Counterurbanization in the Greater Toronto Area

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In The
Greater Toronto Area

By

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Abstract

It was the main objective of this particular thesis to determine whether the experiences of the Greater Toronto Area with respect to patterns in the redistribution of its population, were similar to those in urban areas of other developed nations around the globe. Although a plethora of studies were carried out relating to the counterurbanization phenomenon during the late seventies and early eighties in these other countries, to this point few have been carried out in a Canadian context. In light of this, in completing this thesis, first, we hope to contribute to the literature by highlighting patterns of population distribution in the GTA from 1971-91, utilizing the hoover index of concentration as the primary means of doing this. The results suggest a pattern of population redistribution away from the core, favouring municipalities peripheral to this area. Second, through careful consideration of the key criticisms put forth relating to the study of the counterurbanization phenomenon, we have determined the validity of each in terms of the extent to which they would affect the observed trends in the distribution of the GTA's populations. The results of this analysis offer evidence in support of the 'metropolitan overspill' hypothesis which interprets these trends in the redistribution of population away from the core as the continuation of the process of suburbanisation, only an accelerated level of the phenomenon. Finally, in realizing the importance of studying economic activity alongside any trends in the redistribution of population, analysis of data from the Transportation Tomorrow Surveys of 1986, 91, & 96 has been completed. Once again, we find the results of this analysis lend additional support to the 'metropolitan overspill' hypothesis.

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1.0 INTRODUCTION

1.1 Research Problem

From the onset of the industrial revolution through to the early seventies, there was little disagreement that urbanization, described as the existence of a positive relation between settlement size and population growth (Fielding, 1982), was the dominant trend within developed nations around the world. Amongst population geographers and policy analyst, there existed a general consensus that continued urbanization and the decline of the peripheral regions was inevitable (Alonso, 1977). Since that time, a marked swing in population trends in favour of peripheral regions, medium to smaller sized cities and rural areas has taken place. Characterized by various academics as the 'nonmetropolitan turnaround' (Fuguitt, 1985), 'metropolitan deconcentration (Bourne, 1980) or 'counterurbanization' as Berry (1976) first coined it, no matter how one chooses to label the phenomenon, the existence of this new trend was undeniable. Although consensus on the exact definition of the term does not exist to this day, 'counterurbanization' nonetheless began to gain acceptance as the most popular term used to describe this newly recognized trend in population redistribution patterns. Defining counterurbanization as a process of demographic deconcentration, beyond that of suburbanisation or metropolitan decentralization, Berry (1976), went on to state that "counterurbanization has replaced urbanization as the dominant force shaping the

nation's settlement patterns"(p.17). In making such a statement, Berry triggered ongoing debate amongst academics interested in the phenomenon as to whether these trends do in fact represent the fall of urbanization as the dominant trend amongst developed nations. While some went as far as labelling these developments 'a clean break with the past', critics explained these newly discovered trends as nothing more than the 'accelerated outward growth and overspill of metropolitan areas' into their exurban surroundings, dismissing it as merely the continuation of the suburbanisation process.

Although the existence of the counterurbanization phenomenon was confirmed in many developed nations around the world, to this point few studies have attempted to study counterurbanization in a Canadian context. In light of this, it is our main objective to study the existence or absence of the phenomenon in a Canadian context. Following this, we will turn our attention to the controversy surrounding the 'clean break' hypothesis proposed by Vining and Strauss (1977). If a 'clean break' with past trends is to be recognized in Canada, then our analysis must demonstrate that we have experienced growth beyond the commuting shed of the metropolitan core.

In comparison to the aforementioned issues, explanations have received considerably less attention. Although numerous explanations have been put forth, any attempt at a single explanation would appear simplistic due to the fact that reasons for the reversal are multifaceted and incompletely understood to this point. Sant and Simons (1993) state that "it is difficult, if not impossible to establish the primacy of any single cause...". Instead, authors tend to group respective explanations into exclusive categories, trying to make sense of the many explanations offered. One of the more popular methods

of categorizing for example, is to group factors according to economic and non-economic criteria. Although without doubt, a variety of factors are involved, the one widely excepted viewpoint is the importance of studying economic activity alongside any shifts in population. Although shifts in population may appear counterurban, the level of economic ties to the core could either remain constant or simultaneously be increasing. Therefore although people are increasingly choosing to reside outside the core, its dominance in terms of economic activity may not be jeopardized. In light of this, it is our final objective to study the redistribution of economic activity with the intentions of demonstrating whether these ties to the core are diminishing alongside any shifts in population.

1.2 Methods of Analysis

1.21 Study area

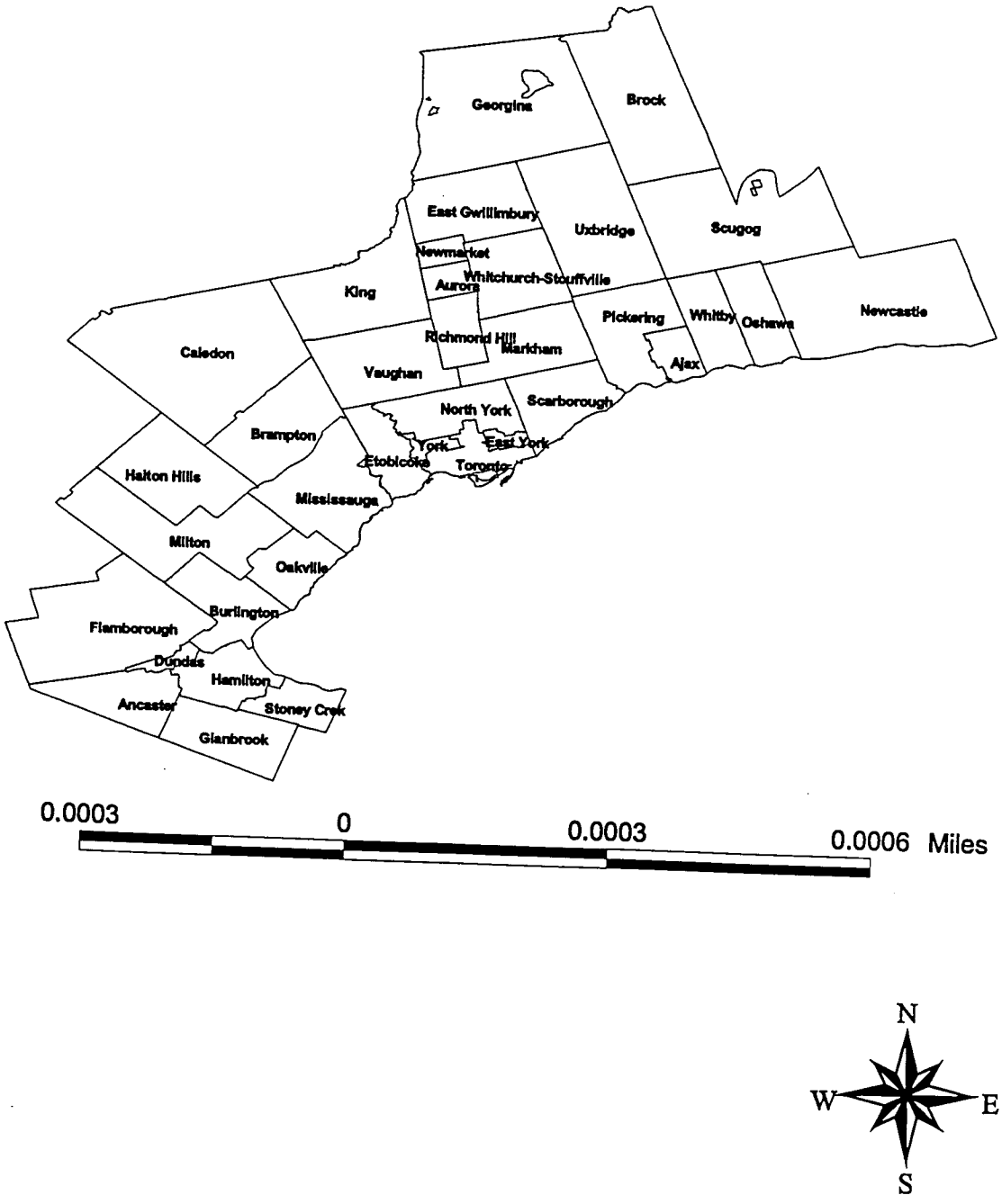
Although a plethora of studies on counterurbanization exist for numerous developed nations around the globe, literature in relation to the Canadian experience has been somewhat lacking in comparison. In response to the request by *Joseph et al* (1988), for more detailed studies in relation to the existence of the phenomenon in Canada, the main objective of this analysis has been to determine both the extent and development of counterurban tendencies in a Canadian context. The Greater Toronto Area (GTA) is the centre of a wide range of activities, including industry, business, non-profit and cultural organizations, social services, research and recreation. Therefore, along with representing

one of Canada's few large scale, internationally competitive urban economies, it also features a diverse set of relationships among human, natural, cultural and financial resources, somewhat similar to that of other large urban regions such as Vancouver and Montreal. Because the economic vitality of Ontario and Canada to a certain extent depends on these large urban centres, the study and understanding of any demographic and/or economic trends which may be developing in these areas is very important. As the largest urban region in both the province and the country, the GTA has obvious demographic and political importance. In recognition of this, the Greater Toronto Area, has been selected as the primary area of study. In light of the fact that there are a number of definitions relating to exactly what area constitutes the GTA, we define it in a similar fashion to that of the Transportation Tomorrow Survey (TTS) of 1986. For the purposes of this particular thesis, the area including the 32 census subdivisions within the ***Regions of Metropolitan Toronto, Hamilton-Wentworth, Halton, York, Peel and Durham*** respectively, will comprise the GTA (see figure 1).

1.212 Profile of the GTA

Founded in 1793 as York on Lake Ontario, what is now the City of Toronto was incorporated as a city in 1834, at which time it had a population of 9000. In 1867, when several provinces confederated to create Canada, Toronto, housing about 50,000, became the permanent capital of Ontario. Following a rapid growth spurt between the 1880s and 1912, nearly 15% of Ontario's population resided within the boundaries of Toronto. Between 1912 and 1940, the city experienced only modest levels of growth. In contrast, during the next fifty years, Toronto experienced record levels of growth, developing into

Figure 1 ***Primary Study Area - The GTA.***



what is now one of Canada's most prominent urban areas, the Greater Toronto Area. In 1940 the city itself housed approximately 650,000, while the urbanized region counted well over 900,000. In 1953, Metropolitan Toronto was officially established. As a result of its location, historical growth, transit availability, diversified business activities, and traditional monocentric urban structure, development remained focussed on the inner core of Central Toronto for many years. Following this, residential and employment areas surrounding the core then began to grow becoming the suburbs of the 1950's and 1960's, which eventually would develop into intermediate centres of employment and commercial activities. With the exception of the late seventies, Toronto continued to attract migrants from other regions of Canada as well as streams of immigrants from overseas (Lemon, 1991). As a result, the urban area experienced growth along the major transportation networks of Yonge Street, Highway #401 and the Queen Elizabeth Way (Q.E.W.) as a more polycentric urban structure began to develop.

Alongside the rapid growth in population, Toronto also experienced a level of household growth which actually 'outstripped' the growth of population and family units, therefore reducing the average number of persons per dwelling unit (Miron, 1977). According to the previous author, this decline in average household size can be mainly attributed to three trends. First, the rise of the one person household, which in 1976 approximately two thirds of all households in the GTA were of this type. Second, decreasing average family size and finally, the increasing tendencies of families to avoid sharing a household with other persons or families. Evidence of the latter can be obtained from census data on 'households by family composition', for the census years between

1951 and 1976. While the number of one person households grew substantially at a compounded rate of 10.6% during this period, the number of one family households with additional persons present and multiple family households either remained stable or declined slightly in this respect. Therefore, some amount of the total growth in households in Toronto can at least in part be attributed to 'undoubling', or the establishment of separate households by families or individuals (i.e. those thought to be in difficult economic circumstances), who previously resided in a dwelling shared with other people (Miron, 1977). The author goes on to discuss some underlying shifts in the demographic structure of Toronto's population which have had important repercussions on household formation. First, the maturing post-war baby boom, which from the mid - 1960's to mid - 1980's was the cause of substantial new household formation. Second, changing attitudes towards marriage and divorce. Third, the changing living arrangements of young single adults and the elderly widowed who are more likely to live on their own. Each of the above, individually and in combination have been key contributing factors in the formation of the previously mentioned patterns in household development.

During the late seventies, Toronto surpassed Montreal as the most populous city in Canada, while the urban structure began to resemble a more polycentric form, as the developing areas surrounding the core matured. In addition, the core's population base continued to change from retired, elderly, empty nesters to younger, professional, double income family units who could afford the rising cost of living in the core area. (Coppack and Robins,1987). As a result of Toronto's dynamic, diversified economy, the city has also become the preeminent financial centre of the country. By 1991, what is now the

Greater Toronto Area, spanning the Lake Ontario between Stoney Creek and Newcastle and north to Lake Simcoe, contained over 4.5 million people, nearly half the population of Ontario. The majority of this population, 3.7 million, resided within the Toronto Census Metropolitan Area (CMA), a geographical unit whose boundary has changed over time to reflect the spatial extent of the local labour market. Although the six municipalities comprising Metropolitan Toronto still accounted for nearly 50% of this population in 1991, between 1981 and 1991, this proportion significantly decreased. This trend can at least partially be explained as a result of the significantly higher growth rates of rapidly developing peripheral municipalities during the same time period.

1.22 The Data

1.221 Population and Area Data

The primary source of data which will be utilized for the demographic analysis has been extracted from a pre-existing database labelled 'ONTPOP', created specifically for the type of analysis which will be completed for this thesis. 'ONTPOP' is an arc-info based boundary file, consisting of population and area data for 1036 census subdivisions within Ontario, for the census years 1986 and 1991. Each census subdivision within the database had previously been coded by a value of 1,2 or 3, identifying it as being part of a 'Census Metropolitan Area', 'Census Agglomeration' or 'Other' classification respectively. In respect of the unique circumstances and experiences of Indian Reserves in terms of migration, population developments and economic activity, these particular census subdivisions were not given one of the previous classifications and therefore were

excluded from the analysis.

1.222 Census Data

A second source of data which is of equal importance for the demographic analysis, is the census data on populations collected at the level of the census subdivision. For each of the census years 1971,76, and 1981, population figures were recorded in a spreadsheet format.

In addition, certain records within 'ONTPOP' required editing as the database was incomplete or in some cases required updating. Therefore, population information for these records was also obtained from the Statistics Canada Census publications.

1.223 TTS Data

The Transportation for Tomorrow Survey (TTS), was the first area-wide survey of its kind since the 1964 Metro Toronto Area and Region Transportation Study (MTARTS). Each TTS has been completed as part of a comprehensive program to monitor and study travel patterns in the GTA. For each household surveyed, information regarding *attributes of the household, residents of the household* and *trips* made on the day previous to that of the survey by household members, have been collected for a stratified sample. Following the completion of the collection phase, each record was then given an expansion factor to represent the total population in the GTA, defined as the ratio of the number of TTS household samples to census dwelling units in an aggregation district. The first TTS was conducted in 1986, and since that time has been the primary source of information for transportation planning in the GTA.

The survey of 1986 was completed with hopes that it would be the first of an

ongoing data collection program. After much debate, it was decided that 1991 would be the year of the next survey. While the 1986 survey, in interviewing 62,000 households had a sample target rate of 5%, the 1991 TTS, which would turn out to be more of an update of the previous survey, interviewed only 25,000. Areas which experienced a high growth rate from the previous census (17% or above), would be sampled at the same rate as 1986, whereas, areas with a lower growth rate had a target sample rate of 0.5%. In addition to concentrating more on high growth areas, the 1991 TTS also set out to obtain information on trips coming into the GTA from the external households located in the 'fringe' area of the original 6 regions included in the 1986 survey. Defining the fringe as a 'band of local municipalities immediately adjacent to the initial study area', a random sample of households (2200 in total) from the 'fringe' were also included in the 1991 survey in order to meet the needs of communities near the outer boundaries.

As with the first two surveys, the 1996 TTS was timed to coincide with the five year cycle of the Canada Census. As opposed to an update, as was done in 1991, this survey would be new, with a target sample range of 4.5% to 5%. With the inclusion of the Niagara Region, Waterloo Region, City of Guelph, Wellington County, Town of Orangeville, Simcoe County, City of Barrie, Victoria County, City of Peterborough and Peterborough County, a total of 115,000 households were interviewed, deeming this to be the largest survey of the three.

1.23 Methodology

It is the intention of this thesis first, to describe developments in terms of population redistribution patterns within the GTA. Using the population and area data set described previously, the existence of counterurban tendencies in the GTA will be tested. Perhaps the most easily understood statistic of concentration is the Hoover Index, named after its originator Edgar Hoover. The Hoover Index for K zonal areas is given by;

$$H_t = \frac{1}{2} \sum_{i=1}^{K} \left| P_{it} - A_i \right| 100$$

Where P_{it} is the proportion of the population residing in area (i) at time (t), and A_i is the proportion of the nation's area taken up by subarea (i). The index obtains values between 0, for a for a 'perfectly uniform' distribution, and 100 for a 'perfectly concentrated' one. An index value greater than zero, indicates the percentage of the population that has to be redistributed in order to achieve an even distribution of population (Kanaroglou and Braun, 1992). Through the calculation of the index of concentration using the census subdivision as the basic unit of analysis, we will first look at the experience of the GTA overall. Following the work of Vining and Strauss (1977), who used the county as their basic unit of analysis, then built increasingly larger areas based on these units, CSDs within each region will be aggregated and the experiences of each individual region, in terms of population concentration within the context of the GTA will be examined. Gordon (1979) suggests computing the index for sets of regions which are exhaustive, as

well as for subsets of regions in order to observe trends in the index that are not affected by trends in other subsets of regions. Therefore, in light of this, we examine each of the above regions as a subset to discover whether the experience of the more populated regions are the cause of inaccurate index values for less populous regions. Following this, descriptive statistics will be utilized in determining municipal outliers in terms of their overall level of concentration and their population growth rates discussed in order to highlight where the major growth and decline is occurring.

One of the major focal points of the literature relating to counterurbanization is the controversy surrounding core/periphery, metropolitan/nonmetropolitan, urban/rural analysis. In light of this, the next objective will be an examination of this issue in the GTA. One of the key criticisms relating to analysis of this nature is the issue of defining core and peripheral regions and how one distinguishes between the two. Depending on how these areas are actually defined, very different results can be obtained using the same data. McCarthy and Morrison (1977), note the importance of considering both the degree of concentration as well as proximity to the core metropolitan area, realizing that growth of suburban communities immediately adjacent to the core can influence observed patterns. Although one could easily prematurely conclude a particular metropolitan area has been experiencing counterurban tendencies without considering proximity to the core, it is possible that the process of suburbanisation is largely responsible for these overall patterns. Therefore, in hopes of adequately addressing this issue, the core will be overbound and the previous analysis will again be carried out with the newly defined core and peripheral areas. Once sufficient insight into the previous issue has been given, the

GTA will itself be overbound to include CSDs located within immediately adjacent regions in order to examine whether these particular regions outside the commuting shed of the Toronto CMA are experiencing significant levels of growth. Although to this point our analysis has been limited to CSDs within the GTA, it is important to examine any growth outside the main commuting shed of Metropolitan Toronto. If in fact these regions display significant levels of growth beyond the levels experienced by the Toronto CMA, the 'metropolitan overspill' hypothesis can be rejected.

Finally, CSDs within the overbound study area will be categorized as being part of a 'CMA', 'CA' or 'Other' development. Following this, analysis in terms of the contribution of each category to the overall levels of concentration in the GTA will be conducted in hopes of further testing the notion that smaller sized cities, outside the influence of the metropolitan core are experiencing significant levels of growth.

Once the existence/nonexistence of the phenomenon has been established demographically, analysis with respect to trends in the redistribution of economic activity will then be completed. Returning to the use of the original study area, which includes all CSDs within the regions of Halton, Peel, York, Durham, Metropolitan Toronto and Hamilton Wentworth, first, changes in the magnitude of commutes with a core destination, then trips with a core origin will be analysed. Next, we will determine the changing magnitude of trips having both a core origin and a peripheral destination, followed by the examination of inter-core activity over the same time period. It is through the completion of the previous analysis of commutes that we will offer some insight into the controversy surrounding the question of the core's dominance decreasing

primarily in terms of population, or whether its economic dominance in terms of being the net attracter of trips from its suburban communities is also deteriorating.

If in fact the core is losing its long held dominance both in terms of population and level of commutes, the question is, where exactly are preferences headed? Although traditionally, as a result of the monocentric urban structure of the area, the urbanized core has been the recipient of the majority of commutes from its suburbs, perhaps these suburbs are increasingly becoming more independent as the urban structure increasingly resembles a polycentric one. Whereas in the past, Toronto, the central area, dominated in terms of the concentration of business, government, institutions and cultural and recreational activities, perhaps certain suburban municipalities are developing into intermediate centres as multi-nucleations continue to develop and mature. In light of this possibility, our next task will be to analyse the directionality of commutes in determining whether the magnitude of commutes from the urbanized core to particular suburbs are increasing. If in fact these CSDs in the suburbs are gaining popularity with respect to being the destination of commutes from the urban core, then in addition to the redistribution of population away from the core, this should be sufficient evidence that perhaps the dominance of the core is in fact diminishing in all respects. With a recent rise in population over recent decades and a subsequent increase in the level of commutes for both work and discretionary purposes, it would be apparent that these suburban communities are perhaps becoming more self-sufficient, with traditional ties to the urbanized core weakening with time. It should be noted at this point that a certain degree of error should be expected due to the limited size of the stratified sample. Although

some general conclusions will be drawn in relation to changes in the directionality and relative magnitude of trips, caution should be taken with any further interpretation of the results.

It is the intention of the final section of the commuting analysis to offer some preliminary insight into the notion of balanced, self-contained developments in the GTA, while emphasising the previous conclusions. Through the calculation of specific indices of both balance and self-containment, the experiences of particular census-subdivisions in these respects will be discussed. Although the balance index is simply the '*ratio of resident workers to jobs in a particular area*', or more specifically '*the number of people seeking jobs locally and the local availability of jobs*', the indices of self-containment require further explanation. The two self-containment indices presented in this section, *Independence* and *Retention* respectively, both of which are based on actual trip behaviour, will be derived from data on the levels of in and out-commuting within census subdivisions in the GTA. While the former is measured as the ***number of work trips that are internal to an area, divided by the sum of work trips out and the work trips in***, the later is calculated by ***dividing the number of internal trips by the sum of internal trips and the trips going out of an area***.

In addition to the implications of our results, the final chapter will consist of some concluding remarks with respect to trends in the redistribution of both population and economic activities in the GTA.

2.0 Background

2.1 Counterurbanization - A Literature Review

2.11 THE DEBATE

A plethora of concepts and terms exist in relation to the counterurbanization phenomenon. In light of this, considerable confusion exists in regards to the distinct meaning of the term counterurbanization and associated concepts. Although there has been a tendency to regard 'population turnaround', 'deconcentration', and 'counterurbanization' as synonymous, the significantly different meanings for each term should be noted. While 'turnaround' refers to movement back to areas of previous loss, 'decentralization' usually involves development within the sphere of influence of the centre from which it originates. 'Counterurbanization', perhaps the most used definition, is the occurrence of a net outflow of people from large urban or metropolitan centres to smaller settlements and rural areas, beyond the influence of these metropolitan centres.

For Berry, counterurbanization is a process of population deconcentration, implying the movement from a state of more concentration to a state of less concentration (Berry 1976, 1980). All evidence drawn upon by Berry in support of the phenomenon in the U.S., involved shifts down the scale of concentration. Evidence put forth by Berry included: (1) the faster growth of the West and South relative to the northeast and north central areas; (2) the rapid growth of the smaller metropolitan centres in the sunbelt and the decline of the larger metropolitan centres in the northeast; (3) the reversal of the

traditional net migration flow out of non-metropolitan America; (4) the outward expansion of the cities' commuting fields; and (5)The emergence of more dispersed and multi-nodal urban regions. In light of his evidence, Berry (1976), goes on to state that "a turning point has been reached in the American experience. Counterurbanization has replaced urbanization as the dominant trend in the nations settlement patterns" (p.17).

