NATIONAL LIBRARY
OTTAWA

CANADA

BIBLIOTHÈQUE NATIONALE
OTTAWA

NAME OF AUTHOR...PAUL TICE.....

TITLE OF THESIS..."ANALYSIS OF INTERMETROPOLITAN LABOUR FORCE MIGRATION IN CANADA, 1971-76".....
1971-1976".

.....

.....

UNIVERSITY.....McMASTER.....

DEGREE FOR WHICH THESIS WAS PRESENTED.....M.A.....

YEAR THIS DEGREE GRANTED.....1980.....

(Signed).....

PERMANENT ADDRESS:

...Dept. of Geography
...McMaster University
.....

DATED June 3, ...1980

NOTICE

The quality of this microfiche is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us a poor photocopy.

Previously copyrighted materials (journal articles, published tests, etc.) are not filmed.

Reproduction in full or in part of this film is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30. Please read the authorization forms which accompany this thesis.

THIS DISSERTATION HAS BEEN MICROFILMED EXACTLY AS RECEIVED

AVIS

La qualité de cette microfiche dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de mauvaise qualité.

Les documents qui font déjà l'objet d'un droit d'auteur (articles de revue, examens publiés, etc.) ne sont pas microfilmés.

La reproduction, même partielle, de ce microfilm est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C 30. Veuillez prendre connaissance des formules d'autorisation qui accompagnent cette thèse.

LA THÈSE A ÉTÉ MICROFILMÉE TELLE QUE NOUS L'AVONS REÇUE

ANALYSIS OF INTERMETROPOLITAN LABOUR FORCE MIGRATION IN CANADA, 1971-76

by

PAUL J. TICE

A Thesis

Submitted to the Faculty of Graduate Studies

in Partial Fulfilment of the Requirements

for the Degree

Master of Arts

McMaster University

1980

ANALYSIS OF INTERMETROPOLITAN LABOUR FORCE MIGRATION IN CANADA, 1971-76

MASTER OF ARTS (1980)

McMaster University
Hamilton, Ontario

TITLE: Analysis of Intermetropolitan Labour Force Migration in Canada, 1971-76.

AUTHOR: Paul J. Tice B.A. (McMaster University)

SUPERVISOR: Dr. Kao-Lee Liaw

NUMBER OF PAGES: ix, 131 pages.

ABSTRACT

Interregional and intermetropolitan migration have long been modelled in an econometric framework in which the migrant is assumed to invest in migration if it is to his economic advantage to do so. Such an approach, commonly identified as human capital theory, is employed here as the basis of an examination of intermetropolitan male labour force migration in Canada for the period 1971-76. Analysis of the mobility rates over the period holds few surprises and serves to reinforce the noted trend at the provincial level of a basic shift in population westward to Alberta and British Columbia. Ontario has lost its position of dominance, Quebec and the prairie region continue to lose population and eastern Canada appears to be holding its own. The motivations of inter-CMA migrants do, however, bear closer scrutiny, as the conclusion reached here through least-squares modelling is that the migrant population may have shifted in its orientation from migration based on chance or speculation to movement to certain employment, laced with a liberal amount of return migration. The argument behind this conclusion is rooted in the economic climate of the period. Further studies will face as their greatest handicaps defining and operationalizing such variables as psychic factors, risk and uncertainty; and the absence in census data sources of information pertaining to multiple or return migration.

ACKNOWLEDGEMENTS

The completion of this thesis gives me the opportunity to express my appreciation to those who gave generously of their time and expertise throughout the course of this work. Special thanks to Dr. Kao-Lee Liaw, my supervisor, for allowing me free rein in determining the direction of my research and for his direction and cheerful, easy-going style of assistance. Thanks also to Hok Woo, for providing a most suituable environment in which to get this effort off the ground, and to "Numbah 10", for his company and sense of humour throughout that period. Rosanna Wan, as usual, rose to the occasion and performed minor miracles on my scratchy penmanship. Margaret Chan did a splendid job on the maps and diagrams. My thanks to all of you.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER ONE

INTRODUCTION

Internal migration has traditionally played an important role in determining the differential growth in population of Canada's provinces, regions and urban areas. The economic development of the nation has involved pronounced changes in the location of economic opportunities, changes that have been accompanied by shifts, at times substantial, in the regional populations. The spatial extent and relatively small population base have accentuated this role.[1]

Indications are that internal population flows will assume increasing significance for at least the next generation. A fertility level of less than 1.0 and the increase in mean age of the Canadian population have produced a declining rate of natural population increase that will persist until well into the next century.[2]

This study concentrates on analyzing the migration flows between the 22 Census Metropolitan Areas of Canada for the period 1971-76. There are two major reasons behind the choice of inter-CMA flows. First, migration is both a cause and an effect of economic change and, to a large extent, one can assess what is happening to the provinces by examining

---

[1] See McInnis (1969a) for a historical perspective on Canadian migration.

[2] See Liaw (1979).

what is happening to the largest urban areas. Secondly, it is believed that the analysis of migration at this level of spatial organization has not been previously undertaken in Canada. Most studies take place at the interprovincial level, giving this study some merit based on comparative ability.

The paper is organized as follows. Chapter Two establishes the theoretical framework through a review of the major avenues that have produced the present approach, that of migration as an investment in human capital. Migrants are presumed to be motivated by economic considerations and will invest in migration if the returns sufficiently outweigh the associated costs. The notion that migration is primarily an investment in human potential places migration in a resource allocation setting, one which can be analyzed through the evaluation of the costs of, and returns to, mobility.

The empirical analysis begins in Chapter Three with an examination of inter-CMA male labour force mobility rates, based on unpublished data provided by Statistics Canada.[3] Although subsequent analyses utilize separate age groups, the analysis in this chapter concerns primarily the total migrant population, since the age-specific patterns of mobility are not substantially different from one another. Total in-,out- and net flows are analyzed, along with the spatial pattern of these flows. The final section uses complete in- and outmigration data for the CMA's, for two time periods, to gauge the impact of migration on the relative growth or decline of urban areas since 1966.

---

[3] 1976 Population Census of Canada, User Summary Tape SDDEM30.

Chapters Four and Five are explicitly concerned with modelling labour force migration behaviour along the lines set out in Chapter Two. Chapter Four details the general form of the model, defines the variables and lists the relevant hypotheses. Chapter Five reports the results that are obtained for the inter-CMA labour force data through an SPSS stepwise regression programme.

The final chapter provides a brief summary and suggests future avenues of analysis.

CHAPTER TWO

MIGRATION AS AN INVESTMENT IN HUMAN CAPITAL

THEORETICAL APPROACHES

2.1 Push-Pull and Selectivity

Three major approaches to the study of internal migration are discernable within the literature. The oldest and most basic is the push-pull hypothesis, developed by Ravenstein (1885) to explain rural-urban migration in nineteenth century England. Ravenstein believed that unfavourable social and economic conditions in agriculture provided a strong push for migrants, a push that was matched by the hope of better employment or education in urban areas, or simply by the "bright lights" of towns and cities. The pull of urban areas was not diminished by high unemployment or underemployment, by poor or dangerous working conditions, or by a subsistence lifestyle on the fringes of the modern economy. He therefore observed that migrants were not necessarily motivated by economic incentives but could be attracted simply by the aura of urban areas and the knowledge that life there could scarcely be worse than in the rural areas. This approach, now dated, sees little application in studies of migration in advanced economies but is, however, still relevant in many Third World nations.[1]

---

[1] See, for example, the study of interregional migration in Jamaica by Adams (1969), in Ghana by Beals et al. (1967) or Sahota's (1968) analysis for Brazil.

The second approach concerns the selectivity of migration and is primarily concerned with the demographic, economic and social characteristics that differentiate the more mobile population groups from those that are not prone to move. For example, sufficient research results are now available to state that the young are more mobile than older people and that migration is positively related to education.[2] In Canada it also appears that high or low income earners are more mobile than those who earn an average wage, that white collar workers move greater distances than blue collar workers, and that language is a significant deterrent to outmigration from Quebec.[3] A fundamental assumption of this approach is that migrants are dynamic risk-taking individuals who are capable of leaving familiar surroundings and prospering in unfamiliar environments. The emphasis is therefore placed on identifying the characteristics which distinguish these individuals from the nonmobile population. The selectivity approach is widely used, particularly when analysis is limited to the description of migrant characteristics. When migration research becomes predictive, or is carried out in a cause-effect framework, the third approach, that of migration as an investment in human capital, is typically employed.

At this juncture the point needs mentioning that none of the three approaches is defined in exclusion of the others. Not only is the data base generally the same (census, social security samples etc.)

---

[2] See Caldwell (1968), Carvajal and Geithman (1974), Courchene (1970) Greenwood (1973) or McInnis (1971).

[3] See Courchene (1970, 1974), Grant and Vanderkamp (1976), and Stone and Fletcher (1977).

but the population characteristics that are chosen for analysis tend to be drawn from the same basic set (age, income, education, unemployment. etc.). The differences that do arise are primarily due to choice of emphasis and interpretation of the data. Thus the human capital approach, which stresses the analysis of the determinants of migration in an econometric framework, embodies much of the selectivity approach and certain elements of the push-pull hypothesis.

2.2 Human Capital Theory

The human capital approach derives from the general theory of investment and may be defined as "the employment of resources for the development of human capacities from which an improvement of individual welfare in the future occurs."[4] This definition, and the attendant line of inquiry, concerns the future well-being of the individual based on investments in the human agent in the present in order to raise the quality of his labour and his earnings ability as a consumer. A major stimulus for research into the quality of labour has been the prominent role of labour in the production process and its consequent high representation in the final cost of goods and services.[5]

One of the most important factors in human capital theory has traditionally been formal education and/or skills upgrading and on-the-job training. Several analogies are readily apparent between investment in education and investment in capital equipment. First,

---

[4] Bodenhöfer (1967) p. 433. Two of the earliest works on human capital theory are Schultz (1962) and Sjaastad (1962).

[5] Courchene (1970) estimates that labour represents about two-thirds of the final cost of goods and services in Canada.

the initial level of investment may be quite substantial and will, in any case, take place over a short period of time relative to the longer payoff period. Secondly, the value of an education can depreciate over time, although this value can be maintained or enhanced through the addition of job experience to the initial level of education. Thirdly, the profitability of the investment is governed by the expected rate of return and the length of the payoff period, and investors will act only after a subjective evaluation of the associated costs and returns. The investment will take place if the rate of return for a given payoff period (discounted for costs and depreciation) is greater in value than the rate of return for the same period in the absence of investment.

Age is an important factor in the profitability of an investment in education since the payoff period is longest for the young while the initial rate of return, or wage, is lower than for older persons in identical situations. This low rate of return and longer payoff period (working life) for the young is particularly attractive to employers, as investment in young employees can be compounded to a greater extent than if the employment investment is made in an older individual who requires a higher initial wage while offering a shorter working life. This greater relative attractiveness may, in turn, make investment in education at a young age more worthwhile for the individual.

The other major human capital investment is that of geographic mobility. All of the above analogies hold because mobility, like education, can permanently increase one's earnings potential by transferring existing skills to areas where they are in higher demand.[6]

---

[6] See Courchene (1970) p. 551.

Migrants are assumed to be rational optimizers who will invest in a move if they perceive that their economic advantage will be maximized. In assessing the profitability of a move, the migrant will reach a decision regarding the relative attractiveness of alternative locations through a subjective evaluation of the potential net benefits, both financial and nonpecuniary, at each location. If the stream of discounted returns is greater than the costs, human capital theory assumes that a move will be undertaken, with the destination being that location where the net differential is the greatest.

For the economy as a whole such movement represents an efficient allocation of resources and may lead to a lowering of regional income differentials. This, according to Sjaastad (1962), places migration within a resource allocation framework, because labour mobility represents an investment in the human agent which increases productivity and promotes an efficient distribution of resources.

A prime advantage of this reasoning is that it provides a ready-made criterion for testing the effectiveness of migration in reducing earnings differentials, i.e. the rate of return on resources allocated to migration. However, there is some difficulty in assessing the relative importance of the various factors that enter into the calculation of the costs and returns associated with migration.

(a) Monetary Aspects

The monetary component of the investment decision is comparatively easy to handle. On the debit side there is the cost of the move -- liquidation of nontransferable holdings, transportation, lodgings, food etc. There is also the opportunity cost of the income

foregone while moving and either looking, or being trained, for a new job. While this is not strictly an out-of-pocket expense, foregone income is easily identified and can be tagged with a dollar value. Differences in prices and costs of living are also registered as part of the financial component.

The money costs associated with migration are usually quite small in relation to the expected financial benefits, which are evaluated in theory as in the case of investment in education -- the discounted present value of the future stream of income perceived as probable at the destination.

(b) Nonmonetary Aspects: Psychic Values

The nonmonetary aspects of the investment decision are not as easy to assess, and there seems to have been a shift of opinion in the literature about the emphasis to be placed on such costs and returns. The most important factor in this regard is psychic considerations. That is, the psychological and sociological costs and returns faced by the migrant. Psychic costs reflect the anxiety associated with leaving family, friends, familiar surroundings and established living patterns for the uncertainty of an unknown location. Psychic returns come in the form of a preference for the destination based on family considerations, climate, quality of life, structural qualities or general well-being.

There is no dispute about the importance of such considerations in the migration decision, or of their effect on subsequent migration patterns. However traditional analysts such as Sjaastad (1962) and Bodenhöfer (1967) have been inclined to argue against the inclusion of psychic factors in the investment calculations, since they neither

represent a real resource cost nor generate a real resource benefit. Their analyses represent a strict economic viewpoint on resource allocation in that they assume that tastes and preferences are invariant. They accordingly argue that transfer subsidies should not be paid to overcome the inertia imposed by psychic costs, since this would be using real resources to overcome a nonresource cost and would represent an inefficient use of real resources.

Theory, however, has had its problems when confronted with reality. Large flows of migrants into, or comparatively small flows out of, depressed regions do not abide well with the idea that migrants are rational, economic maximizers. Economists have for some time experienced difficulty in justifying such flows. As a result it is now common practice in the literature to recognize, either directly or by implication, that endogenous consideration of psychic factors is critical to the adequate assessment and explanation of the forces promoting or impeding geographic labour mobility, particularly in econometric models that adopt a human capital approach.[7]

Psychic costs do involve real resource costs if they result in a maldistribution of labour. In the potential destination the cost to the economy may be measured in abnormally high wage levels induced through labour shortages. In depressed regions the drag of unemployed pools of labour will be reflected in high and sustained levels of social security, transfer and maintenance payments. Investment and

---

[7] See, for example, Courchene (1974), Grant and Vanderkamp (1976), Schwartz (1973) or Vanderkamp (1971).

job creation may be held down due to depressed levels of regional income, shortage of trained personnel, and uncertainty in the marketplace. In such instances the allocation of resources for corrective purposes can, through migration, promote a more efficient and more productive long run distribution and use of labour.

This is not to say that the explicit inclusion of psychic factors offers a ready explanation for large migration flows into depressed regions. But it is a significant step which has, for example, provided insights into return migration, which is discussed later in this chapter.

(c) Nonmonetary Aspects: Information and Uncertainty

Information is another important factor in the migration decision making process which is difficult to assess. Increasing information is generally believed to have a reducing effect on the uncertainty and, therefore, the risk attached to moving. But this is not necessarily so, for two reasons. First, if the perceived risk is felt to be due more to psychic factors or personal values than to questions relating to employment prospects, housing availability etc., then increasing information may not reduce uncertainty, since answers to questions relating to psychic factors are more difficult to obtain than information on job opportunities. Secondly, all information has a cost, either in search and evaluation time or in dollars, and calculating the net benefit of information is made difficult by the different sources of information available to each individual. For some migrants it is conceivable that the cost of information could

outweigh the benefit of reduced uncertainty. For those migrants whose risk is perceived to be primarily psychic, the net benefit may actually be negative if increased information leads to increased anxiety -- possibly culminating in a decision not to move. In general, however, the problems associated with information and uncertainty do not relate to understanding their role but, like psychic factors, to defining, weighting and assigning them values which reflect their real importance in the decision making process.

The continued presence of such grey areas within human capital theory is at least partly offset by the real advantage inherent in the approach of providing a clear and intuitively acceptable link with empirical analysis. A standard human capital model formulation may be represented by the following equation:

$$M_{ij} = f(Y_i, Y_j, P_i, P_j, D_{ij})$$

where migration between regions i and j is a function of income (Y) and population (P) levels at i and j, and the distance (D) between them. Within such a model variables that increase the benefits or decrease the costs of migration are hypothesized to have a positive impact on mobility. Variables that behave in the reverse fashion are expected to exert a negative influence. Many alternative formulations have been utilized, varying in complexity from brief, single equation analyses to simultaneous equation or logit models.[8] Without exception the models

---

[8] Greenwood (1973) and Sahota (1968) provide examples of the simultaneous equations approach and Grant and Vanderkamp (1976) use a logit model.

are tested using least squares techniques, traditionally either multiple or step-wise regression. Yet regardless of the simplicity or sophistication of the chosen model, the selected variables and their expected impacts upon migration tend to be similar, as do the results of statistical testing. The major variables and their reported impacts are discussed below.

DETERMINANTS OF MIGRATION

2.3 Age

Age consistently plays a strong and significant role in determining the level and composition of population flows and is, perhaps, the single most important influence upon migration. The ability of age to capture sizable portions of the variation in migration for males, females or both sexes combined is in large measure due to its strong association with changes in the lifecycle. Few are the migration decisions that are not influenced by lifecycle considerations, especially entry into the labour force, marriage and childbearing -- major changes that tend to cluster together at young ages for both sexes. The role accorded to age appears to hold both over time and for different levels of analysis.

Courchene (1970), using Canadian census data for the period 1956-61, finds that the peak migration rate for males occurs for the age groups 20 - 24 and 25 - 29, tapering to either side of the age spectrum. Those over 45 years of age are less mobile than the 15 - 19 group. Stone and Fletcher (1977), also using census data, confirm these results for the period 1966-71. The over-45 age category continues to be the

least mobile group of labour force age, while male and female mobility rates peak for age groups 25 - 29 and 20 - 24 respectively. The authors also note that a high proportion of females marrying in the 20 - 24 age group have spouses of ages 25 - 29.

The effect of the age variable is also consistent at the inter-metropolitan, interprovincial and intraprovincial levels. At the inter-metropolitan level Greenwood (1973) finds that age is a significant deterrent to outmigration in both three-stage and ordinary least squares estimations of flows among the largest metropolitan areas in the United States. Similar conclusions are reached by Courchene (1974) for both interprovincial and intraprovincial outmigration in Canada. Using tax returns for male tax filers over 1966 - 69, he notes a perfect decline in both rates for all provinces and across all age groups (15 - 29, 30 - 44, 45 - 46).

This brief discussion gives some indication of the importance of age in determining mobility. Since age is related to many of the other major determinants of migration, its full importance will become clearer as it is analyzed in conjunction with the remaining variables.

2.4 Income

Two broad areas are of concern regarding the role of income in the migration process:

(i) the response of migrants to the potential earnings gains that are possible through migration; and

(ii) having made a move, the returns that actually accrue to migrants.

The response issue is clarified here, with the actual returns reserved for brief inclusion in the analysis of return migration.

If the migrant is to be shown as the economic maximizer that human capital theory claims him to be, then potential financial gains must figure prominently in his decision to move. In theory, the best measure of these gains is the migrants expected income after moving. In practice, however, such measures are difficult to operationalize and when their use has been attempted they have performed quite poorly.[9] Since many empirical analyses employ census data of some description, census-derived earnings variables are commonly used to judge the response of migrants to earnings differences between regions.

(a) Income Definitions

Three definitions of income have proven successful in studies of interregional migration. The first of these, and the most common, is simply average annual income in each region. Origin income is usually expected to be negatively related to outmigration, since low incomes should induce a search for alternative regions with higher income levels, and destination income is expected to have the opposite effect. Adams (1969), Greenwood (1969b) and Beals et al. (1967) all report strong and significant results which confirm these relationships.

However this variable is not quite as straightforward as it might seem. While destination income usually shows a strong and unambiguously positive relationship with outmigration, the same cannot

---

[9] See Grant and Vanderkamp (1976), who make such an attempt.

be claimed in confirmation of the origin income hypothesis. Insofar as high levels of origin earnings signal a high foregone income and large opportunity costs, the relationship should be negative as hypothesized. On the other hand, the effect will be positive if higher levels of income are necessary to finance a move. The overall effect, it seems, should still be negative since the actual financial costs of migration are quite small in relation to a relinquished stream of future income. Given this ambiguity the absolute effect of origin income upon migration should be less than the absolute impact of destination earnings.

Courchene (1970) and Vanderkamp (1971) both take up these points. Courchene reports a negative, and not always significant, role for origin income that is quite subordinate to the effect of destination income, while Vanderkamp reports the same order of importance but with a small, positive and significant role accorded to origin income. Using the same data as his colleague, Courchene is able to illustrate that Vanderkamp's positive result is due to his choice of income variable (origin income normalized for distance). Courchene can draw support from the study by Grant and Vanderkamp (1976) which, using an unnormalized income variable, reveals a slight negative role for origin income.

The second and third income definitions, the earnings difference and the ratio of earnings between two regions, are quite similar and both are hypothesized to have a positive effect upon migration, since large values for each signal larger interregional income differences.

Gallaway et al. (1967), Laber and Chase (1971) and McInnis (1971) all find a significant and positive role for the earnings difference variable. Courchene (1970) reports a strong positive relationship between the earnings ratio and interregional migration in Canada, a result which is generally confirmed for the United States by Greenwood (1969a), who uses the same variable at the interstate level.

However not all income measures perform well in migration models. Lowry (1966) uses hourly wage rates in manufacturing in his analysis of intermetropolitan flows in the United States, with poor correlations with the dependent variable and problems of statistical significance and reversed signs. Part of the reason for these results may be that hourly wage rates do not accurately reflect either actual income earned or income foregone, i.e. hours actually worked.

Long and Hansen (1976) also experience difficulty when they use per capita income, which is different from average annual income in that the definition of the latter is usually restricted to the labour force. For total interregional migration over 1955 - 60 and 1965 - 70 in the United States neither origin nor destination income achieve statistical significance, with origin income showing a positive relationship with the dependent variable.

(b) Income and Age

The theoretical relationships between income and migration appear to be intuitively acceptable and are generally confirmed in empirical analysis. With the addition of age to the equation these relationships are clarified further for, as McInnis (1971) points out,

there appears to be a definite and systematic relationship between age and the responsiveness of migrants to potential earnings differences. Young people, particularly if they are single, stand to gain the most from migration due to their long payoff period and comparatively minor investments in location. In contrast, older people stand to lose the most from migration, and the earnings differential offered to older migrants must reflect this if a move is to be made with an acceptable degree of risk. As age increases the payoff period not only becomes shorter, but it does so in conjunction with increasing investments in a particular location that range from a large stake in accumulated job experience, wage levels and pension plans to deep familial and other psychic attachments. A move, quite obviously, will not be made if the proffered gains are not sufficient to cover the attendant costs. The results obtained by McInnis (1971) support this line of reasoning, as migrants aged 20 - 24 are found to be the most responsive to earnings differentials, with the largest decline in response occurring between age groups 20 - 24 and 25 - 34.

The most striking and detailed results are found in the studies by Courchene (1970, 1974) and the monograph of Grant and Vanderkamp (1976). Regarding Courchene's (1974) study of male tax filers, the point was made above that both interprovincial and intraprovincial out-migration rates decline consistently across age groups (15 - 29, 30 - 44, 45 - 64) for each province. When the migrant population is further disaggregated according to low, middle or high income levels, the same trend continues to be observed. In other words, for each income class both outmigration rates decline across the age groups. Newfoundland and

Prince Edward Island deviate from the pattern, but Courchene points out that small data bases make reliable computations difficult.

When each age group is subdivided according to income level, a U-shaped pattern of mobility emerges for interprovincial migration. That is, within each age group the low and high income earners are the most mobile. In the young age group the low income earners are the most mobile while in the remaining categories the high income earners are prone to move. These results are reinforced by Grant and Vanderkamp (1976), who produce a U-shaped pattern for both interprovincial and interregional moves. But for local moves of a few miles or less the outmigration rate falls continuously as income increases for each age group, leading the authors to conclude that short distance moves may be the major avenue open to a low income person to improve his situation, whereas middle and high income earners will find their opportunities spread over greater distances.

The young, particularly those with a low income, thus appear to be the most mobile population group, regardless of income class or level of analysis. As age increases mobility rates decrease, with those older persons who do move having a higher than average income for the group. These results, which are derived from purely descriptive tabulations of tax and social security data, have a remarkably reinforcing effect on Courchene's (1970) econometric analysis of census data, even though the tax analyses relate to the late 1960's and the census data to the late 1950's. By comparing the estimated signs, levels of significance and absolute values associated with origin and destination incomes for interregional migrants, Courchene is able to show that:

(i) the young are the most responsive to potential income gains, and they respond to smaller differentials than do older migrants;

(ii) the young seem to be indifferent to the source of earnings differences, i.e. low origin earnings and high destination income exert approximately the same pressure on young migrants; and

(iii) as age increases not only must the earnings differential increase, but it must be due primarily to favourable destination conditions, as low origin income exerts only slight pressure on older migrants.

The first and second points tie in very well with the high mobility of young, low income earners. Ceteris paribus, the lower the income the smaller should be the required differential to stimulate a move, and the greater should be the indifference to the source of the potential gain -- either a drop in an already low income or a slight increase in destination income. This could also be true for older groups, but their relatively large psychic and financial in situ investments have been noted previously, and too much of a loss may be incurred in their liquidation if they are not matched by a substantial compensating gain at the destination. This is in accord with the third conclusion.

One final point bears mentioning. There is a general agreement that age is a very significant deterrent to the migration of older people. While this point finds no disagreement here, it may be that age is overrated in its deterrent capabilities and that some of the mobility impeding effect of age is actually due to potential earnings

for older individuals that are too low to stimulate a move. If individuals are assumed to be economic maximizers, then every potential migrant has his price, or earnings level, that will be sufficient to cover the liquidated investments, the psychic values, the risk and the necessary profit from a move, regardless of age. As explained previously, the price for older migrants is necessarily greater than for younger migrants. Since the young are more mobile than older people, it is plausible to suggest that the incentive offered to them must more adequately cover their risk, costs and profits than does the incentive offered to older migrants. It then follows that if the lump sum present value of a move (rate of return extended over the payoff period, normalized for skills depreciation) for both the young and the old were calculated to cover equally their respective needs then, logically, the mobility rates of each group would be quite similar. That these rates are not equal is traditionally attributed to age differences. The suggestion here is that the effect of age masks to a certain degree proferred gains to older migrants that are insufficient to cover their costs and investments, vis-à-vis the situation facing the young.

