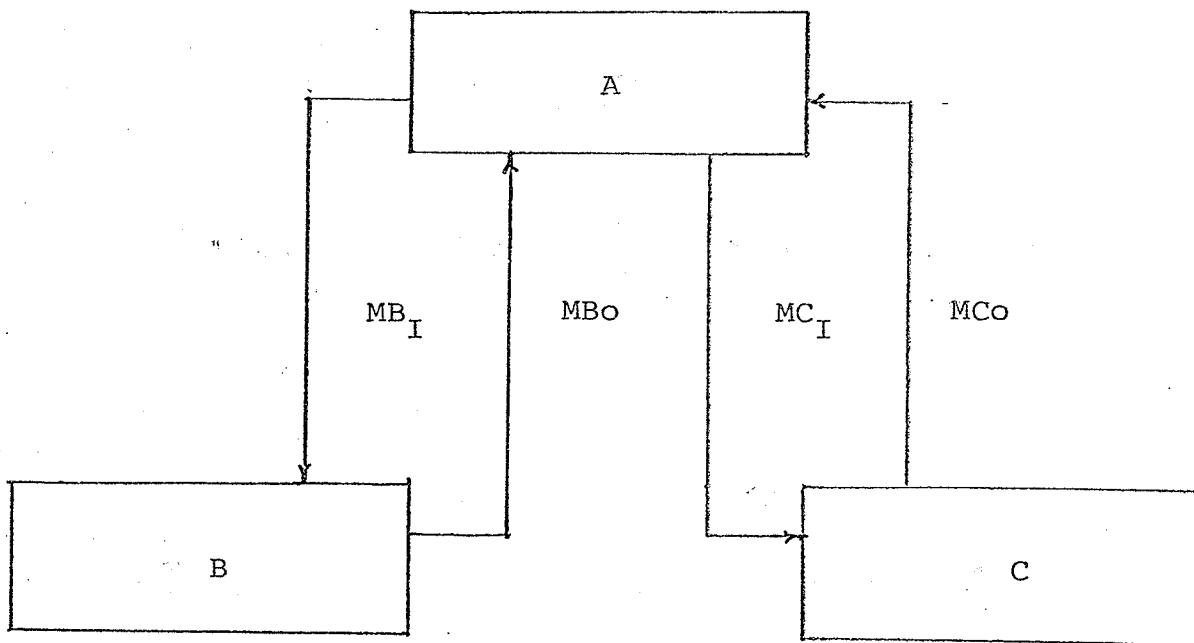
ALTERNATE DEFINITIONS OF MIGRATION

In the process of developing a socio-economic theory of migration, it is essential to make clear the alternative concepts of migration. The following illustration will attempt to explain the alternate types of migration. The absolute movement of people from one specified area to another can be classified into five categories:

1. Total immigration to an area;
2. Total outmigration from an area;
3. Net migration of an area, i.e. total immigration minus total outmigration;
4. Gross migration from one specific area to another specific area; and
5. Net migration between two specific areas.

In figure 3 if area A is taken as the focal point of discussion, total immigration to area A is the flow that sums together the movement of people from area's B and C into area A.

Gross migration to area A is given by the flows M_{Bo} and M_{Co} where M_{Bo} is the migration of people from B to A, and M_{Co} is the migration of people from C to A. As a result of this method of classification, the net migration of area A is the difference between the inflow and outflow of migrants for area A, or the sum of M_{Bo} and M_{Co} minus the sum of M_{C_I} and M_{B_I} .



ALTERNATE DEFINITIONS OF MIGRATION.

FIGURE 3

THEORIES OF MIGRATION

To develop a socio-economic model of migration a reasonable answer should be formulated to the question why people move. The model should include both economic factors and social factors (for example, to be with persons of the same age, and cultural origin), and the theory should be formulated to allow implementation within a probability framework.

Economists have often attempted to present the question of migration as one of resource allocation. To accomplish this, migration is treated as an investment increasing the productivity of human resources. This investment has costs and renders a return over a specified period. The difficulty of this method is that it is necessary to identify and measure the costs as well as the returns to migration; its credit is the possibility of meaningful comparisons between migration and alternative methods of promoting better resource allocation.¹⁹

Private costs can be classified into money and non-money costs. The former include the out-of-pocket expenses of movement, while the latter include foregone earnings and other costs of changing one's environment.

¹⁹L. Sjaastad, "Costs and Returns of Human Migration", The Journal of Political Economy, October 1962, LXX (5): 80-93.