Although Berry's definition seems quite clear and the evidence he draws upon appears in support of his conclusions, aspects of his evidence can be utilized in support of opposing academics. These advocates simply view these new developments in population distribution trends as the continuance of the longstanding outward growth of large metropolitan areas, not a 'turning point' in the urban experience as Berry coined it. Supporters of this hypothesis simply see the metropolitan centres as extending beyond the formerly defined boundaries. Gordon (1979) argued that a continued 'wave' of urban decentralization as well as rural growth seemed to be in progress. The 'wave' theory suggests we might be observing some very traditional trends: growth takes place at the centre of smaller cities and becomes even more removed from the centre as the city gets larger. From this continuing debate, two schools of thought have emerged. The first explains the change in distribution trends as "an accelerated overspill of metropolitan areas into their exurban surroundings" (Regional Planning Association, 1975, p.54), while the second believes these new developments represent a 'clean break with past trends' (Vining and Strauss, 1977). McCarthy and Morrison (1977) acknowledge the opposition to the clean break noting that although metropolitan spillover clearly continues to contribute to nonmetropolitan growth in the 1970s, it is no longer the only factor

involved. Zelinsky (1977) makes note of the fact that although much of the metropolitan to nonmetropolitan flow is attributable to the ever broadening extension of our metropolitan complexes, "the claim that we are merely witnessing the logical continuation of past trends simply will not do" (p.176).

After applying the Hoover Index of concentration at scales ranging from broad geographical divisions down to the individual county in the U.S., Vining and Strauss (1977) found that all scales of analysis indicated deconcentration, signifying a 'clean break' from the past for them.

Robert and Randolph (1983) see counterurbanization as the result of both 'decentralization' and 'deconcentration'. While the former describes the movement of people from inner cities to other urban areas within the urban system, the latter involves movement down the urban hierarchy and beyond the daily urban system (i.e. rural or remote areas). With reference to the 'clean break' hypothesis, these authors suggest that counterurbanization evolved out of decentralization, but later resembled a pattern of deconcentration.

Opposition of the 'clean break' advocates pose the argument that growth within the metropolitan commuting field is merely a continuation of the process of suburbanisation. A 'clean break' can only be recognized if growth is not simply a result of or response to metropolitan spillover. Coombes, Dalla Longa and Raybould (1989) in addition, suggest that a fundamental clean break would require that growth and decline are no longer related to the urban hierarchy, and would have no systematic relationship to the size of an area.

"Decentralization is not confined to metropolitan sprawl. It affects non-metropolitan counties, well removed from metropolitan influence" (Beale 1975, p.7). Beale found that though counties lying adjacent to metropolitan areas were growing more rapidly than those further removed, the difference between the two annual growth rates (1.1%) was relatively small, and much narrower than it had been in the previous decade. For Beale, this was the more impressive fact. Subsequent studies by Morrison and Wheeler (1976) who used the term "rural renaissance" in describing the trend and McCarthy and Morrison (1977) confirmed these conclusions.

Fielding (1982) outlines a method of dealing with the issue of metropolitan spillover. If each area is defined in terms of a 'functional labour market', meaning all areas lying within an urban centres' commuting catchment are assigned to that area. change within a functional labour market area will be regarded as either suburbanisation or local decentralization.

The preceding debate between the two schools of thought lead to further disagreement, relating to how one distinguishes between metropolitan\ nonmetropolitan, core\ periphery and urban\ rural. Long and DeAre (1982) state that the distinction between metropolitan and nonmetropolitan is replacing the traditional urban\ rural distinction. Although the latter distinction is based on residents alone, the former embody both a spatial element (a city and its associated suburbs), and an economic dimension (a unified local labour market), therefore consisting of both urban and rural aspects.

McCarthy and Morrison (1977) differentiate between authors who prefer to distinguish nonmetropolitan counties according to the proportion of the workforce

commuting to a job in the metro area, and others who take into account both the degree of concentration within the county as well as its proximity to a metro area. The advantage of the second method is that it gauges the degree of urban influence both inside and outside the county. Gordon (1979) notes that U.S. census bureau includes all areas outside metropolitan areas (central city and suburban area), as nonmetropolitan, but the exact limit of the commuting field is not adequately determined.

For Vining and associates, the core regions of a country consist of those regions of a country which are economically and politically dominant. Acknowledging the fact that the areal extent used in their studies was subject to considerable controversy, they "overbound" the core regions in anticipation of the "overspill" objection. (Vining and Pallone, 1982). Fielding (1982) in realizing that statistical underbounding is indeed a problem, uses several spatial scales in his analysis and concludes that 'more than suburbanisation was involved'.

2.12 DETERMINATION/MEASUREMENT

Measuring the extent of population deconcentration is not simple. While some authors focus exclusively on population, others concentrate on economic activity, and still others on income and welfare (Gordon, 1979). Bourne (1979), states that the problem is "few authors make explicit what measure they are referring to, why it is a suitable measure, and what it in turn leaves out" (p.41).

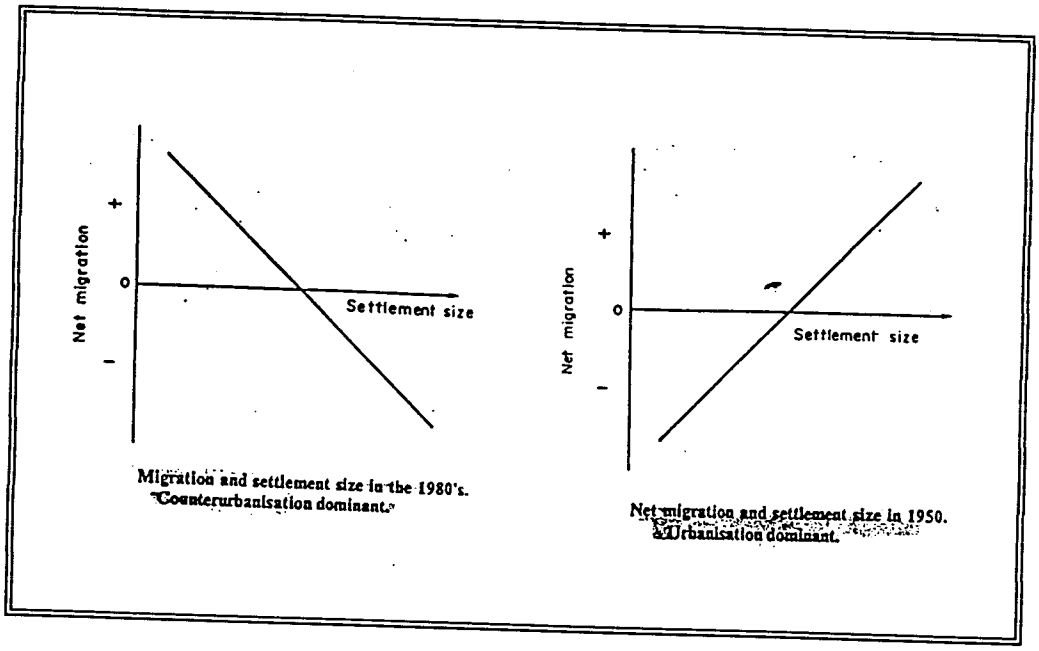
Lichter and Fuguitt (1982) measure population deconcentration by subtracting the urban growth rate from the rural growth rate. This measure allows them to determine

whether the proportionate population increase during any given period was greater in rural or urban parts of the country. Increasingly negative values suggest a certain degree of urbanization, while increasingly positive values suggest dispersal from more to less urbanized places.

Others argue that the redistribution of economic activity should be investigated alongside the shift in population (Perry, Dean and Brown, 1986). In doing this, economically inactive people (i.e. the retired and unemployed), would be excluded. According to Champion (1986), the method of determination simply depends on the working definition of counterurbanization being utilized. Question then arises as to whether counterurbanization is viewed simply as a demographic phenomenon, or as entailing other factors as well (i.e. economic, social).

Fielding (1982) suggests that by examining the correlation between indicators of growth and urban status for all labour market areas, the existence of counterurbanization can be tested. As stated previously, where a positive relation between growth and settlement size exists, urbanization is seen as the prevailing tendency. Just the opposite is true when counterurbanization is the prevailing tendency. Due to data limitations, a more feasible approach (utilized by Fielding) in the study of counterurbanization is to substitute population density for settlement size as the measure of urban status (see figure 2).

Figure 2. **The Relationship Between Net Migration and Settlement Size**



Source: Fielding (1982), Progress and Planning.

Vining and Strauss (1977), test the hypothesis that out-migration from metropolitan areas is nothing more than an 'accelerated expansion of these areas beyond their conventionally defined borders through the use of the Hoover statistic. The authors conclude, after applying the Hoover index for 5 levels of areal desegregation in the U.S., that dispersal was occurring at all levels (see Figure 3).

Gordon (1979) realized that the index could show decentralization when computed over states, even when substantial urbanization was taking place, albeit in less populous regions. In response to this, Gordon, using a new data file for eighteen developed countries, suitable for the computation of various versions of the index, found

that these countries were in fact experiencing more traditional outward expansion. Whereas Vining and Strauss looked at the indices for a variety of exhaustive delineations (ie. national totals as denominators), Gordon (1979) computed the index for sets of regions which were exhaustive, as well as for subsets of regions. "...if however, the set is some subset, such as the set of all urban areas, the denominators used in computing percentages refer to only the total urban area and population" (p.285). Using this approach, he was able to observe trends in the index that were not affected by trends in other subsets of regions.

Long and DeAre (1982) computed the Hoover index for states, nine divisions, and a scheme based on four regions in the United States. The decrease in the index indicated population deconcentration was occurring at all levels of geography for the first time. In addition, the rise of the index in the 1950s and 1960s and the subsequent decline in the 1970s, was an indication that 'population deconcentration was more profound than suburbanisation of the previous decades.'

A number of objections have been raised against the use of the Hoover index as a measure of concentration. According to Cliff and Robson (1978), if distinct physical nucleations are used rather than functional terms, two dilemmas give rise to an ambiguity of data. The first, is whether an unchanging areal definition should be used, while the second involves using a fixed or fluctuating number of towns. In short, problems arise in such statistical analysis because boundaries are constantly changing and the number of towns is in fluctuation.

Figure 3. **Hoover Index - Various Areal Delineations**

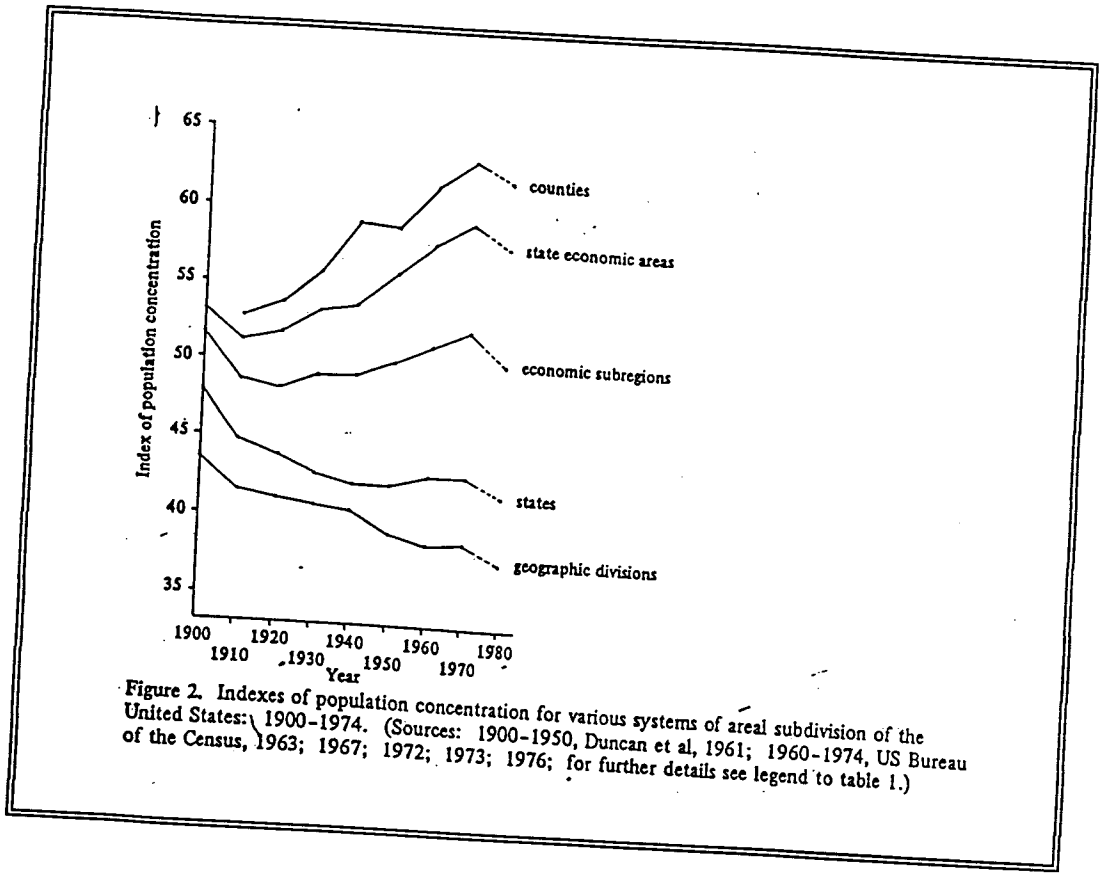


Figure 2. Indexes of population concentration for various systems of areal subdivision of the United States: 1900-1974. (Sources: 1900-1950, Duncan et al, 1961; 1960-1974, US Bureau of the Census, 1963; 1967; 1972; 1973; 1976; for further details see legend to table 1.)

Source: Vining and Strauss (1977), Environment and Planning A.

Wardwell (1977) notes the fact that the number of counties classified as nonmetropolitan in 1970, but reclassified as metropolitan in 1974 is quite substantial, lending support to the aforementioned criticism of the index. Fuguitt, Lichter, and Heaton (1988) also discuss the problem of redefinition, noting that the results of any analysis may depend on the definition used. These authors compare two basic approaches in the monitoring of metropolitan and nonmetropolitan population change. The constant area approach is fairly straightforward, but the use of this method is not without criticism.

First, should counties be recognized as metropolitan at the beginning or end of the period of study (Long and DeAre, 1982). Second, should the same fixed area be used throughout, and if so, for which year should counties be classified as metropolitan or nonmetropolitan (p.116). The component approach monitors population gains in three ways, including: (1) internal growth within areas initially classified as metropolitan; (2) expansion by the addition of areas peripheral to existing metropolitan areas; and (3) the emergence of new metropolitan areas. The authors go on to state that both approaches are affected by official changes in the definition or criteria for attaining metropolitan status. In closing, Fuguitt *et al* (1988) suggest redistribution trends involve a complex process, involving both growth within areas and redesignation or annexation of areas classified as metropolitan.

An additional objection raised against the use of the Hoover statistic is that depending on how one subdivides a nation into subareas, different results can be obtained for the same data file over time. Coombes *et al.* (1989) make reference to an 'end-date' boundary, realizing that the growing integration of the commuting catchment into the metropolis could be misinterpreted.

A time series of the index will not necessarily give an unambiguous answer as to the unevenness of population distribution either increasing or decreasing over time (Gordon, 1979). Where others see this as a problem, Vining and Strauss (1977) see it as 'a resource that can be exploited rather nicely'. Using the county as the basic unit of analysis, and based on these units building up increasingly more aggregated regions, they were unable to find an increase in concentration at any level.

Multiple regression models are a multivariate technique used to investigate associations between population change (concentration or deconcentration) and other explanatory variables. Beale (1977) used multiple regression in attempting to determine the associations between population change and migration, and 10 socio-economic variables and 6 regional location dummy variables. The 16 independent variables together, yielded coefficients of determination (R^2) of 0.34 and 0.40 in both periods (1960-70, 1970-75), therefore accounting for less than half the variation in population change. Through multivariate analysis of county-level data, McCarthy and Morrison (1977) found that migration into entirely rural nonmetropolitan counties had accelerated during the 1960-70 and 1970-74 periods. A further conclusion supported by this analysis was that the previous growth advantages associated with manufacturing and government related activities had diminished, while retirement and recreation appeared to have emerged as growth inducing activities.

Richter (1985) using multiple regression analysis discovered that many factors cited as explanations for the turnaround in the 1970s, shifted in importance by the end of the decade. First, after 1974, state colleges (located outside metropolitan areas) did not appear to draw people to nonmetropolitan areas, although this was not the case previous to that time. Second, until 1977 areas most remote from urban centres were the recipients of a substantial amount of turnaround migration. After 1977, Richter found adjacency to a SMSA to have become the most salient factor. Lastly, while amenity variables continued to be an important factor throughout the 1970s, only areas with both mild temperatures and recreational development were successful in drawing migrants

throughout the late 1970s (p. 260).

In order to examine deconcentration tendencies within industrial sectors among core, urban heartland, and rural hinterland regions in Canada, Polese and Coffey (1988) utilized the shift-share technique. The study demonstrates that processes of economic restructuring (ie. Globalization) are giving rise to new sectoral, occupational and spatial realities that are particularly discernable in metropolitan centres. According to Coffey (1994), through the use of shift-share analysis, employment growth in a region can be desegregated into three components, over a given period. The *national effect* indicates the level of growth that a region would have known if each of its industries had grown at the same rate as total employment in the nation. Given its initial sectoral position, the growth that an individual region would have been expected to experience over a certain period is measured by the *structural effect*. Other factors contributing to employment growth are determined by the *regional effect*.

2.13 DEVELOPED NATIONS

Comparative studies for the 1950-1980 period differ somewhat in approach and in the spatial scale adopted (Champion and Illeris, 1989). While some focus on differences between broadly defined core and peripheral regions (Vining & Kontuly, 1978; Vining & Pallone, 1982; Cochrane & Vining, 1986), others, including Hall & Hay (1980) and Chesire & Hay (1986), examined population trends for 'functional urban regions and urban systems', placing emphasis on the internal development of population trends for cores and rings in addition to overall population change. The work of Fielding (1982,

1986) lies somewhere between these two extremes, examining net migration rates for settlements based on population size.

Vining and Kontuly (1978) applied a consistent framework to 18 countries, comparing net migration flows into core regions within each country. This study demonstrated the widespread nature of the slowdown in metropolitan growth rates. Eleven of the eighteen countries including - Japan, Sweden, Italy, Denmark, New Zealand, Belgium, France, East and West Germany respectively, and the Netherlands - experienced either a dramatic decrease or a complete reversal of net migration flows. Vining and Pallone (1982) both updated and extended this study adding several more cases of metropolitan migration flow reduction or reversal. Canada, the USA, Finland, Spain and Iceland were amongst the countries added to the list by the later study.

Joseph *et al.* (1988) call for more detailed studies on regional variation in relation to the extent of the turnaround in Canada, noting that Canadian researchers have been more active in their research on various aspects of rural population change at more local levels. "In Canada, there has to date been no comprehensive analysis of rural population growth in the 'turnaround period' comparable with the American county-based studies" (p. 18). The authors conclude that even though the rural growth rate probably exceeded the urban rate in Canada, it is premature to join the 'population turnaround bandwagon'.

Davies (1990) in response to the request of Joseph *et al.* (1988) set out to review the 1971-86 population trends of the Canadian Prairie Provinces against the general background of the population turnaround debate. Davies concludes that for the Prarie settlement system as a whole, concentration, not a population turnaround, was the

dominant theme in the 1970s and 80s (p. 318).

Examining population and employment change between 1950-1975 across core and peripheral rings of 539 daily urban systems, and 351 residual nonmetropolitan areas, Hall and Hay (1980) found population deconcentration to be evident in a number of industrialized countries. Among these countries were Britain, the Netherlands, Switzerland, France and West Germany. Using their four-stage model, the authors hypothesize that all industrialized nations fit somewhere on the path of 'urban evolution'. First, population concentrates into the metropolitan area. Next, deconcentration takes place within these areas. In the third stage, jobs too begin to move out. The final stage involves stagnation and decay (especially of larger and older metropolitan areas).

Fielding (1982) concerned with population redistribution across the urban system, was able to confirm the widespread nature of counterurbanization for nine of the fourteen countries studied in Western Europe. In Belgium, Denmark, France, Italy, the Netherlands, Norway, Sweden, West Germany and the UK, the longstanding trend of urbanization, defined as the existence of a positive relation between settlement size and net migration, had either slowed or ended. In addition to this, although caution was urged in interpreting these results, 'counterurbanization was found to be fully developed' in seven of the countries.

An important fact to note before continuing is that there are considerable variations with respect to both the degree of population deconcentration and the spatial extent of the phenomenon in respective countries. To illustrate this point, countries such the USA and Australia recorded a decrease in their metropolitan growth rate, but not a

negative growth rate, while absolute population losses were recorded in some of the largest urban regions of the UK (Champion, 1989).

In terms of the variation spatially both within and between countries, Australia is perhaps the best example for the former. Hugo and Smailes (1986) identify a number of generalizations regarding population dynamics influencing the Australian non-metropolitan sector, including the fact that the nonmetropolitan renaissance was very 'spatially concentrated' in the well watered and attractive areas of the East and Southeast coast, as well as in the margins of the commuting zones of the large cities. In contrast to Australia where the phenomenon was spatially concentrated only in those specific areas noted above, 'the pattern of growth within nonmetropolitan U.S. has been persuasive, affecting most regions, and occurring regardless of levels of urbanization' (Fuguitt *et al.*, 1981).

2.14 TEMPORARY ANOMALY?

Particular developments that took place for certain countries during the latter 1970s, while for others not until the 1980s, have cast doubt on earlier conclusions pertaining to a 'turning point' in the urban experience being reached. Although not to the extent and or in a comparable uniform manner, numerous developed nations which previously had experienced deconcentration have again returned to the traditional trend of concentration in their national core regions. Fuguitt (1985) makes reference to a 'turnbackaround' or a 'reversal of the original reversal' in discussing trends in population dispersal during the 1980s.

In the U.S., Forstall and Engels (1984) observed the metropolitan growth rates

again surpassed those of the non-metropolitan areas as early as 1982. Although many researchers were quick to regard the diminished non-metropolitan growth of the 1980s as evidence that the turnaround of the 1970s was over, Beale and Fuguitt (1990) were able to gather evidence of yet another upturn in population growth rates in non-metropolitan areas. Johnson and Beale (1994) conclude from their findings that it is premature to conclude that population growth in non-metropolitan areas has ended, as it is equally premature to argue that a new trend is again underway based on the evidence of 2 years of population estimates. Engels (1986), in reviewing international statistics, found that in Canada, Norway, and Sweden, metropolitan areas had recovered. Cochrane and Vining (1988) observed net internal migration flows between core and periphery regions for 17 of the 20 countries studied previously by Vining, and found net migrations flows to core regions had once again increased beyond that of peripheral areas. Fielding (1986) also found a reversal of the trends uncovered in his previous study, with countries once again showing a positive relationship between net migration and settlement size.

Countries including Australia, the USA, the UK, Denmark, France and the Federal Republic of Germany are examples of countries that experienced the 'migration turnaround' of the 1970s. The USA, Norway, Japan and the UK provide examples of a later slowdown or reversal of these trends during the 1980s, while France, the Federal Republic of Germany and Australia are countries where deconcentration either intensified or continued at a steady level into the 1980s. In recognizing the diversity amongst developed nations with respect to population redistribution trends in the 1980s, it is quite clear that this time period was rather complex in comparison to the previous decade, with

respect to these trends.

2.15 TOWARDS EXPLANATION

Within the vast body of literature on counterurbanization, lies an equally astounding amount of explanations. Despite the fact that a single all-embracing explanation is tempting, authors in realizing the complexity and diversity of the issues involved, choose a variety of methods in exploring the plethora of explanations. While some choose to organize explanations using a 'unidimensional' or straightforward approach, others use models or more general headings. Perhaps the most straightforward method utilized is simply dividing the explanations into economic vs. non-economic. While examples of the former include factors such as the 'deconcentration of manufacturing', the 'growth of government and service sectors' and 'expanding energy extraction', examples of the latter include 'retirement migration', 'personal preferences', and 'increased accessibility to urban areas'. Alternatively, Perry, Dean and Brown, (1986) taking a more general approach, distinguish between micro and macro explanations. While micro level explanations tend to be singular in nature such as the individual economic/non-economic examples stated above, macro level explanations involve the use of general economic models (see Fielding, 1982), whose effects can be recognized in developed nations around the globe. Champion and Illeris (1989), taking a totally different approach, differentiate between factors leading to dispersal (eg. educational systems outside major cities) and those which have had different effects, depending on their timing (eg. popular attitudes--'anti-urban' of the seventies vs. 'big city revival' of the eighties). Moseley (1984) distinguishes between 'people-led' and 'job-led'

explanations, where the former sees the expression of preferences as the primary factor, the latter places greater emphasis on the redistribution of employment opportunities. Although just a sample of the variety of methods used in organizing the numerous causal explanations has been given, the important point to note is that each author is simply attempting to present the numerous explanations in an organized fashion, while trying to make sense of them.