2.5 Education/Occupation

(a) Education

When education is included in human capital models, it is universally hypothesized to have a positive effect on outmigration, an impact that is frequently linked to information availability. Schwartz (1973) notes two points in relating education to information:

(i) the lower the sophistication of the method by which information is sought, the faster will be the decline in the amount of information available as distance increases; and

(ii) as education increases, the type and sophistication of information available to the migrant also increases.

Sources of information include interpersonal communications, local media, government and private sector placement offices, trade and professional journals, and long distance correspondence. Interpersonal communications are the most basic information channels and the most commonly employed. However as levels of education rise, such channels become augmented through the use of professional placement offices and journals, and long distance correspondence. For the more educated population, the use of such channels is more of a necessity than a luxury, as the labour market tends to become geographically larger but quantitatively smaller as education levels increase, particularly toward the upper end of the spectrum.

Courchene (1970), Greenwood (1969a) and McInnis (1971) all hypothesize and all show that education levels are positively related to outmigration. Courchene uses the percentage of the labour force with education levels exceeding grade 10, and Greenwood defines his education variable as the median number of years of education in the regional labour force. McInnis incorporates education by dividing his sample on the basis of elementary, secondary or university levels of education.

While all of the above definitions lead to acceptable results, none of them disaggregate education into sufficiently fine detail to show

what happens to mobility as education levels are increased by small increments. Long (1973) illustrates that this is a worthwhile exercise, and suggests that a more accurate relationship between education and migration may be U- or J-shaped. Using 5 age cohorts for labour force males and 7 educational categories to span elementary to university levels of education, he points out that those at the extremes of education can expect the most changes in residence (and occupation) over a lifetime. Those at the high end of the spectrum (4+ years of college) are more mobile than those at the lower levels (1-3 years of high school, or less). In support of Schwartz, Long indicates that education is not a very good predictor of short distance moves, but becomes increasingly important as the distance of the move increases.

(b) Occupation

Since the more highly skilled occupations generally require higher levels of education, it is not surprising that patterns of occupational mobility are quite similar to those for education. According to Long (1973), not only does education influence the choice of occupation but, once an occupation is entered, education continues to exercise a strong influence in terms of predisposing individuals toward migration. By using comparable census figures for Canada and the United States, Long shows that the pattern of mobility change among occupational groups is basically the same for both countries. Blue collar workers register the lowest outmigration rates and professional people the highest, being nearly twice as mobile as their blue collar counterparts.

Grant and Vanderkamp (1976) support the findings for Canada, reporting very high rates of mobility for professionals, especially members of the financial community; and low rates for craftsmen, production workers and union members. Aberrations in these results are that doctors and lawyers are not all that mobile, given their reliance on established clientele, while workers in logging, mining and farming are mobile due to the seasonality of their employment.

Ladinsky (1967) is similarily able to offer a degree of confirmation for the pattern in the United States, indicating that mobility is highest at the top and bottom of the occupational ladder. He finds that professional workers are almost twice as migratory as any other group, that young professionals (25 - 29) are even more so, and that for professionals long distance migration is nearly double that for any other occupational category.

In summary, it is reasonable to suggest that those with either low or high educational achievements are the most mobile, and that this, in general, corresponds to the pattern of mobility according to occupational grouping. Those of low education may be employed in relatively low paying, unskilled or semi-skilled occupations that restrict them to short distance moves, based on available information, relatively wide local labour markets and their inability to finance moves of longer distances, this last point pertaining particularly to older migrants. Those that do migrate long distances may do so due to the seasonal nature of their employment, i.e. in primary industries. Those migrants who move long distances are likely to be well-educated, either young persons just entering the labour force or highly skilled older migrants who are

moving to change jobs or are being transferred, and for whom the risk associated with migration is perhaps reduced. Flows at all scales will contain sizeable numbers of young people, but as distance increases the proportion of older migrants is likely to decrease. Note that these are generalizations which remain subject to the vagaries and peculiarities of local labour markets, and to differences in the strength or diversity of regional economies.

2.6 Distance

Distance, as a deterrent to migration, has long occupied a strong position in migration studies. Various definitions -- air miles, road miles, straight line distance, the number of political boundaries crossed -- all have proven significant in impeding migration flows.[10] On the surface the relationship between distance and migration seems to be intuitively obvious and fairly straightforward. However the amount of variability that is assigned to the distance measure has been shown to be too great to be accounted for merely by transportation and moving costs, leading many researchers to suggest that distance is a proxy variable which captures within itself the mobility impeding effects of psychic costs and the costs associated with information and uncertainty.[11] The

---

[10] Lowry (1966) employes air miles and Gallaway (1969) uses the number of regional boundaries crossed by the migrant -- a measure which may be suitable for interstate flows in the U.S.,but one which has obvious disadvantages in Canada. Sahota (1968) appears to use straight line distance, but provides little information on his definition, and Schultz (1971) employes travel time, with some difficulty. The most common definition is road mileage between relevant places, as in Adams (1969), Beals et al. (1967), Courchene (1970), Karp and Kelly (1971) and Grant and Vanderkamp (1976), to list a few examples.

[11] See, for example, Courchene (1970), Long and Hansen (1976) or Vanderkamp (1971).

problem is that much of the discussion concerning the mix of these costs within the distance variable remains little more than informed speculation, since it has not been possible to quantify either psychic costs or the effects of uncertainty. The best results available, those of Schwartz (1973), seem to indicate that the deterrent effect of distance, in excess of the financial aspects of moving, is related more to uncertainty than to psychic costs. These results are based on analyzing the relationships between age and education with the distance variable, with age acting as a proxy for psychic costs and education as a proxy for uncertainty.

That psychic costs increase with age has been established in prior discussion. There is little similar evidence, however, to indicate that psychic costs increase with education. Insofar as increasing education is known to promote mobility, education predisposes individuals to accept possible mobility as part of their employment. In this regard education may decrease the importance of psychic costs in the individual's decision making regarding career advancement. While this is highly probable at extreme education levels, it may not hold at intermediate levels and, as is noted above, professionals such as doctors and lawyers are not that mobile. Therefore, at a minimum, it is only possible to suggest that psychic costs increase with age, but that the effect of education upon psychic costs is nonincreasing. If age then shows a stronger relationship with distance in a human capital model, then it may be possible that the deterrent effect of distance represents in large measure the response of migrants to psychic costs.

Turning to uncertainty, it has also been established that increasing education opens up a greater, more sophisticated number of channels

of information to migrants. Given that individuals who are either highly skilled or in the process of acquiring higher levels of education are, in general, predisposed towards mobility, then increasing amounts of information will reduce the uncertainty and risk associated with migration. In relation to age, there is little information available to suggest that job experience, which is related to age, opens to the migrant the same sources of information as does education. Thus, there is little reason to expect job experience to decrease uncertainty to the same degree as education. It is therefore possible to suggest that the impact of education on uncertainty is much greater than that of age, and that if education shows a stronger relationship with distance than does age, then the effect of distance may reflect uncertainty on the part of migrants more than psychic costs.

Courchene (1970) offers some tenuous support for this line of reasoning based on the income/distance tradeoff, which is simply the amount of additional income necessary to induce a migrant to move an additional mile. If the mobility impeding effect of distance is due primarily to uncertainty instead of psychic costs, then the income distance tradeoff will be greater for, and more sensitive to changes in, education than age. Courchene does not hypothesize along these lines, but he does find the above results.

Notwithstanding Courchene's results, or Schwartz's arguments, there is clearly a need to delimit and quantify the relative contributions of psychic costs and uncertainty to the distance variable.

The final point to be made in regard to the distance variable is that its deterrent effect decreases as the distance is increased.

Vanderkamp (1971) illustrates this quite well in relation to the income/distance tradeoff, and his figures show that, regardless of economic conditions, the tradeoff is approximately six times greater at 500 miles than it is at 3,000 miles, decreasing in a pronounced nonlinear fashion. Courchene (1970) also notes the nonlinear nature of distance, reporting that an incremental 100 miles added to an intended move of 100 miles will be a greater deterrent to migration than will an incremental 100 miles added to an intended move of 1,000 miles.

2.7 Unemployment

The unemployment variable, the final major determinant of migration to be considered here, has a history of inconsistent and troublesome performance in migration models. This performance pattern seems to be linked not only to the ability (or inability) of unemployment rates to accurately capture and reflect how unemployment as a personal experience affects an individual's willingness to move, but also to how appropriate unemployment rates are in describing how general levels of unemployment affect general levels of mobility.

(a) Problems of Consistency

Regarding unemployment as a personal experience, the available evidence suggests that unemployment for the migrant exerts more of a push than a pull on his mobility. Blanco (1963), using a variable which expresses the difference between regional levels of unemployment and the national level, reports that high levels of regional unemployment are positively and strongly related to regional outmigration rates. Fully

85% of the variation in interstate migration is accounted for by this variable.

Also at the interregional level, and using origin and destination unemployment rates, both Courchene (1970) and Greenwood (1969a) indicate that origin unemployment has a significant and positive effect on outmigration, while destination unemployment appears to exert little influence in impeding flows. Courchene's results remain essentially unchanged when the labour force is disaggregated by age. These results are further reinforced by Greenwood (1973) at the intermetropolitan level, as he finds significant positive and negative coefficients for origin and destination levels of unemployment respectively; the origin coefficient is, however, greater in magnitude than the destination coefficient. Other results that support the notion that unemployment is basically a push phenomenon can be found in the work of Adams (1969) and Gallaway et al. (1967).

These findings are at odds with those of Lowry (1966), who essentially discovers the reverse relationship in his analysis of intermetropolitan flows. A strong, negative coefficient for the destination and an apparently negligible role for origin unemployment lead him to conclude, in conjunction with similar results for his income variables, that outmigration is determined primarily by economic conditions in the destination region and not by labour force conditions in the origin.

Between these two poles are those studies that show very weak or inconsistent results for the role of unemployment in influencing mobility, among them being both studies by Carvajal and Geithman (1974, 1976), Grant and Vanderkamp (1976), Greenwood (1973) and Karp and Kelly (1971).

In spite of the wide variety of research results available for unemployment, it nevertheless seems clear that unemployment does provide a stimulus to individuals to move. Examination of Unemployment Insurance Commission data by Grant and Vanderakmp (1976) has yielded higher mobility rates for the unemployed than for those who do not experience unemployment in the origin. But, as the authors note, the duration of unemployment is critical, i.e. people experiencing short periods of unemployment have high mobility rates, but these rates decline as the length of unemployment increases up to about forty weeks, after which there is a slight increase in mobility. These findings are broadly supported by Courchene's (1974) similar analysis of UIC data.

What these results indicate is that people are motivated to move in order to find work, but may either lose the ability to finance a move or lower their aspirations and accept work of a different sort as the period of unemployment lengthens. Long term unemployment in itself may be viewed as an inducement to move, perhaps in the realization that conditions are not likely to improve in the origin.

No similar results are available to assess the relative importance of origin and destination unemployment on mobility, or to accurately determine if high unemployment levels in the destination do inhibit inmigration. In a human capital framework, the only clear tendency seems to be that high unemployment in the origin exerts a push on mobility that is stronger in effect than the pull of low unemployment rates in the destination -- a situation the reverse of that generally found for income varaibles.

(b) Problems of Definition

The second point mentioned at the begining of this section concerns the ability of regional unemployment rates to reflect accurately the effects of general economic conditions on mobility. There is some doubt about their ability in this regard, stemming primarily from two studies by Vanderkamp (1968, 1971).

In the first study, Vanderkamp (1968) hypothesizes that general economic conditions will influence the national rate of mobility, a hypothesis that seems reasonable given that migration is influenced by uncertainty and that slack conditions in labour markets everywhere are bound to increase the general level of uncertainty. In his subsequent test for this hypothesis,however, Vanderkamp uses the national unemployment rate instead of the more usual regional rates, on the grounds that regional rates of unemployment suffer from multicollinearity to the extent that general economic conditions affect unemployment rates everywhere, although not to the same degree.

Although he presents no evidence in defence of his position,his results, tested on a yearly basis over 1947-67 for Canadian interregional migration, do confirm his hypothesis that as general economic conditions deteriorate, the overall rate of mobility is reduced. These results are supported in his later study where, concentrating on income, he reports that mobility responds much less to existing opportunities when there is general slack in the labour market. In terms of the income/distance tradeoff, under depressed conditions the inducement to move an extra mile must be approximately 50% greater than in times of general market tightness.

There are three points to be made here. First, it would be useful if results similar to Vanderkamp's, but using regional rates of unemployment, were available to test for similarity on a yearly basis. Secondly, such results would provide an invaluable comparison with the more usual census data analyses that are based on five year intervals, with the unemployment rates measured at the beginning, the end or over the census period. There is no clear reason why unemployment rates measured over such intervals should be particularly sensitive to short term fluctuations in economic conditions. Much detail can be missed over the intervening five years, and such a comparison may shed some light on the magnitude of these omissions. Finally, the general conclusion, based on aggregate assessment of the above results, is that as economic conditions deteriorate the general level of mobility in the labour force declines, but within the flows that do persist there may be a larger proportion of unemployed migrants moving in search of work.

(c) Problems of Simultaneity

Before moving on the ancillary problem of simultaneity should be mentioned. That is, the extent to which migration influences levels of unemployment just as unemployment affects mobility. Depending on the size of the regional multiplier and the level of expenditures maintained by individuals, outmigration of either employed or unemployed persons from a region of labour surplus can stimulate further unemployment. In this regard Vanderkamp (1970) reports, on the basis of a county level analysis of employment and migration in the Atlantic Provinces, that for every five unemployed persons leaving the Maritimes, two people may

become unemployed. On a net basis, however, the effect of outmigration is to reduce unemployment, albeit over a potentially lengthy period of time.

At the intermetropolitan level Greenwood (1973) shows through a simultaneous equations model that as unemployment increases, outmigration increases, but that this outmigration should lower unemployment levels. Thus it appears that outmigration lowers the level of unemployment in the origin region, but perhaps not without creating more unemployment in the process.

RETURN MIGRATION

The investment in migration proves, for most migrants, to be worthwhile and successful endeavour. But for a minority, however, migration is a disappointing experience that leads to a move back to the place of origin. Such return moves form an integral part of the gross flows upon which most migration studies are based and, for a variety of reasons, exert an influence on the estimated coefficients for the independent variables. Yet the ability of human capital estimations to identify and assess return migration is severely constrained by the absence from most census data of information on multiple and return moves. This study is no different, and in the following chapters little attempt is made beyond informed speculation to test for the size and influence of return flows. Brief discussion is nevertheless deemed advisable, since the effects of these flows are likely to be present in the estimated coefficients.

2.8 Returns to Migration

The monographs by Courchene (1974) and Grant and Vanderkamp (1976), based on the analysis of tax returns and UIC data, supply substantial evidence that points to a high probability of success through migration for the individual. Migrants garner larger income increases than stayers, and the increases tend to increase as the distance of the move increases from local and regional to interprovincial levels. The increase is the largest for young migrants, especially those with a low initial income, and declines with increasing age, although for all low income age groups the returns to migration remain quite substantial. By occupation the payoff follows the pattern for occupational mobility, with the highest payoffs going to those with the highest mobility rates (professionals, managers etc.) and the lowest to those groups exhibiting low mobility (craftsmen, labourers and production workers). A considerable amount of evidence suggests that people are spurred on to migration because of disappointing income experiences or unemployment. Having made a move, migrants are also subject to more unemployment than stayers, but the average level of unemployment among migrants seems to be limited to about two weeks' duration.

Despite the favourable income and employment prospects that seem to be available through migration, an estimated 20 - 30% of migrants elect to return to their original place of residence within a year and 40 - 70% over a five year period, with the proportion apparently exhibiting a negative relationship with the general level of economic

activity.[12] These migrants generally fare worse in terms of income after their return than those migrants who elect not to return. In some instances returnees would have been better off not to have moved at all.

A number of reasons exist for return moves, among them a) disappointment with income and employment prospects or experiences, b) an inability to make the necessary psychic adjustments to the new location, c) a return may have been planned as part of the original move, and d) employment transfers. This last reason may not be very prevalent among return migrants, given that return migrants generally experience a drop in income. There is no reason to expect migrants who return on a job transfer to experience such a decrease.

2.9 Effects on Estimated Coefficients

The major concern here is the effect that hidden return flows may exhibit on the estimated coefficients for the independent variables, assuming that the major portion of returnees are not moving on employment transfers. The general lack of research results concerning return migration does, however, make available only sketchy evidence to support the theoretical reasoning.

The primary reason for concern regarding the presence of return movements in gross migration flows is the reduced economic motivation of

---

[12] Courchene (1974) and Vanderkamp (1972) estimate return migration at 20% of gross flows for 1966-67 and 1967-68, while Grant and Vanderkamp (1976) estimate 30% for interprovincial moves and 20% for interregional local moves. Vanderkamp (1968) produces 40 - 70% return migration over 1956-61. In his 1971 study he also illustrates that the proportion of of return migration should display fluctuations similar to those associated with the general level of unemployment.

return migrants. The income opportunities available to migrants, and the apparently low level of additional unemployment suffered by migrants, seem to indicate that return flows may have a substantial psychic motivation due to either "homesickness" or an inability to adjust to the new location. For those migrants who return because of disappointment with their work or income experiences, or for whom a return move was deliberately planned at the time of the original move, the mere act of returning illustrates that attachments to the original location may be more significant for these individuals than for nonreturning migrants.

This sensitivity to home environments will have an impact on the estimated coefficients for distance, income and unemployment, with the degree of impact depending on the proportion of return migrants in new gross flows. The larger this proportion, the smaller will be the deterrent effect of distance on the entire gross flow, as the major components of the distance variable, psychic costs and uncertainty, are significantly reduced for migrants returning to their original home location. Therefore for new migrants, the coefficient associated with distance, while significant, may nevertheless be underestimated. In support of this argument Long and Hansen (1976) report a significant deterrent effect for distance for total outmigration (including return flows), but an insignificant role for the variable when applied to return migrants alone. In this reduced role, however, Vanderkamp (1972) reports that the probability of a return move should still vary negatively with distance, although there is a real possibility that as distance increases the increasing psychic discomfort may stimulate return flows.

If the migrant perceives that his original move has been, and continues to be, an expensive one in psychic terms, then this should throw into stark contrast the effects of any increase or decrease in the returns to offset this expense on his mobility. Return migrants should, therefore, be particularly susceptible to the push of both low origin income and high unemployment rates at the new location, more so than new migrants who have successfully reconciled their psychic costs with their income and employment positions. In a similar fashion, return migrants may be more responsive to smaller increases in destination income and smaller decreases in home unemployment rates if they perceive that such changes have greatly improved their chances for success in the original region vis-à-vis their current locations. They may also be completely indifferent to income and employment conditions in the original location if their desire to return is strong enough. However conditions in the original location are expected to play a subordinate role to the influence of income and unemployment in the current location.

Earlier discussion has indicated that migrants appear to respond more to destination incomes than to origin earnings, excepting the young, who respond to both equally. If this is indeed the case, then return migration will probably inflate the negative coefficient associated with current earnings. It may also increase the destination income coefficient, providing a larger positive role, although this is not certain given that migrants may move back to their home region regardless of income conditions. However Vanderkamp (1972) implies an increased role for both variables, with support provided through the results of Long and Hansen (1976).

Prior discussion has also revealed that unemployment seems to be more of a push than a pull phenomenon, and the effect of return migration may be to increase the positive coefficient for origin unemployment. As with destination income, the impact upon destination unemployment is less clear, since return migrants may respond to slight decreases in unemployment, thereby strengthening the coefficient, or they may disregard employment conditions entirely in their desire to move back to their original location, which would weaken the coefficient for destination unemployment. The available research results are especially thin on this point, as Vanderkamp (1968) is only able to show that the push aspect of unemployment for return migrants is greater than the pull aspect of the region to which they return.

CONCLUSIONS

Migration as an investment decision is, to a substantial degree, influenced by economic motivations. Rates of migration decline with distance, as the costs associated with distance increase to levels indicating unacceptable risk for many migrants. Mobility also declines with age, as the payoff period is shortened, and older migrants become proportionally smaller in migrant streams as distance increases. The rates rise as levels of education rise beyond intermediate levels, reflecting reduced uncertainty and a response to geographically wider labour markets by these groups vis-à-vis those of lower educational attainments who, while highly mobile, find that short distance moves are perhaps the best avenue for improving their economic situation. The pattern of mobility

for different occupational categories is quite similar to that for education.

Much evidence indicates that migrants are motivated by a desire to better their economic situation, and most seem to be successful. Unemployment is viewed as a strong stimulus to move, although the duration of unemployment is critical, and results for most migrants in the obtaining of work. For all migrants, but particularly the young and low income groups, the returns to migration are substantial. These returns tend to rise as the distance of migration increases, indicating that perhaps the increased costs due to higher levels of risk are being duly compensated.

For a minority of migrants the investment proves to be a poor one which leads to return migration. Some would have been better off not to have made the original move. The motivations and behaviour of this group remains largely speculative, but it is reasonably safe to assume that their economic motivations in returning are less than those of new migrants.

Econometric analysis of the determinants of migration, based on a human capital framework, appears to be a workable method of investigation considering the similarity of results for many diverse nations and for different levels of spatial organization, and considering the degree to which these results accord with theory. However there are problems associated with this approach, not least being the inability to cope with the effects of psychic costs and uncertainty on both new and return migration. The problems associated with return migration are more a function of the structure and content of available data then of the chosen method of analysis.

CHAPTER THREE

ANALYSIS OF LABOUR MOBILITY RATES

3.1 Introduction

The primary purpose of this study is to investigate the determinants of mobility for a subset of the 1971-76 migrant population in Canada -- males of labour force age who moved between Census Metropolitan Area's (CMA's) over the period 1971-76. To accomplish this the overall pattern of mobility within the metropolitan matrix must first be established. Therefore the purpose of this chapter is to provide answers to the following questions:

(i) What is the total volume of inter-CMA migration?

(ii) What are the relations among in, out and net migration?

(iii) How do the flows vary for different age groups?

(iv) What are the spatial patterns associated with these flows?

(v) What is the impact of migration on metropolitan growth?

Since this is not a study of mobility rates per se, this chapter is restricted in length and substance to providing a backdrop against which modelling for the determinants of migration can take place.

3.2 The Risk Population and Total Mobility

The migrant population in this study is based on the 1976 population census. However since individuals in this census were asked

where they resided at the time of the last census, migration status is defined for 1971, resulting in a quinquennial migration measure. The population at risk of moving is therefore the 15 - 59 male population living in CMA's, as defined in the 1971 census. The relevant figure is 3,822,730 individuals, or 60% of the total 1971 15 - 59 male population in Canada.

Table 1 shows the breakdown of this population through a ranking of the 22 CMA's by population size. The capitalized codes on the left are used on the adjoining map and on all following graphic material.

The risk population accounts for approximately 30% of the total metropolitan population, a figure which is, in turn, divided roughly into thirds by age group -- 31% are young (15 - 24), 34% are in the middle age group (25 - 39) and 35% are older men (40-59). A number of points can be made about the age-specific distribution of the risk population:

(i) the greatest variability is associated with, and about equal for, the young and the old groups;

(ii) older labour force members are particularly well-represented in British Columbia and the Golden Horseshoe area of Ontario, while the proportion of the young in these regions is lower than might be expected;

(iii) middle aged males find their strongest representation, in aggregate, in cities of +100,000 labour force size; and

TABLE 1

1971 CMA POPULATION FIGURES

CMA	(1) Total Population	(2) Males 15-59	(3) (2) as % of (1).	(4) 15-24 as % of (2)	(5) 25-39 as % of (2)	(6) 40-59 as % of (2)
MO Montreal	2,944,445	924,875	31.41	31.66	34.59	33.75
TO Toronto	2,511,479	780,350	31.07	27.87	35.95	36.19
VA Vancouver	1,028,334	311,590	30.30	28.77	33.86	37.37
HB Ham.-Burl.	592,352	178,520	30.14	29.18	32.98	37.84
OH Ottawa-Hull	581,876	176,785	30.38	31.82	34.16	34.02
WI Winnipeg	540,262	158,910	29.41	32.04	32.41	35.56
ED Edmonton	522,461	165,840	31.75	31.59	35.40	32.68
QC Quebec City	485,938	145,965	30.04	31.65	36.07	32.27
CA Calgary	447,079	134,540	30.09	31.12	36.00	32.87
LO London	348,622	101,420	29.09	30.55	33.34	36.11
CN St.Cath.-Niag.	347,328	101,355	29.18	30.73	30.65	38.61
WR Windsor	306,399	88,180	28.78	31.99	32.17	35.84
NS Halifax	261,461	78,110	29.87	33.17	34.64	32.19
KI Kitchener	254,037	76,460	30.10	31.77	34.95	33.29
NF St. John's	214,378	60,060	28.02	36.21	30.30	33.48
VI Victoria	204,800	56,145	27.41	31.81	28.63	39.59
SU Sudbury	198,079	62,125	31.36	34.54	33.30	32.17
RA Regina	175,219	50,060	28.57	33.14	31.05	35.81
CH Chicoutimi	163,348	49,015	30.01	37.93	32.36	29.72
SA Saskatoon	153,698	43,750	28.46	33.57	32.62	33.81
TB Thunder Bay	145,390	43,460	29.89	31.68	29.90	38.41
NB St. John	125,447	35,215	28.07	33.54	29.85	36.62
Totals, weighted means	12,552,432	3,822,730	30.45	30.80	34.20	35.00
		Unweighted means		32.20	32.96	34.92
		Standard deviations		± 2.53	± 2.19	± 2.55

Source: Catalogue 92-715, table 9, 1971 Census of Canada.