For Berry (1976), changing residential preferences were the major driving force behind counterurbanization in America. Wardwell (1977) in agreement states " a clear desire for living in smaller sized places, within the commuting radius of the metropolitan centre and for smaller sized places beyond that radius in preference to living within the centre itself has emerged" (p.176). Bourne (1980) in discussing cultural predispositions emphasizes the importance of amenities (space, privacy and newness) and disamenities (pollution, congestion, crime etc.), as key determinants in the redistribution of populations. Higher incomes, greatly increased mobility and vastly improved rural infrastructure have now made it possible for urbanites other than the 'rich, talented and hermit' to move towards their ideal rural paradise (Perry, Dean and Brown, 1986, p.3). Chalmers and Greenwood (1977) note that in addition to increased urban incomes, the availability of relatively cheaper and larger parcels of land in places more distant from urban centres has allowed more people to exercise their preferences for a more suburban lifestyle. Although many authors agreed with Berry (1976), a problem arises when we consider the fact that preferences are usually constrained by wealth, employment, housing and family considerations and therefore, should play only a supportive role in the

explanation of counterurbanization (Fielding, 1982). Perry *et al.* (1986) in a similar line of thought, support Fielding's concern, listing the housing market and the social security system as factors which inhibit the mobility of workers who wish to follow long held preferences for the more spacious and quiet living environments. For the majority of people without capital, superior educational qualifications and marketable skills, the role played by preferences on their overall settlement pattern is quite limited.

Bourne (1980) in his arrangement of potential explanations into five distinct categories, discusses structural change and the search for economic efficiency as a major factor reinforcing counterurban tendencies. A combination of technological innovation, international competition, escalating local production costs and shifting consumption patterns have undermined the existing industrial base, as well as the attraction of larger metropolitan areas as locations for new industry. Moreover, Champion and Illeris (1989) note that in the past, traditional manufacturing production led to the concentration of activities where economies of scale could be achieved, but new work is organized into smaller more flexible units, and that new telecommunications and improved transport have allowed trade of long distances to become easier and cheaper than in the past. Coombes *et al* (1989), grouping the causal hypotheses according to the type of agency put forth as the 'prime mover' also note the importance of the major changes that have taken place in the nature of production in recent years, all of which are expected to have shifted the balance of advantage between metropolitan and rural sites for particular industry (p.13). Examples given include infrastructure development, the replacement of rail by road as the main mode of transport, and the replacement of coal by electricity as the prime

energy source. Fielding (1982), following his discussion of the strengths and weaknesses of some general models (ie. counterurbanization, neoclassical and state intervention), goes on to state that the prime generators of counterurbanization have been firms, which are increasingly becoming multi-national, multi-product and multi-plant, investing in peripheral areas as opposed to centres. Coombes *et al* (1989), in agreement with Fielding, also view industrial development as the leading candidate or 'prime mover' in counterurbanization, stating that multi-national corporations render the location of industry more volatile than the self-contained regional or sub-regional corporations of the past. In a similar line of thought, Vining and Pallone (1982), emphasize the importance of the absence or presence of physical barriers to industrial development, allowing for both decentralization and deconcentration to occur. The elaboration of a national urban network, along with the diffusion of transportation, communications, education, and other social and economic infrastructure have made it economically feasible for both people and firms to move closer to nonmetropolitan amenities (Hansen, 1977). Perry *et al.* (1986) note the importance of the governments role in promoting the process of counterurbanization through the updating of peripheral infrastructure and subsidizing movement to these regions.

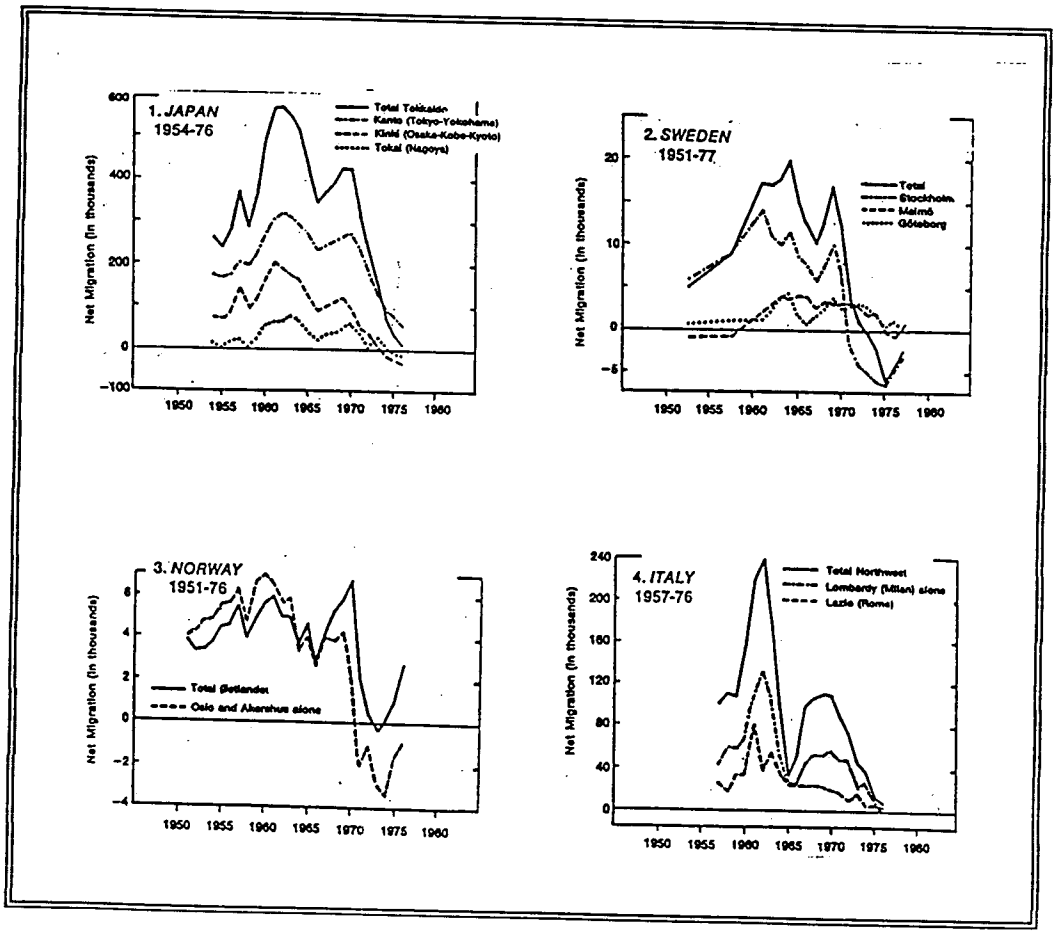
The neoclassical model (see Fielding,1982; Perry *et al.*, 1989) sees the population as adjusting to changing employment opportunities, where job availability and rates of pay are the mechanisms making this possible. According to this model, where unemployment is high and wages are low the market is 'slack'; however, where the opposite situation is the case (low unemployment and high wages), the market is 'tight'.

Migration then takes place from the 'slack' market to the 'tight one'. Coombes *et al.* (1989) in a similar line of thought note the importance of individual scale explanations, involving the decisions of both workers and employers striving to equilibrate labour demand and supply in a locality. Long and DeAre (1982) in agreement, associate population dispersal with the movement of jobs (blue and white collar) towards smaller metropolitan and nonmetropolitan areas. The fact that relative productivity differentials between urban and rural labour forces have diminished, and changes in demographic structures have taken place (the rising labour participation rate of women and the aging 'baby boom' cohort), both of which are listed in Chalmers and Greenwood (1977) to have in combination brought an increasingly mobile number of persons into the labour force, perhaps allowing the processes emphasized in the neoclassical model to take place.

Although the recessions that faced most developed nations around the globe would seem a sure explanation, Vining and Kontuly (1978) were quick to highlight weaknesses within this explanation. Since Norway was able to avoid the great recessions of Western civilization, the authors correctly state that we would not expect the same decline in net migration rates as others who were hit hard by the recession. As shown in figure 4, this was not the case. If we observe the net migration rates of Japan, Sweden and Italy from 1950-1980, we can see the similarity in fluctuations between each respective country, not only amongst each other, but also in relation to Norway. It should be noted that although the recession hypothesis has its weaknesses, the authors do give credit to the economic conditions hypothesis, because of the synchrony in fluctuations in the net migration rates between the countries that did in fact experience the recession (ie. Japan,

Sweden and Italy). "In our view, aggregate economic conditions can only explain part of the reduction of migration into metropolitan regions in the 1970s, else how does one explain the synchrony in fluctuations in Italy, Sweden and Japan from 1955-75" (Vining and Kontuly, 1978, p.57).

Figure 4. **Net Migration Rates During the Recession**



Source: Vining and Kontuly (1978), International Regional Science Review.

2.151 Illustrative Case Studies

Champion (1989) and the collection of case studies from nine developed countries will serve as a guide in illustrating the plethora of explanations put forth thus far, in that authors of each country's case study, highlight separate causal explanations which could be responsible for the change in the redistribution of their respective populations. Using Hugo's Australian case study, Champion's work on the UK, as well as Winchester and Ogden's France case study, the effect of those factors deemed important to the development of deconcentration in each respective country will be highlighted.

According to Hugo, the 'expanding urban fields' approach, 'job-led' structural change, the 'life-style' hypothesis, and the 'welfare-led' approach are the four lines of explanation most relevant to the Australian experience. The expanding urban fields approach is best described as the extension of metropolitan commuting zones and the intensification of suburbanisation. Support for this theory lies in the fact that the most densely settled zones have recorded a large share of the non-metropolitan growth and net migration gain in Australia. Increases in motor vehicle ownership, improvements in public transport, increases in personal incomes and road improvement and building programs are listed as factors which have made such development possible.

The greater increase in the number of employed people living in non-metropolitan locations (372,551), as opposed to metropolitan (302,297) between 1976-1986 lends support to the job-led hypothesis. An additional fact to note is while cities comprised of less than 100,000 had a 23% increase in the number of employed persons over the same ten year period, larger cities had an increase of only 7.9%. The growing

significance of migration, unrelated to economic considerations, to non-metropolitan areas lends support to the life-style hypothesis. Hugo goes on to say that the growing volume of movement of retirees, hobby farmers, long-distance commuters, and people seeking alternative lifestyles all testify to this.

"Transfer payments form a very significant element in the overall income of Australians" (Hugo, 1989, p.78). Age pensioners, widows, sheltered employment allowees, rehabilitation allowees and recipients of a wife's or carers' pension are each examples of people receiving some sort of government transfer. For reasons including the fact that all pensions in Australia are portable, housing in the country is cheap in comparison to metropolitan areas, and non-metropolitan areas often have an abundance of seasonal work (i.e. agriculture), which can be undertaken in addition to a pension, people tend to locate in these increasingly popular areas.

With respect to the situation in the UK, Champion (1989) believes underlying explanations are easier to determine by studying the 1960s, the time when the process was accelerating. The first factor noted by Champion is the fact that 'house construction was taking place at record levels during this time'. It was also during this time that the displacement of people from the inner city took place, due to the clearing of old sub-standard housing. Another important development he notes was that planning controls on urban development now being enforced because of over development in areas like the South East, "where land allocated for a twenty year period was exhausted in ten, forcing private developers to look to more distant locations"(Champion, 1986, p.99). Lastly, regional policies aimed at directing growth to the places affected by the contraction of

jobs in traditional industry (eg. coal mining) coupled with the boom in brach-plant investment during this time, were equally important developments contributing to the decentralization of the population.

Winchester and Ogden (1989) emphasize the impact of government policies, the role of the housing market, and the effects of economic restructuring in addressing explanations for deconcentration within France. Explicit policies of decentralization of population and employment including the decentralization of industry from Paris and subsidized relocation elsewhere, are given as examples of the direct impact of state intervention. While policy for smaller towns has encouraged industrial development and urban conservation, policies for the larger cities include city centre renewal, new towns, new industrial zones and mass transit systems. The combined impact of these policies has encouraged population decentralization in these cities. In addition to these urban policies, in order to maintain population and support primary employment, policies for rural areas also play an important role. Constraints on housing supply, type, and quality as well as price inflation on quality urban housing have also been factors in pushing new housing developments to the periphery of urban areas. "The significance of new housing in France is undeniable" (Winchester and Ogden,1989, p.181). Accounting for a third of all new dwellings built since 1975, houses in rural areas continue to be built. Coupled with the desire to escape from city pressures, and to improve quality of life by moving to the country, demand for individual housing has been cited as a prime explanatory factor. Brought about partly by the new spatial division of labour and partly through intervention of the state in economic planning, decentralization of industry has also taken place.

"Restructuring of economic production, together with associated employment losses, certainly underlies regional migration trends from north to south" (Winchester and Ogden, 1989, p.182).

In light of the preceding discussion involving the case studies of Australia, the UK, and France, it is quite clear that a variety of plausible explanations exist. While certain explanations may play an important role in the development of deconcentration in certain countries, its effect may be considered minimal in others.

2.16 CONCLUSIONS

In concluding, a considerable amount of confusion exists in relation to the phenomenon of counterurbanization. Although consensus on definition, timing, method of determination, and underlying explanatory factors fails to be found, the importance of the change in the distribution should not be second guessed. Aside from all the controversy surrounding the phenomenon, as mentioned previously, the fact that changes in the settlement pattern had taken place is undeniable. In light of this, it must be realized that these new trends should have important implications for the logic and design of regional development policies for both metropolitan and nonmetropolitan areas (McCarthy and Morrison, 1977). The duplication of infrastructure, the loss of prime agricultural land, and inflated land and housing prices are some of the many consequences of the 'rural renaissance' (Moseley, 1984). Almost any shift in pattern requires government adjustment in response (Long and DeAre, 1982). The authors go on to state that new roads, schools, and other forms of infrastructure are required where there

is population growth, and new ways to finance existing facilities must be discovered where there is decline. Government policy should be directed at channelling development in such a way so as to maximize the advantages of the new system of development, while ensuring that the negative impacts of such growth are minimized. As McCarthy and Morrison (1977) suggest, policies must be designed which will develop each areas potential for growth. Planning policy will have to be directed at compensating the process of movement down the urban hierarchy, instead of the reverse as was the case in the past. Problems of political coordination between urban places and their rapidly growing country sides, inefficiencies in energy utilization, and improper infrastructure planning are just examples of potential problems arising if these developments in the distribution of population are not incorporated into policies for future development.

3.0 Counterurbanization

3.1 Existence of the Phenomenon within the GTA

3.11 Utilizing The Hoover Index

The Greater Toronto Area, as defined for the purposes of this thesis, consists of six regional municipalities and thirty-six census subdivisions varying in both areal extent and population size. In 1971, with a total population of approximately 3,300,000, as figure 5 suggests, the greatest proportion of the region's population resided within Metropolitan Toronto area. Although this particular pattern of population distribution has been evident for many years, it is our main objective to study the trends in the redistribution of the population away from this core area, utilizing the hoover index of concentration as the primary tool to accomplish this. Following the work of Vining and Strauss (1977), who used the county as the basic unit of analysis and built increasingly aggregated regions based on this scheme, the census subdivision will be the basic unit of analysis for our purposes. Initially, separate indices have been calculated for each individual municipality within the GTA, then based on these results, the indices for specific regions, as well as the GTA as a whole, have been determined.

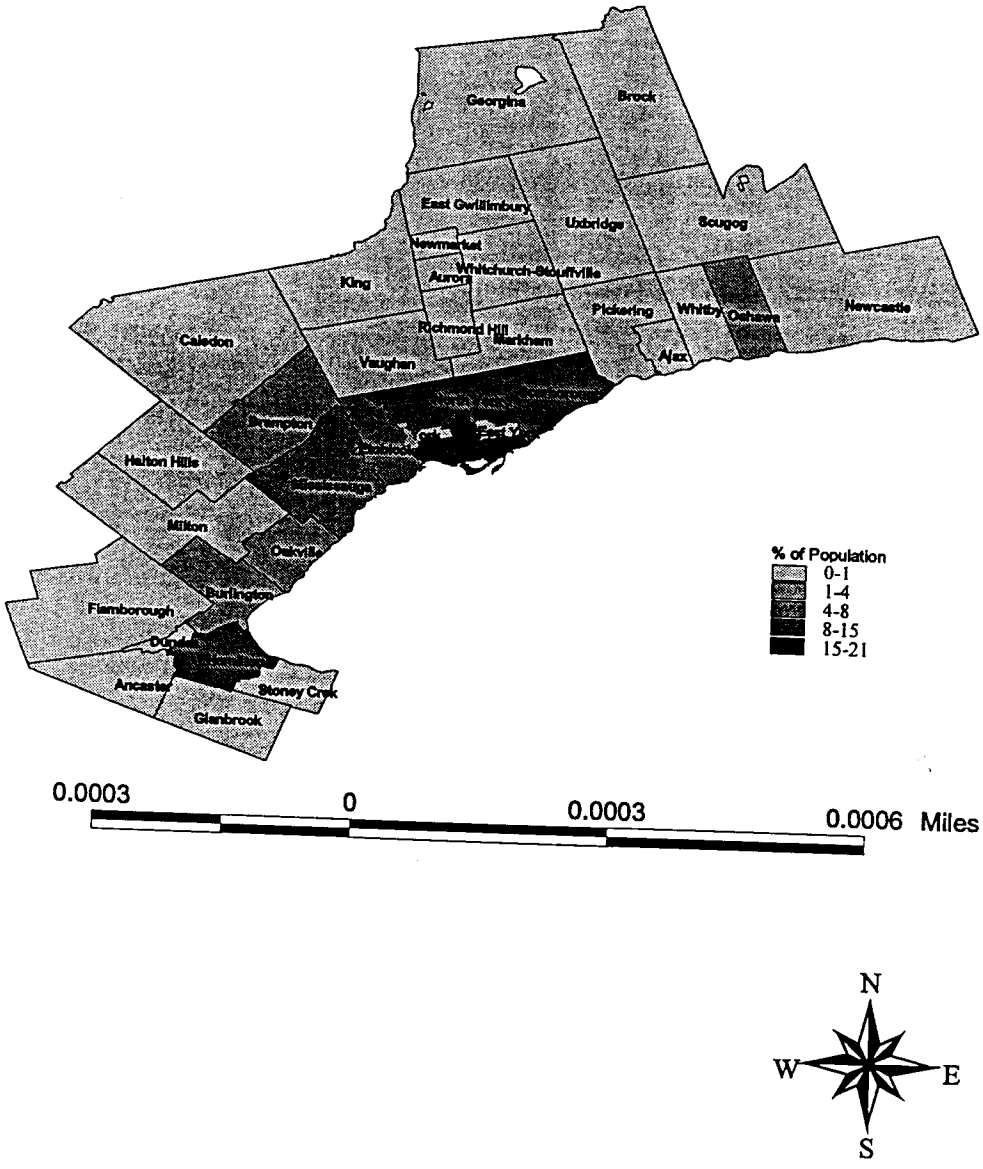
3.12 The Greater Toronto Region (GTA).

Despite an overall growth in population of 1,463,000 between 1971-91, the GTA experienced a steady decline in the hoover index during the entire study period (see Figure 6). With an index value equal to 74 in 1971, by 1991 the index decreased to a value of 69,

indicating that 69% of the population would have to be redistributed in order to achieve an even distribution of the population throughout the GTA. Thus although the value of the index is high by any standards, the overall level of population concentration continually declined. In light of this, it has initially been concluded that although the population

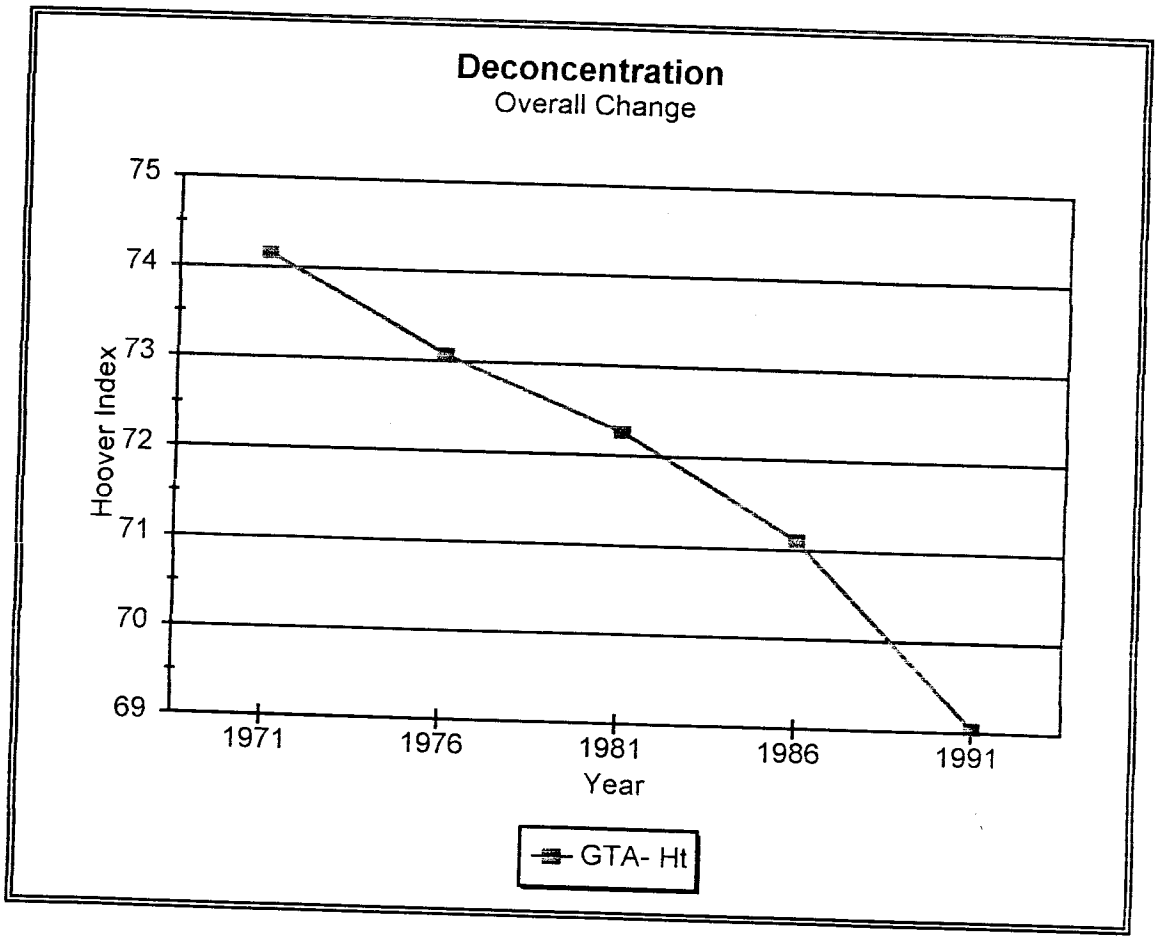
Figure 5

Population Distribution - 1971



remains concentrated within the metropolitan core, as has been the case for many decades, this longstanding trend appears to be becoming less pronounced with time.

Figure 6.



3.13 Individual Regional Experiences

Although overall the GTA. consistently displayed counterurban tendencies for each of the five periods of study, the experiences of the individual regions were mixed in that while some regions experienced population concentration marked by an increase in the

that while some regions experienced population concentration marked by an increase in the index, others at the same time experienced deconcentration. Relative to the other regions in the study area, *Metropolitan Toronto*, experienced the most significant level of deconcentration as indicated by the index. The proportion of the GTA's population residing in Metropolitan Toronto ($\mathbf{P}_{it}$) dropped from 63% to 47% during the study period (see Figure 7). What is more interesting is the fact that only 7.5% of the land ($\mathbf{A}_{it}$) is accounted for in the same area, deeming Metropolitan Toronto the most densely populated region in the GTA., despite the redistribution of the population (see Figure 8).

Figure 7.