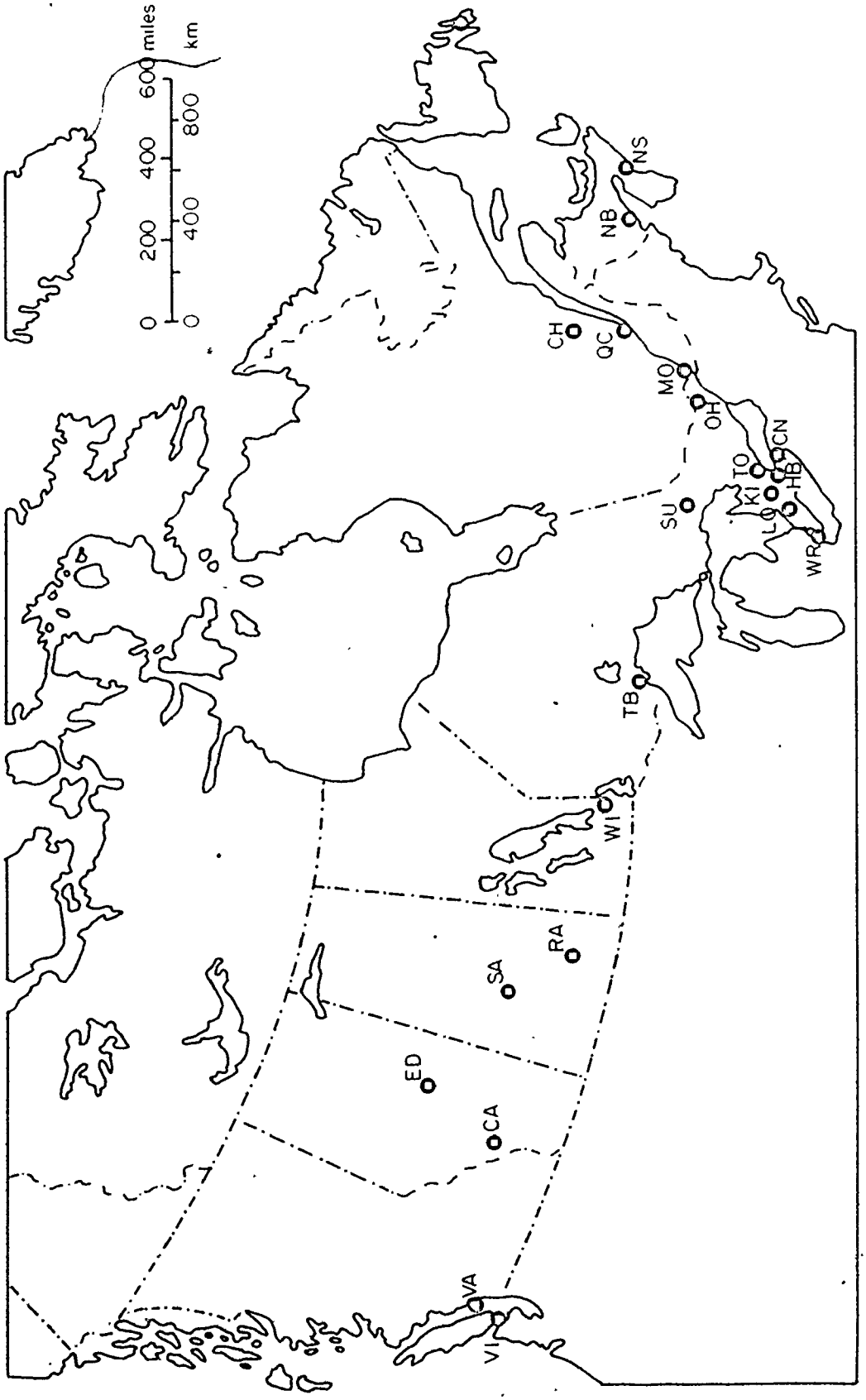


Figure 1. Locations of Census Metropolitan Areas

(iv) young males are represented strongly in cities of less than 100,000 labour force size, particularly in Sudbury, Chicoutimi, the East and Saskatchewan.

The significance of this distribution surfaces in conjunction with age-specific net migration.

The total mobility of males 20 - 64 over 1971-76 measures 1,772,715 individuals, of which 214,315, or 12%, moved between CMA's, yielding a quinquennial mobility rate of 5.61%.[1] Nearly half of these intermetropolitan migrants (45.68%) are aged 20-29, while less than a sixth (15.71%) are older males aged 45 - 64. The middle group of ages 30 - 44 account for 38.6% of the inter-CMA flows. As might be expected, the young dominate the migration streams and play a large role in determining the overall pattern of mobility.

3.3 Total Migration Flows

(a) Total Immigration

The quinquennial, age-specific inmigration rates are defined as $(M_{kji}/P_{(k-5)i}).100$, or the number of 1971-76 male migrants of 1976 age group k who resided in CMA_j in 1971 and CMA_i in 1976, divided by the 1971 male population of age group (k-5) at CMA_i. There are four 1976 k age groups for migrants: 20 - 29, 30 - 44, 45 - 64 and 20 - 64, which correspond to the 1971 (k-5) risk populations of males 15 - 24, 25 - 39;

---

[1] The ages of migrants are defined as of 1976.

40 - 59 and 15 - 59 in each CMA. The risk populations are narrowly defined, after Long and Hansen (1976), and are represented by 1971 figures since this is the initial year of departure to destination CMA's.

The inmigration rates of Table 2 reveal western Canada to be the clear beneficiary of inmigration, especially Victoria (15.17%) and Calgary (13.01%). Alberta and British Columbia CMA's are, on average, more attractive than metro areas in Ontario, although Hamilton-Burlington, Ottawa-Hull and Kitchener all experience comparatively high rates of inflow. The high rate of inflow into Hamilton-Burlington is believed to be due to the inclusion of the Burlington-Oakville corridor in this CMA (see Appendix A), while for Ottawa-Hull most of the migrants are probably destined for Ottawa.

Toronto (4.27%), Sudbury (3.61%) and Windsor (3.38%) record the lowest rates of inflow in Ontario. Low inmigration to Toronto may be more a statistical than real problem due to CMA definition (see Appendix A), since many of the migrants to Hamilton-Burlington may be oriented toward Toronto. Sudbury's low rate of inmigration is no doubt due to its dependence on the mining industry, a narrow labour market and uncertain future propsects governed by the international demand for minerals. Windsor may be in a situation similar to Sudbury, given its location outside of mainstream southern Ontario and the strong presence of the auto industry.

The metropolitan areas east of Ontario are, in aggregate, the least attractive in Canada. Especially troubling is the very low rate of inmigration to Montreal (2.06%), a rate not subject to the boundary definition problems of Toronto . It seems that the national and

TABLE 2

1971-76 INTER-CMA LABOUR FORCE
MIGRATION RATES, MALES 20-64

	CMA	Inflow	Outflow	Netflow	Δ Labour Force
NF	St. John's	3.65	3.79	-0.14	-84
NS	Halifax	6.70	6.57	0.13	101
NB	St. John	4.64	3.10	1.54	542
CH	Chicoutimi	4.61	6.47	-1.86	-912
MO	Montreal	2.06	3.12	-1.06	-9804
QC	Quebec City	4.51	6.56	-2.05	-2992
OH	Ottawa-Hull	10.01	6.92	3.09	5463
WR	Windsor	3.38	6.07	-2.69	-2372
LO	London	7.74	7.75	-0.01	-10
KI	Kitchener	9.88	8.08	1.80	1376
CN	St. Catharines-Niagara	7.03	6.55	0.48	486
HB	Hamilton-Burlington	10.33	7.34	2.99	5338
TO	Toronto	4.27	5.54	-1.27	-9910
SU	Sudbury	3.61	8.45	-4.84	-3007
TB	Thunder Bay	6.13	6.20	-0.07	-30
WI	Winnipeg	4.71	7.09	-2.38	-3782
RA	Regina	7.44	9.54	-2.10	-1051
SA	Saskatoon	7.60	11.84	-4.24	-1855
CA	Calgary	13.01	7.76	5.25	7063
ED	Edmonton	9.03	7.39	1.64	2720
VA	Vancouver	7.03	4.35	2.68	8351
VI	Victoria	15.17	7.34	7.83	4396
	Means	6.93	6.72	0.21	
	Standard deivations	3.29	2.01	3.02	

Source: 1976 Census of Canada, User Summary Tape SDD EM30

international character of of this city is not enough to overcome its Quebec location, and a weak relationship between labour force size and inmigration ($r = -0.32$) is not strong enough to fully account for the low rate of inflow.

In the Atlantic region Halifax, at 6.70%, ranks about average in attractiveness, with a rate of inflow approximately twice those of St. John and St. John's. In the prairies, Regina (7.44%) and Saskatoon (7.60%) are slightly above average and both are more attractive than Winnipeg (4.71%).

(b) Total Outmigration

The outmigration rates are complementary to the rates of immigration. That is, outmigration is defined as $(M_{kij}/P_{(k-5)i}).100$, or the number of migrants of age group k in 1976 who moved from CMA_i to CMA_j, divided by the age-specific 1971 (k-5) male population at CMA_i, expressed as a percentage.

Referring again to Table 2, the first observation is that there is a slightly stronger negative association with labour force size for outmigration than for inmigration ($r = -0.44$ vs. $r = -0.32$), suggesting a slight tendency for large cities to lose fewer labour force members on a percentage basis than smaller CMA's, perhaps because of larger and more diverse labour markets. The three largest CMA's all experience outmigration rates which are well below the 6.72% average --. Montreal loses 3.12%, Vancouver 4.35% and Toronto 5.54% of males of labour force ages.

Saskatoon (11.84%) and Regina (9.54%) are the largest losing CMA's in the country. The lowest aggregate level appears in the Atlantic region, although the outmigration rate for Halifax, as with inmigration, is approximately twice the rates for St. John and St. John's.

High rates of outmigration in Ontario are associated with Kitchener (8.08%), which may be a function of its high rate of inmigration, and Sudbury (8.45%), which does not experience large inflows.

Excluding the three largest CMA's, centers in the western region have an aggregate level of outmigration of about 7.5%, Ontario 7% (with wide variability) and Quebec roughly 6.5% -- all quite close to one another. The coefficient of variability associated with outmigration (29.9%) is substantially less than that associated with inmigration (47.5%), indicating that outflow may be somewhat more predictable than inflows and that the decision to move may be easier to make than choosing where to go. These differences in variability are clearly illustrated in Figure 1, which contrasts gross outmigration with gross inmigration. The graph also shows a moderate positive relationship ($r = 0.45$), suggesting that mobility is a stimulus to further mobility. The status of a CMA as a growing or declining center due to migration also appears to be related more to inflows than outlfows, a point which receives further attention below.

(c) Total Net Migration

Recalling that inter-CMA flows represent only 12% of total male labour force flows, Figure 1 establishes that:

(i) all prairie and Quebec CMA's suffer decline through

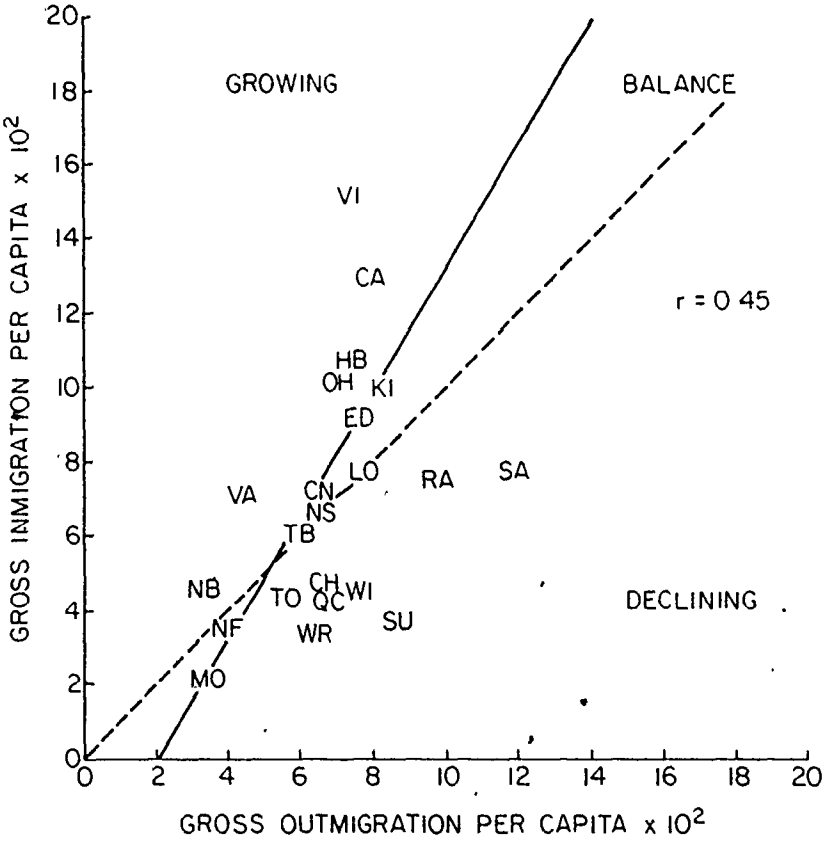


Figure 2. Relationship Between Gross Outmigration and Gross Inmigration.

migration, while all western CMA's gain;

(ii) Hamilton-Burlington, Ottawa-Hull and Kitchener are the only Ontario CMA's exhibiting any degree of net gain from migration; and

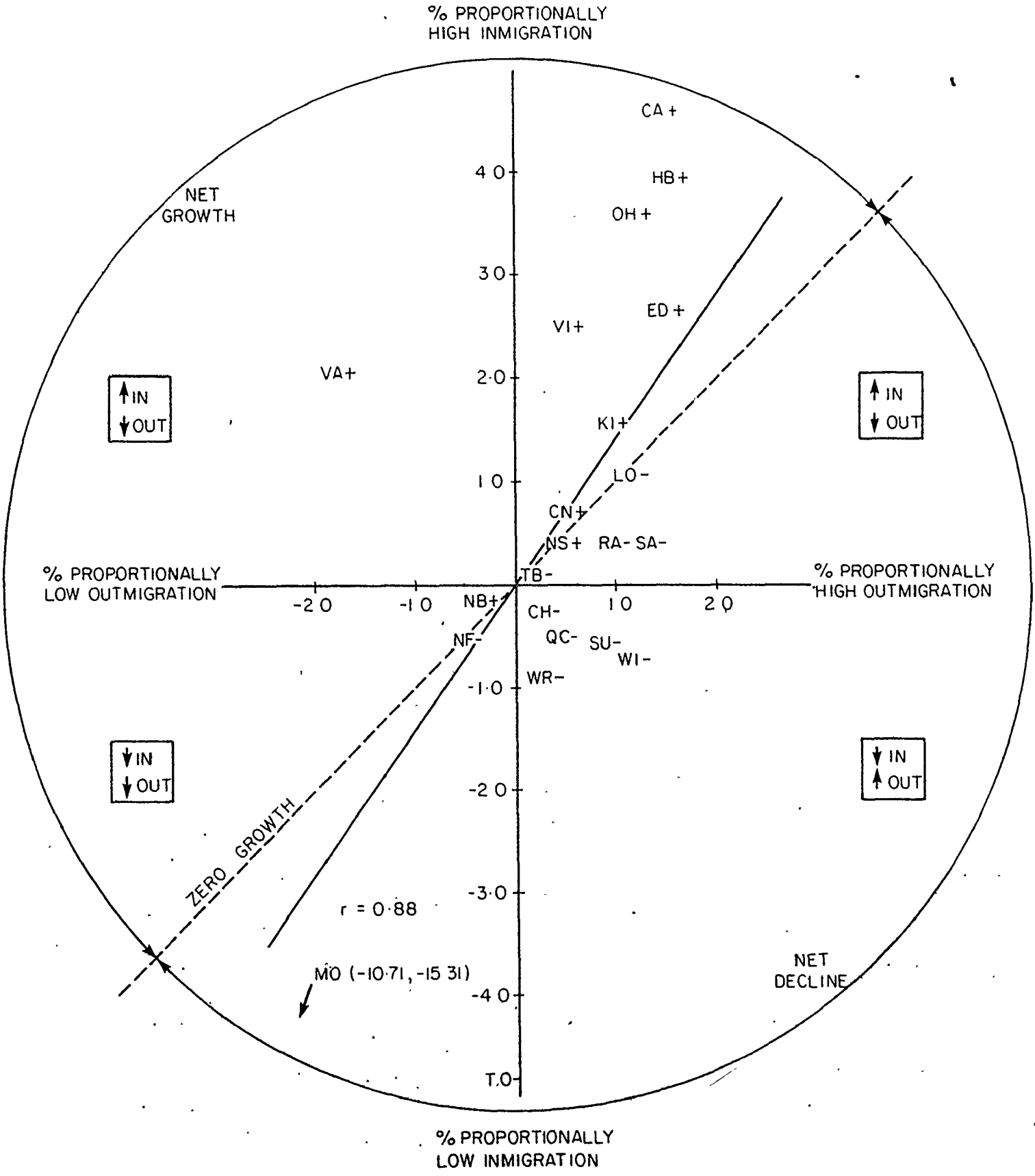
(iii) St. John, the smallest CMA in Canada, shows the most favourable net migration of the Atlantic CMA's, while Halifax and St. John's have negligible net migration rates.

Figure 2 deals in a more precise manner with net labour force changes, illustrating the deviation of each CMA from the proportional shares of in and outflows that each city should experience based on their share of the total CMA labour force. Cities to the left of the 45° axis experience net growth due to migration and those to the right suffer net decline.

The prior suggestion that mobility begets mobility finds additional support here through a positive correlation of 0.88, giving substance to the argument that high rates of inmigration will, if prolonged over a sufficiently lengthy period of time, gradually produce a base labour force population that is more prone to mobility, as judged by prior migration behaviour, than the labour force in a CMA that is not subject to high rates of inmigration. Large inflow associated with high rates of outmigration may therefore result in greater fluctuations and instability in the rate of labour force growth than in the case where a moderate rate of inflow is matched by a moderate or low rate of outflow.

On these grounds Vancouver is perhaps in the most advantageous

Figure 3. % Deviation of CMA's from Expected Migration Rates Based on the Proportional Distribution of Total CMA Males, 20-64.



position of all Canadian CMA's, enjoying a proportionally greater rate of inflow than it should, based on population, and a proportionally lower rate of outmigration. Victoria, the largest net gainer in the system, is comparable to Vancouver in that the increase is due entirely to a rate of inmigration that is much greater than it should be, given the size of the city's labour force. Calgary, Ottawa-Hull and Hamilton-Burlington follow Victoria as the largest net gaining CMA's, although their respective outmigration rates are neither small nor inconsequential. The particularly high rate of inmigration to Calgary, considering its population, clearly indicates the boom-town position of this city in the metropolitan system.

In the long run perhaps the worst position for a CMA to be in is to experience prolonged high outmigration matched with low inmigration. Sudbury, Chicoutimi, Quebec City, Windsor and Winnipeg all seem to suffer from the two-pronged problem of losing too many and attracting too few migrants to ensure a positive rate of labour force growth. In Saskatoon, which is the second largest net losing CMA after Sudbury, and Regina the problem is more one-sided, i.e. not so much how to attract migrants as how to keep them, since for each city both gross rates are proportionally larger than they should be, with outmigration exceeding inmigration.

Edmonton, Kitchener and St. John experience only slight net growth due to migration. Edmonton and Kitchener gain only incrementally despite high rates of migration, while St. John experiences a similar rate of growth but through much smaller rates of in and outflow. This relative stability, i.e. gross flows that are proportional to population size, also characterizes Halifax and St. John's.

The position of Montreal at the extremity of the graph is cause for concern. The rate of outmigration is extremely low, a condition which, in itself, is not undesirable. However the political changes that have occurred in Quebec since 1971, and the resulting economic uncertainty, have undoubtedly produced an increase in outmigration, an increase which can only aggravate the even lower rate of inmigration. The overall rate of decline in Montreal's labour force is quite small (-1.06%) and the possibility of stagnation must be viewed as remote. However since this decline has surely risen since 1976, and since these flows represent only intermetropolitan movements, then this condition may signal a declining role for Montreal in the urban system, particularly if these flows are heavily weighted for members of the professional,managerial and financial communities.

The same concerns do not arise for Toronto, partly because it stands to benefit from the problems of Montreal and partly because the low rate of inmigration may reflect an underbounded city. The rate of outflow is about what it should be, given the size of the city.

THe remaining Ontario CMA's, St. Catharines-Niagara, London and Thunder Bay, experience little net labour force growth or decline through migration.

3.4 Age and Migration

Disaggregating the mobile labour force into age groups does not reveal age-specific patterns of migration that are substantially different from the pattern of total mobility, as illustrated in the group A correlation coefficients in Table 3. Nevertheless the central

TABLE 3

SUMMARY CORRELATIONS
MIGRATION RATES AND MALE LABOUR FORCE PROPORTIONS

Group A*

Total IM	vs.	20-29 IM = 0.97				
Total IM	vs.	30-44 IM = 0.96				
Total IM	vs.	45-64 IM = 0.92				
			Total NM	vs.	20-29 NM = 0.92	
			Total NM	vs.	30-44 NM = 0.93	
Total OM	vs.	20-29 OM = 0.95	Total NM	vs.	45-64 NM = 0.90	
Total OM	vs.	30-44 OM = 0.94				
Total OM	vs.	45-64 OM = 0.89				

Group B*

20-29 IM	vs.	30-44 IM = 0.87				
20-29 IM	vs.	45-64 IM = 0.84				
30-44 IM	vs.	45-64 IM = 0.90	20-29 NM	vs.	30-44 NM = 0.74	
			20-29 NM	vs.	45-64 NM = 0.74	
20-29 OM	vs.	30-44 OM = 0.81	30-44 NM	vs.	45-64 NM = 0.88	
20-29 OM	vs.	45-64 OM = 0.71				
30-44 OM	vs.	45-64 OM = 0.94				

*all Coefficients significant to $\alpha = 0.01$

role of age as the conjoiner of many of the factors which influence mobility calls for a brief examination of the characteristics of the age-specific mobility rates.

The aggregate rates of mobility for each age group confirm that the propensity to migrate declines with age. Males aged 20 - 29 show an 8.31% rate of mobility, the middle group a rate of 6.33% and the 45 - 64 age group a very low 2.52%. The pattern of mobility for the middle age group appears to resemble that of the older age group slightly more than that of the younger group, while the migration patterns of the young and the old show the least amount of similarity, as evidenced in the group B coefficients.

Additional support for mobility declining with increasing age is found in Table 4, where all outmigration rates decline with age for all CMA's. The average rates of outflow are 10.43%, 7.22% and 2.81% for the 20 - 29, 30 - 44 and 45 - 65 age groups respectively. The variances associated with these measures ($10.65\%^2$, $4.17\%^2$ and $1.02\%^2$) reveal a rate of mobility for the young that is high and exhibits wide variation while for the oldest group both measures are substantially reduced. The rate of outmigration for the middle age group is closest to that of the young, but with a more moderate variance.

Comparing rates of in and outflow reveals average rates of inmigration approximating those of outmigration -- 10.02% for the young, 8.12% for the middle group and 3.06% for the oldest group. However the variability associated with inmigration is more than twice the comparable figures for outmigration -- $22.53\%^2$, $12.99\%^2$ and $3.94\%^2$ for the young, middle and oldest age group, respectively.

TABLE 4

1971-76 INTER-CMA LABOUR FORCE MIGRATION RATES (%)

		Δ Total Net L.F.	Young (20-29) In	Young (20-29) Out	Young (20-29) Net	Middle (30-44) In	Middle (30-44) Out	Middle (30-44) Net	Old (45-64) In	Old (45-64) Out	Old (45-64) Net
VI	Victoria	7.83	19.15	12.26	6.89	17.36	7.90	9.46	10.38	2.97	7.41
CA	Calgary	5.25	20.63	11.10	9.53	13.35	8.48	4.87	5.43	3.82	1.61
OH	Ottawa-Hull	3.09	13.51	9.32	4.19	12.09	9.02	4.07	4.66	3.58	1.08
HB	Ham.-Burl.	2.99	13.22	11.79	1.43	14.73	8.37	6.36	4.28	3.02	1.26
VA	Vancouver	2.68	10.92	6.56	4.27	7.80	5.12	2.68	3.36	1.95	1.41
KI	Kitchener	1.80	16.34	14.72	1.62	9.62	7.58	2.04	3.99	2.26	0.30
ED	Edmonton	1.64	14.28	9.96	4.32	9.20	8.35	0.85	3.72	3.83	-0.11
NB	St. John	1.55	5.21	5.21	0	7.14	3.47	3.67	2.09	0.85	1.24
CN	St. Cath.-Niag.	0.48	9.17	12.44	-3.27	9.40	6.10	3.30	3.46	2.22	1.24
NS	Halifax	0.12	9.13	9.24	-0.11	7.85	7.41	0.44	2.94	2.92	0.02
LO	London	-0.02	12.62	12.86	-0.24	8.07	8.24	-0.17	3.29	2.99	0.30
TB	Thunder Bay	-0.07	9.30	9.62	-0.32	7.81	7.31	0.50	2.22	2.52	-0.30
NF	St. John's	-0.14	4.69	6.37	-1.68	5.19	3.63	1.56	1.12	1.14	-0.02
MO	Montreal	-1.06	2.74	4.04	-1.30	2.57	3.59	-1.02	0.90	1.81	0.09
TO	Toronto	-1.27	7.55	8.07	-0.52	4.09	6.83	-2.74	1.94	2.31	0.37
CH	Chicoutimi	-1.86	5.92	10.30	-4.38	6.15	5.67	0.48	1.27	2.44	-1.17
QC	Quebec	-2.05	7.04	9.20	-2.16	4.81	7.64	-2.83	1.70	2.77	-1.07
RA	Regina	-2.10	11.30	13.80	-2.50	8.88	10.94	-2.06	2.62	4.38	-1.76
WI	Winnipeg	-2.38	6.18	9.56	-3.38	5.99	8.49	-2.50	2.23	3.59	-1.36
WR	Windsor	-2.69	5.00	10.60	-5.60	3.89	6.08	-2.19	1.49	2.02	-0.53
SA	Sasktoon	-4.24	11.92	18.62	-6.70	8.34	11.63	-3.29	2.60	5.31	-2.71
SU	Sudbury	-4.84	4.71	13.75	-9.04	4.40	7.93	-3.53	1.63	3.30	-1.67

Prior discussion has established that differences in inmigration account in large part for the differences in net migration among the 22 CMA's. From the above it seems that this can be largely reduced to the rates of inmigration in the youngest age group, especially in view of the results in Table 4.

The cities in this table are grouped by net gain or loss through migration, and the most obvious regularity seems to be that any substantial net change is almost invariably spread across all three age groups. For the young and middle-aged migrants, which account for 85% of the total flows, this holds with only one exception -- that of Chicoutimi, which registers a slight middle aged gain within an overall net labour force loss. The central group of CMA's, those which gain or lose less than 1.0% of their total labour forces through migration, are classed as experiencing essentially zero growth through migration.

The influence of young migrants on net migration is particularly evident where net labour force decline is concerned. In no case does a CMA record a signficant increase in the size of its labour force if net young migration is negative. Large total net losses are acutely related to large net losses in the young category, as shown for Saskatoon and Sudbury in particular, and also for Winnipeg and Windsor. Where large total net gains are concerned, the reason is most often substantial young inmigration, frequently supplemented by significant middle aged inflows. The bulk of the net total gain accruing to Calgary, Vancouver and Edmonton is made up of young migrants, while in Hamilton-Burlington and St. John most of the gain is in the form of middle aged migrants. For Ottawa-Hull and Kitchener the net gain is spread over

both age groups,while in Victoria the net gain includes a very substantial inflow of 45 - 64 migrants. With the further exceptions of Saskatoon (-2.71%) and Sudbury (-1.67%), older migrants do not exert a significant influence upon migration.

3.5 The Spatial Pattern of Flows

The spatial pattern of inter-CMA migration, as represented in Table 5, clarifies a number of underlying trends present in the preceding analysis of mobility rates. The most important of these are:

(i) the westward shift of population to Alberta and British Columbia;

(ii) the consequent weakening of Ontario as the major growth region in Canada;

(iii) the continued net outflow of population from Manitoba and Saskatchewan;

(iv) the mobility impeding effect of cultural differences on population flows either into or out of Quebec; and

(v) the comparatively small role of the Atlantic region in the flows matrix, reflecting its isolation and small metropolitan populations.

Starting with the East, the isolation of the Atlantic region proves to be no impediment to regional outmigration. The aggregate percentage of outmigrants who stay in the region (16.29%) is the lowest stayer rate of all the regions, due primarily to high regional outmigration from Halifax. For those moving out of the region, Ontario is

TABLE 5

% DISTRIBUTION OF OUTMIGRANTS 20-64
BY REGION OF DESTINATION

		Outflow	East	Quebec	Ontario	Prairies	West
NF	St. John's	2,275	18.68	6.81	55.39	3.52	15.60
NS	Halifax	5,135	11.10	12.07	43.33	4.97	28.53
NB	St. John	1,090	35.78	6.88	37.16	1.83	18.35
	Total	8,500	16.29	9.76	45.65	4.12	24.18
CH	Chicoutimi	3,170	1.74	81.07	12.78	1.10	3.31
MO	Montreal	28,900	3.96	21.23	53.72	3.27	17.82
QC	Quebec City	9,580	0.89	78.71	16.70	0.52	3.18
	Total	41,650	3.09	39.00	42.09	2.47	13.35
OH	Ottawa-Hull	12,240	6.05	24.22	38.44	6.09	25.20
WR	Windsor	5,355	2.61	3.45	78.07	2.80	13.07
LO	London	7,865	3.31	3.37	73.93	3.18	16.21
KI	Kitchener	6,175	3.72	3.97	76.04	3.56	12.71
CN	St. Cath.-Niag.	6,640	1.81	2.64	80.94	2.86	11.75
HB	Ham.-Burl.	13,105	2.71	3.74	78.29	2.33	12.93
TO	Toronto	43,250	6.37	8.16	59.05	4.27	22.15
SU	Sudbury	5,250	3.05	6.29	77.51	2.48	10.67
TB	Thunder Bay	2,695	2.41	3.15	51.21	20.41	22.82
	Total	102,575	4.70	8.05	64.37	4.27	18.61
WI	Winnipeg	11,265	2.97	5.19	28.90	9.72	53.21
RA	Regina	4,775	1.05	1.36	14.55	31.31	51.73
SA	Saskatoon	5,180	1.06	1.83	10.82	29.82	56.47
	Total	21,220	2.09	3.49	19.72	19.49	55.21
CA	Calgary	10,445	2.15	3.06	15.56	14.17	65.06
ED	Edmonton	12,250	2.04	2.69	15.84	11.35	68.08
VA	Vancouver	13,555	2.21	7.45	27.78	10.73	51.82
VI	Victoria	4,120	8.25	2.67	15.78	7.52	65.78
	Total	40,370	2.76	4.38	19.77	11.48	61.61

the favoured destination, capturing nearly half the total outflow, followed by the western region, which attracts about 25% of the outmigrants. Toronto, Ottawa-Hull, Kitchener and Hamilton-Burlington are the preferred Ontario destinations, especially for migrants from St. John's. British Columbia is more attractive than Alberta, perhaps due to the coastal locations of Victoria and Vancouver. Victoria attracts an especially large number of outmigrants from Halifax, particurlarly in the oldest age group. The prairie and Quebec CMA's are the least attractive destinations for eastern outmigrants, and flows into Quebec can be equated largely with migration to Montreal.

Outmigrants from the Quebec CMA's do not favour either eastern or prairie locations. Approximately 80% of the outmigrants from Chicoutimi and Quebec City remain in Quebec, most of them going to Montreal. For migrants from these two cities Ontario is a very distant second choice and the numbers moving west are minimal. Migrants from Montreal cast a longer shadow over the metropolitan system, with about a fifth of them staying in the province (most to Quebec City), a fifth moving west and over half going to Ontario. Toronto and Ottawa-Hull are the popular Ontario distinations, more so than the other attractive centers of Hamilton-Burlington, London and Kitchener. Vancouver and Calgary are the most favoured western destinations.

Ontario migrants, on the whole, prefer to remain in Ontario, perhaps because of the wide range of comparatively short distance destination possibilities within the province. For those that do leave (about 35%), the Atlantic and prairie regions are of roughly equal low attraction and Quebec is only marginally more preferable. Approximately 19% of Ontario's migrants move west.

Ottawa-Hull, Toronto and Thunder Bay differ significantly from the above trend. Perhaps reflecting its cross-cultural definition and national capital role, Ottawa-Hull sends a substantial (24.22%) flow to Quebec, primarily to Montreal and Quebec City, and higher than average proportions to the Atlantic region and prairie CMA's. Migrants from Toronto move to the Atlantic region in proportions comparable to Ottawa-Hull, and most of the higher than average flow between Toronto and Quebec is destined for Montreal. A large proportion of Thunder Bay's migrants move to Winnipeg, as might be expected given its location. All three of these Ontario cities send higher than average proportions of outmigrants to Alberta and British Columbia.

The prairie region is strongly oriented toward its western neighbours, with approximately 55% of prairie outmigrants moving to Alberta and British Columbia, the majority to Calgary and Edmonton. Regina and Saskatoon exchange a substantial number of migrants and Winnipeg is attractive to migrants from both cities, although neither city is particurlarly desirable to Winnipeg outmigrants. A regional stayer rate of 9.72% for Winnipeg ranks as the lowest in the metropolitan system. Toronto and Ottawa-Hull are the most attractive Ontario cities for prairie outmigrants, with Thunder Bay an additional strong locational choice for outmigrants from Winnipeg. Neither the eastern region nor Quebec attract large proportions of movers from prairie CMA's.

The western region derives the most benefit from inter-CMA flows, not only through attracting a substantial proportion of the total flows but also by managing to retain within the region a large proportion of its CMA outmigrants. For those leaving the region, British Columbia

outmigrants show a preference for Ontario, while movers from Alberta find Ontario and the prairies nearly equal in attraction. Toronto, Ottawa-Hull and Hamilton-Burlington are, once again, the most attractive Ontario CMA's. Movement to Quebec is minimal, except for Vancouver (7.45%), and in all cases the flows are almost exclusively to Montreal. Migration into the Atlantic region is similarly slight, except for a relatively substantial exchange between Victoria and Halifax.

On a regional basis, inter-CMA migration produces the following net rates of labour force change:

Atlantic CMA's	+0.32%
Quebec CMA's	-1.22%
Ontario CMA's	-0.17%
Prairie CMA's	-2.65%
Western CMA's	+3.37%

Thus it appears that Alberta and British Columbia gain at the expense of labour force growth in all regions except the Atlantic, where there may be a slight resurgence in population growth through migration. The following section addresses more adequately the issue of population growth through migration.

3.6 Urban Growth and Migration

Declining rates of population growth in Canada necessarily dictate that migration will become increasingly important in determining the relative growth or decline of the provinces, regions and metropolitan areas. This is, perhaps, the most important reason for analyzing

inter-CMA flows, since the economic health of the largest metropolitan areas will significantly affect, and reflect, the health of the regions and provinces at large. However the inter-CMA male labour force sample employed in this study, while adequate for its intended purposes, does not allow for an adequate assessment of the impact of migration upon urban growth, since it represents only about 17% of the total flows into or out of CMA's over 1971-76.

For the purpose of identifying the impact of migration on urban growth total in, out and net migration figures for the entire population are employed. A ten year period of analysis is established through the use of 1966-71 and 1971-76 census data and quinquennial migration rates are defined as the total flows either originating in, or destined for, CMA's over the two time periods, with the total CMA populations in 1966 and 1971 used as the risk populations. These rates are presented in Table 6.

The final column in this table contains the net labour force flows between CMA's over 1971-76. These rates are presented to provide only a cursory comparison between labour force and population flows since, for three reasons, there is no a priori reason to expect close correspondence between the two. First, the labour force data is strictly inter-CMA in nature, while the population data concerns total internal flows without regard to either source, in the case of inflows, or distination, in the case of outflows. Secondly, the labour force data excludes for the most part those dependents that are, by definition, included in the population flows. Thirdly, the CMA boundaries for the labour force data are derived, due to the nature of the available

TABLE 6

IN, OUT AND NET MIGRATION RATES FOR TOTAL CMA FLOWS, ALL AGES AND BOTH SEXES, 1966-71 AND 1971-76.

	CMA	Inmigration Rates		Outmigration Rates		Net Migration Rates		
		66-71 Total Pop.	71-76 Total Pop.	66-71 Total Pop.	71-76 Total Pop.	66-71 Total Pop.	71-76 Total Pop.	71-76 Male L.F.
NF	St. John's	12.29	12.45	11.04	12.11	1.25	0.34	-0.14
NS	Halifax	15.54	19.38	17.30	19.62	-1.76	-0.24	0.13
NB	St. John	9.45	13.50	10.02	10.58	-0.57	2.92	1.54
CH	Chicoutimi	7.93	8.50	11.82	10.59	-3.89	-2.09	-1.86
MO	Montreal	6.24	6.38	6.52	7.28	-0.28	-0.90	-1.06
QC	Quebec City	11.94	13.68	7.70	9.99	4.24	3.69	-2.05
OH	Ottawa-Hull	16.18	17.76	10.90	13.10	5.28	4.66	3.09
WR	Windsor	7.80	6.05	8.20	11.22	-0.40	-5.17	-2.69
LO	London	16.78	14.83	13.82	15.64	2.96	-0.81	-0.01
KI	Kitchener	17.11	18.91	13.15	15.97	3.96	2.94	1.80
CN	St. Catharines-Niagara	8.14	9.87	8.70	9.10	-0.56	0.77	0.48
HB	Hamilton-Burlington	10.00	10.40	8.61	10.70	1.39	-0.30	2.99
TO	Toronto	8.10	7.03	8.98	11.50	-0.88	-4.47	-1.27
SU	Sudbury	16.70	11.03	14.00	18.05	2.70	-7.02	-4.84
TB	Thunder Bay	9.83	12.34	9.69	11.69	0.14	0.65	-0.07
WI	Winnipeg	11.52	11.80	13.23	13.66	-1.71	-1.86	-2.38
RA	Regina	19.22	21.87	20.84	21.73	-1.62	0.14	-2.10
SA	Saskatoon	23.50	23.77	24.21	25.38	-0.71	-1.61	-4.24
CA	Calgary	23.72	24.76	15.93	19.52	7.79	5.24	5.25
ED	Edmonton	18.91	20.58	15.53	19.30	3.38	1.28	1.64
VA	Vancouver	14.10	12.21	9.12	12.79	4.98	-0.58	2.68
VI	Victoria	20.34	23.62	13.11	16.11	7.23	7.51	7.83

Source: 1966-71 data - 1971 Census of Canada, catalogue 92-828, tables 37 & 38
1971-76 data - 1976 Census of Canada, User Summary Tape SDDEM30.

migration data (see Appendix A), and are slightly different than the census boundaries employed in the population data. The major discrepancies that do exist between the data sets (Quebec City, Hamilton-Burlington, Regina and Vancover) are felt to be due primarily to this last reason. Notwithstanding these differences, the net migration rates for 1971-76 do show a significant degree of similarity ($r = 0.79$).

Between 1966-71 and 1971-76 inmigration increased by 3.5%, while the risk population increased by a lower 2.14%. This, together with an increase in the aggregate CMA inmigration rate from 11.09% to 11.24%, suggests that metro areas became slightly more attractive to migrants over the decade. Swings in the CMA-specific rates of inflow are relatively subdued, and a correlation of 0.93% between the rates indicates that a given level of inflow in 1966-71 tends to be repeated in 1971-76. The highest rates of inflow belong to the prairie and western CMA's, excluding Vancouver, and the lowest are registered at Windsor, Montreal, Toronto and Chicoutimi. The rates of inmigration rise between the periods for all except five CMA's - Windsor, London, Toronto, Sudbury and Vancouver.

On a regional basis the Atlantic, Quebec and prairie CMA's gain the most from increased inmigration, Ontario fares the worst and the western region is not quite able to hold its high aggregate rate of inflow. For the Atlantic, Quebec and prairie regions, the aggregate regional rates of inflow in 1971-76 are respectively 21.78%, 5.77% and 4.76% greater than in 1966-71, while in Ontario and the western region the rates are reduced by 4.32% and 0.32% respectively.

The rather substantial relative gain in the Atlantic region is primarily to St. John, then to Halifax, while in the other gaining regions Quebec City, Regina and Saskatoon register the largest increases. The inmigration increases that occur in Ontario are not enough to offset the declines of Sudbury, Windsor, Toronto and London, while in the western region the large increase at Victoria and the moderate gains at Calgary and Edmonton are effectively cancelled by the reduced inflow to Vancouver.

The increased general attractiveness of CMA's to migrants over the decade is, however, reduced to a net decline in CMA population growth through migration due to a greater increase in the aggregate rate of outmigration -- from 9.96% over 1966-71 to 12.8% over 1971-76. This produces a shift from aggregate net CMA growth over 1966-71 (1.13%) to an aggregate net loss (-0.76%) over 1971-76. All CMA's except Chicoutimi experience higher 1971-76 outmigration rates and a correlation of 0.96 suggests that outmigration rates of a given magnitude over 1966-71 are reproduced for 1971-76. The highest rates of outmigration occur in the CMA's of Saskatchewan and Alberta, and also at Halifax and Sudbury. The lowest are found in the CMA's of Quebec, the Golden Horseshoe region of Ontario and at St. John.

In terms of the rate of increase in outmigration, the pattern is slightly different from above. Western CMA's show 1971-76 outmigration rates that are, on average, about 23% larger than in 1966-71, with Vancouver recording a substantial 40% increase in outmigration. Substantial increases in outmigration are also noted for Windsor (36.83%), Quebec City (29.74%), Sudbury (28.93%) and Toronto (28.06%).

The prairie CMA's and St. Catharines-Niagara, on the other hand, register increases in outmigration between the periods of only about 4.0%. St. John registers a slightly higher 5.59% increase while Chicoutimi, as noted before, experiences a decline in outmigration (-10.4%)

The notion that prior mobility stimulates further mobility is also confirmed in Table 6, as the pattern of outmigration over 1971-76 bears a strong resemblance to the pattern of inmigration over 1966-71 ($r = 0.89$).

Turning to net migration, the information in Table 7 summarizes the net impact of migration upon CMA's in terms of the absolute change in net flows to CMA's over 1966-71 and 1971-76. The associated signs indicate only the direction of this net change and do not reflect the final 1971-76 status of a CMA as a net gaining or net losing city. This information is given in the other two columns in the table.

The group A cities are in the most favourable position regarding net migration, even though some of them are still losing population through migration. These are the only CMA's in the system that show an increase in net flows that is due to a rate of inmigration that is rising faster than the rate of outmigration. For St. John, Regina and St. Catharines-Niagara this produces a shift from net losing status in 1966-71 to net gaining status in 1971-76, while at Chicoutimi and Halifax the net loss of population through migration is considerably reduced. Chicoutimi is the only CMA to experience rising inmigration in conjunction with declining outmigration, and Thunder Bay is the only CMA to experience increased positive net growth due to a rate of increase in inflows that is greater than the rate of increase in outmigration.

TABLE 7

CHANGES IN NET MIGRATION
TOTAL POPULATION FLOWS TO CMA'S, 1966-71 AND 1971-76

CMA	Net Status 1966-71	Net Status 1971-76	Absolute Net Change
Group A			
St. John	-	+	+3.49%
Chicoutimi	-	-	+1.80
Regina	-	+	+1.76
Halifax	-	-	+1.52
St. Catharines-Niagara	-	+	+1.33
Thunder Bay	+	+	+0.51
Group B			
Victoria	+	+	+0.28%
Quebec City	+	+	-0.55
Ottawa-Hull	+	+	-0.62
St. John's	+	+	-0.91
Kitchener	+	+	-1.02
Edmonton	+	+	-2.10
Calgary	+	+	-2.55
Group C			
Winnipeg	-	-	-0.15%
Montreal	-	-	-0.62
Saskatoon	-	-	-0.90
Hamilton-Burlington	+	-	-1.69
Group D			
Toronto	-	-	-3.59%
London	+	-	-3.77
Windsor	-	-	-4.77
Vancouver	+	-	-5.56
Sudbury	+	-	-9.72

The cities in group B all experience net positive growth through migration over both time periods but, unlike the cities of group A, this net growth is decreasing due to rates of outmigration that are rising faster than the associated rates of inmigration. That all of these CMA's are still enjoying positive net migration derives solely from inmigration rates that are substantially greater than their outmigration rates. Notwithstanding the availability of only two time periods, the trend noted here is one of convergence between these rates due to more rapidly increasing outmigration.

The group C CMA's represent the best of the worst cases according to changes in net migration. The common factor in this group is outmigration rates that exceed the rates of inflow, with the increases in outmigration outstripping any increases in inmigration over time. For Winnipeg, Montreal and Saskatoon this produces an increased net loss of population through migration, while for Hamilton-Burlington the result is a shift from net gaining to net losing status in 1971-76.

The final group of CMA's are in the least favourable position regarding net flows. That is to say, all of them suffer decreases in inmigration in association with increases in outflows over the two time periods. As a result London, Vancouver and Sudbury change to net losing status in 1971-76, while the 1966-71 net losses for Toronto and Windsor become magnified over 1971-76.

A number of final points can be made based on the above discussion of total population flows. These points must, however, be regarded as tentative due to the use of only two time periods:

(i) Five of the six largest metropolitan areas in Canada -- Montreal, Toronto, Vancouver, Winnipeg and Hamilton-Burlington -- are losing population through internal migration, and the trend appears to point to increased losses over time.

(ii) The CMA's that are tending toward increased net growth over time (group A) are, with the exception of St. Catharines-Niagara, among the smallest in the metropolitan system. None of them are normally associated with high rates of economic growth.

(iii) The most rapidly growing cities in the system -- Victoria, Calgary and Ottawa-Hull -- are showing signs of tapering net growth due to a faster rise in outmigration than in inmigration. Edmonton may shift to net losing status by the time of the 1981 population census.

(iv) Sudbury, Windsor and London must be viewed as being in the worst position, especially Sudbury. These cities do not enjoy the size and diversity advantages of Toronto and Vancouver.

(v) On a regional basis, the Atlantic region appears to be experiencing a resurgence of sorts and both Quebec and the prairie region seem to be facing a reduction in their respect net population losses. Ontario appears to have shifted to an aggregate net loss through migration, while the western region as a whole continues to grow. The large declines to Vancouver, however, means an overall

decline for British Columbia while Alberta continues to experience positive net growth. These trends are comparable to the results obtained by Liaw (1979) for the provinces.

3.7 Summary

The major conclusion to be drawn from this chapter is the apparent shift in focus for internal migration from the metropolitan areas of Ontario to the CMA's of Alberta and British Columbia. This is apparent in both sets of data and, if the labour force flows are a reliable indicator, seems to be due not so much to migrants moving out of Ontario CMA's to other regions but to a reduced inflow of migrants from other regions. In other words, inmigration to the western CMA's takes place primarily at the expense of inflows to Ontario's metropolitan areas. In the labour force data the high Ontario stayer rate for outmigrants cannot compensate for the loss of inmigrants from other regions, while in the population data Ontario cities are in the majority in the class of CMA's that faces potentially increased net negative growth through migration in the future. Note, however, that foreign immigration is not included in this latter data set.

The migration patterns for the remaining regions are less distinct. For the labour force data the cultural isolation of Quebec points to reduced inter-CMA flows within the metropolitan system and may result in declining metropolitan populations in the future, although the population data appears to indicate declining losses over time.

Reduced net losses also seem to be apparent in the prairie region, particularly in Saskatchewan where there is the strongest spillover effect from migration into Alberta. The CMA's of the Atlantic region appear to have shifted from net negative to slightly net positive growth through migration. St. John's still registers a downward turn in net migration but this may change as a result of offshore resource exploration and development.

Over the decade 1966-76 metropolitan areas in general became more attractive to inmigrants but somewhat less so to their present residents, producing an aggregate net loss of population in CMA's over the period. The most severely affected are the largest and smallest metropolitan areas, with the smallest CMA's gaining in population at the expense of net losses in the larger centers. The highest rates of inflow are registered west of Winnipeg, but for those CMA's normally associated with urban or economic growth outmigration that is increasing more rapidly than inmigration seems to point to continued net population growth, but at reduced rates.

There is little evidence to suggest that the patterns of migration for labour force males vary to any great extent for different age groups, although their motivations may differ somewhat. Outmigration declines consistently as age increases, particularly for the 45-65 age group. The young, representing nearly half the inter-CMA flows, exert a strong influence on the net gaining or net losing status of a CMA, especially where a net labour force loss is concerned.

Inmigration is roughly tiwce as variable as outmigration for the age-specific migrant populations, and for both data sets the pattern

of net migration is determined more by the pattern of inmigration than outmigration. This latter finding, and the confirmation that mobility begets further mobility, are supported by the findings of Cordey-Hayes and Gleave (1974). Courchene (1974) and Greenwood (1973) offer additional support for the mobility-inducing effects of prior mobility.

CHAPTER FOUR

MODEL DEFINITION AND STATEMENT OF HYPOTHESES

4.1 General Form of the Model

Given the pattern of mobility established in the preceding chapter, the remainder of this study is devoted to seeking answers to the question of why this pattern exists. The emphasis is placed specifically on determining what factors are likely to prompt or motivate a member of the labour force to undertake a move to another metropolitan area. The model employed is a traditional human capital formulation -- a stepwise regression model of the CMA-specific, origin-destination flows of migrants over 1971-76.

Separate models are tested for each of the male age groups 20 - 29, 30 - 44 and 45 - 64, since different age groups are likely to have different reasons for moving in spite of age-specific patterns of mobility that are quite similar. The basic model is of the following general form:

$$M_{ijk}/P_{i(k-5)} = f(Y_i, Y_j, U_i, U_j, E_i, E_j, D_{ij}, P_j)$$

where:

M_{ijk} = the number of male migrants of age group k in 1976 who lived in CMA_i in 1971 and CMA_j in 1976.

$P_{i(k-5)}$ = the 1971 male population of age group (k-5) at CMA_i.

$M_{ijk}/P_{i(k-5)}$ = the quinquennial rate of outmigration of males of age

group k from CMA_i to CMA_j over 1971-76.

Y_i, Y_j = 1971 average annual employment income of i and j.

U_i, U_j = 1971 rate of unemployment at i and j.

E_i, E_j = 1971 rate of employment of eligible labour force males at i and j.

D_{ij} = road miles between i and j.

P_j = 1971 total population at j.

While the model is traditional in nature, there are at least three reasons why the results may not coincide with those discussed in Chapter Two. First, the migrant sample is limited to urban-urban flows at the high end of the Canadian urban hierarchy. The motivations of migrants at this level may be different from the motivations of migrants in general, although there is no definite evidence on this point since inter-CMA flows have not previously been studied within a human capital framework. Nevertheless the sample is rather select in terms of its composition.

Secondly, the time period of this study is characterized by an economic climate that is unique to the period. With the exception of a slight resurgence over 1972-74, depressed rates of growth and increased economic uncertainty mark the period 1971-76.[1] What makes this period unique from other slack periods in the economy is that high and rising inflation has moved in tandem with high and rising unemployment since 1970. Coincidental with increasing unemployment levels has been an increase in the duration of unemployment.[2] The effects of these conditions

---

[1] See generally the Economic Council of Canada (1978)

[2] Economic Council of Canada (1976) p. 10.

on inter-CMA flows can be complex. Gross flows are composed of both new and return migrants, and the new migrants can be divided into those who are moving on speculation i.e. in order to find employment, and those who have confirmed employment waiting at the destination, either as new employment or a job transfer. Since increased economic uncertainty and depressed levels of employment can increase the risk of failure and dissatisfaction associated with migration, it seems reasonable to expect that such conditions can (1) reduce the overall level of gross outmigration, with the greatest reduction found in the high-risk group, i.e. those migrants who move on speculation, and (2) raise the proportion of dissatisfied return migrants within the gross flows. Under extreme circumstances it is possible that the majority of outmigrants could be return migrants and migrants who are moving to take up specific employment -- and for neither of these two groups are traditional variables such as income, employment opportunities and unemployment likely to have much influence.