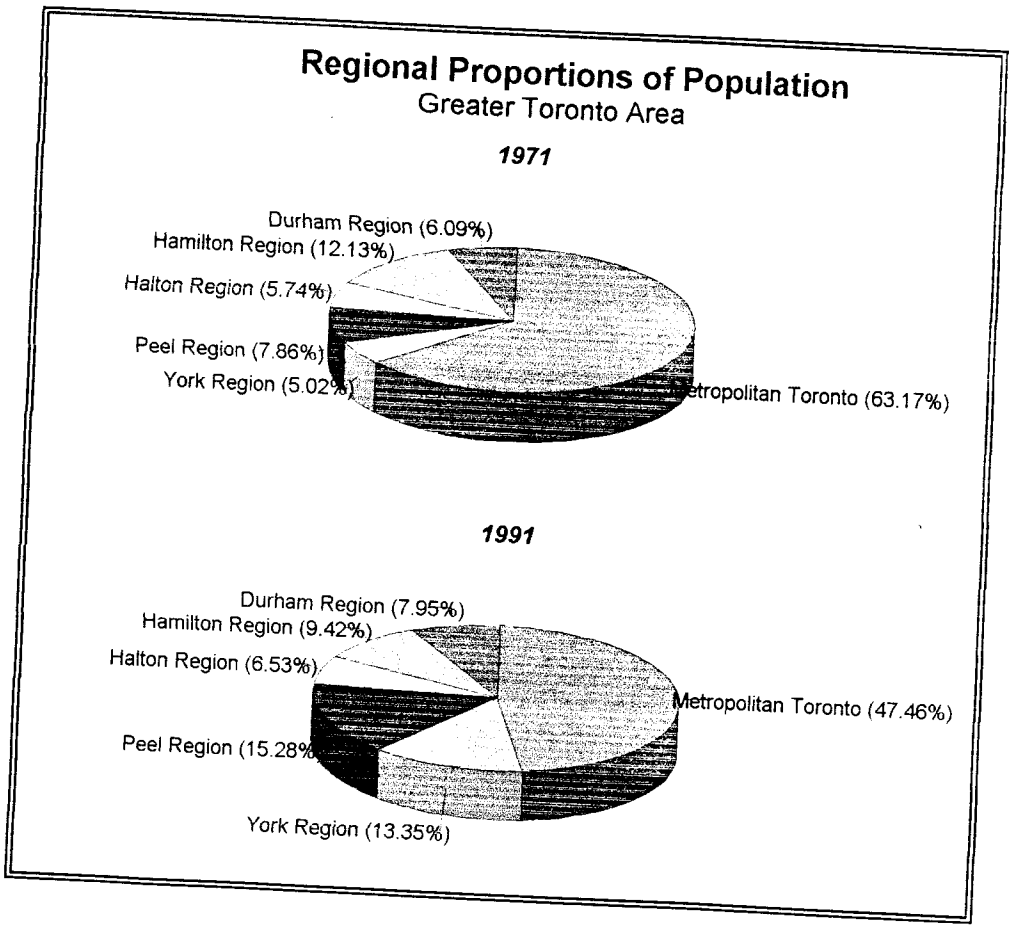
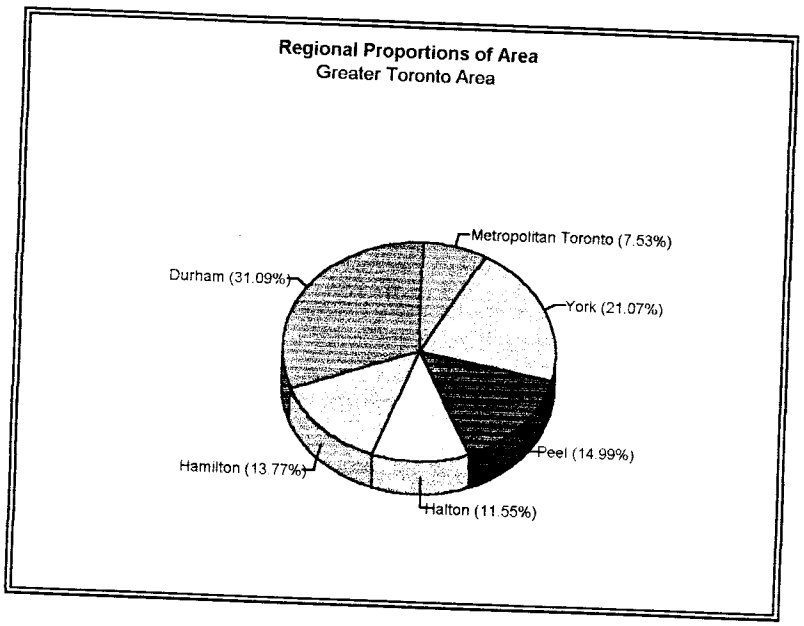


Figure 8.



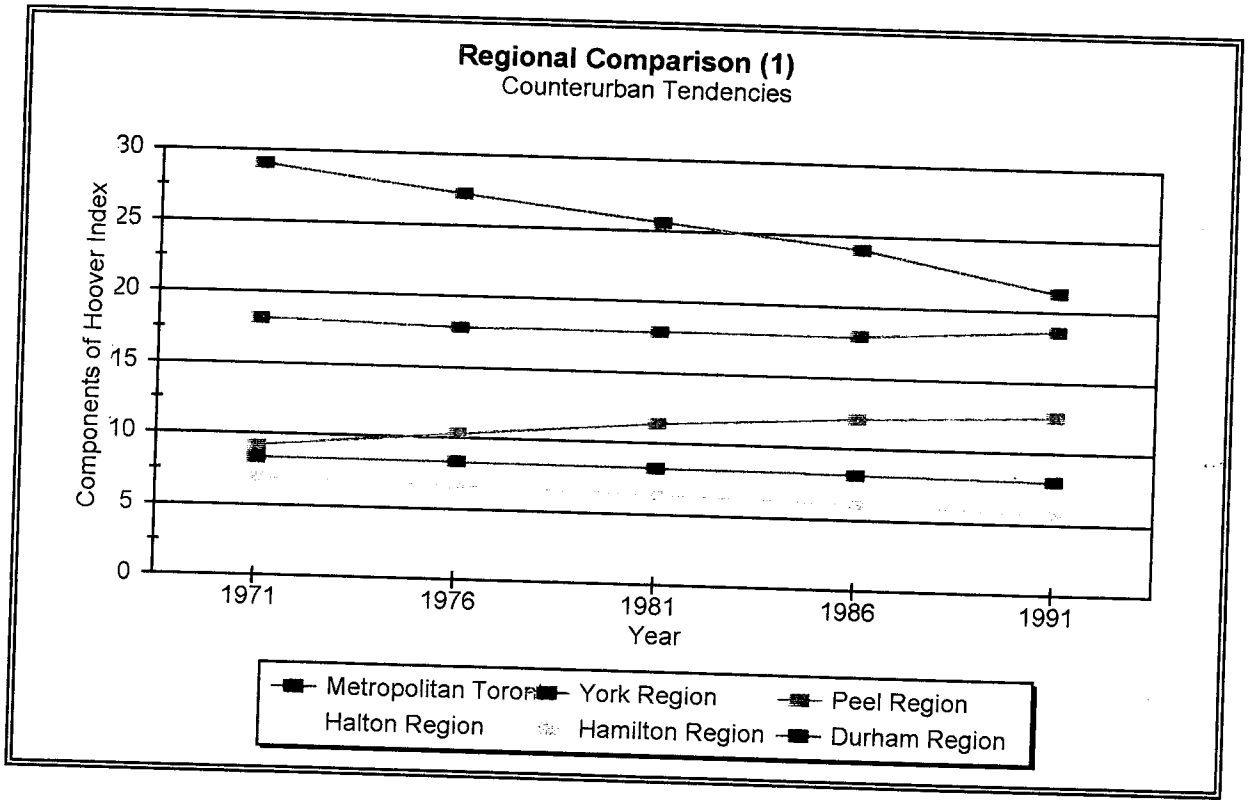
Although during the initial decade of the study, Toronto was by far the most concentrated of the six regions as indicated by the value of the index, like the GTA as a whole, the trend in population distribution was consistently counterurban for each time period (see Figure 9). By 1991, the index value for the *Regional Municipality of York* had approached that of the former. Accounting for 21% of the total land area in the GTA, the proportion of the population residing in the York Region increased from 5% to 13% as shown in figure 7. It should be noted that the slight decline in the index for the York Region may be somewhat misleading in that although the proportion of the population in this region nearly tripled, this substantial level of growth is not detected in the value of the index for two reasons. First, if one simply relies on the index value as the sole determinant of population concentration, the experiences of the more populated regions may be the cause of spurious results in less populous regions as will be discussed in the

proceeding section. Second, because the absolute difference between Pit and Ait is utilized in calculating the index value for each respective region, due to the relatively large size of this region, one could easily misinterpret the high index value. In comparison to the other regions in the study area, although the *Regional Municipality of Peel* experienced the highest rate of increase in terms of the level of concentration, the value of the index only increased from 4.06 to 7.50 overall. The fact that 15% of the total land lies within this region should be taken as an indication that although the region increased its share of the population substantially, from 8% to 15%, in terms of density of population per unit of area, it does not compare to the previously mentioned Region of Metropolitan Toronto which contains three times the population and only half the land area.

Lastly, the *Regional Municipality of Hamilton-Wentworth* experienced a slight level of deconcentration, marked by a decrease in the index. Accounting for 13.75% of the GTA's total area, the proportion of the population residing in the region decreased from 12% to 9%. Although in 1971 the Hamilton Region was second only to Metropolitan Toronto in terms of the proportion of the population residing in a single region, by 1991 both York and Peel had surpassed Hamilton in this respect (see Figure 7 above).

As a result of the previous analysis we conclude that as the urban core regions of the GTA continue to lose their traditional dominance in terms of attracting the masses, regions outside these metropolitan areas are apparently becoming more popular with time in this respect.

Figure 9



3.14 Regions as Subsets

To this point, we have studied the indices for a variety of exhaustive delineations Gordon (1979), suggests computing the index for sets of regions which are exhaustive as well as for subsets of regions, in realizing that the index could show deconcentration when computed over large geographic regions, even when substantial urbanization is taking place, albeit in less populous regions. Following Gordon's methodology, the index has been computed for a scheme based on subsets of the GTA, namely, the six regional geographic divisions discussed previously. *Metropolitan Toronto*, the first subset of the

GTA examined, displayed deconcentration, with the value of the index decreasing from an initial value of approximately 24 to 16, by 1991. Therefore, whether it be in the context of the GTA or examined as a subset, in each scenario the region consistently displayed a significant level of deconcentration. The *City of Toronto*, the most noteworthy census subdivision in the region in terms of population concentration, decreased its share of the GTA's population from 34% to 27%. Scarborough at the same time increased its share from 16% to 23%. In examining the individual census subdivisions, it appears that while Toronto continued to lose its dominance in terms of attracting the masses, experiencing an overall 11% rate of decline in population from 1971-91, Scarborough, with an overall 55% rate of growth, consistently increased its share of the population to the point where it was nearly equal to that of Toronto in this respect. It should be noted that although by 1991, the proportion of the GTA's population residing within Scarborough approached the level of Toronto in this respect, Scarborough is twice the size of the latter, accounting for 30% of the land, therefore Toronto, with 6540 persons/km^2, remained to be the most densely populated city.

The *Regional Municipality of York* as a subset, ranked third amongst other regions with respect to the concentration of population as indicated by the index in 1971. By 1991, with an index value of 66, the region had become the most concentrated in this respect. Although in the context of the GTA only a slight level of concentration was displayed, these results indicate that the region as a subset, underwent quite a significant level of concentration as indicated by the index. The *City of Vaughan*, undergoing an average 67% rate of growth between each census year, advanced from accounting for

9.5% of the GTA's population to 22% during this time. The increase in the index from 2.3 to 8.6 is explained by the fact that only 5% of the land falls within Vaughan. The *City of Markham*, at the same time increased its share of the population from 22% in 1971 to 31% by 1991. By 1991 then, Vaughan had reached the level of density Markham started out at in 1971, but Markham with an average 43% rate of growth each 5 year interval, continued to increase its overall share of the regions population. The value of the index increased simultaneously from 9.15 to 13.42 over the period of study, deeming Markham the most densely populated census subdivision in the York Region, with 727 persons/km^2.

The index of concentration for the *Regional Municipality of Peel* as a subset, as in the other series of calculations constantly increased, although the increase was in fact less pronounced than was the case in the previous calculations. In terms of population distribution amongst census subdivisions in the region, The *City of Brampton* , growing at an average rate of 35% between the census periods, increased its share of the regions population from 27% to 32%, with the increase in the index reflecting this. In terms of density, Brampton is only half that of *Mississauga*. The latter, while growing at a comparable rate of 28%, decreased its share of the population from 66% to 63% over the study period. Although similar in size, the proportion of the population residing in Mississauga is nearly double that of Brampton, therefore the index of concentration is much higher in the former.

With an index value of approximately 67, relatively speaking, in 1971 the *Regional Municipality of Hamilton-Wentworth* was the most concentrated in terms of

population distribution. As with previous calculations, the value of the index consistently decreased to 1991, by which time the York Region had surpassed it, becoming the more concentrated region. The *City of Hamilton,* with an average growth rate of less than 1%, decreased its share of the regions population from 77% to 70% by the end of the study period. *Stoney Creek* on the other hand, experienced an average growth rate of 16%, while increasing its share of the regions population from 6% to 11%.

In light of the previous analysis it has been concluded that in terms of the regions examined thus far, regardless of how one chooses to compute the index, the trends appear to be the same. Although it is possible that the index could show deconcentration when computed over large geographic regions, even though substantial urbanization is taking place in less populous regions, this does not appear to be the case with respect to the GTA. Whether exhaustive delineations or subsets were examined, the overall resulting trends as seen through the values of the index are not altered.

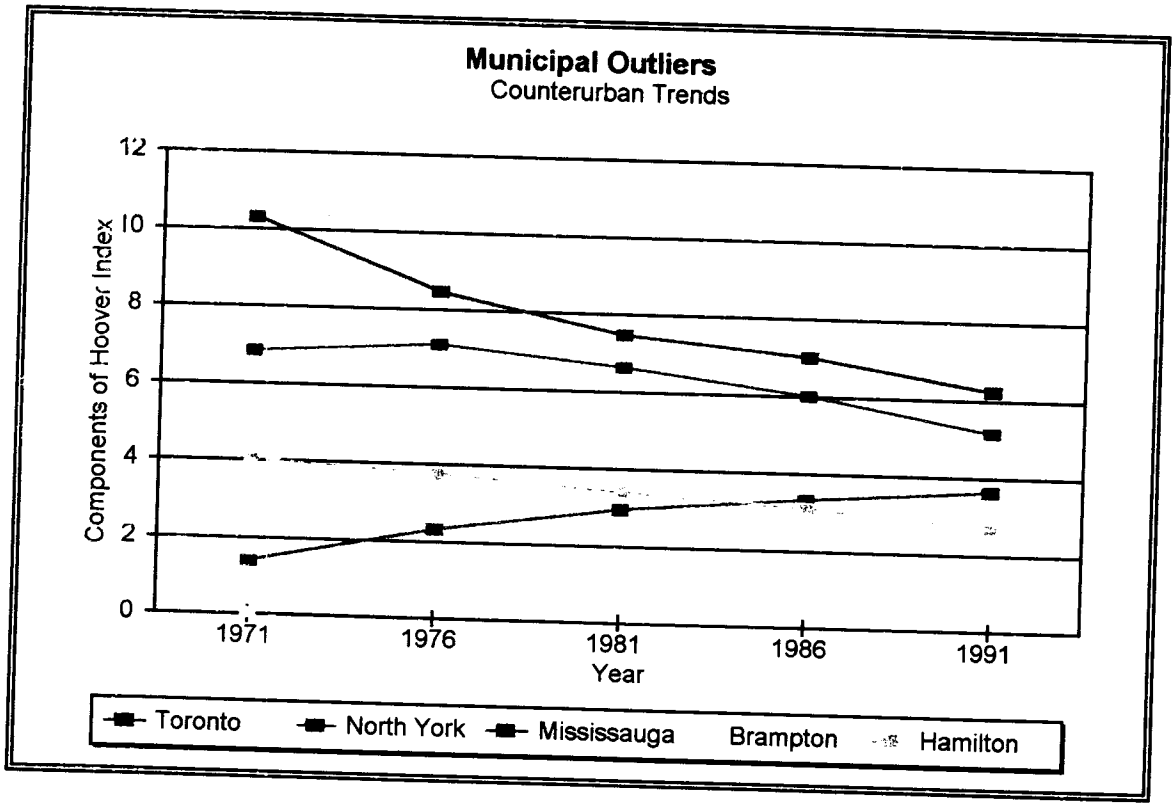
3.15 Municipal Outliers

Although the census subdivision has been used as the basic unit of analysis, a detailed discussion of the resulting index values for each individual census subdivision within the GTA could prove to be both time consuming and confusing. In light of this, outliers in terms of overall change in the value of the index between 1971-91 have been determined. The mean change in the index was (-.13), with a standard deviation of (0.92). With reference to these figures, outliers were those census subdivisions that experienced a change in the index placing it beyond 2 standard deviations from the mean. *Toronto, North York, Mississauga, Brampton and Hamilton* were determined to be the

five outliers in this respect. Figure 10, depicts the change in the index for each municipality during the study period.

For the City of Toronto with less than 1% of the total land of the GTA, the proportion of the population decreased from a substantial 21% to 13% by 1991

Figure 10.



In addition, the value of the index decreased each census year, recording a substantial level of population deconcentration during each interval. Therefore, in addition to the relative growth of Toronto's suburbs, the city's simultaneous decrease in population of 77,391 had an equally negative effect on the value of the index.

North York was the second qualifying outlier located within Metropolitan Toronto. Accounting for slightly less than 1% of the total land in the GTA, and decreasing its share of the population from 15% to 11%, it too experienced population deconcentration each year. Although only half that of Toronto's experience, North York ranked second in terms of overall decline as indicated by the index. The City of Hamilton, the final outlier in terms of the level of deconcentration, accounted for 1% of the land and decreased its share of the population from 9.3% to 6.6%. The overall growth in population of *9326* had an insignificant effect on the value of the index, due to the experiences of other more rapidly growing peripheral municipalities.

On the other end of the spectrum, displaying a positive deviation from the mean is Mississauga, with an overall increase in population of *291,346*. Accounting for approximately 2% of the total land, the proportion of the population residing in the city increased from 5% to 10%. Brampton also more than doubled its numbers in terms of the proportion of the population residing there from 2% to approximately 5%. With a population increase of 163,607, the index of concentration constantly increased each year. Alongside the slowing growth and in some cases decline of metropolitan areas, as municipalities outside these core areas continue to grow, the net effect on the level of concentration has in the past and will continue to be a negative one.

As a result of our analysis of outliers with respect to the overall level of concentration/deconcentration, a number of pertinent conclusions have been reached. First, the results lend initial support to the metropolitan overspill hypothesis discussed in the literature, which interprets these trends in the redistribution of populations simply as

an advanced stage of suburbanisation. While the outliers in terms of deconcentration are the urban cores of the GTA, in terms of concentration, the outliers are the municipalities outside Metropolitan Toronto, but within the main commuting shed of the region. Therefore, although substantial growth is occurring in municipalities outside this core area, it is the municipalities located in close proximity to the core which have experienced the most impressive levels of growth.

A second related conclusion is the fact that alongside the slowing growth and in the case of Toronto, actual decline of metropolitan regions, as municipalities outside the urban cores of these regions continue to experience substantial levels of growth, the net effect on the overall level of concentration will continue to be a negative one.

Finally, in the context of their respective regions, a clear relationship exists in that the experience of the outliers appears to have a substantial influence on the overall experience of their respective regions. Metropolitan Toronto for example experienced deconcentration, while North York and Toronto were the individual outliers in terms of deconcentration as indicated by the index. The Peel region on the other hand displayed concentration overall, with Mississauga and Brampton being the two outliers in this respect. Lastly, the trend in the Regional Municipality of Hamilton was one of deconcentration, while the City of Hamilton was also an outlier in this respect. Possible explanation for this trend is without question partially due to the sheer size of the relative populations of these outliers in comparison to other area municipalities.

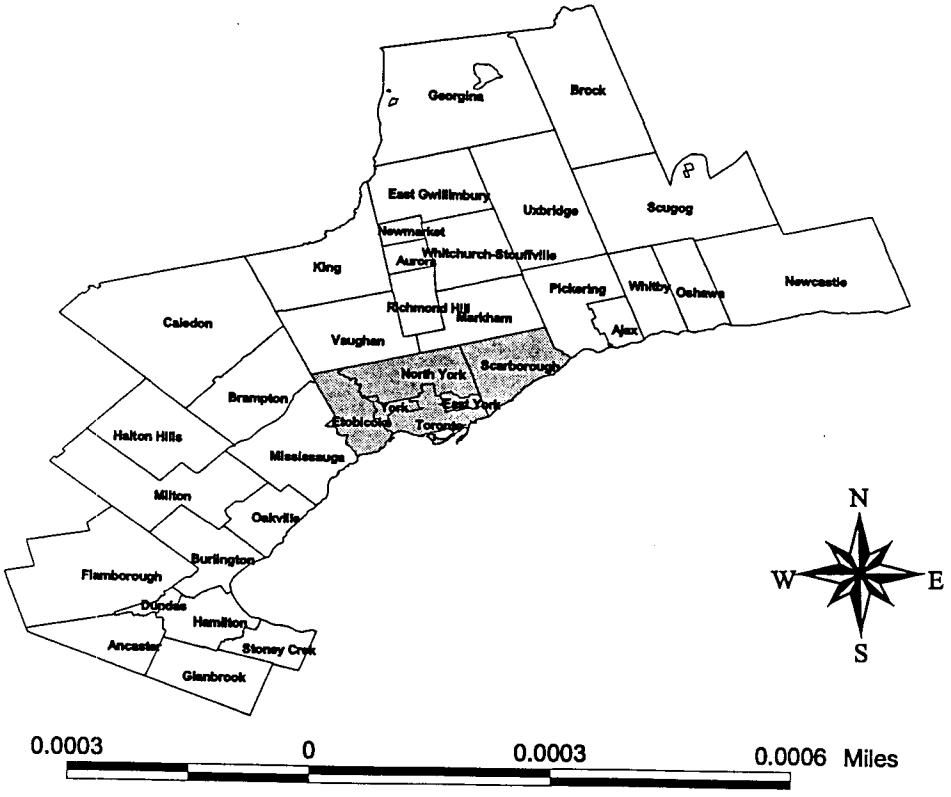
3.16 Core vs. Periphery

As suggested previously in the literature review, a second area of debate in

relation to counterurbanization involves how one should distinguish between metropolitan/nonmetropolitan, core/periphery and urban/rural. In terms of the Greater Toronto Area, initially, ***Metropolitan Toronto*** (*Etobicoke, York, East York, North York, Scarborough and Toronto*) will be defined as the metropolitan/core region, while the nonmetropolitan/peripheral area will consist of remaining census subdivisions included in the GTA (See figure 11). The results of our analysis of trends in the core and periphery, lead to the conclusion that overall, the GTA has experienced decentralization, defined as 'the movement of people within the existing urban system' (Robert and Randolph, 1983).

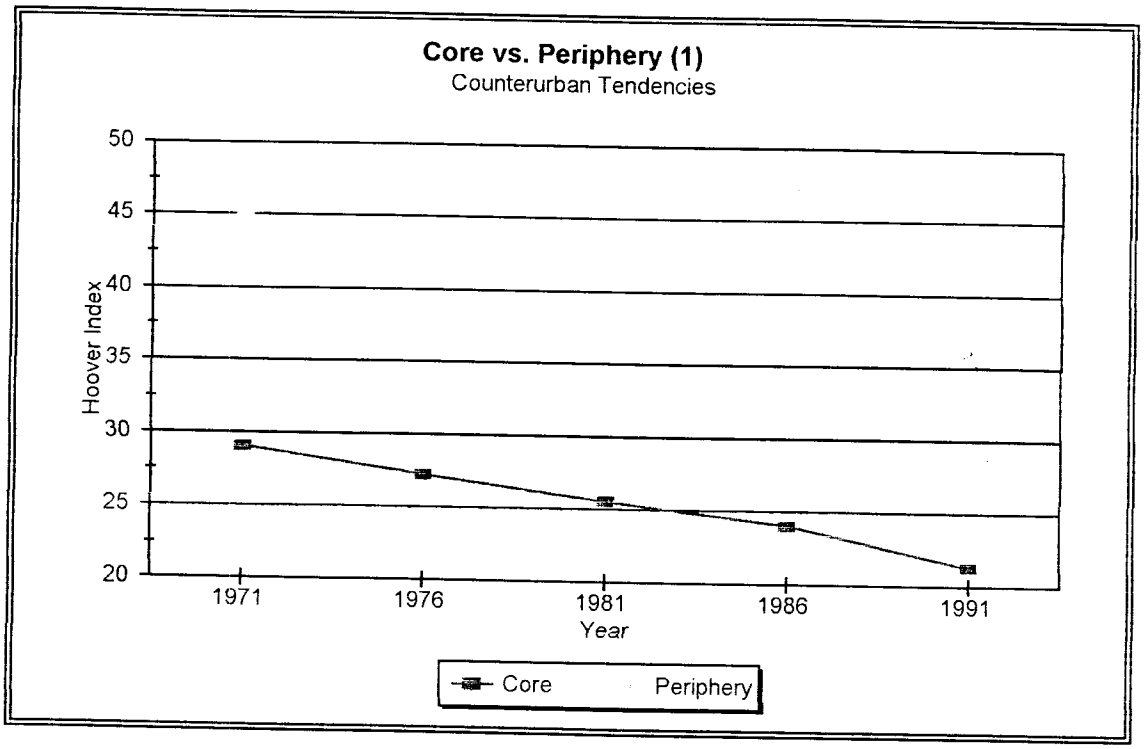
Figure 11

Metropolitan Toronto - The Core of the GTA



While the core experienced deconcentration (marked by a constant decrease in the value of the index), the experience of the periphery was one of concentration (see figure 12). In this preliminary analysis of the core and periphery, the very definition of counterurbanization which as stated previously is 'the movement from dense to less dense places', is evident. In 1971, 62% of the population resided in the core region, but by 1991 that figure decreased to 45%. Referring back to the regional analysis in *section 3.13*, in comparison to the core region, the next closest region in terms of density would be Peel. Not only does Peel account for less of the GTA's total population, in terms of area (ie. km^2) the region is twice the size of the core, therefore in terms of density (persons/km^2), there is no close second to the core, Metropolitan Toronto.