Finally, the spatial organization of the metropolitan system along a predominantly east-west axis injects a substantial distance component into the flows matrix, a component which under healthier economic conditions is normally assoicated with risk and uncertainty.[3] Yet it may be, paradoxically, that increased economic uncertainty in general, once it has depressed the level of gross flows due to the potential threat of unemployment, may lead to a migrant population in which the uncertainty and risk attached to moving is considerably reduced. If depressed economic conditions produce a migrant population in which there

---

[3]The mean distance between CMA's in the origin-destination matrix is 1,055 highway miles.

are few speculative migrants and large numbers of dissatisfied or disappointed return migrants and migrants who are moving to take up specific jobs, then the role of distance should be reduced due to the low levels of risk and uncertainty attached to these latter types of moves.

Since no research results are available for the period 1971-76, this discussion represents no more than speculation about how the results of this study may diverge from those discussed in Chapter Two. Nevertheless the discussion is pertinent to defining the hypotheses and expectations of the tested models.

4.2 Migration Rates and Population Variables

The dependent variable employed here, the rate of outmigration, is only one of a number of possible specifications.[4] No matter which specification is used, the chief consideration is to allow for the effect of population size in determining the level of outmigration (since the number of migrants depends partly on the number who are eligible to move) while at the same time constraining this effect from spilling over into the other independent variables. Normalizing M_{ij} by $P_{i(k-5)}$ satisfies the eligibility criterion and removes the effect of population size from the dependent variable. The size effects of origin and destination population levels upon the independent variables, which might inflate the estimated coefficients by attributing to them some of the variability in outmigration that is more properly due to variations in population sizes, are removed by normalizing each economic variable by a narrowly

[4] For example, Greenwood uses $M_{ij}/\Sigma_j M_{ij}$ (1969) and M_{ij}/P_iP_j (1971), Sahota (1968) uses gross flows M_{ij} and Vanderkamp (1971) uses $M_{ij}/(P_i+P_j)$.

and appropriately defined base population. Aside from limiting the estimated coefficients to what are interpreted as economic influences upon outmigration, these normalizations also reduce the likelihood of spurious correlation and overestimating the explanatory powers of the complete models.

Destination population is included on the right-hand side of the equation, a move which has drawn criticism from Young (1975) on the grounds that this variable is too frequently used to represent the unmeasurable or undefinable aspects of urban size upon migration. His solution is to normalize the gross flows through M_{ij}/P_iP_j, a practice which, by constraining the dependent variable to unitary elasticity, is expected to remove all population effects from the model. This solution also finds favour in Vanderkamp (1976).

There are two reasons why this formulation is not employed here. First, the use of M_{ij}/P_iP_j, requires a tradeoff between removing the effects of population and accepting the assumption of unitary elasticity. This is a rather stringent assumption, as there is no a priori reason to believe that a proportional change in either the origin or destination population will bring about an equal proportional change in outmigration flows. Secondly, a size variable such as destination population is relevant if it is meant to represent the uncertainty-reducing effects of information availability and the presence of relatively large and diverse labour markets in large urban centres. Section 3.2 points out the apparent orientation of young migrants toward the larger CMA's -- an orientation which may be reflected in the tested models in significant roles for destination population, interpreted as

above, and E_j, a proxy variable for the probability of success in the search for destination employment.

There are two testable hypotheses for the effect of urban size on inter-CMA flows:

(i) outmigration from CMA_i to CMA_j is positively related to the population size of CMA_j; and

(ii) this relationship is expected to decline with age, since older migrants are generally less stimulated to move by given labour market conditions, and are even less so as retirement approaches.

All of the independent variables are defined for the beginning of the period, a step taken in order to eliminate the problem of simultaneity bias, i.e. of migration flows affecting the economic variables simultaneously with the independent variables influencing outmigration.

4.3 Income (Y_i, Y_j)

Income is defined as the average annual income from employment for 1971, and within this definition only those sources of income that are spatially tied to location are included. In other words, the income variable is defined to include all forms of wages and salaries net of income from bonds, dividends or investments, or government transfer payments.[5]

---

[5] data source: 1971 Census of Canada, catalogue 94-711, table 35.

The expected sign on the origin income variable is not easily predicted, given the dual role of origin income noted in Chapter Two. Dissatisfaction with a low income, particularly for return migrants, or an unwillingness to part with a high income may both produce an inverse relationship between origin income and outmigration. On the other hand, a basic level of income may be necessary to finance a move, which would tend to produce a positive relationship between the two variables, especially if migration is primarily speculative in nature. On balance, however, it is expected that this cancelling effect will produce a negative coefficient for origin income since the financial costs associated with migration are comparatively slight.

Destination income is expected to have a positive effect on inter-CMA flows regardless of the composition of the gross flows, although a small coefficient may be indicative of a large proportion of either return migrants who are not very sensitive to economic conditions in their original CMA's or new migrants who are moving to specific jobs. Given the ambiguity associated with origin income, the impact of destination income on outmigration is expected to be greater than the impact of origin income.

The combined effects of age and income are best discussed in relation to Section 2.4, where it is shown that within each age group the pattern of mobility by income is U-shaped for moves of more than a few miles in length. The young, particularly low income earners, are the most responsive to potential income gains and they respond to relatively small income increases with apparent indifference to the source of earnings differences -- either low origin income or high destination

earnings. In the older age groups the high income earners are the most prone to migration, and it appears that these groups require not only larger earnings differences to stimulate a move, but differences that are due primarily to high destination incomes. These groups are not generally responsive to changes in origin income. On the basis of these trends it is reasonable to assert that the response of migrants to given levels of income in both the origin and destination will decline with age.

In summary, there are four testable hypotheses concerning income:

(i) migration from CMA_i to CMA_j is negatively related to the level of employment income of CMA_i;

(ii) migration from CMA_i to CMA_j is positively related to the level of employment income at CMA_j;

(iii) the impact of employment income at CMA_j on inter-CMA flows is greater than the impact of employment income at CMA_i; and

(iv) the impact of both income variables on inter-CMA flows declines with age.

4.4 Distance (D_{ij})

Distance, defined as the highway mileage between CMA's, has a straightforward impact on migration flows which is embodied in three testable hypotheses:

(i) migration from CMA_i to CMA_j is negatively related to the distance between them;

(ii) the mobility-impeding effect of distance increases with age; and

(iii) this increasing deterrence is reflected in an income/distance ratio which increases with age.

The income/distance ratio is a proxy measure for the marginal increase in income required to induce a migrant to move an extra mile. This ratio should increase with age, given that the monetary and nonmonetary costs of migration also increase with age.

4.5 Unemployment (U_i, U_j)

Unemployment is defined in this study as the percentage of unemployed males in the 1971 male labour force population in each CMA.[6] The most common effect of unemployment on migration flows is for origin unemployment to exert a push on migrants while destination unemployment impedes inmigration. However in the present context, i.e. in a time period characterized by high levels of general unemployment and depressed economic conditions, both unemployment variables can be expected to affect inter-CMA flows in an ambiguous fashion. The net impact of each variable depends on a variety of factors, most notably the proportion of return migrants.

High unemployment in a CMA should stimulate outmigration if return migrants are strongly represented in the migration streams, since these individuals are sensitive to economic dissatisfaction. High unemployment should also promote the outmigration of new and speculative migrants if this unemployment is not spread equally among all CMA's, since

---

[6] data source: 1971 Census of Canada, catalogue 94-703, table 5.

migrants may perceive that significant employment differences exist within the metropolitan system. In both cases unemployment at CMA_i should be positively related to outmigration.

However if unemployment rates are generally high everywhere the proportion of speculative new migrants should be reduced, leading to a negative relationship with outmigration, while the effect on return migration may remain positive. Considering that the level of gross flows should be reduced and should contain a large proportion of return migrants, the net effect of origin unemployment on inter-CMA flows should be positive, perhaps not statistically significant.

By the same reasoning, high unemployment that is variable among locations should result in a deterrent effect for destination unemployment on new migration. This effect should be smaller for inflows of return migrants, particularly if they are motivated more by psychic than economic considerations. If high unemployment is characteristic of all CMA's, then the level of gross flows should be reduced, again with a smaller effect on return migrants. On balance the net effect should be a negative relationship between unemployment at CMA_j and the rate of flow from CMA_i to CMA_j. Again, this relationship may not be statistically significant.

In summary, it is expected that:

(i) migration from CMA_i to CMA_j is positively related to the unemployment rate at CMA_i;

(ii) migration from CMA_i to CMA_j is negatively related to the unemployment rate at CMA_j; and

(iii) the impact of both unemployment variables declines with age.

4.6 Employment Opportunities (E_i, E_j)

The first point to be made is that this variable is not the complement of the unemployment rate. The risk population used to define unemployment is the male labour force population, whereas for employment the risk population is the male population of labour force age. The latter population includes all males who are eligible for the labour force while the former is defined for those males who are in the labour force.

The employment variable, which is used as a proxy measure for employment opportunities, is defined for 1971 as the percentage of eligible males who are employed.[7] There are three reasons for its inclusion here. First, it draws attention to the employment side of the labour market without ignoring those who are unemployed or seeking work. Secondly, the ability of unemployment rates to accurately reflect economic hardship has decreased as more households have become characterized by multiple income earners and government income support schemes have become more widespread. Finally, unemployment and job vacancies have traditionally enjoyed a strong inverse relationship in labour economics. However since 1970 this relationship has been eroded as an increase in job vacancies has not been matched by a decline in unemployment.[8]

There are three testable hypotheses regarding employment opportunties:

(i) migration from CMA_i to CMA_j is negatively related to the employment level at CMA_i;

(ii) migration from CMA_i to CMA_j is positively related to the level of employment at CMA_j; and

---

[7] data source: 1971 Census of Canada, catalogue 94-802, table 6.

[8] Economic Council of Canada (1976) p. 200.

(iii) the impact of both employment variables declines with age.

These hypotheses are expected to hold regardless of the proportion of return migrants present in the gross migration streams.

4.7 Dummy Variables

Dummy variables are employed in the tested models to acknowledge the presence of unusual or extraordinary influences upon outmigration. The variables relate to:

(i) flows into and out of Quebec, which are judged to be inordinately low partly because of language and cultural differences;

(ii) flows into Alberta and British Columbia, which are judged to be high due to high levels of economic activity and a bandwagon effect among potential migrants;

(iii) flows out of Alberta and British Columbia, which are high since they represent the counterstream of high inflows; and

(iv) flows into and out of Ottawa-Hull, which show a different pattern due to its capital function and cross-cultural definition.

These variables also provide a measure of how capable the traditional economic variables are of explaining the variation in migration flows, since their inclusion indicates significant patterns in the variation of the flows not accounted for by the economic indicators.

CHAPTER FIVE

MODELLING RESULTS

5.1 Introduction

Three sets of empirical results are presented in this chapter. The first set includes only those economic variables that can be found in traditional human capital analyses (income, distance, employment and unemployment), in order to gauge the impact of economic influences on outmigration. In the second set destination population is added on the grounds that, since it is a contentious variable, its inclusion allows for a comparison of results in order to judge its influence on the estimated coefficients. The third set of models adds six regional dummy variables to the economic and population variables, and comprises the final modelling effort.

The operational form of the final model is given in the following equation:

$$1 + [(M_{ijk}/P_{i(k-5)}).1000] = b_0 + b_1P_j - b_2Y_i + b_3Y_j + b_4U_i - b_5U_j - b_6E_i + b_7E_j - b_8D_{ij} + e$$

In order to capture the non-linear relationships in the data both the dependent and explanatory variables, excepting the dummy variables, are log-transformed.[1] The "e" element is the error term.

---

[1] Adding a value of one to the migration rates allows log transformations to take place in spite of occasional zero flows between CMA's. However the estimated coefficients do not strictly represent the elasticities of outmigration, which may be obtained via:

$$\frac{1 + [(M_{ijk} \cdot P_{i(k-5)}).1000]}{(M_{ijk}/P_{i(k-5)}).1000}$$

Since the differences between the exact elasticities and the coefficients for the dependent variables are extremely slight, the coefficients are interpreted as elasticities.

The 22 metropolitan areas produce an origin-destination matrix of 462 inter-metropolitan flows which, due to its size, is not reproduced here. However the income, employment and unemployment data are found in Appendix B. Stepwise regression is used for all estimations and all of the coefficients for the independent variables are significant to at least $\alpha = 0.05$, most to $\alpha = 0.001$. All of the models are significant to $\alpha = 0.001$.

Perusal of the estimated results reveals coefficients that differ in many ways from those that are estimated in the models of Chapter Two. This is not totally unexpected, given the relatively long distances involved in inter-CMA migration, the nature of the sample (urban-urban moves at the high end of the urban hierarchy) and the general climate of economic uncertainty in Canada throughout the period in question. What is unexpected is the apparently reduced role for traditional economic influences on outmigration, and patterns among the coefficients which seem to point to inter-CMA flows that are composed largely of migrants who are moving not so much from place to place but, more specifically, from job to job. The results also suggest that vague regional factors (represented by the dummy variables) are important and that there may be substantial return flows. However there is little evidence to indicate much in the way of speculative migration based on the chance of finding employment in the destination -- which is the type of migration upon which most human capital models are built. The following discussion develops this line of reasoning through a comparison of the estimated results with those found in the studies cited in Chapter Two.

5.2 Economic Influences on Migration

Table 8 contains the first set of estimated coefficients and shows that the levels of explanation of these models is not great, yielding

TABLE 8

MODELLING RESULTS: ECONOMIC VARIABLES

20-29 Outmigration*

Variable	B	Std. Error	R^2 %	ΔR^2 %	IR^2 %	Excluded
Distance ij	-0.4401	0.036	28.38	28.38	20.16	Income i
Income j	2.0844	0.392	36.63	8.24	3.76	Unemployment j
Unemployment i	-0.3044	0.091	38.05	1.43	1.48	Employment i
Employment j	1.4108	0.487	39.17	1.12	1.19	
Constant	-19.6121	3.054	-	-	-	

30-44 Outmigration*

Distance ij	-0.3693	0.033	27.70	27.70	17.70	Income i
Income j	1.9163	0.351	35.39	7.69	4.10	Unemployment i
Employment i	1.1744	0.370	36.67	1.29	1.38	Unemployment j
Employment j	0.9623	0.436	37.34	0.67	0.67	
Constant	-22.4611	3.274	-	-	-	

45-64 Outmigration*

Distance ij	-0.2746	0.024	26.87	26.87	18.17	Income i
Income j	1.6580	0.226	34.27	7.40	7.66	Unemployment i
Employment i	0.6182	0.277	34.98	0.71	0.71	Unemployment j
Constant	-14.7942	2.434	-	-	-	Employment j

- variables listed by order of inclusion
*all coefficients significant to at least $\alpha = 0.05$

only 35-40% of the total variation in outmigration. Most of the explained variance can be attributed to destination income and distance, as the employment-related variables contribute little and seem to diminish in importance as age increases.[2]

Destination income has the greatest effect on outmigration, in terms of the size of the coefficients, and is positive as hypothesized. A 10% change in destination income produces changes of 21%, 19% and 17% in the outmigration rates of the young, middle and oldest age groups, respectively, which also lends support to the hypothesis that the impact of income declines as age increases. In terms of explanatory power, however, this is not a strong variable. One may conclude that the response of migrants to destination incomes among the CMA's is sporadic, but where income does exert an influence this reponse is likely to involve substantial flows of migrants.

The distance coefficients are negative and confirm the basic hypothesis that increasing distance is an impediment to mobility. Its impact on outflows is less than that of destination income, judging by the coefficients, but is more widespread and consistent, as shown by the contributions to R^2. Curiously, the impeding effect of distance declines with increasing age, which is not as hypthesized and does not parallel the more usually obtained results of Courchene (1970) and Long

---

[2] IR^2, the incremental contribution to R^2, is provided as a check against ΔR^2, the increase in R^2 as a result of inclusion. The computation of ΔR^2 biases levels of explanation toward variables that are included in the early steps of the regression procedure, and sums to R^2, whereas IR^2 does not.

and Hansen (1976). A 10% change in distance leads to a 4.4% change in 20-29 outmigration, a 3.7% change in 30-44 outmigration and a 2.7% change in outmigration in the 45-64 age group. If the young are the most sensitive to distance, then this result produces large numbers of young people who prefer shorter distance moves in comparison to the relatively fewer older migrants who are willing to travel further. Since this result is equally true for the following models, some discussion is advisable.

If the impeding effects of distance decline with increasing age, then some combination of the major components of the distance variable -- financial costs, psychic costs and uncertainty -- should also decline with age. Since the financial costs of moving are slight and do not vary much with age, this leaves only the latter components to potentially decline with increasing age.

Three types of migrants have been described in this study:

(i) speculative migrants - those employed or unemployed migrants who move on the chance of finding employment in the destination;

(ii) non-speculative migrants - those migrants, also employed or unemployed, who move to take up specific employment; and

(iii) return migrants - those migrants who, either due to dissatisfaction or prior arrangement, move back to their original location.

Of the three types, speculative migrants face the greatest risk of failure through migration and, since the risk attached to speculative migration also increases with age (see Section 2.4b), they should be

found in decreasing proportions in the gross flows as age increases. Therefore as age increases the risk of failure in migration also increases, with speculative migrants, especially in the oldest groups, facing the greatest risks.

No a priori reasons exist to indicate that this ordering of the risk should vary according to the state of the economy. However it is logical to suggest that as slack in the labour market develops in a somewhat ubiquitous fashion among the CMA's, not only will gross levels of outmigration drop (see Vanderkamp 1968, 1971), but they will do so to the greatest extent among those migrants facing the highest risk of failure in migration. Since non-speculative and possibly return migrants are relatively immune to the effects of increasing unemployment, this reduction should come largely out of the speculative portion of the gross flows, with the greatest proportional reductions occurring in the oldest age groups.

If this is actually the case, then the oldest age group should contain almost no speculative migrants while the youngest group may still contain a fair measure, with the proportion depending on the degree of slackness in the labour market. This, in turn, should leave an older group of primarily non-speculative and/or return migrants who, as a body, face less risk than the younger group of migrants -- and who, as a result, are willing to travel greater distances in the course of moving.

For return migrants, the effect of distance should be quite reduced in comparison to the effect on total gross flows, although this impact may still increase with increasing age. Vanderkamp (1968, 1971)

argues in favour of the reduction and Long and Hansen (1976) verify both the reduced impact and the idea that it seems to increase with age. Vanderkamp (1968) also points out that return flows tend to be in the direction of regions that are losing population through migration.[3]

For non-speculative migrants who are moving to specific employment the uncertainty involved in migration should be considerably reduced. Psychic costs, however, may be another matter insofar as the security of a job in a distant CMA may do little to relieve the anxiety of leaving a familiar environment, particularly for older migrants. Nevertheless a sufficiently high proffered income should be able to overcome these costs to an extent, especially if one subscribes to the notion in Section 2.4b that every migrant has a price that will stimulate a move. In this regard increasing values for the income/distance ratio suggest that older migrants are receiving more compensation than younger migrants for moving a given distance.[4]

The conclusion reached here is that the inter-CMA flows matrix is probably dominated by a large non-speculative component, a dominance brought on primarily through the reducing effects of economic uncertainty and slack labour market conditions on the proportion of speculative migration, and a significant amount of return migration which, due to

---

[3] The available evidence in Section 3.6 suggests a slight resurgence for the Atlantic region and reduced losses over time for Quebec and the prairie region. See also Liaw (1979).

[4] After Courchene (1970), this is the ratio of the estimated coefficients for Y_i and D_{ij}, and is employed as a proxy measure for the change in income needed to induce a move of one more mile. The ratios are 4.73, 5.19 and 6.04 for the young, middle and old age groups, respectively. Note that the weak contribution of Y_j detracts from the reliability of these measures.

depressed economic conditions, may be greater than would otherwise be expected.[5] The empirical results contained in Table 8 tend to support this line of reasoning, since:

(i) the overall explanatory power of the economic variables variables is quite low, which either lends credence to the notion that current inter-CMA flows are not much affected by economic influences, or points out that traditional measures are failing to identify and sufficiently assess these influences on outmigration;

(ii) origin income does not enter any of the equations, suggesting that the ability to finance a move and the anxiety over foresaking a large income for a chance move are not significant factors; and

(iii) the unemployment and employment variables affect outmigration very little, suggesting that employment considerations are of little concern to outmigrants.

Since the interpretation presented here represents something of a departure from conventional practice in human capital models, exclusive reliance is not placed on these three models. Additional support is drawn from the following regressions.

5.3 Inclusion of Population (P_j)

As shown in Table 9, adding destination population increases the explanatory power of the models considerably (27 - 30% ΔR^2), without detracting significantly from the contributory abilities of the economic

[5] See footnote 12, Section 2.8.

TABLE 9

MODELLING RESULTS: ECONOMIC VARIABLES AND POPULATION

20-29 Outmigration*

Variable	B	Std. Error	R^2 %	ΔR^2 %	IR^2 %	Excluded
Population j	0.5431	0.037	28.96	28.96	20.21	Income j
Distance ij	-0.4295	0.031	50.97	22.01	18.25	
Unemployment j	-0.3078	0.091	53.72	2.75	1.09	
Unemployment i	-0.2120	0.088	55.20	1.48	0.55	
Employment j	1.1089	0.422	55.80	0.60	0.66	
Employment i	1.3481	0.448	56.28	0.48	0.86	
Income i	-0.7382	0.331	56.75	0.47	0.47	
Constant	-5.1227	3.469	-	-	-	

30-44 Outmigration*

Population j	0.5043	0.033	30.98	30.98	22.49	Unemployment i
Distance ij	-0.3604	0.027	52.17	21.19	17.05	Income i
Unemployment j	-0.2261	0.081	54.05	1.89	0.76	Income j
Employment i	1.1923	0.311	55.38	1.33	1.42	
Employment j	0.7693	0.374	55.79	0.41	0.41	
Constant	-10.2715	2.222	-	-	-	

45-64 Outmigration*

Distance ij	-0.2717	0.021	26.87	26.87	18.35	Unemployment i
Population j	0.3571	0.024	47.35	20.48	22.50	Employment j
Unemployment j	-0.3789	0.053	51.09	3.73	3.83	Income i
Employment i	0.6375	0.238	51.83	0.76	0.76	Income j
Constant	-3.7926	1.103	-	-	-	

-variables listed by order of inclusion
*all coefficients significant to at least $\alpha = 0.05$

variables. The distance variable is largely unaffected by the inclusion of population, although the minor variables do undergo some change. Destination income is now excluded, due to correlation with destination population, and is replaced with employment and unemployment variables, albeit at lower levels of contribution to R^2 than the income variable. Since the population variable appears to occupy a relatively autonomous position within the model structure, problems do not arise with its inclusion but, rather, with its interpretation.

Destination population is positive and declines with increasing age, both of these results confirming prior hypotheses. This greater sensitivity on the part of young migrants substantiates the result in Section 3.2 that the young are primarily oriented toward the larger CMA's.

Two major roles for this variable have been postulated: that of reducing uncertainty through information availability and that of representing large and diverse labour markets. If the major role of destination population is to reduce uncertainty, then it seems reasonable that a strong contribution to R^2 by population should be matched by some decline in the value of the distance coefficient, since uncertainty is a major component in the distance variable. This does not occur, except very slightly in the 20 - 29 model, which seems to indicate that either destination population does little to reduce uncertainty or there is little uncertainty present in the migration system.

This is a difficult point to resolve. However it should be mentioned that Courchene (1970) and Long and Hansen (1976) show that migration has been proceeding with increasing efficiency over time, as

measured through declining distance coefficients. This reduction in the friction of distance may be due to many reasons, all of them difficult to pinpoint with the available data -- greater and more widespread information, a greater ease in transportation or a higher incidence of migrants moving to certain employment. But whatever the reason(s), this increased efficiency can be interpreted to mean that the amount of uncertainty involved in moving a given distance has declined.

It should also be pointed out that the coefficients for distance estimated here are generally lower than those found in the above studies. Long and Hansen find that the impact of distance still increases with age, which tends to point to chance migration; whereas here the coefficients decline with increasing age, which suggests non-speculative migration.

Turning to the second interpretation for destination population, if this variable is a proxy for the diversity of labour markets, then it should appeal primarily to those migrants who move on chance. Furthermore, a significant role for population in this context should be associated with a significant and positive role for the employment level at the destination (E_j), which can be interpreted as the probability of employment after migration. This result is found in Table 9, but the weak contribution of destination employment indicates that there are few migrants who are either concerned with destination employment prospects or who move on the chance of finding employment.

The low levels of contribution of all the employment-related variables in Table 9 suggests that few migrants are affected by employment or unemployment conditions. The positive sign on origin employment and the negative influence of origin unemployment both indicate a high probability of migrants being employed prior to moving, or of not being

concerned with the state of the labour market. This result, which is also found in Table 8, is at odds with the more usual finding that high levels of unemployment are positively and strongly related to high levels of outmigration, and does not conform to the hypotheses put forward in Chapter Four.[6] A negative impact for destination unemployment and a positive role for destination employment suggests large flows of migrants into CMA's where the probability of employment after migration is high. This does conform to prior hypotheses and is in keeping with the findings of Greenwood (1973) for inter-metropolitan flows in the United States. However Adams (1969), Gallaway et al. (1967) and Greenwood (1973) show that origin unemployment exerts a stronger influence on outmigration than destination unemployment, while Courchene (1970) and Greenwood (1969a) report a strong positive role for origin unemployment and very little influence for destination unemployment. In this study both employment variables depress outmigration, with destination unemployment having the larger impact. Unemployment is not found to exert a push on migrants.

The reason for these results may relate to the economic conditions of the time period. The Economic Council of Canada (1976, 1978) has noted that coincidental with jointly rising rates of unemployment and inflation has been an increase in the duration of unemployment. Grant and Vanderkamp (1976) indicate that the unemployed are more mobile that the employed, a finding that receives support from Courchene (1974). However they issue a caution that the duration of unemployment is critical, i.e. as unemployment increases beyond about six weeks, mobility rates start to fall.

---

[6] See Blanco (1963), Courchene (1970) or Greenwood (1969a, 1973).

It is quite possible that, since 1970, unemployment has become more of a handicap than a stimulus to migration, since the ability to finance a move, particularly of the speculative variety, declines with extended unemployment. The result may be a migrant population in which few of the unemployed move.

One may question whether the weak contributions of the employment variables indicate that few migrants are affected by such considerations, or if there is some problem with the defintion, relevance or appropriateness of the economic variables used in this study. This is a valid question, and in answering it two points are made. First, the definition of these variables does not differ substantially from the definition of the variables employed in the studies discussed in Chapter Two. The point is made in Section 2.1 that both the data bases (primarily census) and the population characteristics chosen for analysis in human capital models tend to be quite similar. And while the concession is made that these variables are but proxy representations for what influences migrant behaviour, they have nevertheless performed reasonably well in a variety of different time periods and cultural settings. The definition, relevance and appropriateness of these variables does not appear to acocunt for their low level of explanation, insofar as comparison with other studies is concerned.

Secondly, if the migrant population actually is sensitive to economic influences of the type represented here, then this sensitivity should be reflected in the levels of explanation afforded by the inclusion of, and in the coefficients associated with, these variables. Strong results in models employing these variables, such as Courchene (1970),

are interpreted to indicate a migrant population that is sensitive to conditions in the labour market and the economic climate in general. It is logical to conclude that this population is moving on chance or speculation, i.e. on the prospect that suitable employment can be found at a payoff (income) level that is sufficient to justify the effort. If this is the true nature of the migrant population, then when economic conditions deteriorate their sensitivity should increase, resulting in stronger employment coefficients, since the general level of uncertainty should increase as conditions become depressed and slack develops in the labour market.

In this study the strength of the economic variables has been found to be much weaker than in other studies from earlier time periods and under different economic circumstances. This does not belie the assumption that migrant sensitivity to economic factors increases as economic uncertainty increases. Rather, it may point to a migrant population whose orientation, as a result of this uncertainty, has shifted from one of chance movement to one of moving largely from one job to certain employment in another CMA. Vanderkamp (1968, 1971) argues that this sensitivity to uncertainty and depressed economic conditions is reflected in reductions in the gross levels of outmigration. The suggestion is made here that rising levels of unemployment and reduced employment prospects effect a withdrawal from the migration streams of those who face the greatest levels of uncertainty, leaving a migrant population that is primarily non-speculative in nature and which, through the certainty of employment, is not much influenced by prevailing economic conditions. The behaviour of the employment and

unemployment variables, the apparent impact of distance and the virtual elimination of income considerations from the models give some merit to this viewpoint.

5.4 Inclusion of Regional Dummy Variables

The addition of six dummy variables to the previous model produces a substantial increase in the R^2 values, but at the same time detracts further from the contributory abilities of the income and employment variables. As illustrated in Table 10, the coefficients associated with distance and destination population are increased by their inclusion, but the other economic variables are reduced to near-zero influence on outmigration.

These dummy variables allow extraordinary flow patterns to be recognized within the model -- flows to and from Quebec, the western region and Ottawa-Hull. The dominant variables are those associated with Quebec, indicating that migrants from outside Quebec are reluctant to move to Quebec CMA's, while migrants from Quebec are hesistant about moving to CMA's outside the province. The coefficients associated with these two variables are about equal and they decline with increasing age, revealing the young to be the most sensitive about migration either to or from Quebec. Ceteris paribus, these flows are only 0.36 , 0.44 and 0.68 as great as the flows which do not involve Quebec CMA's, for the young, middle and old age groups, respectively. This reluctance on the part of migrants is usually attributed to language and cultural differences but, since these influences are neither precisely defined nor quantified, they remain rather vague.

TABLE 10

MODELLING RESULTS: ECONOMIC, POPULATION AND DUMMY VARIABLES

20-29 Outmigration*

Variable	B	Std. Error	R^2 %	ΔR^2 %	IR^2 %	Excluded
Population j	0.6501	0.032	28.96	28.96	19.54	Income i
Distance ij	-0.5953	0.026	50.97	22.01	25.33	Employment j
To Quebec	-1.0079	0.071	62.18	11.21	9.60	Unemployment i
From Quebec	-1.0145	0.082	70.23	8.06	7.23	Unemployment j
To West	0.8951	0.070	75.95	5.72	7.75	From Ottawa-Hull
Income j	-1.5657	0.261	76.82	0.86	1.70	
To Ottawa-Hull	0.5883	0.108	78.18	1.36	1.45	
Employment i	-1.0190	0.310	78.65	0.47	0.51	
From West	0.1730	0.066	78.97	0.32	0.33	
Constant	16.0446	2.654	-	-	-	

30-44 Outmigration*

Population j	0.6054	0.030	30.98	30.98	21.85	Income i
Distance ij	-0.5081	0.024	52.17	21.19	23.78	Employment j
To Quebec	-0.8340	0.066	61.44	9.28	8.47	Unemployment i
From Quebec	-0.8206	0.077	68.73	7.29	6.10	Unemployment j
To West	0.6815	0.065	72.34	3.61	5.79	From Ottawa-Hull
To Ottawa-Hull	0.6229	0.101	73.46	1.12	2.02	
Income j	-1.5502	0.245	75.33	1.87	2.15	
From West	0.1886	0.062	75.78	0.46	0.50	
Employment i	-0.7321	0.291	76.12	0.32	0.34	
Constant	14.4158	2.491	-	-	-	

45-64 Outmigration*

Distance ij	-0.3452	0.020	26.87	26.87	22.32	Income i
Population j	0.4219	0.025	47.35	20.48	22.01	Income j
To Quebec	-0.7698	0.076	55.47	8.12	7.76	Employment i
From Quebec	-0.3985	0.054	59.91	4.45	4.12	Unemployment i
To West	0.3262	0.058	63.68	3.77	2.38	From Ottawa-Hull
Employment j	-1.7384	0.306	65.28	1.60	2.43	To Ottawa-Hull
Unemployment j	-0.1777	0.055	66.07	0.79	0.78	
From West	0.1130	0.054	66.40	0.33	0.33	
Constant	5.9384	1.270	-	-	-	

-variables listed by order of inclusion
*all coefficients significant to at least $\alpha = 0.05$

Flows to the CMA's of the western region are, ceteris paribus, greater than the other flows in the system by factors of 2.45, 1.98 and 1.39 for the young, middle and old age groups, respectively. The young are the most attracted to the region, but note that their greater sensitivity to distance relative to the other age groups is interpreted to mean that young migrants to the western region and not moving as great a distance as older migrants to the region. Regarding the qualitative interpretation of this variable, its inclusion reinforces the long-term westward shift of population in Canada. McInnis (1969a) presents figures which illustrate that between 1901-61 the decadal net migration rate for Alberta and British Columbia combined has consistently been positive and has, with equal consistency, outstripped the same rate for Ontario -- the only other region to experience positive net migration over the entire period. There is no reason to doubt that this trend has not continued since 1961 but, again, the exact attraction for migrants remains vague and undefined.

The remaining dummy variables add little to the models. The inclusion of the variable representing flows to Ottawa-Hull is expected due to the national capital function of Ottawa and the somewhat different migration pattern that this function produces. Flows from the western region and Ottawa-Hull are not much different from the general pattern of flows within the system.

Income, employment and unemployment at the destination and employment at the origin are variously included in the models, but none are strong enough to counter the effects of the major dummy variables. The coefficient associated with destination income is negative, perhaps

due to the absence of a cost of living correction factor . The origin and destination employment variables also assume negative signs, but their influence on outmigration is so weak that tracing the origin of these signs is not felt to be necessary.

5.5 Summary

The net result of the analysis conducted in this chapter is to produce a series of equations which, in terms of statistical explanation, say a great deal about inter-CMA migration but which, in terms of identifying the factors that influence or motivate these migrants, do not really reveal very much. The major defined variables, destination population and distance, have about them roles or aspects which remain, if not unknown, at least unquantified, and the prospects for separating these components (risk, uncertainty, psychic values, labour force diversity etc.) are slim within a human capital framework. By the same token, the dummy variables indicate that some flows are substantially different from the general pattern of flows, but the real reasons behind these flows are not brought to light by their inclusion.

Those variables which are relatively narrow in their definition and which have a decent history of performance in human capital models, i.e. the income and employment-related variables, do not, for the most part, exert much influence on inter-metropolitan migration flows. That these variables seem to be losing their explanatory or predictive powers may be due to the following:

(i) changes in the motivations of the migrant population, i.e. a shift from migration based largely on chance

or speculation to movement based on the certainty of employment;

(ii) migrant motivations or influences that are different at the large-scale, urban-urban level than those at the interregional level, which is the most common level of analysis in human capital models; or

(iii) the absence of a time factor, or variables which measure the changes in income and labour market conditions over time, to go with the level-type economic variables employed here.

It has been argued here, more on logic than on fact, that the diminished role for the economic variables is due to a migrant population that, because of economic uncertainty, has shifted from one of primarily chance movement to one of non-speculative flows laced with a liberal amount of return migration. If this is the case, then human capital models based on regression analysis hold little promise for further investigation, for two reasons. First, in non-speculative migration the payoff is known and accepted as adequate before the move takes place, and the actual move occurs with very little risk or uncertainty, or regard for prevailing labour market conditions. In a like manner, return migrants are believed to possess lower economic motivations than speculative migrants (see Vanderkamp, 1971). Secondly, census data do not contain information on either multiple moves over the census period or migration to specific employment. It seems clear that if this is the true nature of the migrant population, then either a new analytical framework or alternative data sources are required.

However the present modelling approach is not without merit if the lack of impact for the economic variables is due to either migrant motivations that are particular to this level of analysis or the absence of change variables. It is a relatively simple matter to contrast the inter-CMA results with those obtained by applying the models at the inter-regional level. Nor is it difficult to define and add change variables that can act as proxy indicators for the rate of economic growth or decline over the time period.

In conjunction with this expanded analysis, more work needs to be done on both the distance and population variables, as they capture large shares of the variation in outmigration while remaining relatively indistinct in their definition. Further attention should also be given to defining variables which more adequately capture and reflect the influence of Quebec upon the migration system.

If the analysis undertaken here can be considered as a first-level examination of inter-CMA flows, then perhaps the next and potentially most immediately profitable step should be a more detailed analysis in the same vein, with a more comprehensive variable set, possibly in a simultaneous equations format. Should the subset of economic variables still prove to lack influence, then this would be grounds for developing a different approach to the analysis, or pursuing alternative data sources.

CHAPTER SIX

CONCLUSIONS

The analysis in the last chapter reveals clearly the major unanswered question in this study: who is moving, the employed or the unemployed? Since no answer is possible here, there is little profit in pursuing the policy implications of these flows, especially if, as reasoning suggests, employed migrants comprise the major portion of the migrant population. The migrant who is moving to confirmed employment has made a personal decision and should be indifferent to prevailing economic circumstances and policy schemes which attempt to influence his behaviour. The only recommendation to be made is that further studies of inter-CMA mobility should concentrate on resolving the unanswered question,perhaps along the lines suggested in the previous chapter.

Aside from this problem, the aggregate flow patterns hold few surprises. The young are substantially more mobile than the oldest age group and migration does decline with increasing age. The age-specific patterns of mobility do not differ much from one another, and cities that experience any degree of net gain or loss in population through migration invariably find these changes spread over the three age groups. However since the 20-29 age group represents nearly half the total migrant flow, the migration status of a CMA depends heavily on its ability to attract young migrants.

In spatial terms, the CMA's of the prairies and Quebec all lose population, those of Alberta and British Columbia gain through migration and change in the eastern region is revealed to be slight. Ontario presents a mixed picture, with Ottawa-Hull, Kitchener and Hamilton-Burlington gaining in population; Windsor, Toronto and Sudbury losing through migration and the others remaining essentially unchanged. The gains to the western CMA's come at the expense of all CMA's except those east of Quebec, especially from Ontario. Most of the large prairie outflow moves west, while Ontario is the preferred destination for Quebec outmigrants. Excluding the preference of Ontario outmigrants for remaining within the province, the underlying tendency is toward a westward shift in population.

Over time, however, metropolitan areas in general appear to have lost some of their prior attractiveness. Between 1966-71 and 1971-76 outmigration became greater than inmigration, leading to a slight net loss in CMA population. While noting that this loss is indeed slight, it is nevertheless in keeping with a recently noted trend toward migration turnaround away from large metropolitan areas in the United States.[1] In Canada this is best revealed by examining the proportional growth or decline in CMA's over the decade. Section 3.6 and Table 7 point out that the largest CMA's face declining populations through internal migration while some of the smallest metropolitan areas exhibit the best growth prospects. The western CMA's remain strong in their growth, Ontario has shifted to a net loss, the Atlantic CMA's are experiencing a slight resurgence and the prairie and Quebec CMA's

[1] See Alonso (1977), Beale (1977), Chalmers and Greenwood (1977), Hansen (1977), McCarthy and Morrison (1977) or Zelinsky, (1977).

seem to be facing reduced net losses over time. These changes, at this point in time, are slight and very subtle. Nevertheless they do mark something of a departure from the historical record and as such may warrant time-series analysis in greater detail.

However any future analysis of either inter-CMA migration or the growth or decline of metropolitan areas through migration will face as its greatest stumbling block either inadequate or extremely cumbersome data bases. Census data cover a rather lengthy five year period, a span which misses both a great deal of mobility and migrant responses to short-run changes in economic conditions. Neither does the data contain any information on multiple or return moves. For analysts who opt for social securtiy or unemployment insurance data (see Courchene (1974) or Grant and Vanderkamp (1976)), the task of reducing the available information to a workable level is formidable and often precludes an in-depth examination of the data.

Coincidental with the data problem there remains the task of further refining some of the variables used in human capital analyses and of giving careful consideration to the definition of new variables which reflect more accurately the motivations of present migrants. High on the list for redefinition are distance and population, both of which are usually important in human capital models, but which contain significant unspecified components -- psychic values and uncertainty in the case of distance and labour market considerations in the population variable. Other influences which should be tested for include the quality of life or an index of the amenity value of a particular location, the effects of an increasing number of multiple income-

earning households and the long-run economic growth prospects of the destination region.

In conclusion, the statistical results of this study do reveal consistent and significant regularities in the inter-CMA migrant population. The problems arise in attempting to attach labels to these regularities. Clearly, migration requires a motivation of some description. Researchers have always assumed, and usually shown, that this motivation is largely economic in nature. Only argument, and not statistical evidence, allows the same conclusion to be made here. If the regularities detected here can be assumed to point to common motivations or aspirations or the part of migrants, then it seems logical that the next step should be the articulation of these regularities in order to identify and describe these motivations in greater detail.

APPENDIX A

DEFINITION OF CMA'S

Statistics Canada defines a census metropolitan area as the main labour market of a continuously built up area having a population of 100,000 or more. This definition does not allow for the reconstruction of CMA's through the addition of whole census divisions, although this is possible at the subdivision level. Since the migration data employed in this study are based on census divisions, strict conformity to the census definition of CMA's is therefore not possible.

The CMA's are instead defined on the basis of the major census divisions that either lie within the CMA boundaries or for which the majority of their population lies within the metropolitan area. The accompanying maps detail the geographical extent of the 22 CMA's employed in this study.

These constructions form the basis for definition of all the variables used to analyze inter-CMA labour force mobility. Quick perusal of the maps reveals that most of the CMA's are geographically larger than their census-defined counterparts. The populations are also larger, varying from city to city and depening on which census divisions are either included or excluded in the CMA definition.

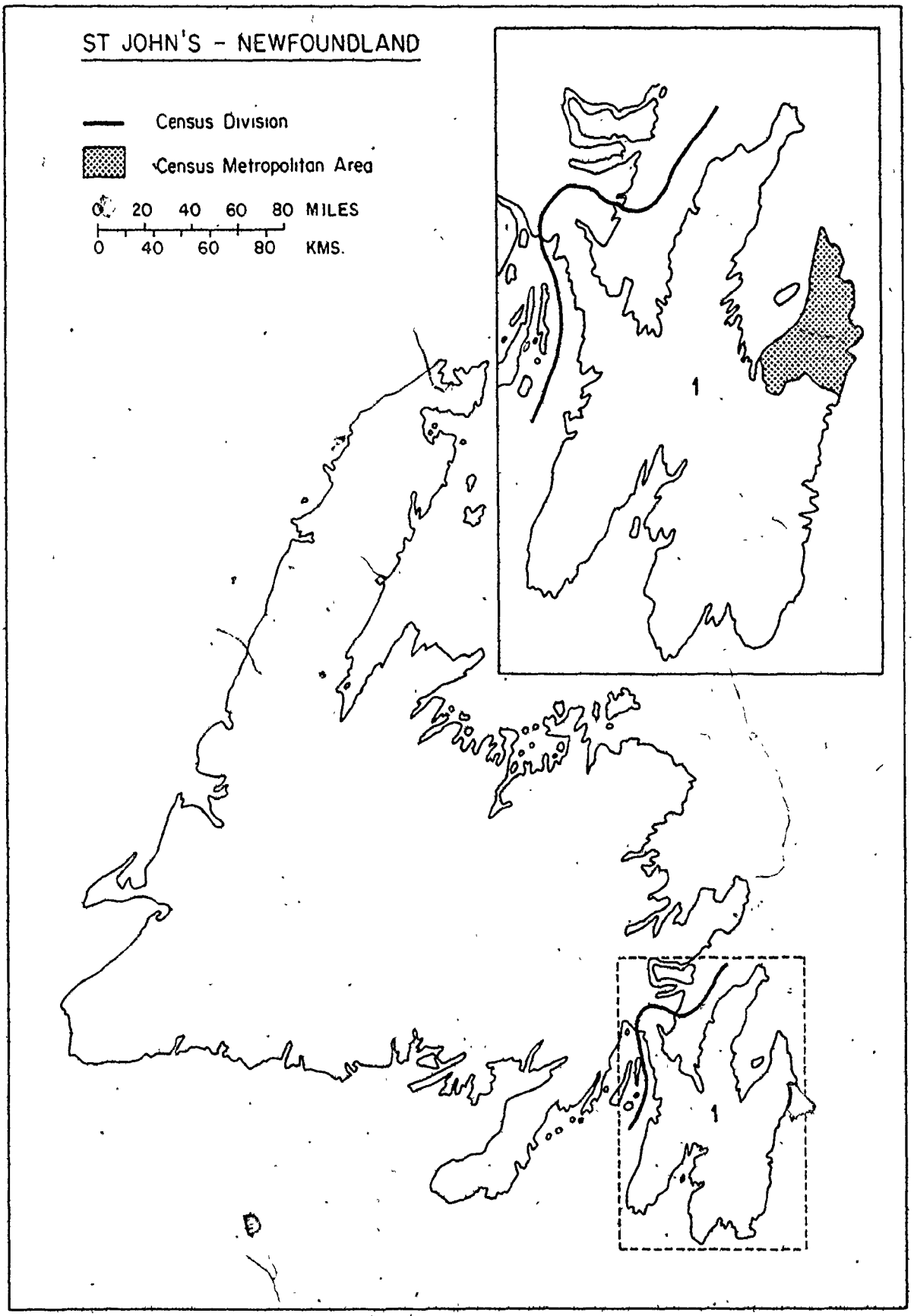
Halifax, St. John, Montreal, Windsor, Kitchener, Sudbury, Thunder Bay should not be interpreted as including large hinterland populations.

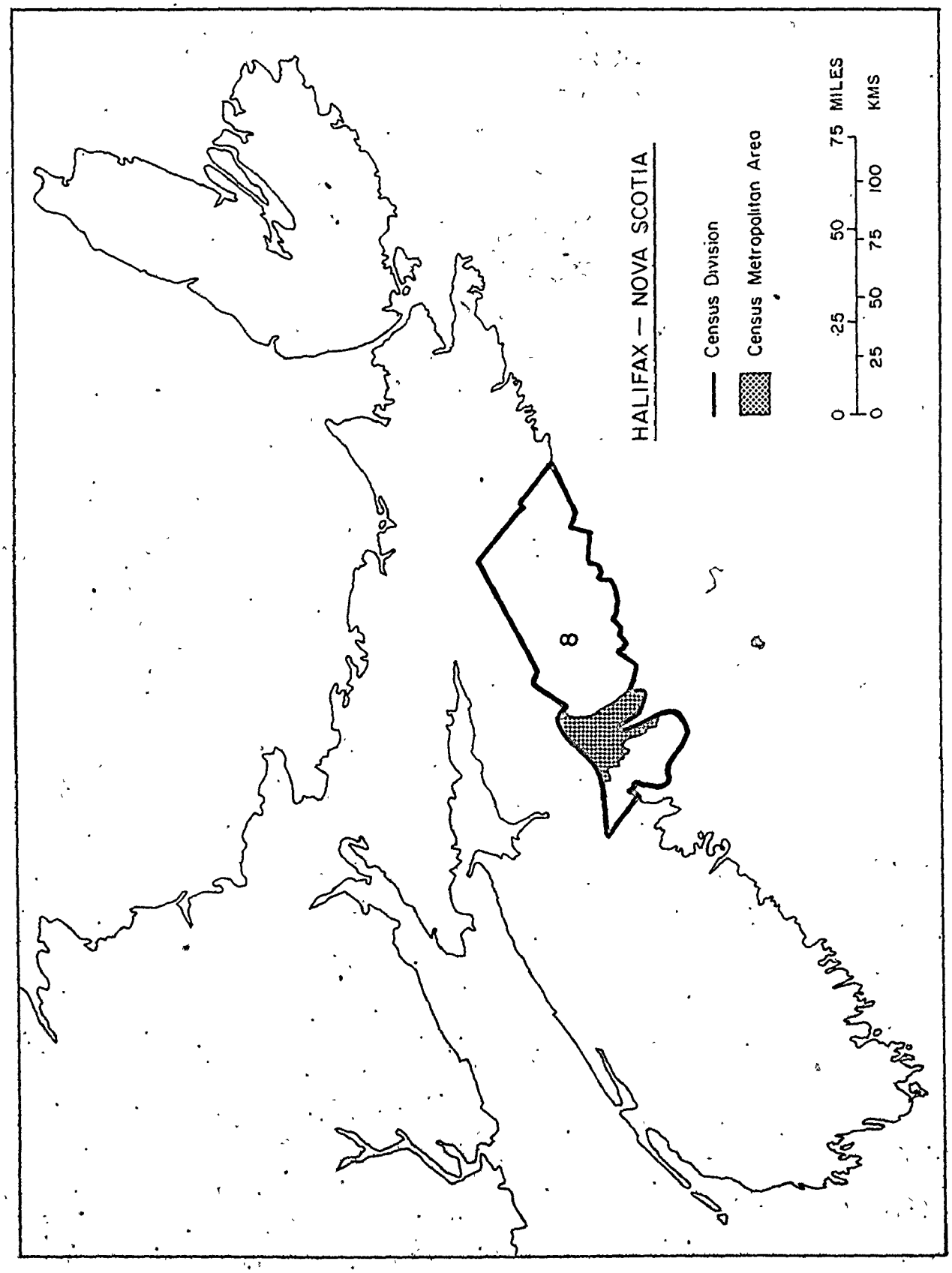
Toronto and Vancouver are potentially underpopulated in comparison to their census definitions -- particularly Toronto, where the eastern and western reaches of the labour force area are omitted. On the west side, this is due to the presence of Oakville and Burlington in the same census division. A choice had to be made to either include Burlington with Toronto or Oakville with Hamilton, and the latter was chosen on the basis of the proximity of Burlington to Hamilton. At the eastern extremity, part of the build-up area was excluded because inclusion would have meant adding Oshawa to Toronto.

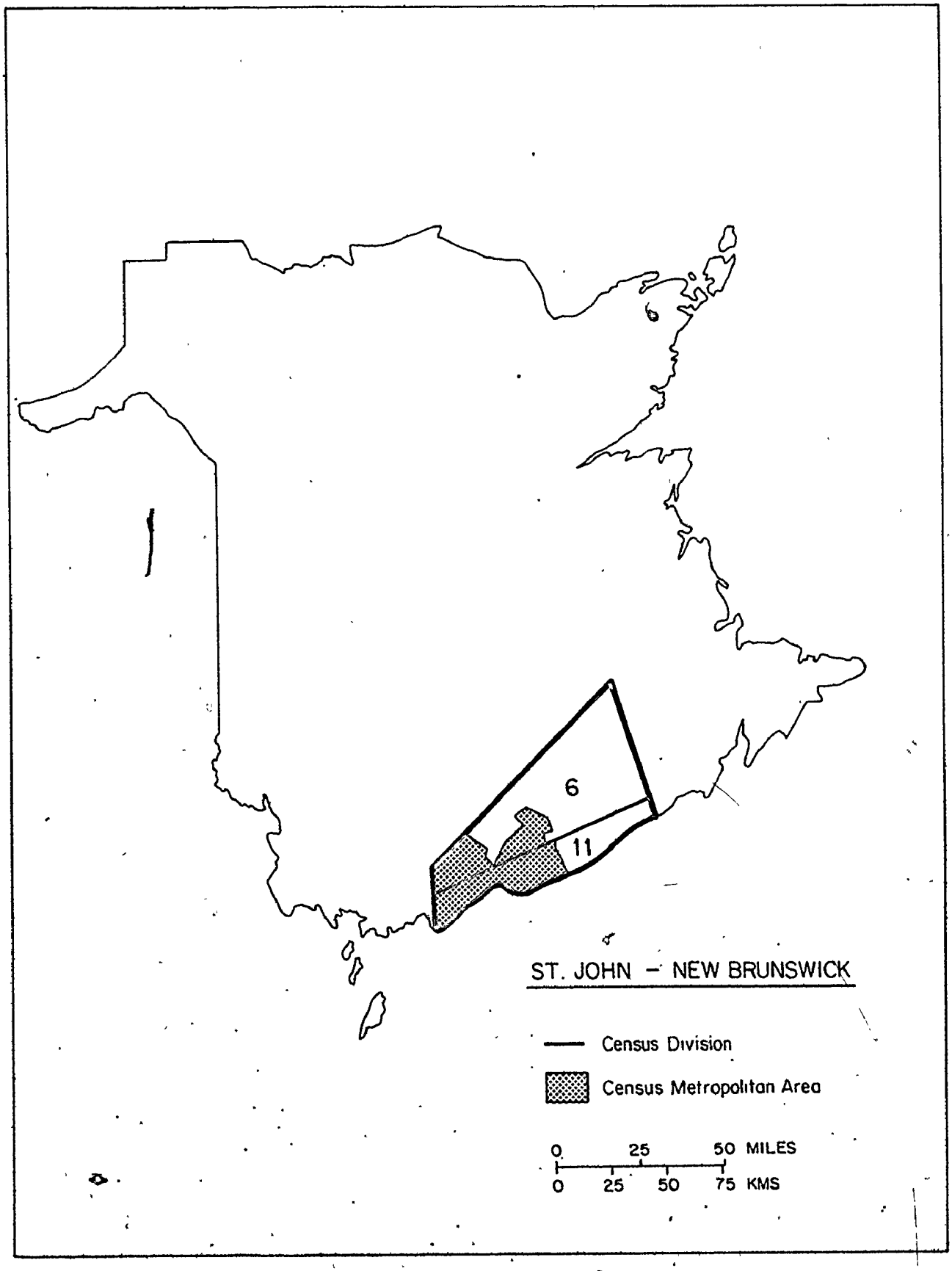
The remaining CMA's are all over-defined in relation to their census definitions. The Quebec CMA's are especially troublesome due to the protracted rectangular shapes of many of the census divisions. But since consistency is maintained in the definition of the explanatory variables, any analytical differences between the results obtained here and those derived from using the census definitions should be due more to differing population bases than to measurement errors.