Figure 12.



3.2 Overbounding the Core

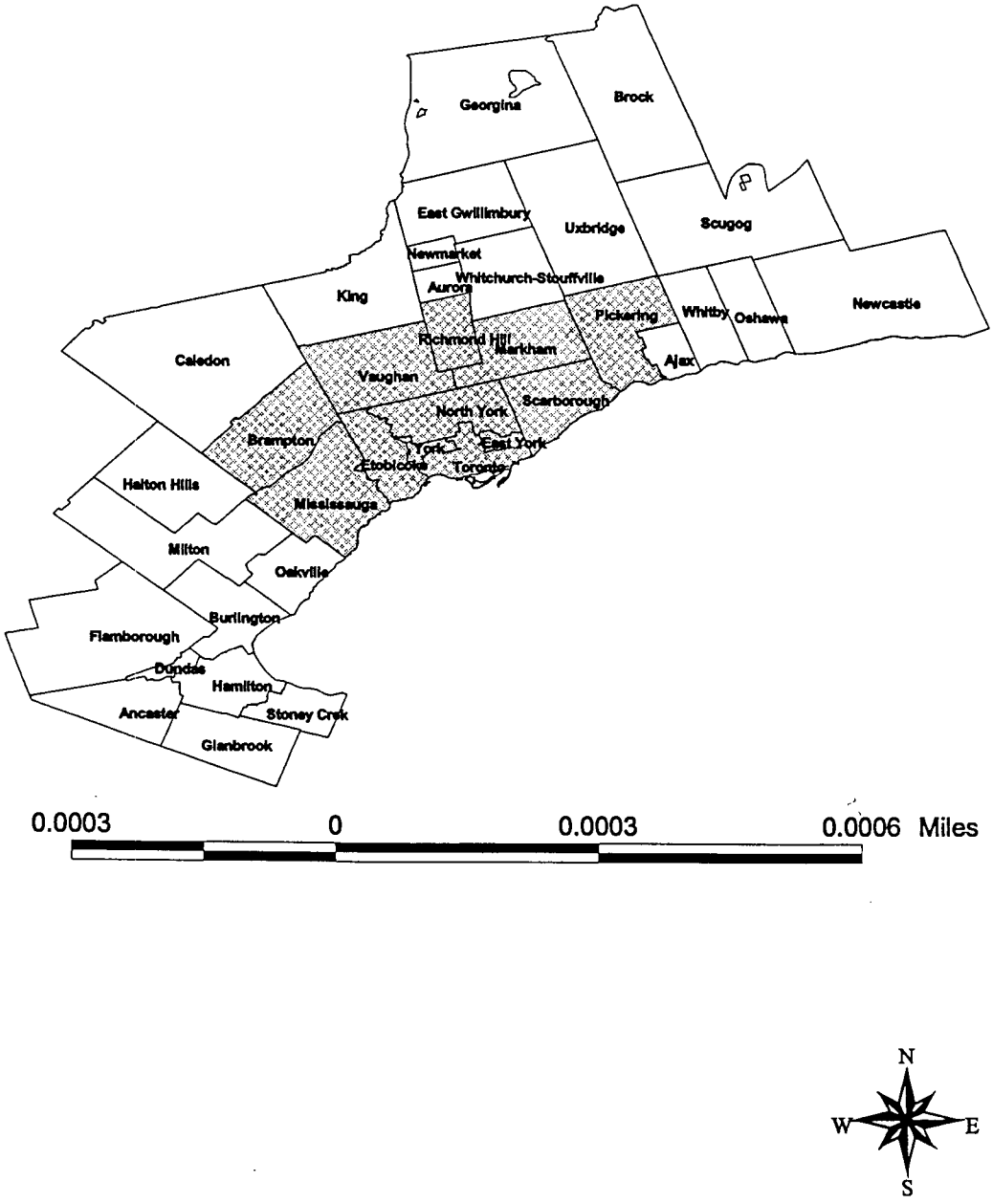
Following the work of Vining and Pallone (1982), who in anticipation of the 'overspill' objection, overbound the core region, the metropolitan core has been overbound to include the municipalities immediately adjacent to ***Metropolitan Toronto*** (*Mississauga, Brampton, Vaughan, Markham, and Pickering*)(see figure 13). Reasoning behind this step lies in the fact that according to the 'metropolitan overspill' hypothesis, the previous results of section 3.1 can be explained as the accelerated overspill of the metropolitan area's population into its immediate suburbs. Therefore, by including those municipalities immediately adjacent to the metropolitan area as part of the core, the areal extent of the core will no longer be subject to controversy. Although the newly defined core accounted for 73% of the population in 1971, by 1991, this would only slightly decrease to 70%, while accounting for a total 15% of the land in the GTA. The value of the index for the core once again consistently decreased as shown in Figure 14. In light of this, one may prematurely conclude that the Metropolitan Toronto area is in fact experiencing counterurban tendencies, even when overbound to compensate for expected overspill into adjacent suburbs. It is the experience of the periphery in this case that was less impressive in that it also experienced a slight level of decline in the value of the index. Therefore, although the results indicate the population is moving from the more 'dense places' within the core area, the destination in this scenario does not appear to be the 'less dense places beyond the direct influence of the core' as Berry coined it.

Coupled with the results our analysis of outliers in section 3.15, it has been concluded that to this point, sufficient evidence has been gathered in support of the

'metropolitan overspill' hypothesis. In light of this, it has been concluded that any evidence of counterurban tendencies

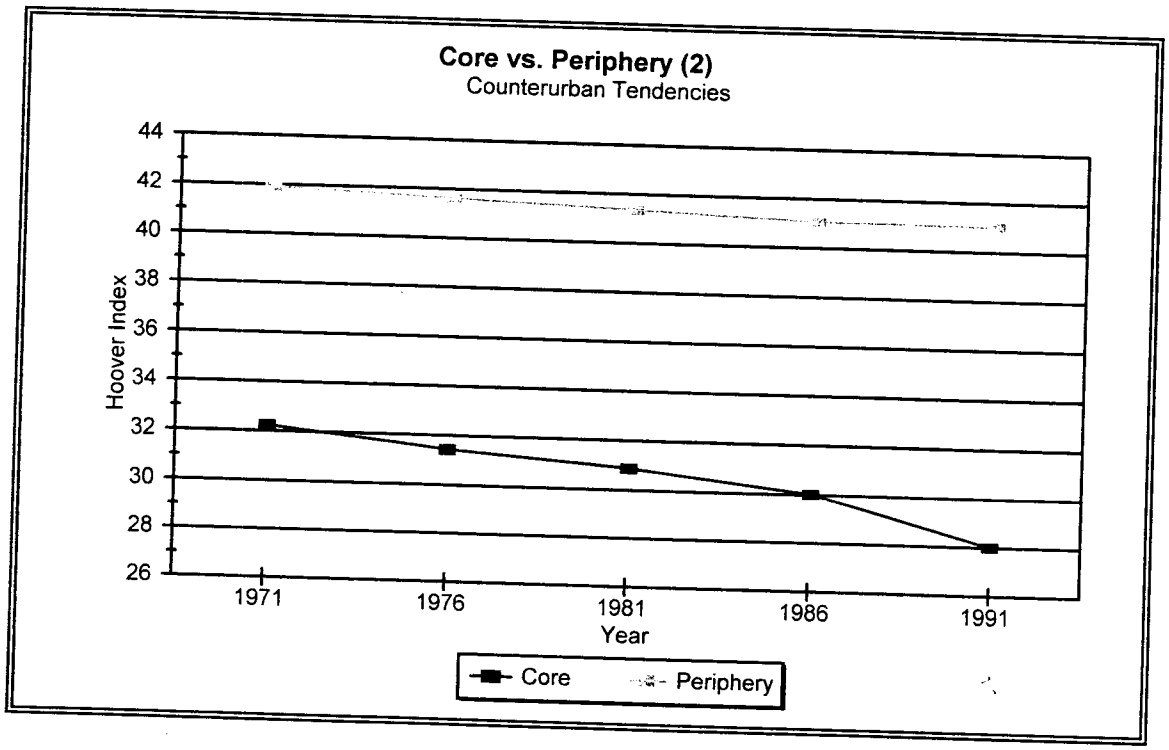
Figure 13

The Overbound Core



illustrated thus far, can be attributed in part to the growth of municipalities immediately adjacent to the metropolitan core. Although other peripheral municipalities experienced significant growth during the study period, when separated from the growth of these immediate suburbs, as Zelinsky (1977) suggests, it appears that the majority of the flow from core to periphery is attributable to the ever broadening extension of the metropolitan core.

Figure 14.

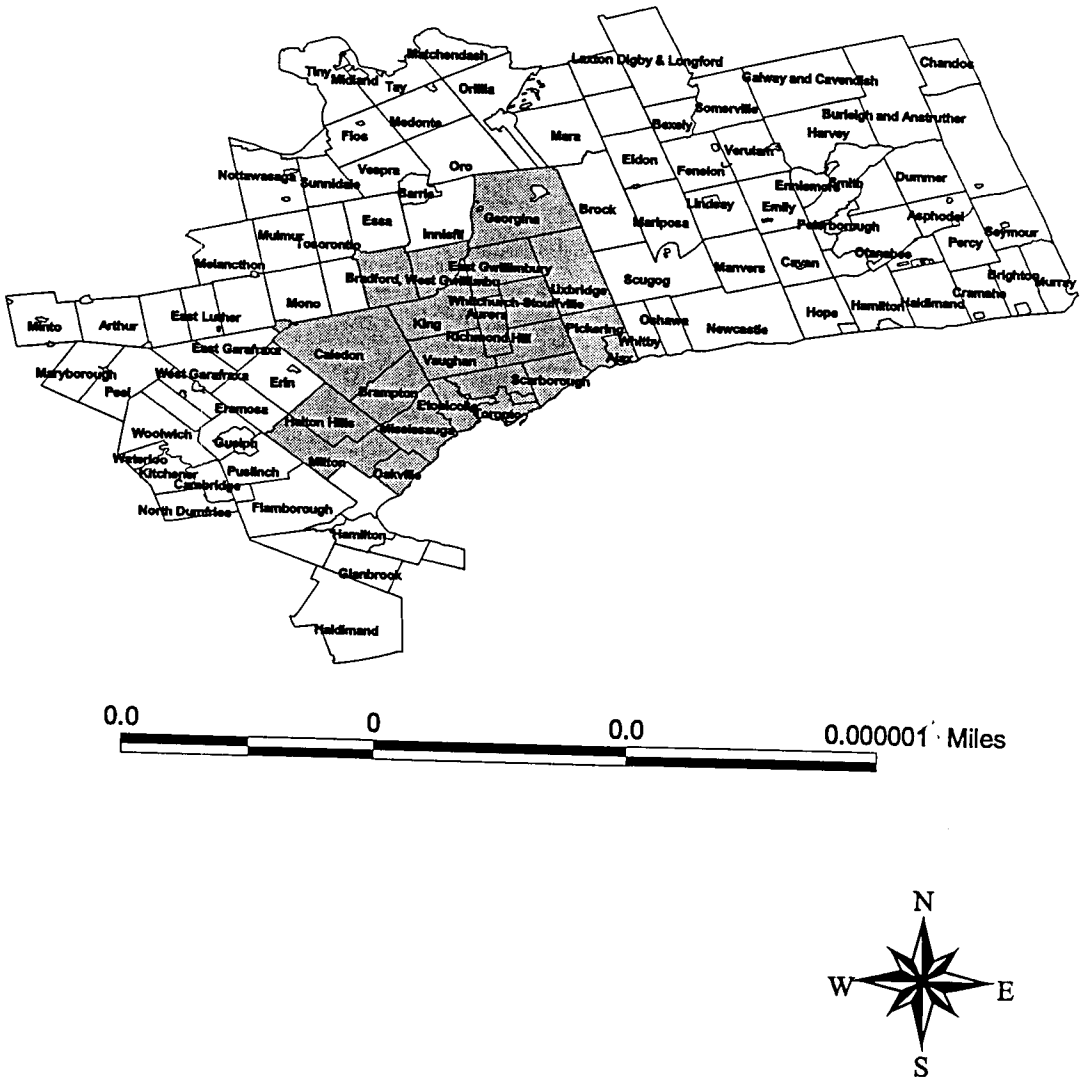


3.3 Metropolitan Overspill

According to various authors, the importance of studying counterurbanization as more than a strictly demographic phenomenon should not be understated. The majority of municipalities within the 6 regions included in the area of study thus far, are included

Figure 15

Overbounding the Toronto Census Metropolitan Area



in the Toronto Census Metropolitan Area. According to Statistics Canada (1991), at least one of the following criteria must be met to qualify for inclusion; **(1).** 50% of workforce living in the CSD commutes to the urbanized core, **(2).** 25% of the workforce living in the urbanized core, commute to a particular CSD, or **(3).** the CSD falls completely or partly within the urbanized core. Criterion #1 could in fact be used in support of the 'accelerated expansion hypothesis', in other words, although CSDs meeting criterion #1 may appear to be experiencing counterurban tendencies (studied strictly in terms of population change), 'metropolitan overspill' could actually be the explanation, since population growth in these areas is within the main commuting shed of the metropolitan area. In light of this, the study area has been expanded to include census subdivisions falling within the regions of ***Norththumberland, Peterborough, Victoria County, Dufferin County, Simcoe County, Wellington County,*** and the ***Hamilton Census Metropolitan Area***, immediately surrounding, but not included in the Toronto CMA *(see Figure 15)*. If the index of concentration continues to indicate counterurban tendencies at this point, this should be sufficient evidence that more than just 'overspill' is taking place.

3.31 CMA vs. Periphery

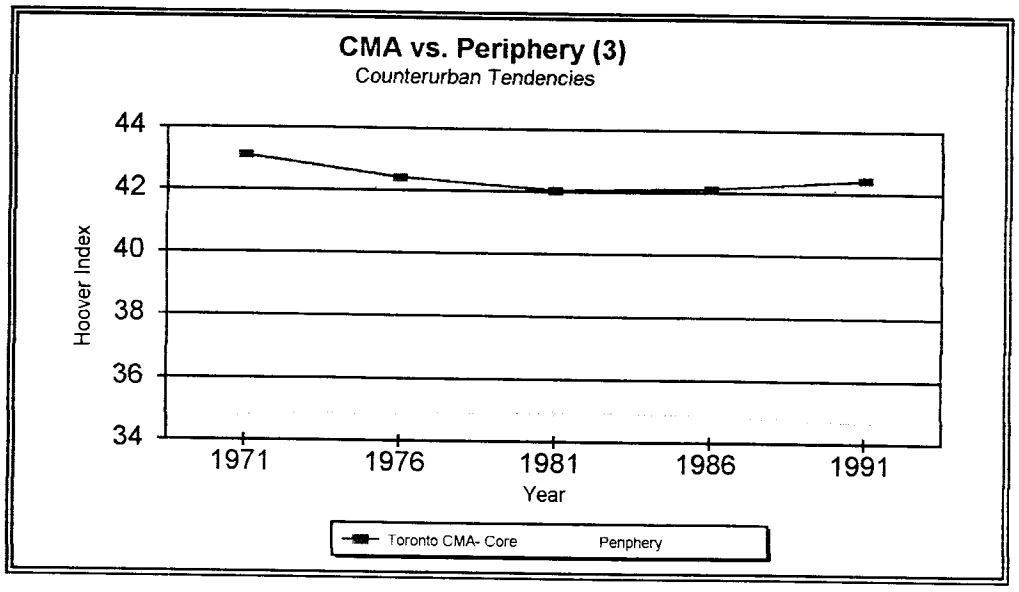
The Toronto Census Metropolitan Area experienced an overall decline in the index during the study period, although as figure 16 suggests, the decline was not constant. Between 1971-81, the index indicated population deconcentration, but for the remainder of the study period this was not the case. From 1981-91, the index actually increased slightly. The experience of the peripheral area was equally as interesting in that it was opposite that of the core. From 1971-81 the value of the index increased, indicating a

slight level of concentration, while from 1981-91 the value of the index began to slightly decrease. The results indicate that although between 1981-91 the experience of the core and periphery in terms of population redistribution patterns was similar to those previously defined, between 1981-91 the redefined core for the first time, began to show signs of concentration while the periphery showed signs of decline in this scenario.

While accounting for 36% of the total land area, the proportion of the population residing in the Toronto Census Metropolitan area actually decreased from 1971-76, after which, it steadily increased until 1991. Again this supports the fact that although the peripheral area appeared to be becoming the more popular destination during the early to mid seventies, from the late seventies onward, the core appears to have began to regain its traditional dominance in terms of attracting the masses. This apparent reversal in trends, referred to as the 'reversal of the original reversal' in the literature, has also been documented in Norway, Japan, USA and the UK

(Fuguitt, 1985). Although for a period of time, evidence of counterurban tendencies may have existed, the results of this analysis suggest that as opposed to a 'clean break' with past trends, these developments may have been nothing more than a temporary anomaly.

Figure 16.

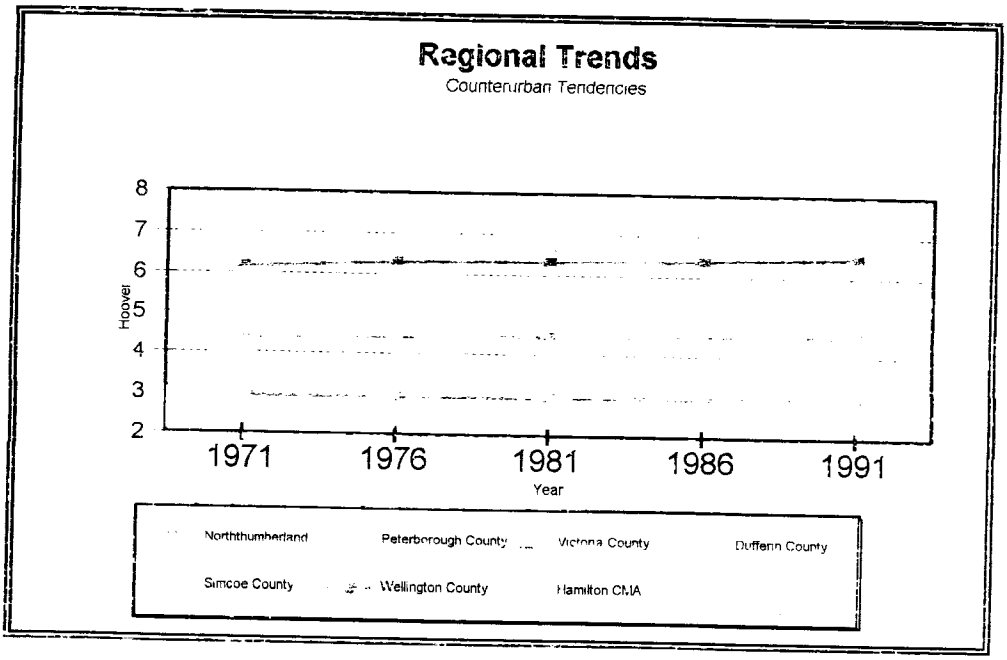


3.32 Regional Experience

Of the seven regions included in the periphery, five displayed only a modest level of population concentration throughout the period of study (see figure 17). As indicated by the value of the index, Simcoe, Peterborough and Wellington County, despite only slightly increasing their respective levels of population concentration, were the leading regions in 1971. Throughout the period of study, the index value for each of the three regions slightly increased during each time interval.

As indicated by the decline in the index, figure 17 suggests, the Hamilton CMA experienced the highest level of deconcentration of all peripheral regions. Although in 1971 the proportion of the population residing in the Hamilton CMA was nearly triple that of any other region in the periphery, by 1991 this was no longer the case. While the

aforementioned regions continued to grow, the Hamilton CMA decreased its overall proportion of the population. Although still nearly double the population of any other peripheral regions, its dominance in this respect continually declined. Again, it should be noted that although the Hamilton CMA continued to decline in terms of the proportion of the population residing there, the proportion of the total area which the CMA accounts for is rather small in comparison to these other regions. In light of this, in terms of the overall level of concentration, the Hamilton CMA was able to maintain its ranking. It should also be noted that although the Hamilton Region has been included as peripheral to the Toronto CMA, it too is a metropolitan core in its own right. Therefore, any level of deconcentration experienced in this particular region should be separated from the experiences of other peripheral regions. Reasoning behind such a statement lies in the **Figure 17.**



fact that the experiences of the Hamilton Census Metropolitan discussed above only lends additional support to the counterurbanization hypothesis.

3.33 Outliers

Once again outliers for the entire study area were determined in relation to the overall change in the index. With a total of 130 census subdivisions, the mean change was (-0.01) with a standard deviation of (0.45). As in the previous analysis, in order to qualify as an outlier, the overall change in the index for an individual census subdivision had to be beyond two standard deviations from the mean. Once again, while both Toronto, North York and Hamilton were outliers in terms of population deconcentration, Mississauga and Brampton experienced the highest level of population concentration. In addition, Markham also qualified as an outlier in the later respect. Increasing in population from an initial 36,700 to 153,800, by 1991 Markham tripled in size, with the proportion of the GTA's total population residing in the city increasing from 1% to 3%. Therefore, in addition to the conclusions reached in section 3.15, Markham's qualification as an outlier in this respect only strengthens the 'metropolitan overspill' hypothesis in that it is located immediately adjacent to the metropolitan core. Like the experiences of Mississauga and Brampton in terms of population growth, Markham's growth can also be attributed to the expansion of the core area into its immediate suburbs.

3.4 CMA, CA & Other

Continuing with the study area as defined in section 3.3, each individual census-subdivision has been categorized as falling within a *Census Metropolitan Area (CMA), Census Agglomeration (CA),* or *neither (OTHER).* Further analysis was then conducted

in order to discover whether the experiences of the aforementioned types of developments differ in terms of trends in population distribution during the period of study.

According to *Statistics Canada (1991)*, any contiguous development along with its local labour market, consisting of a population greater than 100,000, qualifies as a CMA, while developments with a population greater than or equal to 10,000, but less than 100,000 qualify as a Census Agglomeration. Overall, the over bound GTA consists of the four CMAs (43 Census-subdivisions) of *Toronto, Hamilton, Kitchener and Oshawa*, and a total of eight CAs (25 Census-subdivisions) including; *Peterborough, Midland, Guelph, Barrie, Orillia, Collingwood, Cobourg and Lindsay*. The remaining 85 Census-subdivisions were included in the *Other* category, which consists of developments which do not fall within the previous two categories.

3.41 Area vs. Population

The relative proportions of the total land area occupied is quite consistent with the sheer number of CSDs within each category. While the four CMAs account for 40% of the land and the eight CAs cover only 11%, the 85 CSDs included in the *Other* category account for approximately 48 % (see *figure 18-A*). In terms of the relative proportion of the GTA's total population in 1991, the vast majority lies within the regions CMAs as shown in *figure 18-B*. Although category #3 consists of the greater number of CSDs and covers the most area, in terms of population, it is but a small fraction of the former.