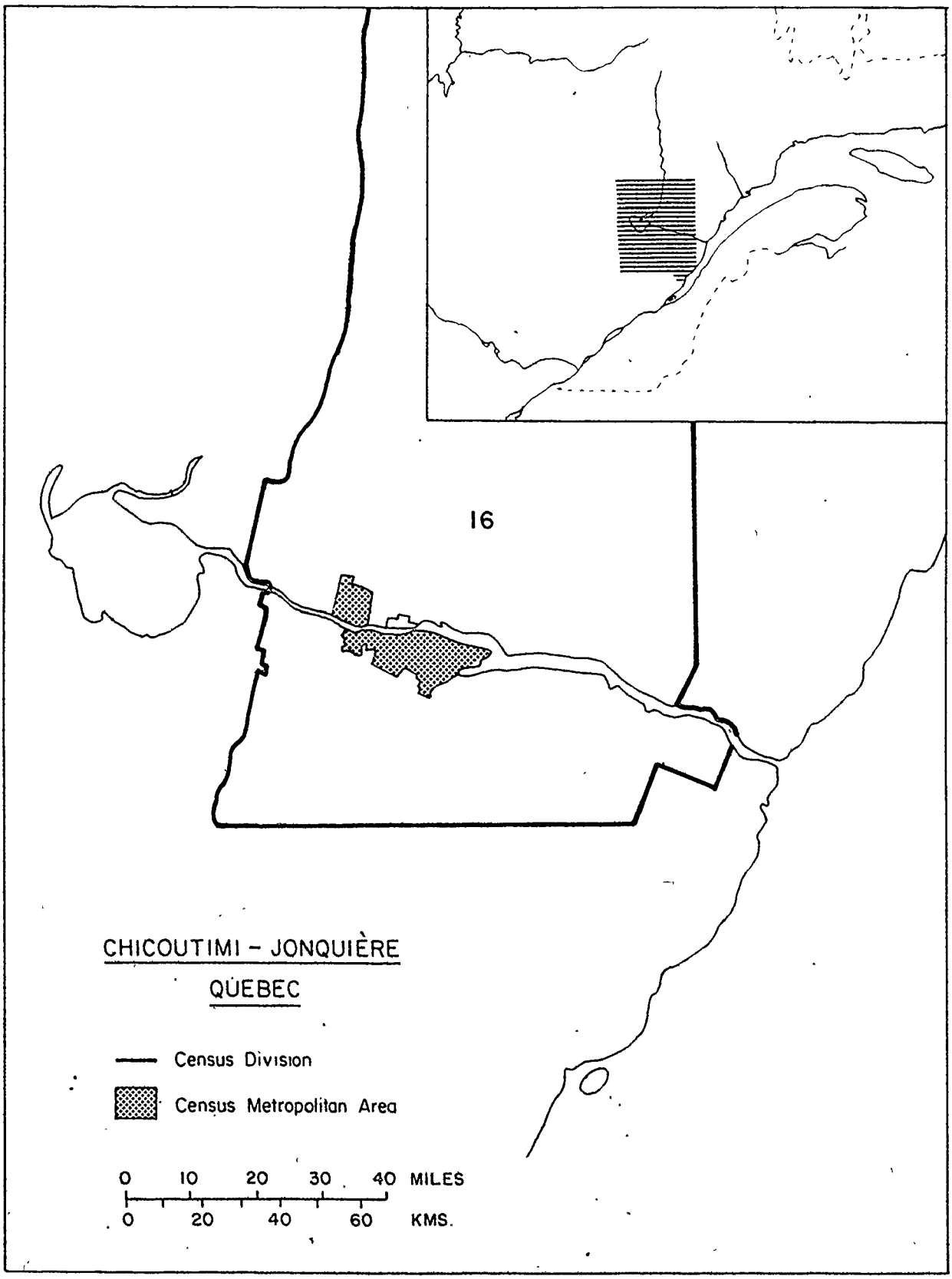
APPENDIX A

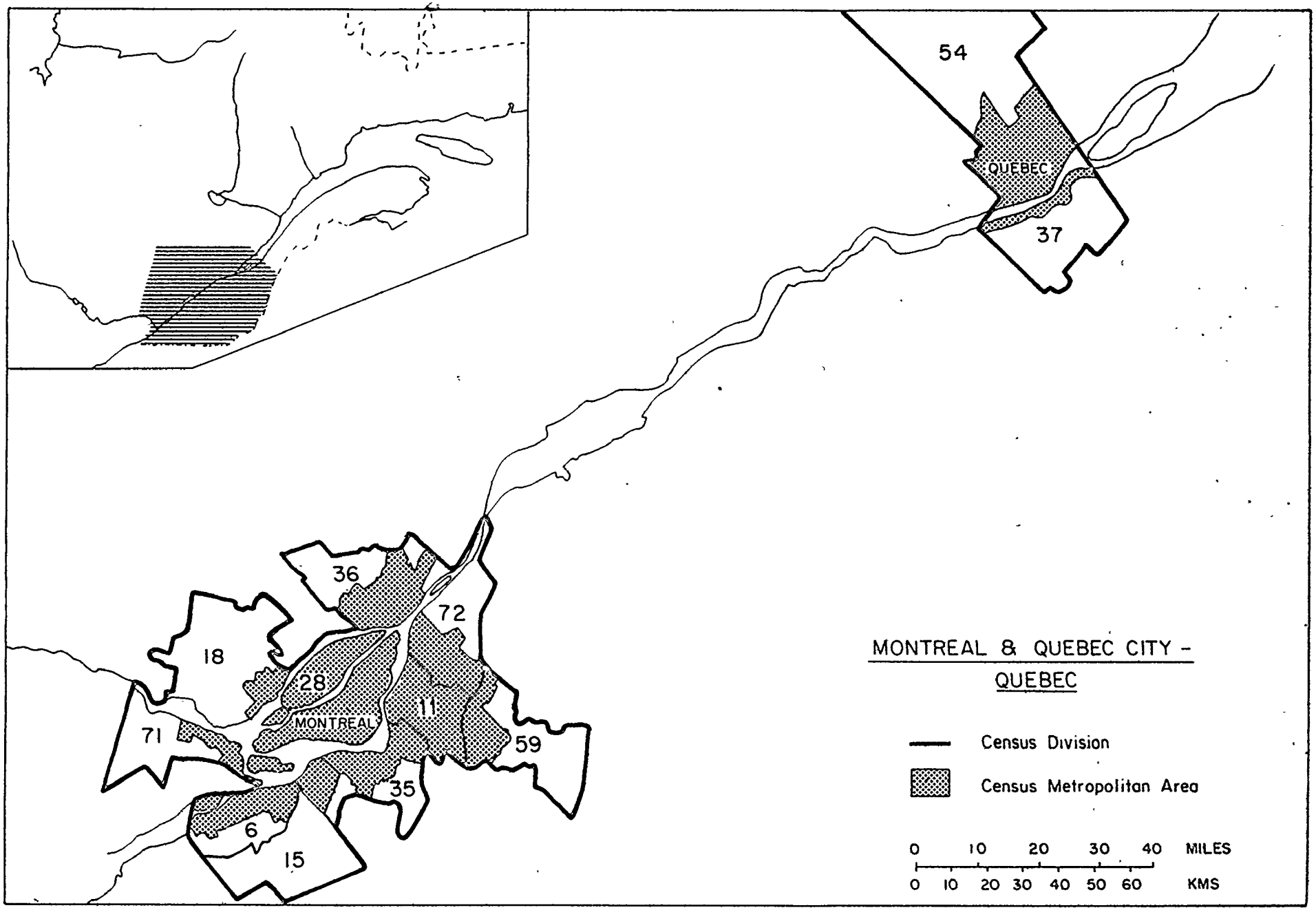
DEFINITION OF CMA'S

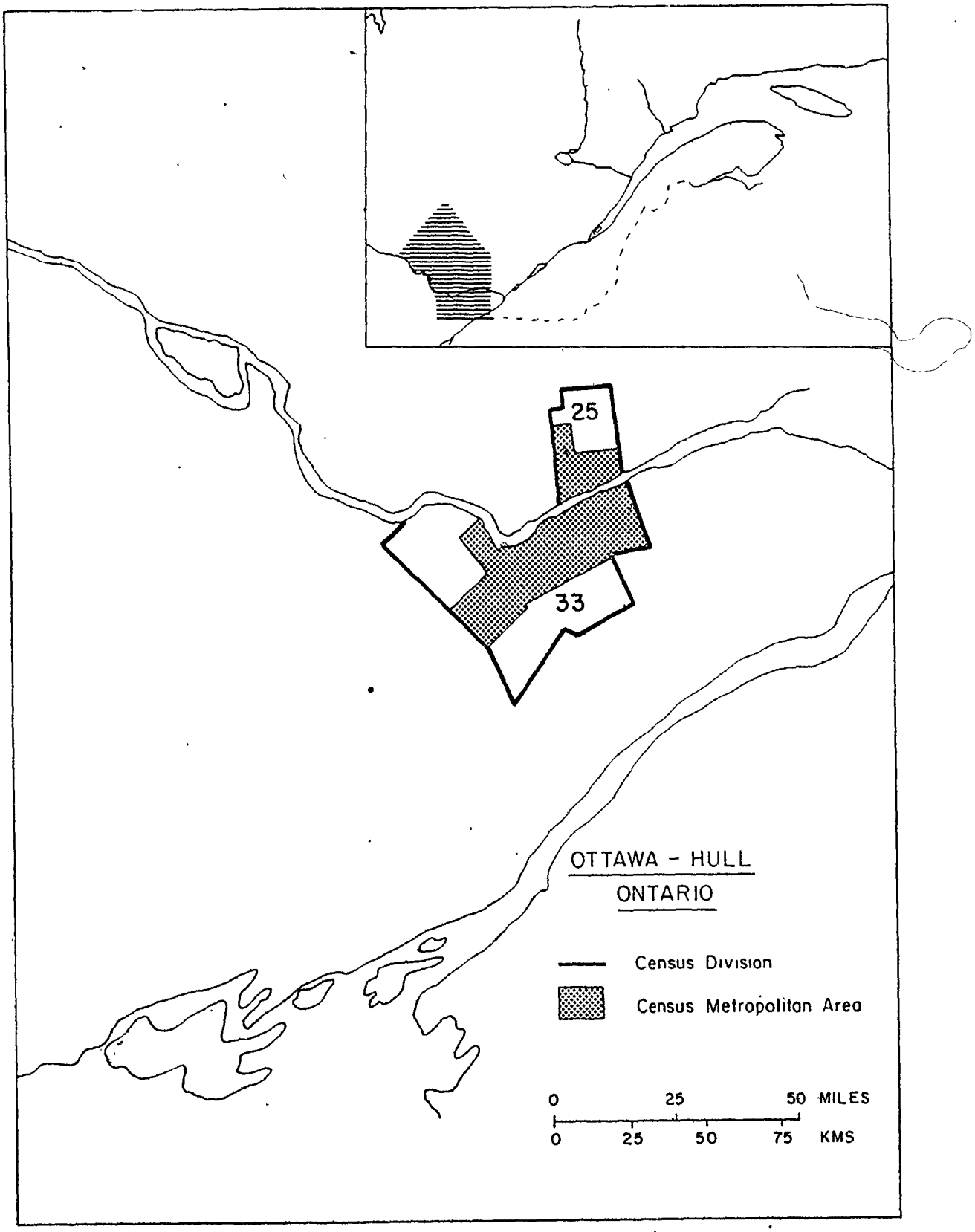

ST JOHN'S - NEWFOUNDLAND
Census Division
Census Metropolitan Area
0 20 40 60 80 MILES
0 40 60 80 KMS.
1
1

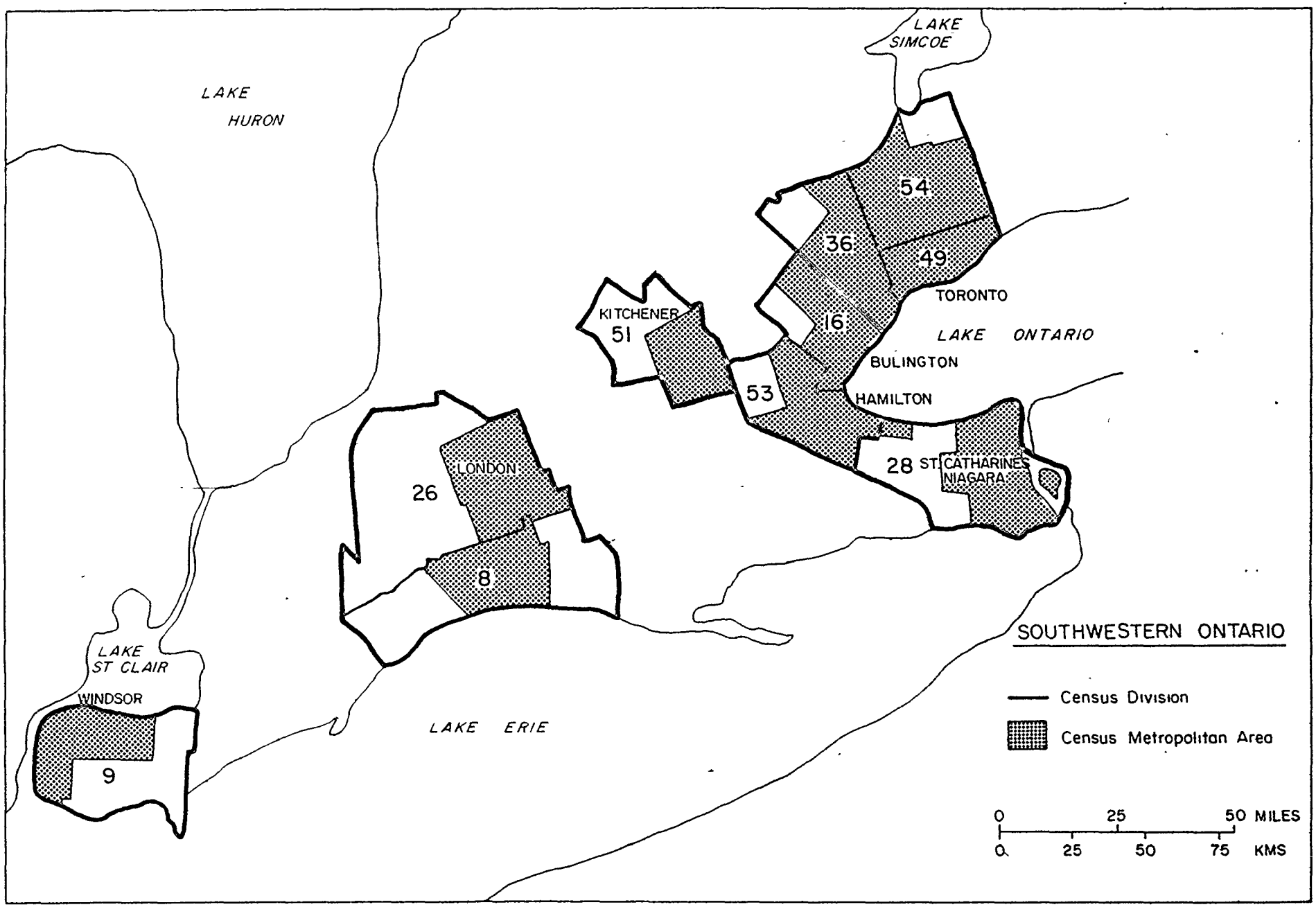

HALIFAX — NOVA SCOTIA
Census Division
Census Metropolitan Area
8
0 25 50 75 MILES
0 25 50 75 100 KMS

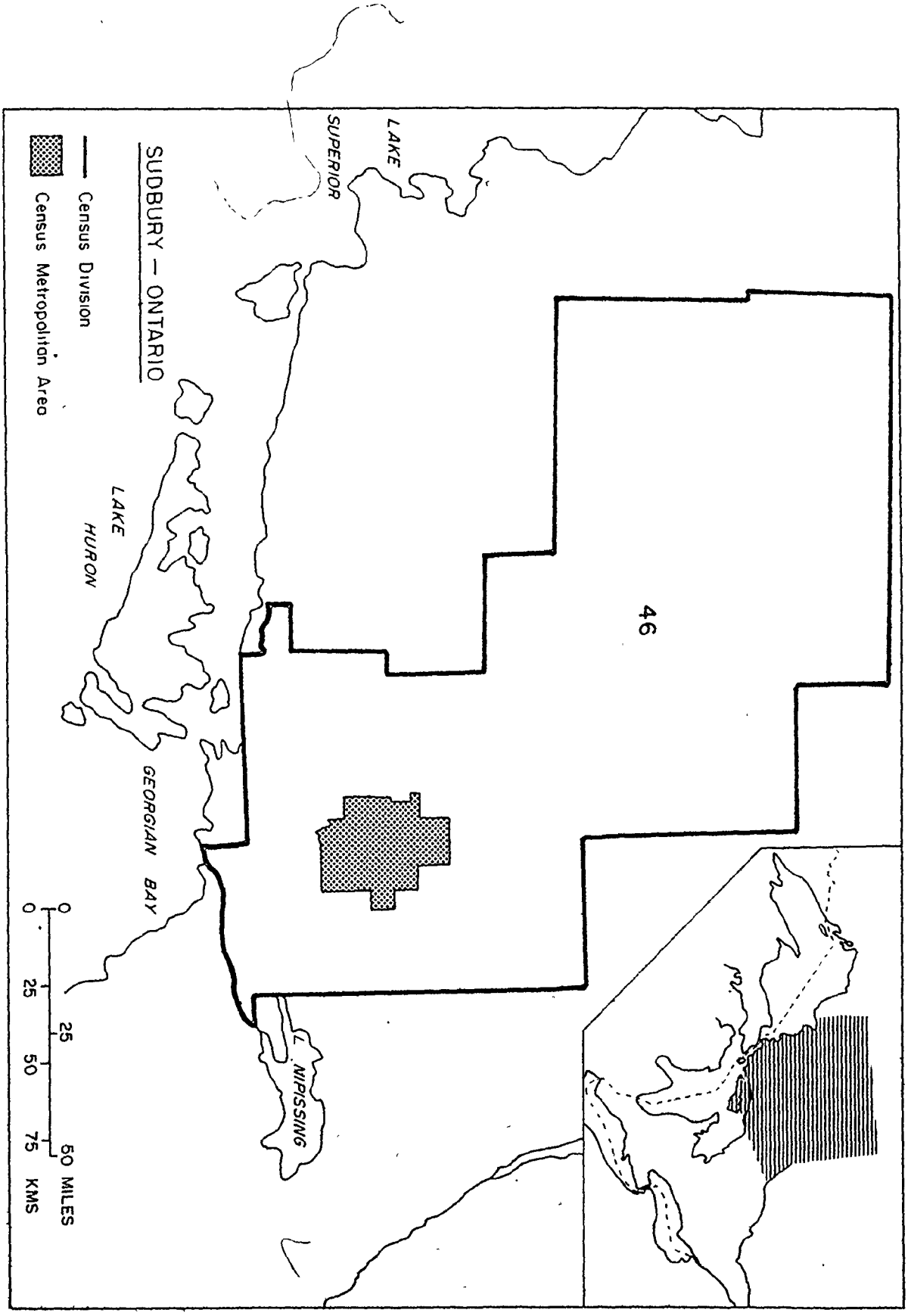

6
11
ST. JOHN – NEW BRUNSWICK
Census Division
Census Metropolitan Area
0 25 50 MILES
0 25 50 75 KMS

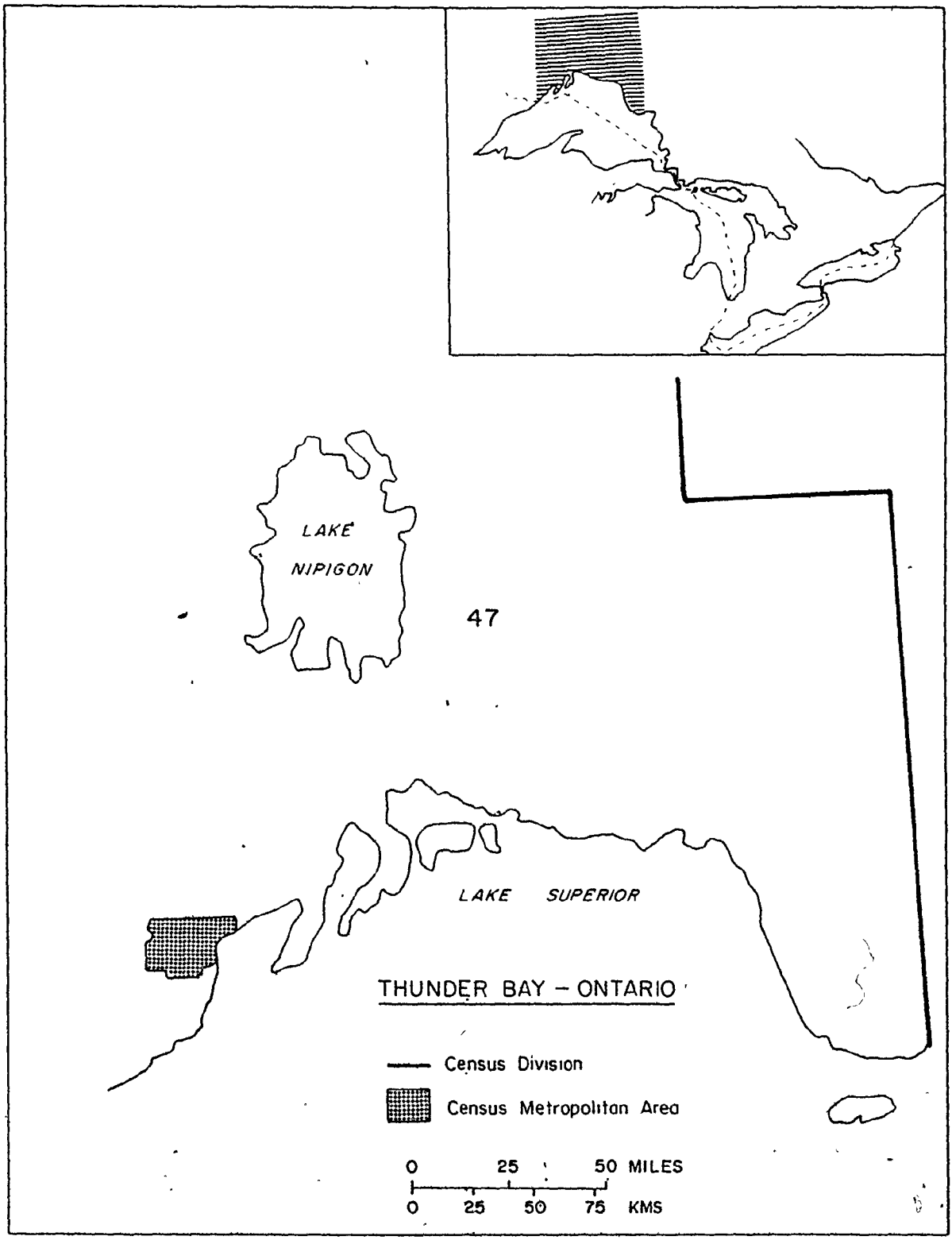

16
CHICOUTIMI – JONQUIÈRE
QUEBEC
Census Division
Census Metropolitan Area
0 10 20 30 40 MILES
0 20 40 60 KMS.

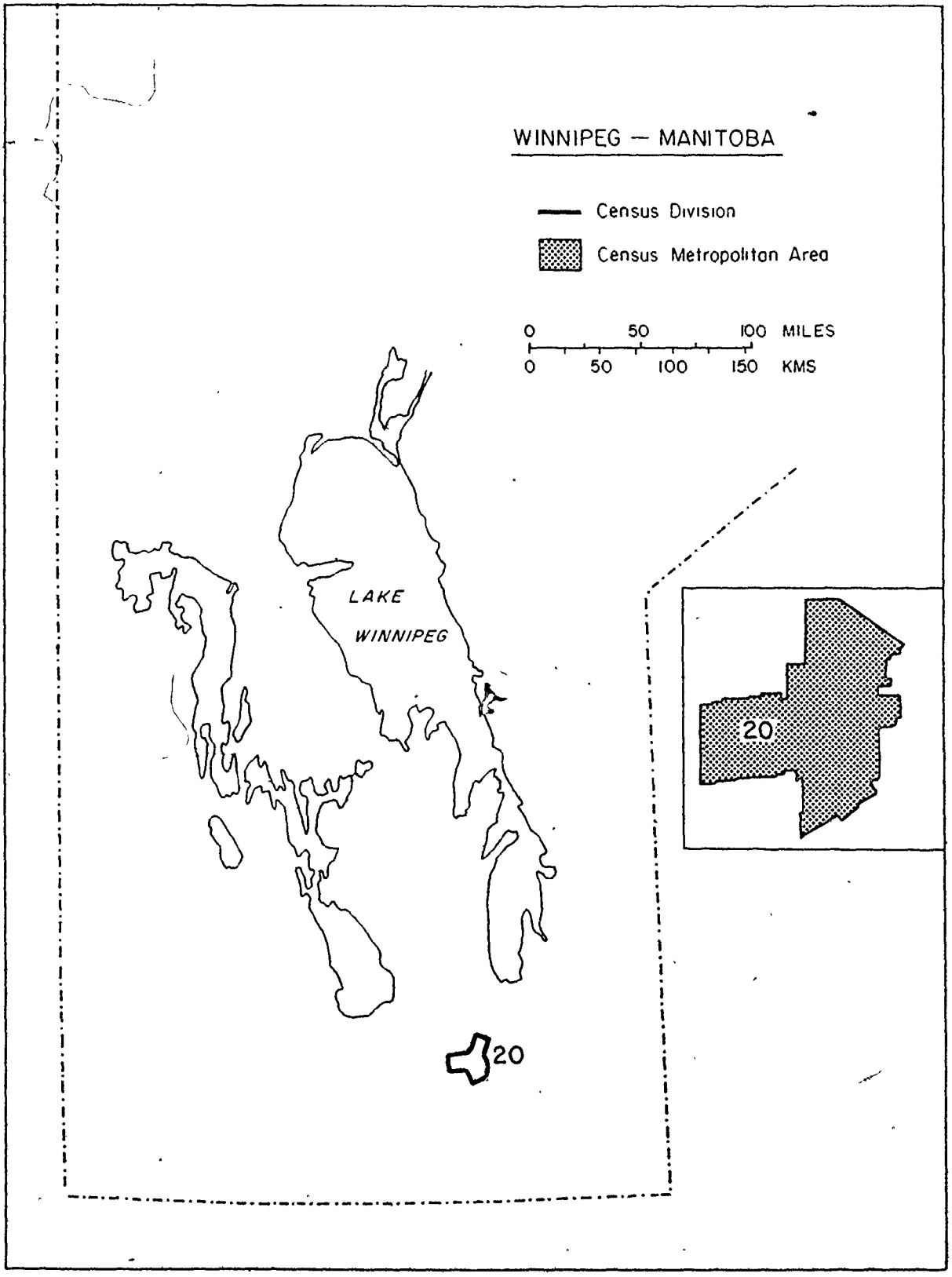

54
QUEBEC
37
36
72
18
28
MONTREAL
11
71
59
35
6
15
MONTREAL & QUEBEC CITY -
QUEBEC
Census Division
Census Metropolitan Area
0 10 20 30 40 MILES
0 10 20 30 40 50 60 KMS