Figure 18-A

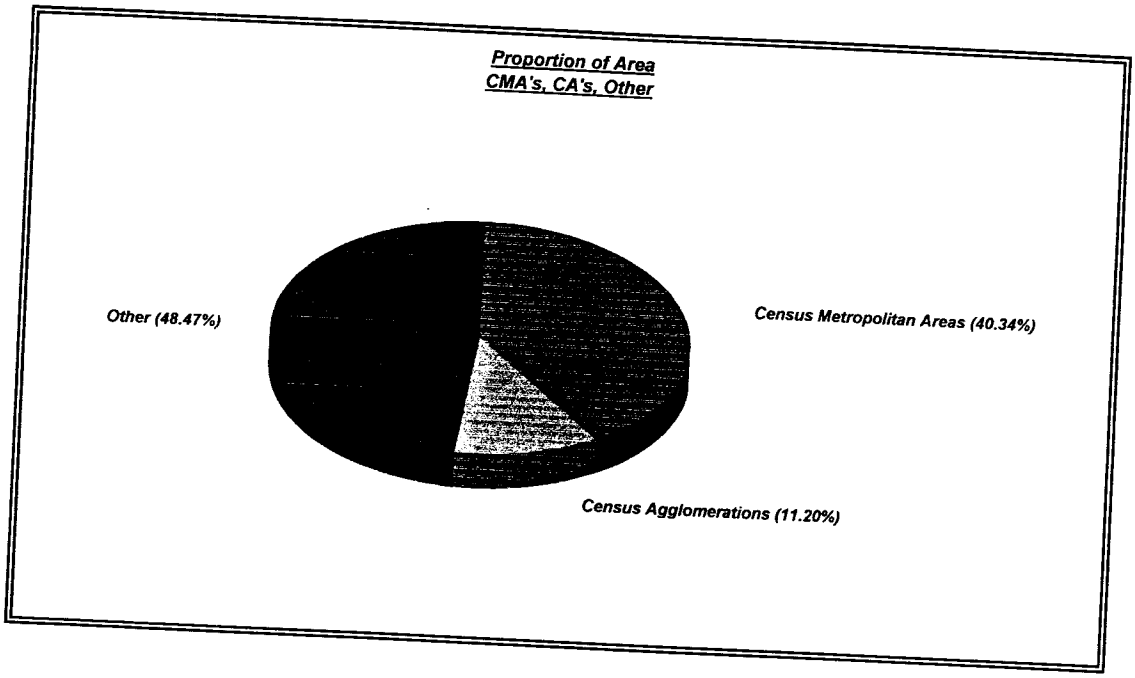
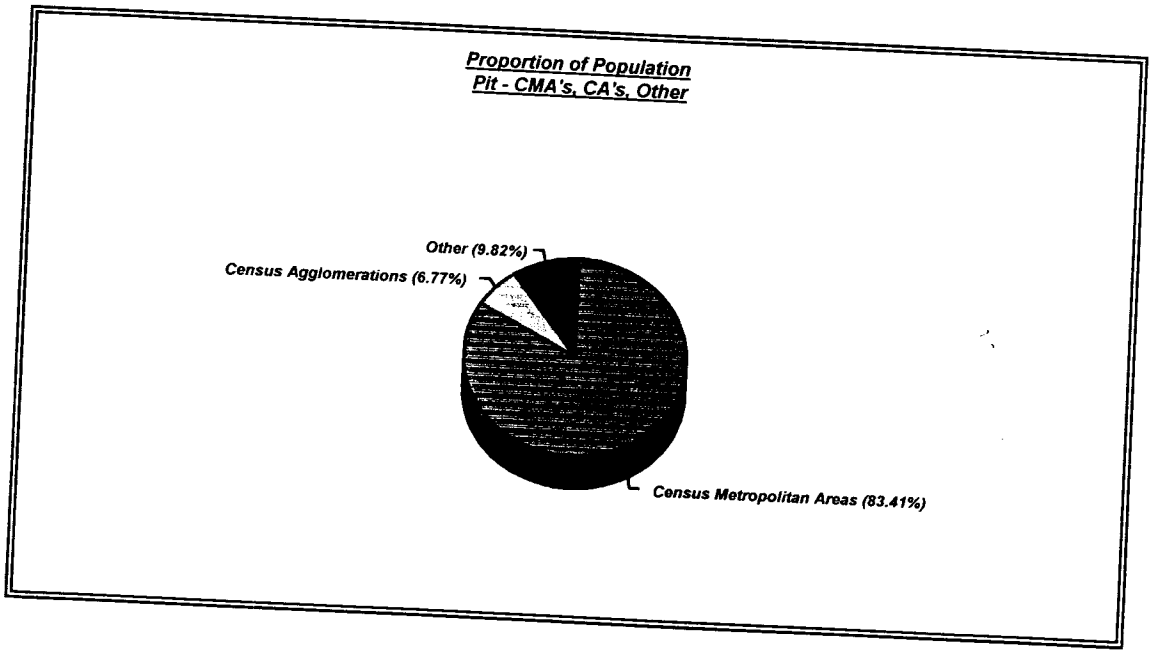


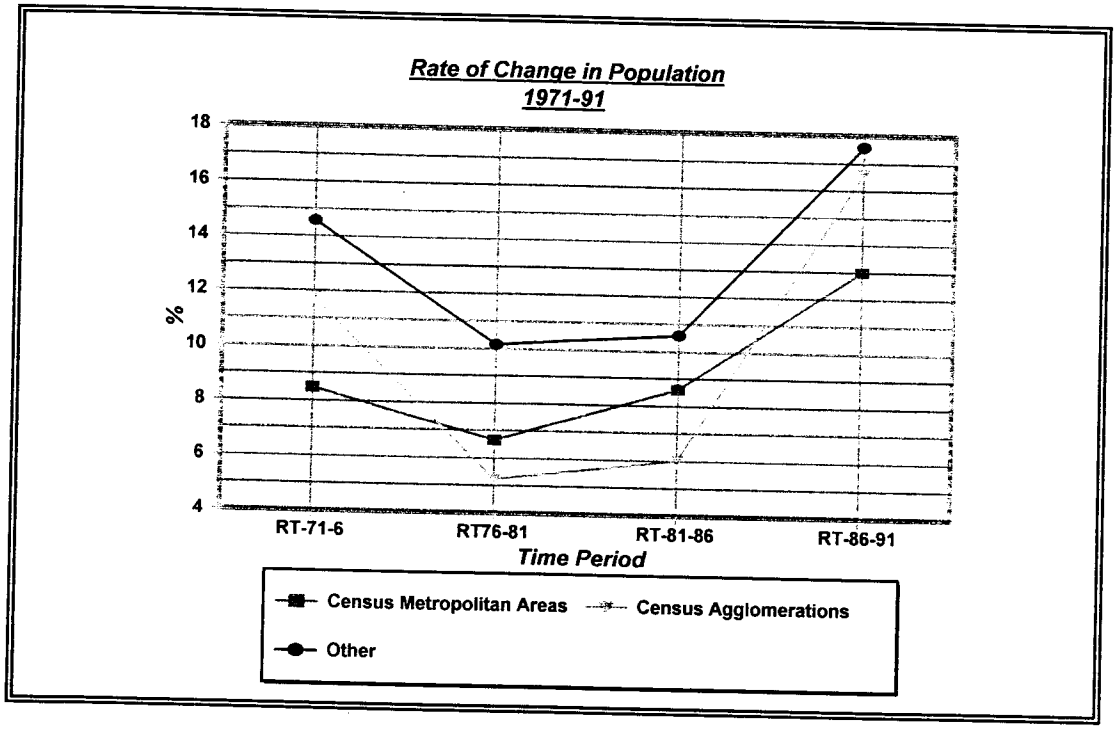
Figure 18-B



3.42 Population Growth Rates

Although useful in displaying the overall dominance of CMAs in terms of population, the fact that the regional CMAs accounted for such a large proportion of population in 1991 sheds little light on the main objective of this thesis which is to illustrate the existence or absence of counterurban tendencies. As mentioned in the previous section, overall, CMAs experienced the most growth if measured solely in terms of actual numbers, but studying the overall rate of population growth within our three categories, ultimately allows us to eliminate the bias of relative size. Figure 19, depicts the rate of population growth for each category. During each interval, CSDs within the *Other* category grew at a higher rate, although the difference became less pronounced with time. The relative experiences of the former categories is less straightforward. Although from 1971-76, CAs were growing at a higher rate than CMAs, from 1976-81, the growth rate of the former decreased to half its original value, dropping below that of CMAs. From 1981-86 all three categories increased their respective growth rates, with CMAs increasing the most. From 1986-91 each category's growth rate increased substantially. Not only did each category grow at nearly the same rate, but CAs surpassed CMAs once again, while approaching the level of growth more close to the 'Other' category.

Figure 19

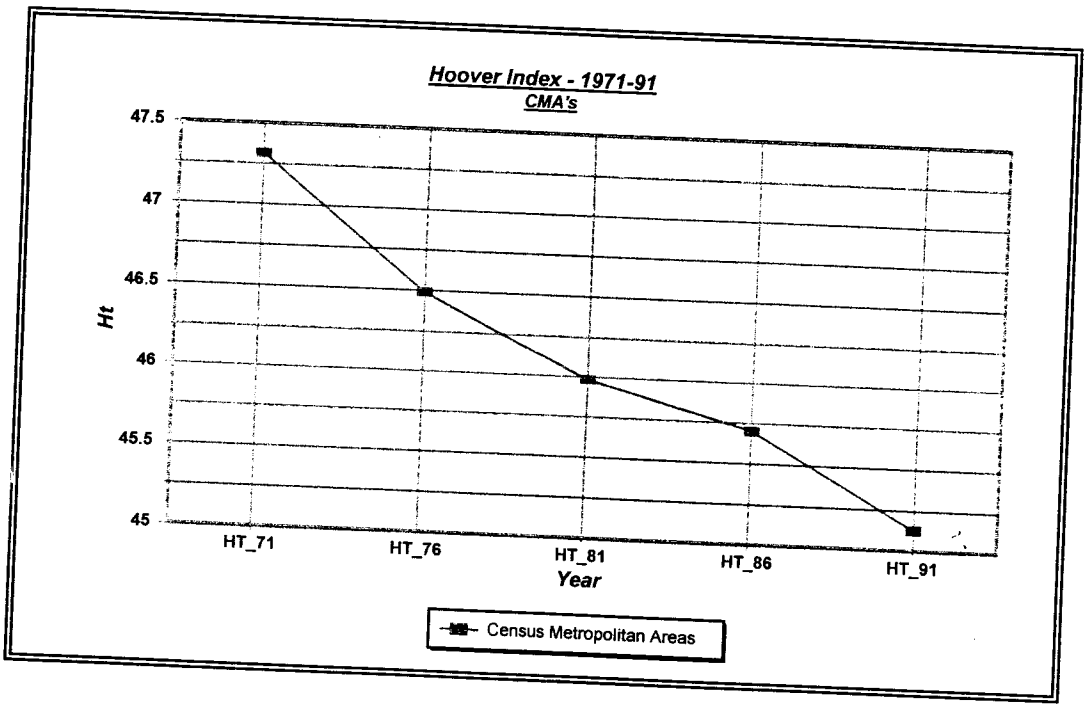


3.43 The Index of Concentration

Overall, in the context of the entire study area, the index of concentration consistently decreased, although the contribution of each of the three categories to the overall counterurban trend was quite different. According to the index values, CMAs as a whole displayed a pattern similar to that of the entire study area, namely, one of deconcentration (see figure 20). Of the four CMAs, it appears that Toronto and Hamilton were mainly responsible for this overall trend. While the index values for both consistently decreased, the former experienced its most substantial decline in the value of the index during the first decade of the study, followed by the subsequent levelling off during the following decade. Although the decline in the index values for the Hamilton CMA was

more steady than its counterpart, between 1981-91, the level of decline increased slightly when compared to the previous decade. In terms of the level of concentration as indicated by the index, neither the Kitchener nor Oshawa CMAs varied significantly from their respective levels of concentration throughout the entire study period. In light of this it has been concluded that the more populated CMAs of Toronto and Hamilton have been the main cause of the overall trend of deconcentration displayed not only by this category, but also overall.

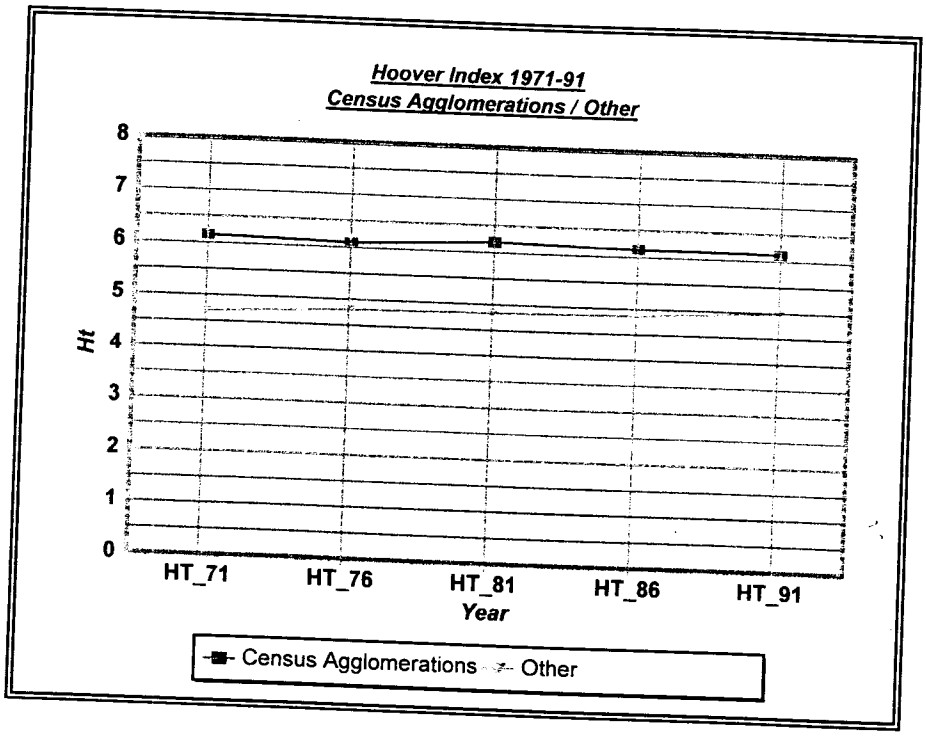
Figure 20



While the index value for CAs remained fairly stable overall, the index for the *'Other'* category, although not substantially, only slightly increased during each interval as

shown in figure 21 below. It is in light of this and the previous findings, it has been concluded that the main cause of the decline in the index and therefore overall trend of deconcentration, is the experiences of the CMAs, namely the Toronto and Hamilton Census Metropolitan Areas. While developments outside these two metropolitan areas may have experienced some growth, it is the experiences of these more highly populated regions which appears to be responsible for influencing the overall trends observed in the context of the GTA as a whole.

Figure 21



3.44 Summary

From the initial results of section 3.12, one could prematurely conclude that between the years 1971-91, overall the GTA experienced counterurban tendencies similar to those documented in other developed countries around the world. Upon further examination, it was discovered that unlike the results of Vining and Strauss (1977) and Long and DeAre (1982), who after applying the index at various levels of areal disaggregation concluded that dispersal was occurring at all levels, with respect to the GTA, individual regional experiences varied. While the main urban cores of the GTA, Metropolitan Toronto and the Regional Municipality of Hamilton-Wentworth, experienced significant levels of deconcentration, the Regional Municipalities of York and Peel respectively, simultaneously recorded significant levels of concentration.

Following these initial conclusions, we then set out to test the validity of key criticisms put forth by Gordon (1979), one of the main advocates of the overspill hypothesis. The previous author dismisses any trends in the redistribution of population away from the core as nothing more than the accelerated expansion of these core areas into their suburbs. First, in realizing that the index could show deconcentration when computed over large geographic regions (as illustrated in the case of the GTA), even when substantial urbanisation is taking place in less populous areas, after computing the index for a scheme based on regional subsets of the GTA, we find that the overall patterns remained the same. Therefore in the context of the GTA, whether exhaustive or exclusive delineations were used, this would have little effect on our overall results.

Initial evidence gathered in support of the 'overspill' hypothesis was obtained in

our analysis of individual growth rates at the level of the municipality. First, the cities of Vaughan, Markham, Mississauga and Brampton, each located immediately adjacent to the metropolitan core, in terms of the average rate of growth of their respective populations, experienced the most substantial levels of growth. Therefore, although municipalities further removed from the direct influence of the core also experienced growth, it is the previously mentioned municipalities which stand out as the major growth areas of the GTA in this respect.

Next, in terms of the overall change in the level of concentration as indicated by the index, municipal outliers were determined and the individual experiences of each in this respect examined. With Toronto, North York and Hamilton qualifying as outliers in terms of their respective levels of deconcentration, Brampton and Mississauga were the leaders in terms of concentration. These analysis offer additional evidence in support of the metropolitan overspill hypothesis. While the metropolitan core area(s) continue to decline in terms of population concentration, these suburban municipalities to the core are experiencing levels of population concentration unmatched elsewhere in the GTA, contributing to the relative decline of the core in this respect.

Although the initial core/periphery analysis, perhaps lends limited preliminary support to the counterurbanization hypothesis, once the core area was overbound, what is interesting is the fact that both the core and periphery areas experienced deconcentration overall. From this we conclude that the criticisms surrounding the issue of how one defines core and periphery are valid. When the expected growth of municipalities immediately adjacent to the metropolitan core was taken into consideration, in terms of displaying counterurban tendencies, the resulting patterns in redistribution of the GTA's

population were less impressive than those of the former analysis.

In section 3.3, the experience outside the Toronto Census Metropolitan Area was examined in realizing that any growth within the commuting shed of the metropolitan core could be interpreted as a continuation of the process of suburbanization. Aside from the Hamilton CMA, all other regions either remained stable, or experienced a slight level of concentration as indicated by the value of the index. The overall experience of the Toronto CMA, our redefined core, and the peripheral area was similar to the trends discussed in the literature, referred to as the 'turnbackaround' or the 'reversal of the original reversal'. While the core appeared to be losing its long held dominance in terms of attracting the masses in the early to mid seventies, by the early eighties, the trend would once again be one of concentration in the metropolitan core area, marking the return of urbanization as the major settlement pattern throughout the overbound GTA. In light of this we conclude that although there was evidence of counterurbanization during the initial phase of the study, these results suggest that as stated in the literature (see Forstall and Engels (1984), Engels (1986), Cochrane and Vining (1988), and Fielding (1986)), these developments were perhaps nothing more than a 'temporary anomaly'. Finally, the experiences of municipalities comprising CMAs, CAs and 'Other' developments (i.e. those not included as part of the former), within the GTA were examined. Offering additional evidence in support of the 'temporary anomaly' hypothesis, although census subdivisions comprising the 'Other' category displayed the highest overall rate of growth in population from 1971-76, within five years this substantial level of growth would decline. From 1981-86, while growth in the former levelled off, both CMAs and CAs experienced

an increase in their respective population growth rates, apparently regaining some traditional dominance in this respect. Therefore, although these developments which are outside the influence of the urban areas, experienced substantially higher levels of population growth during the early seventies, from the mid seventies onward, the difference would become less pronounced.

As mentioned previously, it was the main objective of this analysis to shed some light on the counterurbanization issue in both a Canadian and urban context. Because of its dominance in terms of both economic activity and population concentration, the Greater Toronto Area was chosen as the ideal setting for the study. Following the consideration of the major criticisms put forth in revolving around the issues of areal delineations, distinguishing between core and peripheral areas and finally, metropolitan overspill, sufficient evidence has been found in support of the conclusions that in the context of the GTA as defined for our purposes, metropolitan overspill has played a major role in influencing the resulting trends in population distribution. In the context of the overbound Toronto CMA, although during the early seventies, our results may have suggested that perhaps a new pattern of population redistribution was developing, it turned out to be a 'temporary anomaly' as evidence of the 'reversal of the original reversal' experienced internationally, was documented. Therefore, the bulk of our results suggest that metropolitan overspill has played a major role in influencing the overall resulting trends in population distribution in the GTA.

4.0 Toward Explanation - Commuting Analysis

4.1 Introduction

It has been demonstrated in Chapter 3, that the Greater Toronto Area experienced substantial changes in terms of population redistribution patterns over the twenty-year period between 1971-91. Although to this point the primary focus of this thesis has been the analysis of trends in population distribution, of equal importance are the developments in relation to economic activity that may have taken place alongside these trends. In addition to the shift in the concentration of the urban population from the metropolitan core to the surrounding municipalities, a corresponding shift in terms of economic activity may have also taken place. Therefore, growth of suburban communities may not only be affecting where people are choosing to live, but also where potential employers are increasingly locating, and therefore where potential employees both in and around these high growth suburban areas are choosing to work. It is the aforementioned issue that will be the focus of this final chapter of analysis. First, if both the populations and the level of employment in certain high growth areas are becoming increasingly concentrated, the question is; are these trends simultaneously jeopardizing the traditional dominance of the metropolitan core in both respects? On the other hand, despite the trends in population redistribution away from the core, it is possible that although people's preferences are increasingly becoming suburban, economically, ties to the metropolitan core could have either remained stable or even become stronger with time. Once sufficient insight into the above issue has been given, the final objective, somewhat related to the previous, will be to shed some light on the notion of 'balanced',

'self-contained' developments in the GTA. If in fact the core is losing dominance in terms of being the primary focus of economic activity and population concentration, as these rapidly growing suburbs become more independent with the development of a multi-nodal urban structure, the indices of balance and self-containment should lend additional support to this conclusion.

4.1 Methodology

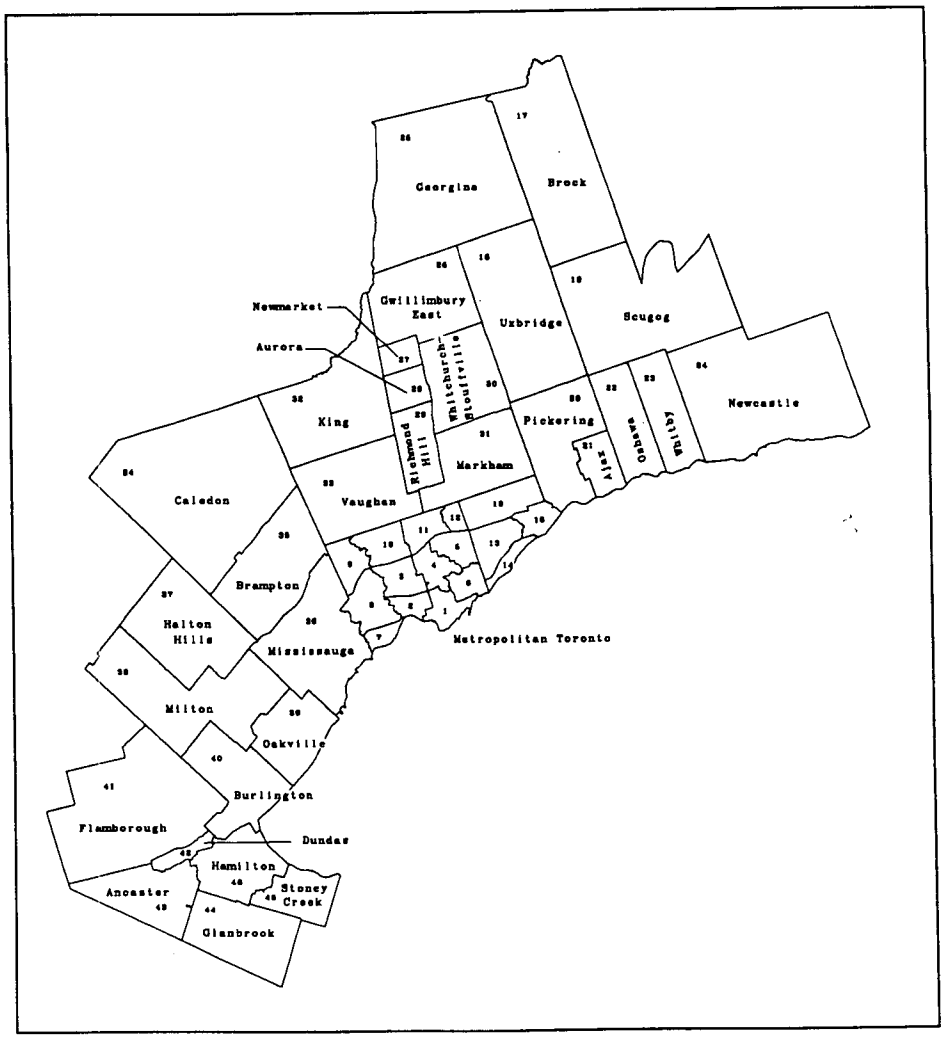
In order to analyse the patterns of economic activity and its potential redistribution away from the core, commuting data from the Transportation Tomorrow Surveys (TTS) of 1986, 91 & 96, has been obtained. In order to represent the total population of the GTA, each record has been given an expansion factor, defined as the ratio of the number of TTS household samples to census dwelling units in an aggregation district. As mentioned previously in section 1.223, the three surveys differ in terms of the survey area and data collection methods. Although both the 1991 and 1996 surveys contained information about trips coming into the GTA from the fringe area, to be consistent with the 1986 survey data, these trips have been excluded from the analysis. In addition, the 1991 survey was conducted as an update of the initial 1986 survey, with particular emphasis on information only in areas that experienced rapid population growth during the five-year period between the two surveys. In response to this, the 1996 survey has been included to ensure that any conclusions drawn are not erroneous, due to the limitations of the 1991 data set.

For each survey, separate origin-destination trip matrices have been compiled for work and discretionary purposes. The matrices, covering a 24-hour period, include all travel modes, and include only the first trip of the day to work for each person. In the

case of multi-purpose trips, the commuter's zone of residence was taken as the origin of the trip, rather than the actual origin as recorded in the survey to ensure consistency in the data.

Initially, the resulting trip matrices corresponded to planning districts as defined by the surveys. There are a total of 46 planning districts defined for the GTA. Districts 1-16 make-up Metropolitan Toronto, while the remaining 30 districts (17-46) are defined by municipalities (see figure 22). In order to ensure consistency, planning districts located within Metropolitan Toronto were manually aggregated to the level of the municipality.

Figure 22.

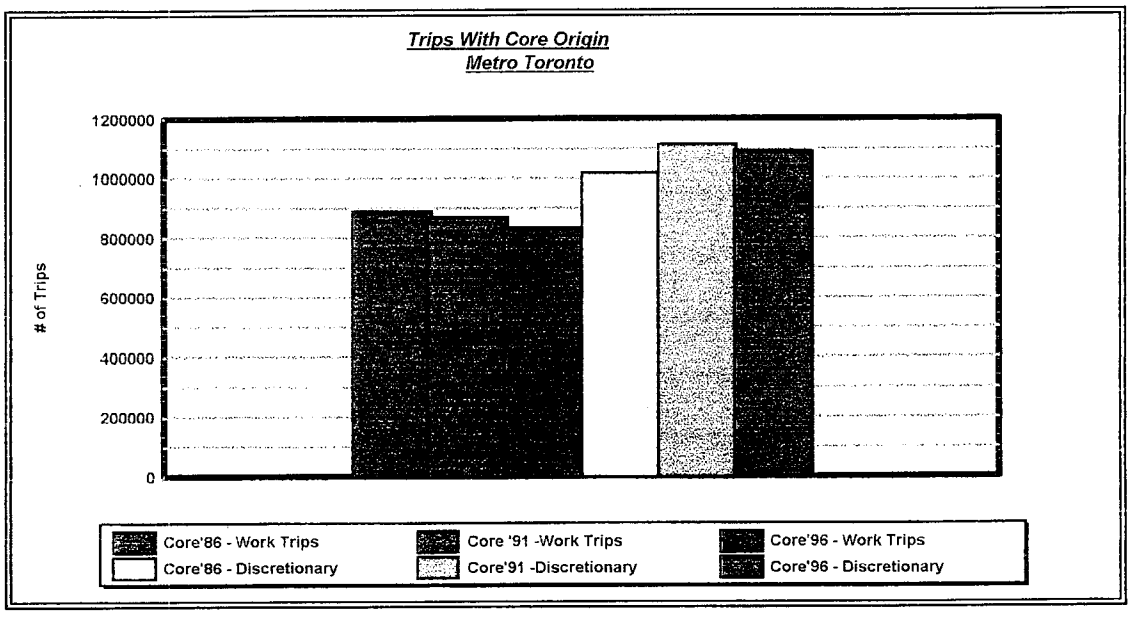


4.2 Core vs. Periphery

4.21 Core Origin/Core Destined Trips

Metropolitan Toronto, defined as the core, has a commuting shed that spans the entire Greater Toronto Area as defined for the purposes of this thesis. It was previously determined that not only did the core lose its dominance in terms of population concentration, but it actually experienced an overall decline in terms of the number of people residing in the region between 1971-91. As figure 23 below suggests, alongside the shift in population away from the core area, the total number of work trips having an origin within the core also consistently decreased between 1986 and 1996. This initial observation comes as no surprise, since it is only natural that if fewer people are living within the boundaries of the core area, then fewer work trips will be originating there as a

Figure 23



result. Possible exceptions to the previous statement, would be a situation where strictly unemployed people moved from the core region, perhaps because of the higher cost of living within the metropolitan boundaries. A second, more plausible exception would be a scenario where the number of multiple worker households in the core region, increased during the same time period. An illustrative example would be the experience Toronto CMA from 1951-1976. As empty nesters and families with children migrated to the suburbs during this period, their vacant dwelling units were increasingly being re-occupied by young aspiring multiple worker households.(Miron,1979).

As figure 23 suggests, the number of discretionary trips having an origin within the core, are substantially higher in comparison to the former and conversely have been on the rise. Therefore, although fewer people live in the core region, those remaining are apparently taking more trips for discretionary purposes. Gordon, Kumar and Richardson (1988), note the importance of changing lifestyles (e.g. more meals eaten outside the home, frequent visits to health clubs etc.), resulting in more frequent and more regular non-work trips.

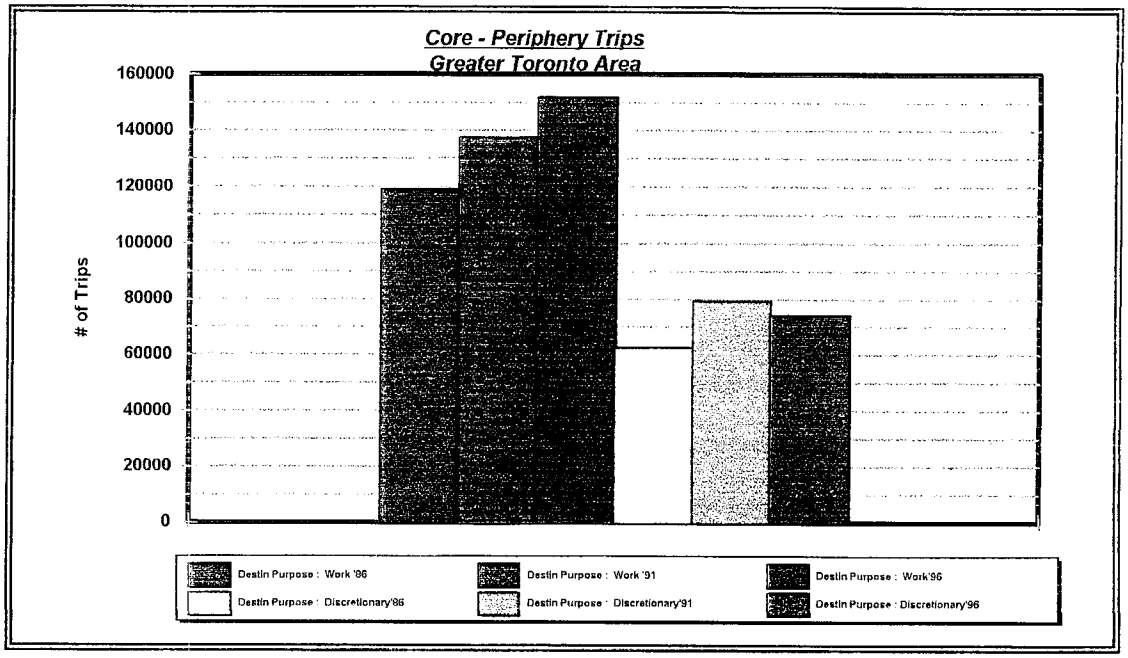
A similar pattern in relation to the total number of trips destined for the core is also evident. Overall, the number of work trips destined for the core decreased, perhaps as a result of decentralising industry. Therefore, not only has there been a relative population shift to peripheral regions, but also a similar shift in employment occurred, which caused the observed decline in work trips with either an origin or destination within the core. Once again, the total number of core-bound discretionary trips increased, which is quite consistent with the literature. While Gordon et al (1988) observed that non-work trips in the USA grew at a substantially higher rate than work trips, Gordon and Richardson (1990) discuss the importance of decentralized life-styles and the impact they have had in

terms of facilitating the rising number of non-work trips.

4.22 Core-Periphery Activity

In observing the total trips with a core origin and a peripheral destination, not only have the number of work trips going from core region to peripheral areas increased, but as figure 24 illustrates, the number of discretionary trips also increased. Although in previous decades, the core may have been the more popular location for work purposes, this observation illustrates the undeniable reversal of this trend. With certain peripheral areas becoming increasingly 'built up', the dominance of the core in terms of attracting the work forces of its suburban areas is perhaps shifting outwards to the rapidly growing municipalities such as Vaughan, Mississauga, Markham and Richmond Hill, highlighted in chapter 3.

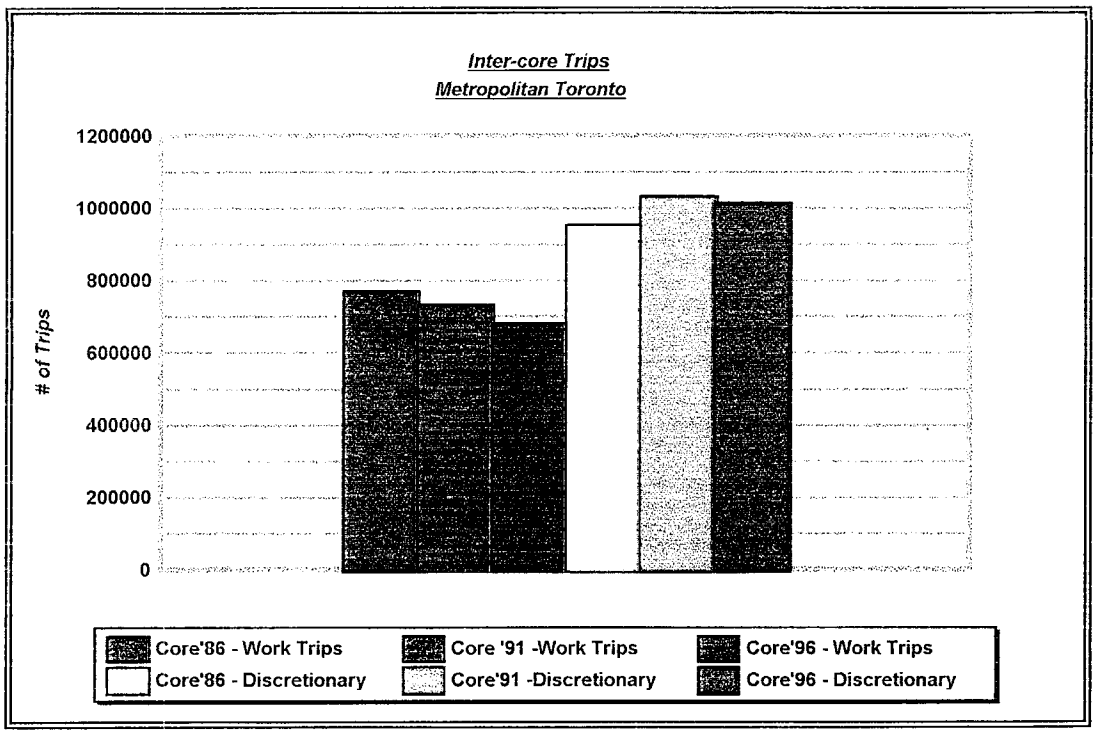
Figure 24



4.23 Inter-core Activity

The patterns observed in relation to inter-core trips, (i.e. those having both an origin and destination within the core), offer additional support to the previous conclusions drawn in sections 4.21 and 4.22. While the level of inter-core work trips declined, inter-core discretionary trips increased (see figure 25). Again, not only were there fewer work trips having either an origin or a destination within the core region, but in addition, the number of self-contained work trips within the metropolitan area also declined. In light of this and the previous findings we conclude that as work related activity gradually migrates to more suburban locations, perhaps discretionary activities are then 'filling the void'.

Figure 25



These preliminary analyses of the overall change in the magnitude of trips for both work and discretionary purposes support the conclusions that not only have the trends in population redistribution favoured the more peripheral regions, but the trend appears to be the same for all activities. In addition to attracting more trips from other peripheral regions that in the past may have been destined for the core, as time progresses, peripheral areas in general appear to be attracting more trips from the core itself. In light of this, it appears that the declining influence of the core is not a strictly demographic phenomenon, but also has economic underpinnings.

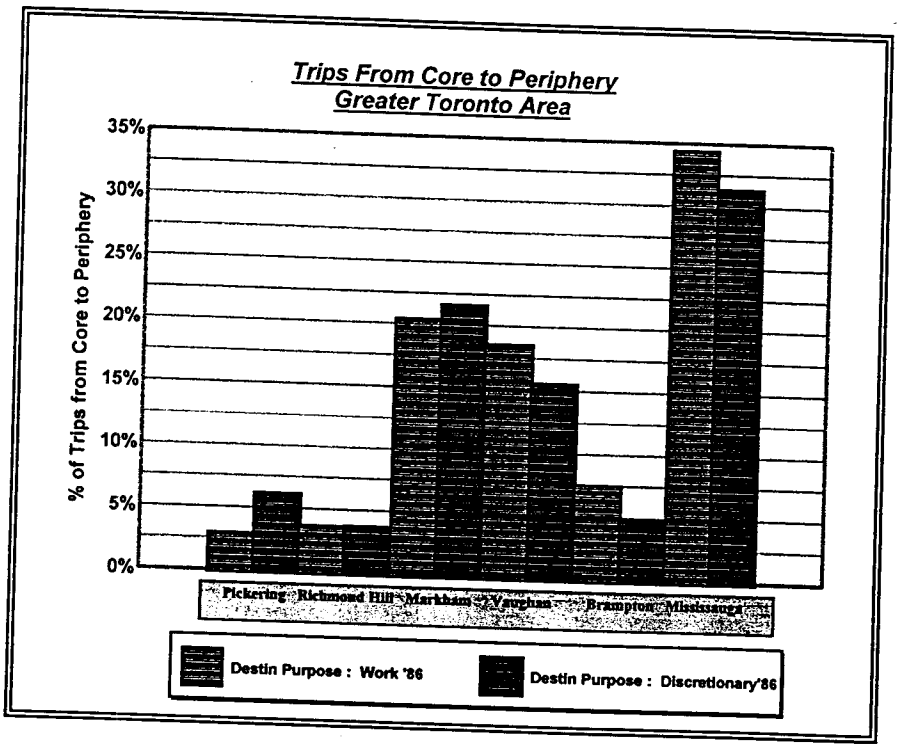
4.3 Peripheral, Municipal Experiences

It was our objective in the previous section to draw some conclusions with respect to changes in the overall level of activity between the metropolitan core and its periphery. Although some general trends were successfully determined, it is our intention in this section to further analyse these trends at a greater level of detail. It has not only been determined that the overall level of work-related activity in the core, whether it is trips having an origin, destination or both within this area, consistently declined, but in addition, the periphery is increasingly becoming the net attractor of these trips with time. Although as the numbers suggests, our conclusions are quite clear, the question now becomes; *where exactly in the periphery are these trips being attracted?*

4.31 Influencing the Metropolitan Core

As figure 26 suggests, the majority of trips going from core to periphery in 1986 were destined for a select few municipalities. With little change in the overall distribution of trips between the three surveys, the Municipalities of Brampton, Mississauga, Markham and Vaughan together, accounted for more than 80% of these trips. With respect to discretionary trips, a similar pattern is also apparent in that the previously mentioned municipalities were again the net attractors of the majority of trips going from core to periphery. In light of these preliminary observations, we conclude that although the trends discussed in terms of core-periphery analysis are valid, as with the redistribution of population, it is specifically within these particular municipalities that the majority of trips from the core to periphery are destined.

Figure 26



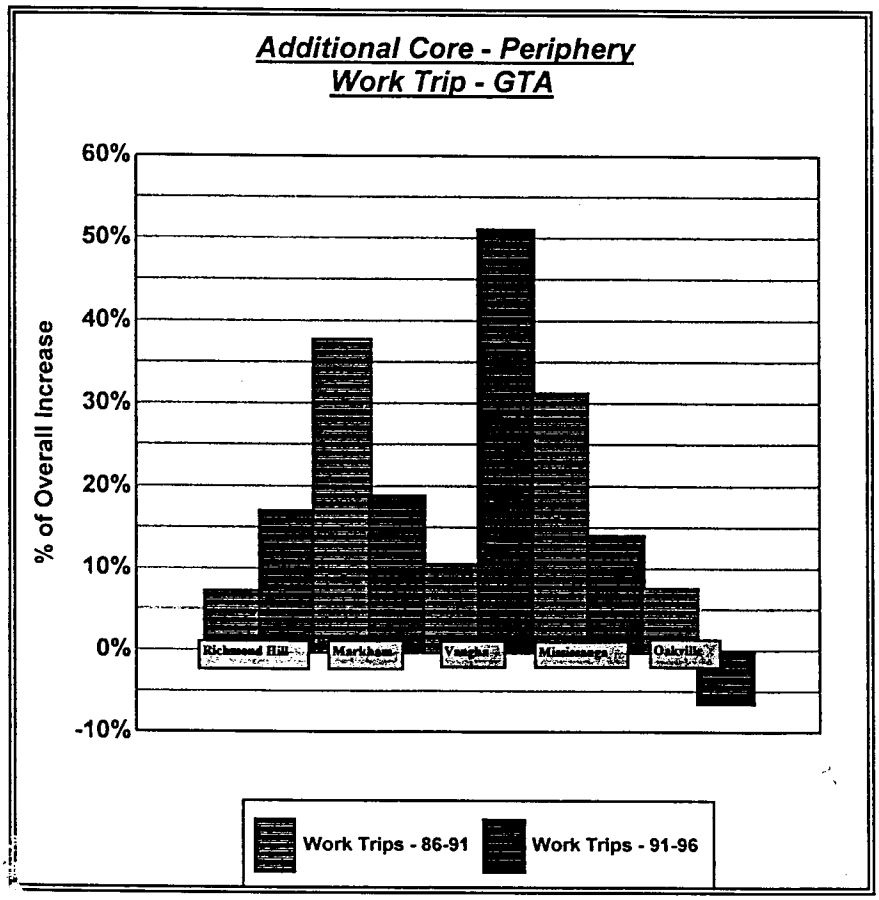
It should be noted that there are in fact trips originating in the core that are destined for other municipalities in the peripheral area, which we have not included in figure 26, since individually these destinations account for less than 1% of the overall trips. Pickering and Richmond Hill have been included above because each municipality, accounts for at least 5% of the overall trips from core to periphery, which we have deemed a significant amount, at least in comparison to other municipalities located in the peripheral area.

4.32 Additional Activity

Although the majority of trips going from core to periphery are destined for the municipalities shown in figure 26, it is possible that other peripheral municipalities could be responsible for attracting the additional work trips highlighted in section 4.22, which originated in the core but were destined for a peripheral location. Due to the magnitude of these additional trips relative to the total, it is possible that this pattern may not have been detected within the previous analysis. In light of this, separate analysis was conducted with respect to the additional work trips incurred between each survey. The results suggest that as well as attracting the majority of trips from the core, the Municipalities of Markham, Vaughan and Mississauga also attracted the majority of the additional work trips incurred between each survey (see figure 27). Between 1986-91, Markham and Mississauga together, accounted for nearly 70% of the additional trips, while Richmond Hill, Vaughan and Oakville accounted for approximately 25%. Between 1991-96, Vaughan itself, significantly increased its individual share of the additional trips to more than 50%, which is perhaps indicative of rapid development and the existence of new employment opportunities, or the movement of existing facilities from elsewhere to this location. Combined, Richmond Hill, Markham and Mississauga accounted for the remaining 50% of the additional trips. Therefore, in addition to being the traditional net attractors of trips originating within the metropolitan core with a peripheral destination, from 1986 onwards, it appears that the overall influence of these particular municipalities in this respect has continued to increase with each survey. Although from 1986-96 the relative level of influence shifted between the aforementioned municipalities, overall these

specific municipalities are mainly responsible for the general patterns discussed in section 4.2. In light of these findings, it has been concluded that in addition to experiencing rapid levels of growth in terms of population, evidently at the expense of the core's traditional dominance, a similar pattern has been illustrated in relation to the level of economic activity and influence.

Figure 27



4.33 Influence of the Metropolitan Core

To this point we have illustrated the influence that particular municipalities have had on Metropolitan Toronto in terms of attracting and redirecting activity away from this

area. Although it has been established that a select few municipalities have been responsible for the general trends highlighted in the previous sections, we will now turn our attention to an equally as interesting issue, mainly the influence the core has had throughout each survey on these particular municipalities. Figure 28, offers some preliminary insight into the previous issue.

Of the total work trips in 1986 having a destination within each respective census subdivision, the percentage of trips coming from the core area has been highlighted. The results suggest that the influence of the core in this respect to some extent, may be a function of distance. While the municipalities immediately adjacent to the core in 1986 were experiencing the greatest level of influence from the core in this respect, as distance from the core increases, the overall percentage of work trips which have a core origin decreases. It should be noted that in making such a statement we are not disregarding the existence of additional explanatory factors, but simply noting the possibility of distance being an important factor amongst others such as population size, accessibility, or whether an area is 'job rich' or 'job poor' for instance.

Although the above may have been the case in 1986, again question arises whether this pattern actually became more or less pronounced with subsequent surveys. Table 1 suggests it is the later that has developed with time. In each case, the percentage of the total trips coming from the core has decreased between 1986-96. Therefore, although ties to the core remain to be significant, they are becoming weaker with time as the core's contributions with respect to the overall level of activity becomes less pronounced.

Figure 28

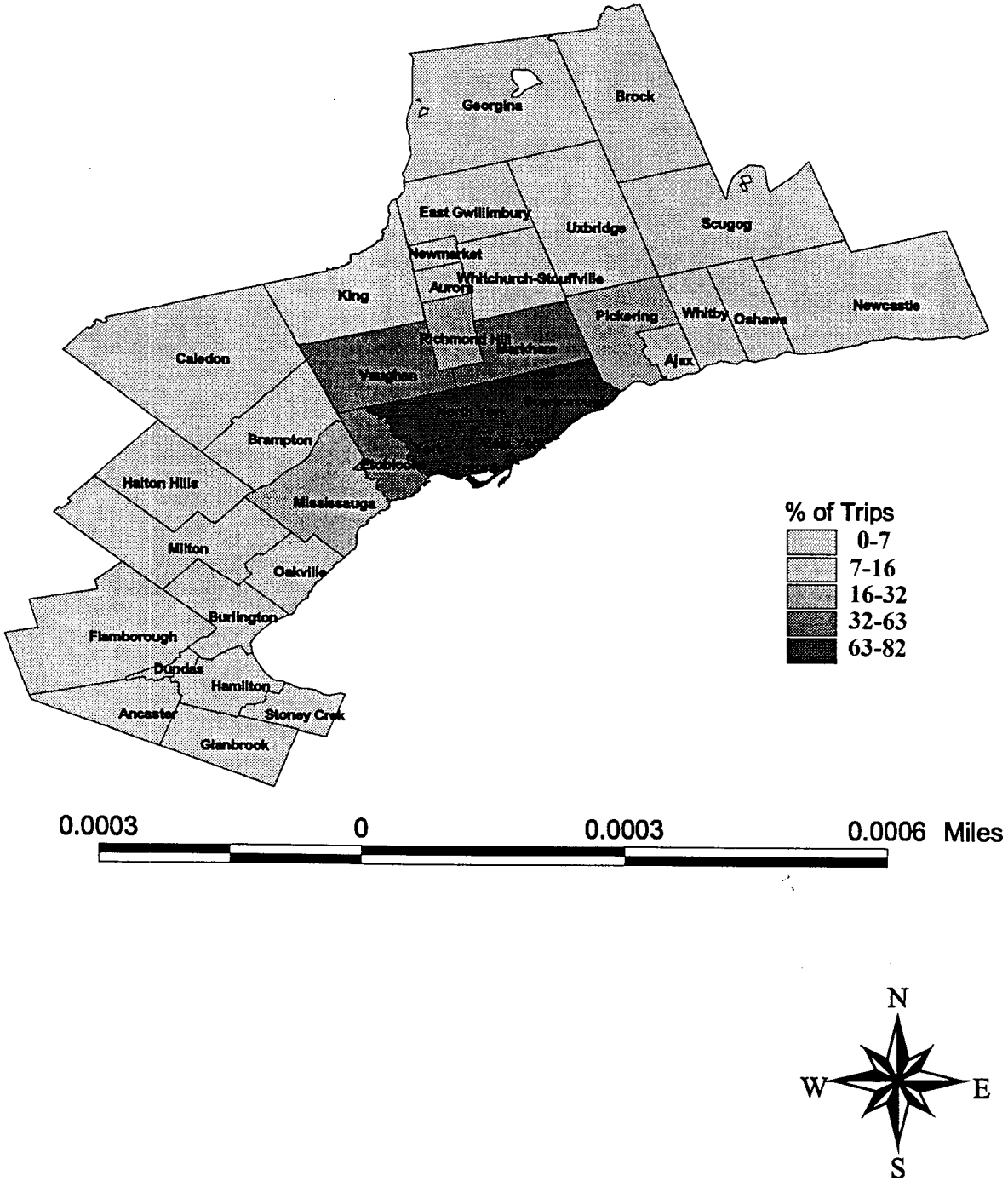

Georgina
Brock
East Gwillimbury
Uxbridge
Scugog
Newmarket
Whitchurch-Stouffville
Aurora
King
Pickering
Whitby
Oshawa
Newcastle
Richmond Hill
Markham
Caledon
Ajax
Vaughan
Brampton
Halton Hills
Mississauga
Milton
Oakville
Burlington
Flamborough
Dundas
Hamilton
Ancaster
Stoney Creek
Glanbrook
% of Trips
0-7
7-16
16-32
32-63
63-82
0.0003
0
0.0003
0.0006 Miles
N
W
E
S

Table 1

Core Originating Work-Trips as a % of the Total With Municipal Destination

Municipality	*1986 TTS*	*1991 TTS*	*1996 TTS*
Brampton	16	12	15
Markham	53	47	47
Mississauga	28	25	23
Pickering	29	18	18
Richmond Hill	32	30	30
Vaughan	57	47	48

Although the proportion of trips coming from the core to each municipality is definitely on the decline, it is possible that the number of trips going in the opposite direction could simultaneously be increasing in magnitude. In light of this, the final objective of our analysis will be to take a brief look at the level of influence the core has had in terms of attracting trips from the previously mentioned municipalities. Although not as pronounced as the pattern of declining influence in the opposite direction, Table 2 suggests a similar pattern has developed. In 1986, the core was the destination for at least 40% of the total work-trips originating in the municipalities of Mississauga and Richmond Hill and accounted for over 60% of those originating in Markham and Pickering. With the exception of Richmond Hill, in each case at least a slight decline in this respect was recorded between 1986-96. Markham, Mississauga and Vaughan recorded the greatest decline in terms of the percentage of trips destined for the core area. Along with the

previous results, these findings have been interpreted as preliminary evidence in support of the increasing independence of these particular municipalities from the core area.