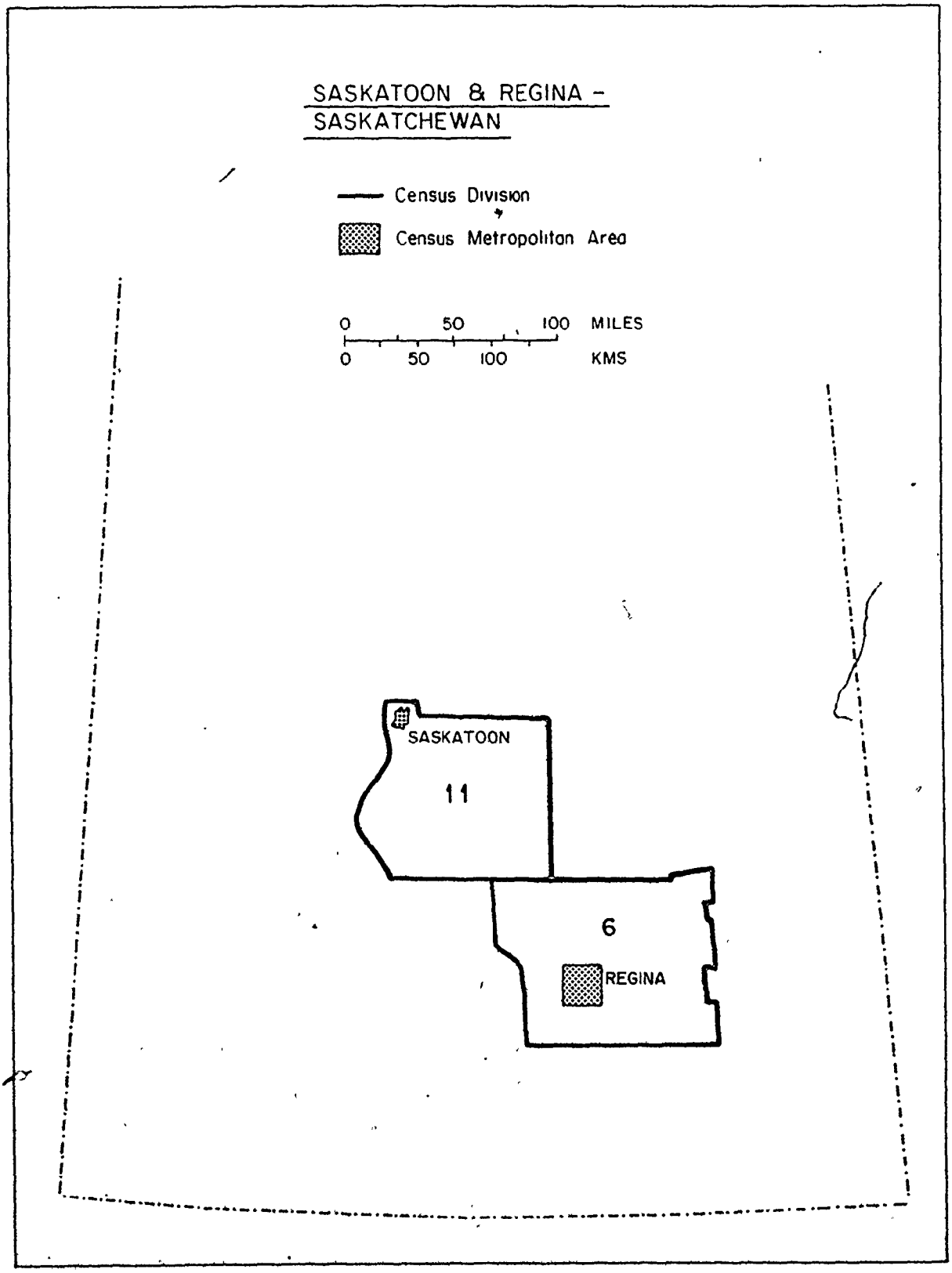

25
33
OTTAWA - HULL
ONTARIO
Census Division
Census Metropolitan Area
0 25 50 MILES
0 25 50 75 KMS

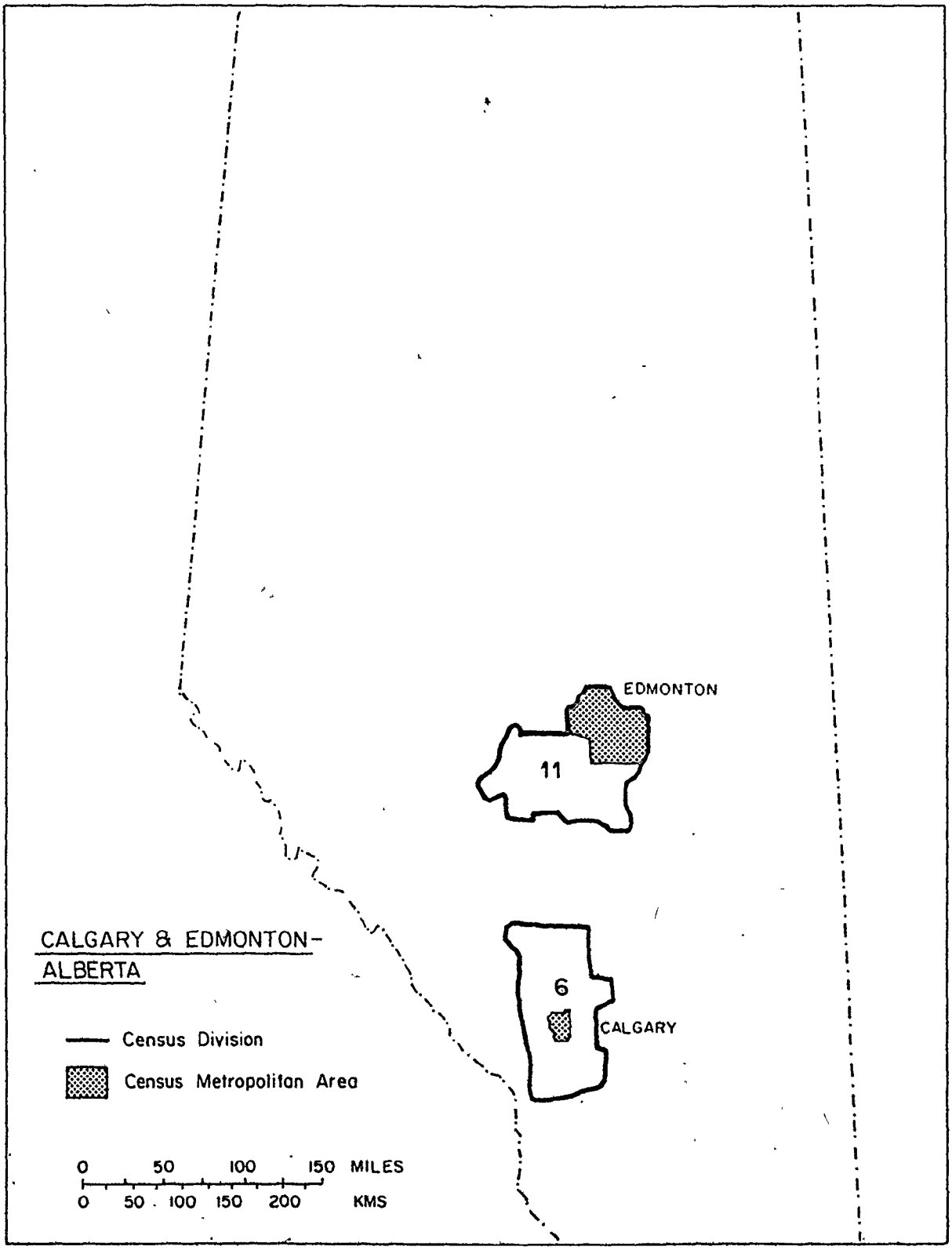

LAKE
HURON
LAKE
SIMCOE
54
36
49
TORONTO
KITCHENER
51
16
LAKE ONTARIO
BULINGTON
53
HAMILTON
28
ST. CATHARINES
NIAGARA
LONDON
26
8
LAKE
ST CLAIR
WINDSOR
9
LAKE ERIE
SOUTHWESTERN ONTARIO
Census Division
Census Metropolitan Area
0 25 50 MILES
0 25 50 75 KMS

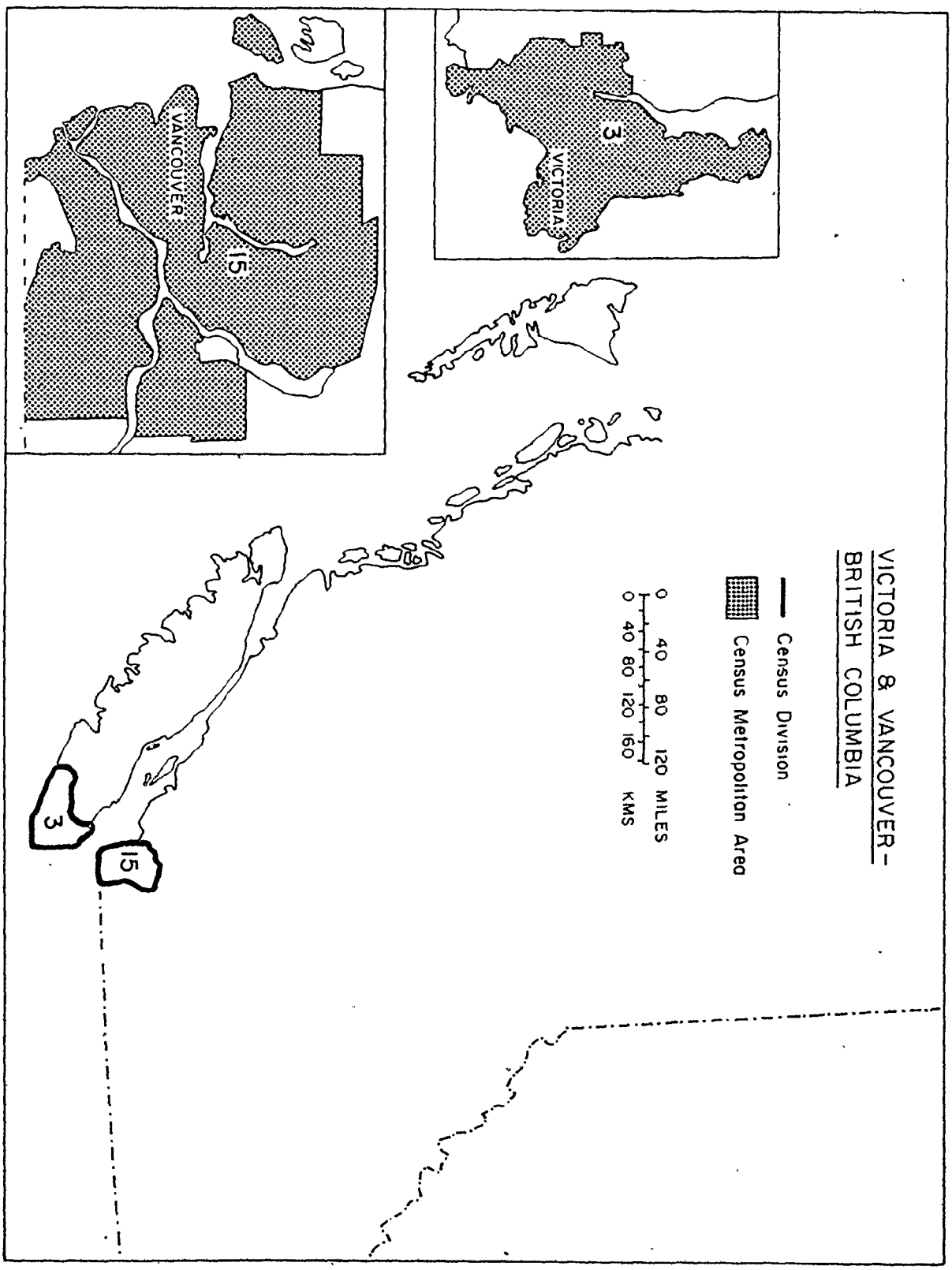

SUDBURY – ONTARIO
Census Division
Census Metropolitan Area
LAKE SUPERIOR
LAKE HURON
GEORGIAN BAY
L. NIPISSING
46
0 25 50 75 KMS
0 25 50 MILES


LAKE
NIPIGON
47
LAKE SUPERIOR
THUNDER BAY – ONTARIO
Census Division
Census Metropolitan Area
0 25 50 MILES
0 25 50 75 KMS


WINNIPEG — MANITOBA
Census Division
Census Metropolitan Area
0 50 100 MILES
0 50 100 150 KMS
LAKE
WINNIPEG
20
20


SASKATOON & REGINA -
SASKATCHEWAN
Census Division
Census Metropolitan Area
0 50 100 MILES
0 50 100 KMS
SASKATOON
11
6
REGINA


EDMONTON
11
6
CALGARY
CALGARY & EDMONTON-
ALBERTA
Census Division
Census Metropolitan Area
0 50 100 150 MILES
0 50 100 150 200 KMS


VICTORIA & VANCOUVER-
BRITISH COLUMBIA
Census Division
Census Metropolitan Area
0 40 80 120 MILES
0 40 80 120 160 KMS
3
VICTORIA
15
VANCOUVER
3
15

APPENDIX B

INCOME, EMPLOYMENT AND UNEMPLOYMENT DATA

APPENDIX B

INCOME AND EMPLOYMENT DATA

CMA	Income ($)	Employment (%)	Unemployment (%)
St. John's	5249	59.72	11.25
Halifax	6627	74.03	6.36
St. John	5669	70.64	6.74
Chicoutimi	6266	55.69	15.45
Montreal	6985	67.48	9.02
Quebec City	6863	65.76	7.93
Ottawa-Hull	7937	75.52	5.62
Windsor	7679	72.30	7.74
London	6925	76.01	5.46
Kitchener	6860	80.26	4.94
St. Catharines-Niagara	6987	74.87	5.94
Hamilton-Burlington	7701	77.45	5.67
Toronto	7861	77.54	6.36
Sudbury	7941	77.01	4.85
Thunder Bay	6906	71.02	7.92
Winnipeg	6707	73.97	6.92
Regina	5900	74.84	6.25
Saskatoon	6041	73.69	6.98
Calgary	7369	77.37	6.35
Edmonton	7117	76.40	6.74
Vancouver	7481	70.72	9.04
Victoria	6729	67.20	1.73

Data Sources: Income - 1971 Census of Canada, catalogue 94-711, table 35
Employment - 1971 Census of Canada, catalogue 94-802, table 6
Unemployment - 1971 Census of Canada, catalogue 94-703, table 5.

REFERENCES

Adams, N.A., 1969. "Internal Migration in Jamaica: An Economic Analysis", Social and Economic Studies, Vol. 18, 137-51.

Alonso, W., 1972. "Policy Implications of Intermetropolitan Migration Flows" working paper No. 177, Institute of Urban and Regional Development, University of California at Berkeley.

Alonso, W., 1977. "Surprises and Rethinkings of Metropolitan Growth: A Comment" International Regional Science Review, Vol. 2, No. 2, 171-174.

Beale, C.L. 1977. "The Recent Shift of United States Population to Nonmetropolitan Areas, 1970-75" International Regional Science Review, Vol. 2, No. 2, 113-122.

Beals, R.E., M.B. Levy and L.N. Moses, 1967. "Rationality and Migration in Ghana", Review of Economics and Statistics, Vol. 49, 480-486.

Blanco,C., 1963. "The Determinants of Interestate Population Movements", Journal of Regional Science, Vol. 5, 77-84.

Bodenhöfer, H-J., 1967. "The Mobility of Labour and the Theory of Human Capital", Journal of Human Resources, Vol. 2, 431-448.

Caldwell, J.C., 1968. "Determinants of Rural-Urban Migration in Ghana", Population Studies, Vol. 22, 361-377.

Carvajal, M.J. and D.T. Geithman, 1974. "An Economic Analysis of Migration in Costa Rica" Economic Development and Cultural Change, Vol. 23, 105-122.

Carvajal, M.J. and D.T. Geithman, 1976. "Migration Flows and Economic Conditions in the Dominican Republic", Land Economics, Vol. 52, 207-220.

Chalmers, J.A. and M.J. Greenwood, 1977. "Thoughts on the Rural to Urban Migration Turnaround", International Regional Science Review, Vol. 2, No. 2, 167-170.

Cordey-Hayes, M. and D. Gleave, 1974. "Migration Movements and the Differential Growth of City Regions in England and Wales", Papers of the Regional Science Association, Vol. 33, 99-123.

Courchene, T.J., 1970. "Interprovincial Migration and Economic Adjustment", Canadian Journal of Economics, Vol. 3, No. 4, 550-576.

Courchene, T.J., 1974. "Migration, Income and Employment: Canada, 1965-68", C.D. Howe Research Institute, Montreal.

Economic Council of Canada, 1976. "People and Jobs: A Study of the Canadian Labour Market", Supply and Services Canada, Ottawa.

Economic Council of Canada, 1977. "Living Together: A Study of Regional Disparities", Supply and Services Canada, Ottawa.

Economic Council of Canada, 1978. "A Time for Reason", Fifteenth Annual Review, Supply and Services Canada, Ottawa.

Fields, G.S., 1976. "Labour Force Migartion, Unemployment and Job Turnover", Review of Economics and Statistics, Vol. 58, No. 4, 407-415.

Gallaway, L.E., 1967. "Industry Variations in Geographic Labour Mobility Patterns", Journal of Human Resources, Vol. 2, 461-474.

Gallaway, L.E., 1969. "Age and Labour Mobility Patterns", Southern Economic Journal, Vol. 36, 171-180.

Gallaway, L.E., R.F. Gilbert and P.E. Smith, 1967. "The Economics of Labour Mobility: An Empirical Analysis", Western Economic Journal, Vol. 5, 211-223.

Gallaway, L.E., R.F. Gilbert, and P.E. Smith, 1968. "The Economics of Labour Mobility: An Empirical Analysis", Reply to Comment, Western Economic Journal, Vol. 6, 244.

Grant, E.K. and J. Vanderkamp, 1976. "The Economic Causes and Effects of Migration: Canada, 1965-71", Economic Council of Canada, Supply and Services Canada, Ottawa.

Greenwood, M.J., 1968. "The Economics of Labour Mobility: An Empirical Analysis: Comment", Western Economic Journal, Vol. 6, 243-244.

Greenwood, M.J.,1969a. "An Analysis of the Determinants of Geographic Labor Mobility in the United States", Review of Economics and Statistics, Vol. 51, 189-194.

Greenwood, M.J., 1969b. "The Determinants of Labor Migration in Egypt", Journal of Regional Science, Vol. 9, 283-290.

Greenwood, M.J., 1970. "Lagged Response in the Decision to Migrate", Journal of Regional Science, Vol. 10, 375-384.

Greenwood, M.J., 1973. "Urban Economic Growth and Migration: Their Interaction", Environment and Planning, Vol. 5, 91-112.

Greenwood, M.J., 1975a. "Research on Internal Migration in the United States: A Survey", Journal of Economic Literature, Vol. 13, 397-433.

Greenwood, M.J., 1975b. "Simultaneity Bias in Migration Models: An Empirical Examination", Demography, Vol. 12, 519-537.

Hansen, N., 1977. "Some Research and Policy Implications of Recent Migration Patterns in Industrial Countries", International Regional Science Review, Vol. 2, No. 2, 161-166.

Karp, H.H. and K.D. Kelly, 1971. "Toward An Ecological Analysis of Intermetropolitan Migration", Markham Publishing, Chicago.

Laber, G. and R.X. Chase, 1971. "Interprovincial Migration in Canada as a Human Capital Decision", Journal of Political Economy, Vol. 79, 795-804.

Ladinsky, J., 1967. "The Geographic Mobility of Professional and Technical Manpower", Journal of Human Resources, Vol. 2, 475-494.

Lansing, J.B. and J.N. Morgan, 1967. "The Effect of Geographic Mobility on Income", Journal of Human Resources, Vol. 2, 449-460.

Liaw, K.L., 1979. "Analysis and Projections of the Canadian Interregional Population System", Research Report to the Social Sciences and Humanities Research Council of Canada, Dept. of Geography, McMaster University, Hamilton, Ontario.

Long, L.H., 1973. "Migration Differentials by Education and Occupation: Trends and Variations", Demography, Vol. 10, 243-258.

Long, L.H. and K.A. Hansen,1976. "Models of Return, Repeat and Primary Migration by Age and Race", Population Division, U.S. Bureau of the Census, mimeograph.

Lowry, I.S., 1966. "Migration and Metropolitan Growth: Two Analytical Models", Chandler Publishing, San Francisco.

Lycan, R., 1969. "Interprovincial Migration in Canada: The Role of Spatial and Economic Factors", Canadian Geographer, Vol. 13, No. 3, 237-254.

McCarthy, K.F. and P.A. Morrison, 1977. "The Changing Demographic and Economic Structure of Nonmetropolitan Areas in the United States", International Regional Science Review, Vol. 2, No. 2, 123-142.

McInnis, R.M., 1969a. "Provincial Migration and Differential Economic Opportunity" in L.D. Stone (ed.) - Migration in Canada: Regional Aspects' Census Monograph, Statistics Canada, 131-202.

McInnis, R.M., 1969b. "Specification of a Regression Model for the Analysis of Interpovincial Migration" in L.D. Stone (ed.) 'Migration in Canada: Regional Aspects' Census Monograph, Statistics Canada, 380-391.

McInnis, R.M., 1971. "Age, Education and Occupation Differentials in Interregional Migration: Some Evidence for Canada", Demography, Vol. 8, 195-204.

Raimon, R.L., 1962. "Interstate Migration and Wage Theory", Review of Economics and Statistics, Vol. 44, 428-38.

Ravenstein, E.G., 1885. "The Laws of Migration", Journal of the Royal Statistical Society, Vol. 48, No. 2, 167-227.

Renshaw, V., 1975. "The Relationship of Gross Migration to Net Migration: A Short-Run, Long-Run Distinction", Regional Science Perspectives, Vol. 5, 109-124.

Sahota, G.S., 1968. "An Economic Analysis of Internal Migration in Brazil", Journal of Political Economy, Vol. 76, 218-251.

Schultz, T.P., 1971. "Rural-Urban Migration in Columbia", Review of Economics and Statistics, Vol. 53, 157-163.

Schultz, T.W., 1962. "Reflections on Investment in Man", Journal of Political Economy, Vol. 70, No. 5, 1-9.

Schwartz, A., 1973. "Interpreting the Effect of Distance on Migration", Journal of Political Economy, Vol. 81, 1153-1167.

Sjaastad, L.A., 1962. "The Costs and Returns of Human Migration", Journal of Political Economy, Vol. 70, No. 2, 80-93.

Stone, L.O. and S. Fletcher, 1977. "Migration in Canada", Statistics Canada Profile Study, Catalogue No. 99-705, Ministry of Industry, Trade and Commerce, Ottawa.

Vanderkamp, J., 1968. "Interregional Mobility in Canada: A Study of the Time Pattern of Migration", Canadian Journal of Economics, Vol. 1, 595-608.

Vanderkamp, J., 1970. "The Effects of Outmigration on Regional Employment", Canadian Journal of Economics, Vol. 3, 541-550.

Vanderkamp, J., 1971. "Migration Flows, Their Determinants and the Effects of Return Migration", Journal of Political Economy, Vol. 79, 1012-1031.

Vanderkamp, J., 1972. "Return Migration: Its Significance and Behaviour", Western Economic Journal, Vol. 10, 460-465.

Vanderkamp, J., 1976. "The Role of Population Size in Migration Studies", Canadian Journal of Economics, Vol. 9, 508-517.

Yezer, A.M. and L. Thurston, 1976. "Migration Patterns and Income Change: Implications for the Human Capital Approach to Migration", Southern Economic Journal, Vol. 42, 693-702.

Young, G., 1975. "The Choice of Dependent Variable for Cross-Section Studies of Migration", Canadian Journal of Economics, Vol. 8, 93-99.

Zelinsky, W., 1977. "Coping with Migration Turnaround: The Theoretical Challenge", International Regional Science Review, Vol. 2, No.2,175-178.