Table 2

Percentage of Total Work-Trips Having a Destination Within the Core

Municipality	*1986 TTS*	*1991 TTS*	*1996 TTS*
Brampton	28	25	26
Markham	64	60	57
Mississauga	44	41	38
Pickering	63	63	62
Richmond Hill	45	50	46
Vaughan	62	59	53

4.4 Breheny's Indices

It is the objective of this final section of analysis to offer some preliminary insights into the issue of balanced, self-contained developments in the Greater Toronto Area. To this point it has been determined that a select few municipalities, namely those located immediately adjacent to the metropolitan core area, have been mainly responsible for the general trends highlighted in the previous sections 3.1- 4.3. In light of this, it is our opinion that the experiences of these particular municipalities along with that of the core, with respect to the notion of balanced, self-contained development is worthy of further discussion.

4.41 Jobs/Housing Balance

Existing research tends to focus on either the issue of *jobs-housing balance* or *excess commuting* as the two main approaches taken in attempts to answer the question of *how urban structure affects commuting*. It is the former that is of interest for our purposes and therefore will be further discussed. Jobs-housing balance as a public policy tool has been proposed by various regional authorities throughout developed nations as a remedy for the escalating traffic congestion problems. Theoretically, the main objective in creating balance is to have a similar number of jobs and housing units in a defined geographical area (Cervero, 1989). It is assumed that there will be high rates of travel within and less commuting into or outside a defined community, therefore raising the probability of travel by modes other than motorised personal vehicle (ie. travelling by foot, bicycle or public transit). By moving workers and houses closer together, and as a result, reducing the overall amount of commuting, jobs-housing balance offers an apparently simple solution to alleviate congestion problems. Although the concept sounds reasonable, jobs-housing balance remains to be highly controversial as a public policy tool.

It has been suggested that the viability of balance as a policy tool rests on the initial assumption that intervention is actually required to achieve balance within a defined area. Giuliano (1992), concludes that as part of the urban development process, jobs-housing imbalances often recede over time, as jobs and housing mutually co-locate to optimise travel times and ease commuting, therefore intervention is not necessary. As demonstrated in the history of urban development, metropolitan areas expand as households seek lower cost housing at the periphery and as these new settlements develop,

this new labour force attracts employers.

Equally as critical to the policy intervention argument is the demonstration of the existence of a significant relationship between jobs-housing balance and commuting patterns. Giuliano (1992), following an extensive literature review finds that empirical evidence, whether it be supporting or refuting the idea is somewhat lacking and that balance tactics have little impact on reducing traffic congestion in the past. Similar conclusions were reached by other critics of the jobs-housing balance hypothesis including the work of Downs (1992), Giuliano and Small (1993), and Wachs et al. (1993) pointing out the many other sources of growth in traffic congestion (ie. population, per capita use of automobiles female labour force participation), which may be equally or more important. Nowlan and Stewart (1991) and Cervero (1989), are two of the only studies which deal directly with the relationship between jobs-housing balance and commuting. Nowlan and Stewart, in examining the City of Toronto's core, found that although substantial office construction occurred between 1975-88, much of its impact on peak-hour work-trips entering the area was offset by accelerated housing construction. Cervero (1989) on the other hand found longer commutes to be associated with jobs-housing mismatches. Housing cost and availability were found to be significant explanatory factors in residential location choice, and in areas where characteristics of the workers did not match the housing stock, more inter-zonal commuting was recorded. These two studies provide evidence, though limited, in support of the hypothesis that jobs-housing mismatches can and does in fact lead to longer commutes. Although there is a clear need for additional empirical studies documenting the relationship between traffic and the

spatial relationship between jobs and housing, it is not within the objectives of this thesis to explore this issue.

Although the majority of the literature makes reference to the ratio of jobs to homes as the working definition of 'balance', it is the balance between the number of people actually seeking jobs in an area and the local availability of jobs which is perhaps most important. In light of this, perhaps a more useful measure is the ratio between resident workers and jobs (Breheny *et al*, 1998). Balance indices, measured as the number of jobs available in a particular municipality per resident worker, have been calculated for each respective municipality and are displayed in Table 3, derived from the origin/destination matrices for the GTA. As expected, due to the limited nature of the sample, a certain degree of error has been introduced as reflected in the rather low index values overall. In light of this, the main objective of this section of analysis to simply examine and comment on relative values in discussing the development of particular areas in terms of having a jobs-housing balance.

As mentioned previously, an index value equal to 1.0 for a specific area signifies a perfectly balanced community, while variation above or below this suggests a particular area is relatively 'job rich' or 'job poor'. According to these standards, the indices suggest that municipalities comprising the Greater Toronto Area appear to be 'job poor', in that the number of resident workers exceed the local availability of jobs. It should be noted at this point that although the relative distribution of employment throughout the GTA is quite accurate, levels of employment concentration within the respective municipalities are under-represented, as indicated by the low index values. Sufficient

explanation for this apparent under-representation lies in the fact that the GTA is a substantial net attractor of trips from surrounding areas outside the boundaries of the GTA as defined in this thesis. Although the 1991 and 1996 surveys were expanded to include information on trips coming into the GTA from areas outside the outer boundaries of the six regional municipalities participating in the 1986 survey, no information on cross boundary work linkages was collected for the latter. To ensure consistency in the data, information on trips beyond the outer boundaries of the GTA as defined in the original survey were excluded. Because a significant number of trips destined for the GTA have origins outside the area (i.e. adjacent communities and large urban areas outside the GTA such as Guelph, Barrie, Cambridge and Kitchener), the overall number of jobs in certain municipalities (i.e. sum of total work trips destined for an area) will be under-represented.

It comes as no surprise that the Metropolitan Toronto Core as a whole, relatively speaking is amongst the leaders with respect to being furthest along the balance scale. It is also worth noting that although this region is amongst the leaders in terms of population density and balance, according to the results of our analysis, its dominance in both respects appears to be deteriorating with time. As evidenced in the previous analysis of section 4.2, the magnitude of trips with an origin in the core and a destination within the high growth municipalities in the suburbs has been increasing. Therefore, if potential employers who have in the past chosen to locate in the core area, are now choosing these suburban locations at the expense of the core, this would be reflected in the overall decrease in the value of the balance indices.

The cities of Hamilton and Oshawa, each being the urban core of their respective

Census Metropolitan Areas, although in the case of the former not to the same extent, have also been experiencing a situation similar to that of Metropolitan Toronto. Both Hamilton and Oshawa were amongst the leaders in terms of being the most balanced in 1986. While the former decreased only slightly in this respect, the latter experienced a decline in the index equal to that of Toronto. Again, as these 'built-up' areas develop with time it appears that they too are perhaps experiencing growth in their suburbs at the expense of the main core area itself.

The townships of Brock, Georgina and Halton Hills were also amongst the most balanced municipalities with values ranging from the high seventies to the low eighties in 1986. Perhaps due to the lower levels of population density in these areas, the close match between resident workers and the local availability of jobs is made possible. Discarding the 1991 figures due to sampling error, as evidenced in the decrease in the index values, it appears that the level of population growth is exceeding local job growth as these townships continue to develop.

It should be noted that only in the case of extremely low index values can we assume an area is largely residential in character. With respect to the high growth municipalities highlighted previously, 4 of the 6 can be classified as extremely 'job poor'. With index values less than 0.30 in the cases of Pickering, Richmond Hill and Markham and as low as 0.12 for Vaughan in 1986, these high growth areas which are increasingly exerting their economic influence on the core area, relatively speaking, appear to be amongst the most 'job poor' municipalities within the Greater Toronto Area. Along with the previous observations in section 4.3, this has been interpreted as evidence in support of the 'urban

development hypothesis'. Although the first steps of development were largely demographic, as reflected in the rates of growth, this initial development in population over the past few decades is perhaps acting as a catalyst to the re-location or new development of economic activities in the same areas. In the case of Vaughan, the significant increase from 1986-96 in the value of the index is perhaps further supporting evidence. The fact that Pickering, Richmond Hill and Markham either experienced a slight decrease in the value of the index or remained stable, has been interpreted as evidence that not only is the population continually migrating to these particular areas, but they are continuing to do so at a higher rate than potential employers.

Although the index values for Mississauga and Brampton suggest an under provision of jobs in comparison to the number of resident workers, again relatively speaking, with index values in the high forties and fifties, compared to the previous municipalities they appear to be further along in the traditional urban development process. In addition to the fact that both municipalities were the outliers in terms of their respective levels of population concentration, such a conclusion has some merit. Considering these municipalities are further developed in terms of residential concentration, according to the urban development hypothesis it only makes sense that the level of economic development should also be more advanced.

Table 3. - Indices of Balance 1986-96

Origin Purpose : Home *Destin Purpose : Work* *Start Time : 24 Hour*	*Balance Indices*		
CSD	*1986*	*1991*	*1996*
Toronto	0.43	0.43	0.42
York	0.28	0.26	0.26
East York	0.13	0.17	0.10
Etobicoke	0.34	0.32	0.28
North York	0.30	0.25	0.24
Scarborough	0.52	0.50	0.45
Core	0.76	0.73	0.71
Brock	0.81	0.65	0.71
Uxbridge	0.51	0.30	0.54
Scugog	0.73	0.56	0.67
Pickering	0.25	0.32	0.25
Ajax	0.34	0.35	0.31
Whitby	0.34	0.37	0.33
Oshawa	0.64	0.58	0.57
Clarington	0.53	0.61	0.65
Georgina	0.82	0.70	0.80
East Gwillim	0.31	0.31	0.32
Newmarket	0.45	0.36	0.41
Aurora	0.36	0.39	0.35
Richmond Hil	0.30	0.29	0.27
Whitchurch-St	0.34	0.35	0.28
Markham	0.22	0.21	0.21
King	0.35	0.32	0.33
Vaughan	0.12	0.19	0.19
Caledon	0.50	0.66	0.47
Brampton	0.58	0.58	0.56
Mississauga	0.46	0.45	0.46
Halton Hills	0.76	0.56	0.71
Milton	0.62	0.53	0.50
Oakville	0.46	0.44	0.39
Burlington	0.56	0.58	0.52
Flamborough	0.46	0.56	0.46
Dundas	0.43	0.20	0.30
Ancaster	0.36	0.34	0.30
Glanbrook	0.21	0.39	0.30
Stoney Creek	0.33	0.38	0.35
Hamilton	0.72	0.69	0.69

4.42 Self-Containment

While the ratio between resident workers and jobs is reflected in the aforementioned indices of balance, self-containment indices are based on actual trip behaviour. Whereas the former represents the potential for internal trip making, the latter measures the extent to which trips actually materialize within a defined geographical area (Cervero, 1995). The main objective of self-contained developments is basically achieving a built form which is self-sustaining, therefore allowing its residents to work, shop and recreate within it. Table 4 below, derived through the application of equations 1.1 and 1.2 to data on the levels of in and out-commuting, is a list of the resulting indices of self-containment.

Equation 1.1 $$\textit{Index of Independence} = \frac{\textit{Internal Trips}}{\sum \textit{In-coming and Out-going Trips}}$$

Equation 1.2 $$\textit{Index of Retention} = \frac{\textit{Internal Trips}}{\sum \textit{Internal and Out-going Trips}}$$

The indices of independence (see equation 1.1), measuring internal trips relative to the sum of the total in-coming and out-going trips, vary from as low as 0.05 and in the case of the core region up to 2.33. With higher index values reflecting a greater degree of self-containment, the results suggest that in terms of self-containment, with an individual value of 1.47 in 1986, the City of Hamilton was the leader in this respect. The index of retention (see equation 1.2), essentially, by ignoring trips into the area, with an upper limit of 1.0 (a case where all resident workers live and work in the same geographical area),

measures the proportion of resident workers employed locally. As illustrated above, the index is calculated by dividing the number of work trips that are internal to an area by the sum of the total internal trips and work trips out. In examining the indices of retention (see Table 6 also), Hamilton recorded the highest index once again at 0.77. Possible explanation for these relatively high values is probably related to the fact that the nations leading steel industry is located in Hamilton and therefore a large proportion of the industry's employees are obviously locals. As was the case with the indices of concentration and balance, the indices of self-containment and retention also decreased with each subsequent survey. In light of this, one might conclude that as people move to the suburbs and jobs have began to follow, people who still reside in the main city, for various reasons are perhaps increasingly choosing to take advantage of employment opportunities outside the built up area. Secondly, perhaps more people are choosing to reside in suburban locations but continuing to commute to the urban core. Either scenario or a combination of both could essentially be responsible for the downward trend in the respective index values. A similar trend is evident in the case of Metropolitan Toronto. Although in 1986 with a self-containment index value as high as 2.33 and a retention index of 0.87, by 1991 these values would decrease substantially. In addition to this, the index values for the municipalities of Mississauga, Markham, Vaughan and Pickering, immediately adjacent to the core region, either increased or remained stable. Therefore, as the core's ability to retain trips internally and attract trips from external locations continues to decline, perhaps its longstanding economic dominance in this respect is shifting to these rapidly developing suburban municipalities. Once again, the City of Vaughan, despite scoring very low in the case of self-containment and relatively low in the

case of retention in 1986, recorded the greatest increase between subsequent surveys in both cases (as with the indices of concentration and balance). Therefore not only is Vaughan the outlier in terms of population growth and the level of concentration, the results suggest that it also appears to be the most rapidly developing in terms of becoming a more balanced, self-contained built form.

The previous analysis of the jobs/housing balance and self-containment in the context of the GTA, offers additional evidence in support of our previous conclusions. The relative decline in both population and commuter flows together, emphasize the faltering dominance of the metropolitan core, in terms of attracting and retaining both the masses and economic activity. As long as a combination of populations, industry and other forms of business continue to suburbanize and take advantage of the relatively cheaper, more spacious environment, available only outside the metropolitan core, the continuation of this trend is inevitable.

Table 6. - Indices of Self-Containment 1986-96

Origin Purpose : Home *Destin Purpose : Work* *Start Time : 24 Hour*	*Independence*			*Retention*		
CSD	*1986*	*1991*	*1996*	*1986*	*1991*	*1996*
Toronto	0.55	0.56	0.51	0.67	0.68	0.64
York	0.16	0.13	0.13	0.20	0.17	0.17
East York	0.08	0.11	0.06	0.15	0.19	0.13
Etobicoke	0.26	0.24	0.21	0.35	0.33	0.31
North York	0.21	0.18	0.17	0.29	0.29	0.28
Scarborough	0.38	0.36	0.32	0.37	0.37	0.34
Core	2.33	1.82	1.57	0.87	0.84	0.82
Brock	0.79	0.41	0.45	0.49	0.35	0.35
Uxbridge	0.27	0.20	0.28	0.27	0.28	0.27
Scugog	0.40	0.29	0.35	0.32	0.27	0.30
Pickering	0.13	0.18	0.12	0.17	0.23	0.16
Ajax	0.20	0.18	0.15	0.24	0.21	0.18
Whitby	0.21	0.22	0.19	0.26	0.26	0.23
Oshawa	0.81	0.61	0.53	0.60	0.53	0.47
Clarington	0.41	0.32	0.29	0.39	0.28	0.25
Georgina	0.41	0.28	0.36	0.31	0.24	0.28
East Gwillim	0.06	0.06	0.07	0.06	0.07	0.08
Newmarket	0.32	0.20	0.27	0.34	0.24	0.31
Aurora	0.21	0.22	0.18	0.25	0.25	0.22
Richmond Hill	0.18	0.15	0.15	0.23	0.19	0.21
Whitchurch-St	0.19	0.18	0.15	0.23	0.21	0.19
Markham	0.14	0.15	0.15	0.23	0.26	0.26
King	0.11	0.10	0.11	0.13	0.11	0.13
Vaughan	0.09	0.13	0.15	0.19	0.24	0.27
Caledon	0.19	0.33	0.23	0.19	0.28	0.24
Brampton	0.50	0.48	0.42	0.44	0.42	0.39
Mississauga	0.42	0.42	0.45	0.45	0.46	0.48
Halton Hills	0.57	0.25	0.43	0.41	0.24	0.34
Milton	0.51	0.45	0.42	0.43	0.42	0.42
Oakville	0.40	0.33	0.30	0.43	0.37	0.36
Burlington	0.49	0.56	0.44	0.44	0.48	0.43
Flamborough	0.23	0.20	0.21	0.24	0.19	0.22
Dundas	0.19	0.06	0.15	0.20	0.07	0.19
Ancaster	0.18	0.19	0.13	0.21	0.23	0.16
Glanbrook	0.06	0.10	0.11	0.07	0.10	0.12
Stoney Creek	0.18	0.20	0.18	0.21	0.23	0.21
Hamilton	1.47	1.21	1.13	0.77	0.72	0.69

5.0 CONCLUSIONS

A number of conclusions have been drawn from the previous analysis of chapters 3 and 4, with respect to trends in the redistribution of both the population and economic activity in the GTA. The results of both chapters offer convincing evidence in support of the conclusion that *contrary to traditional trends favouring metropolitan areas*, the patterns in both the redistribution of the population and economic activity are becoming less oriented to this area, while favouring specific peripheral areas outside the metropolitan core itself.

Initially, from the analysis of chapter 3, we concluded that the overall pattern with respect to the redistribution of population was one of deconcentration for the GTA as a whole. Upon further review though, we find evidence in support of the hypothesis that the observed trends can simply be interpreted as the continuation of the process of suburbanisation, only at an accelerated level. Evidence gathered in support of the previous hypothesis began with our analysis of individual growth rates at the level of the municipality. First, the cities of Vaughan, Markham, Mississauga and Brampton, each located immediately adjacent to the metropolitan core, in terms of the average rate of growth of their respective populations, experienced the most substantial levels of change. Therefore, although municipalities further removed from the direct influence of the core also experienced growth, it is the previously mentioned municipalities which stand out as the major growth areas of the GTA in this respect. Second, outliers in terms of the

overall change in the level of concentration as demonstrated through the observed change in the value of the Hoover index of concentration were determined. While the Cities of Toronto and Hamilton, the urban cores of their respective census metropolitan areas, were determined to be amongst the outliers in terms of the level of deconcentration, outliers in terms of concentration once again included the municipalities of Brampton, Mississauga and Markham. Therefore, in terms of population, not only are these particular municipalities experiencing the highest growth rates, but each has experienced levels of concentration unmatched elsewhere in the GTA. Third, although our initial analysis of the core/periphery suggested that perhaps counterurban tendencies had developed, after overbounding the core to include immediately adjacent municipalities, this was no longer the case. In light of this and the previous results, we conclude that it is mainly the municipalities immediately adjacent and therefore under direct influence of the metropolitan core which are responsible for the observed trends in the redistribution of population from the core areas of the GTA to the periphery.

In realizing the importance of studying economic activity alongside any trends in population redistribution, we set out to do this through the analysis of TTS data for the GTA. The results from the analysis of commutes in chapter 4, lend additional support to the former conclusions. From our initial analysis of core-periphery activity, it has been demonstrated that the total work-trips with a core origin, as well as the total number of inter-core trips, each decreased between 1986-96. As mentioned previously, this is not surprising since it was determined in chapter 3 that the Metropolitan Toronto core area experienced a substantial decline in population between 1971-91, therefore if less people

are living in the core, it only makes sense that less work-trips will have an origin in this particular area. More interesting though, is the fact that in ascertaining the nature of commuter interaction between the metropolitan core and the peripheral areas we find the total trips with both a core origin and a peripheral destination, also increased. In addition, total commutes in the opposite direction also decreased. Therefore, both observations emphasise the relative decline in commuter flows to the core area, although in terms of net inflows, overall the core continues to dominate. As a result of the previous observations, it has been concluded from our analysis of core-periphery activity that patterns in the redistribution of economic activity in the GTA are similar to those previously determined in relation to the redistribution of the population. Therefore, not only is the core losing its traditional dominance with respect to attracting the masses, but these preliminary results suggest that in terms of economic activity a similar pattern has developed. These observations coincide with observations made by Gera et al. (1978) who conclude that as a result of the development of both residential and work nodes in peripheral areas, commuting to the metropolitan core gradually decreases.

Although as in chapter three, one might prematurely conclude from this preliminary analysis that the redistribution of economic activity discussed above is evidence of counterurbanization, a more detailed examination suggests otherwise. Through the analysis of the specific municipal destinations of those trips originating in the core, with a destination in the periphery, it has been determined that it is a select few municipalities which are responsible for the bulk of this trend. Once again, the municipalities of Vaughan, Markham, Mississauga and Brampton together accounted for

a substantial 80% of the trips coming from the core in 1986. As stated above, the magnitude of trips going from core to periphery increased, therefore it is possible that these additional trips could have destinations outside these high growth municipalities. In light of this, these additional trips were examined separately. The results show that from 1986-91, Vaughan, Markham and Mississauga, together accounted for over 70% of these additional trips, between 1991-96 the City of Vaughan itself would account for over 50% of the additional trips. In light of this it has been concluded that these particular municipalities, located immediately adjacent to the metropolitan core are mainly responsible for the overall patterns in the redistribution of both population and economic activity from the core area to the periphery.

Finally, our preliminary analysis of balance and self-containment offered some finalizing evidence in support of the previous conclusions. Although in 1986, the Metropolitan Toronto core was amongst the leading areas in terms of being balanced and self-contained, subsequent surveys demonstrate both the gradual development or in certain instances stagnation of suburban municipalities and the decline of the core area in both respects.

It was the main objective of this thesis to study the counterurbanization phenomenon in a Canadian context. The results suggests that for the most part any patterns which could be interpreted as possible evidence of the existence of counterurban patterns can be explained through the 'metropolitan overspill' hypothesis, which simply explains these patterns as the continuation of the process of suburbanisation. As population growth within municipalities outside the metropolitan core continues, this

development creates a demand for other types of activity in the periphery (i.e. various services, commercial and industrial jobs and recreational activities). As this process continues, identifiable centres develop outside the inner core and become the focus for employment, administrative and commercial activities. The resulting urban form increasingly resembles a multi-nucleated city structure. Although the core continues to provide a focus for populations and jobs, some of its dominance in these respects is shifted to these newly developed centres, leading to the observed patterns in the redistribution of economic activity and population away from the urban core.

Although the process counterurbanization has not been documented in the context of the GTA, the trends which have been documented should still have important implications for the logic and design of regional development policies for both core and peripheral areas. It has been demonstrated in this thesis that in addition to personal preferences shifted in the direction of peripheral locations, as these areas continue to consolidate, apparently economic activities (ie. commercial and industrial jobs) have done the same. These patterns of development coincide with the 'Official Plan for the Urban Structure: Metropolitan Toronto, 1984', in which there are three types of centres designated. First, there is the 'Central Area', the dominant area for the concentration of business, government, institutions and cultural and recreational activities. Second, 'Major Centres' are multi-functional in land use, and compact and pedestrian oriented in design. Finally, 'Intermediate Centres' which although smaller in scale, have similar characteristics to the core. In light of this, we conclude that government policy should continue to be directed in such a way as to maximize the advantages of this current

polycentric system of development, while ensuring that the negative impacts of this growth are minimized.

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