

SMALL-TOWN VIABILITY AND THE RURAL ECONOMY: SOUTHERN MANITOBA 1971-81

BY

ADISON LEE

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF ARTS

THE UNIVERSITY OF MANITOBA
WINNIPEG, MANITOBA
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ABSTRACT

The growing concern with balanced regional development has led the politicians to pay attention to the redistribution of socio-economic wealth between the urban and rural regions. Regional development policies, on the one hand, are designed to maximize socio-economic well-being of a region regardless of rural or urban distinction. On the other hand, they are also intended to minimize the spatial differences in income, employment opportunities, living standards, and population growth between the urban and rural settlement systems.

Within the last two decades, the formulation and implementation of regional development policies in Manitoba had become even more complicated by the issue of population reversal away from metro Winnipeg to rural Manitoba small towns. Although regional planners welcome this geographic redistribution of economic and social activities, the underlying causes and consequences of such a phenomenon are not well understood.

In this thesis, attempts have been made to uncover the answers of such an unusual phenomenon in order to provide rational guidance for future small-town development. This research adopts the premises that regional planners ought to include not only economic factors but also social factors and spatial components in a comprehensive regional analysis. Equally important to the objective quality-of-life and economic activity indicators, the subjective components measuring rural residents' preferences for small-town living are also analyzed in depth.

The phenomenon of small-town population revival and levels of economic activities are reviewed in the first four chapters of this thesis and together form regional comparisons among the U.S.A., Canada, and Manitoba. The questions of small-town viability and rural economy in the Rural Southern Manitoba region are analyzed by means of statistical modelling in Chapter Five. Throughout that chapter, small towns with different population thresholds and characteristics are incorporated for formulating various regional policies. In the last Chapter, policy implications directed to population growth, manufacturing development, and tertiary employment for small-town development are identified.

The empirical findings revealed that subjective factors are positively linked to small-town population growth although they are not correlated with economic development. Based on the findings, some important policy implications are recommended, albeit couched to take into account local needs and resources.

In essence, this work provides the understanding of causes and consequences of small-town growth, future research direction in this area, and regional planning policies for the Manitoba government.

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REGIONAL RESEARCH AND THE STUDY OF SMALL-TOWN VIABILITY

Urbanization has been a major factor in the development of societies throughout the world since the turn of the century. Before 1850 no society could be described as predominately urbanized. Yet today, urbanized cities can be found from the underdeveloped countries to the very highly-industrialized nations. Associated with the urbanization process are flows and counterflows of people from small villages to large cities; from the inner cities to the suburbs; from the suburbs to the countryside; and from the suburbs back to the inner city neighbourhoods. Obviously there is a movement of population continuously searching for ideal places to live and stay. Prior to 1970, the majority of the people settled down in the metropolitan centres. While everyone at that time thought that rural to urban migration was an inevitable trend, census material released throughout the 1970s indicated that small towns across the North American continent were the growth centres. The unexpected population turnaround put most regional planners in a new dilemma. On the one hand, the old problems remained; namely, those of metropolitan areas faced with issues of declining functions of central business districts, urban sprawl, ghetto expansion, air and water pollution, traffic congestion, social disorder and shrinking city tax revenue due to the flight of industrial, commercial and retail establishments.¹ On the other hand, however, migration turnaround also

¹ Robert E. Firestine (1977), "Economic Growth and Inequality, Demographic Change, and the Public Sector Response" In D.C. Perry and A. J. Watkins eds., The Rise of Sunbelt Cities, Beverly Hills, Cal.: Sage, pp. 191-210.

brought along undesirable side effects for small towns. For example, some communities worried about the destruction of agriculturally-productive lands by urban expansion.² Other people were concerned that the new migrants into nonmetropolitan areas were older and less skilled than those who had left. Moreover, Summers points out that industrial development does not necessarily bring with it increased community well-being. Some new manufacturing plants often cost the rural community more than it gains.³ Other negative consequences are also cited by a number of writers. The consequences may be manifested through competition in work institutions,⁴ in alteration of the stratification system,⁵ in the residential segregation of newcomers and oldtimers,⁶ in possible disagreements on priorities for neighbourhood services and institutions,⁷ and possible conflicts in cultural interests, taste, and life styles.⁸ Nevertheless, one may also argue that the population growth in the nonmetropolitan areas can also bring

² William Alonso (1977), "Surprises and Rethinkings of Metropolitan Growth: A Comment." International Regional Science Review, vol.2, no. 2, p. 172.

³ Gene F. Summers (1976), "Small Towns Beware: Industry Can be Costly." Planning, no.4, pp. 20-21.

⁴ Edna E. Raphael and Tom Gillaspay (1974), "Population Redistribution and Industrial Change in Nonmetropolitan Labor Forces" in Wilbur Zelinsky et al. eds., Population Change and Redistribution in Nonmetropolitan Pennsylvania, 1940-1970. Report Submitted by Population Issues Research Office, Pennsylvania State University, to the Center for Population research, National Institute of Child Health and Human Development, Washington, D. C.

⁵ A. C. Sectorsky (1955), The Exurbanite. New York: J. B. Lippincott.

⁶ Wilbur Zelinsky, et al. eds., op. cit.

⁷ Gordon F. De Jong (1974), "Residential Preference Patterns and Population Redistribution" In Wilbur Zelinsky et al. eds., op. cit.

⁸ A. C. Sectorsky (1955), op. cit.

economic prosperity, higher living standards, greater community satisfaction, better social services as well as a balanced growth between urban and rural regions if appropriate planning policies are well administered. Unfortunately, according to the population estimates for 1980-83, urban America was growing faster than rural America again. This latest phenomenon leads one to suspect that the population turnaround in the 1970s is definitely terminated. Nevertheless, the controversial and unpredicted population phenomenon has important policy implications for both the rural economy and rural planning.

As a microcosm of the North American situation, Manitoba also had experienced the effects of population reversal in the 1970s. However, no up-to-date population census information is available to indicate that revived urban growth had happened in Manitoba in the early 1980s. Without a comprehensive study on the phenomenon of population turnaround and the causes of the latest urban growth, it is impossible to effectively plan for Manitoba small towns. Furthermore, the positive and negative effects of population turnaround which may occur in rural Manitoba are not well known. Should we encourage developments in rural areas? Should we re-allocate more resources for rural planning? Will the phenomenon of population turnaround in rural Manitoba persist in the 1980s despite the U.S. trend? What are the causes and consequences which may affect small-town viability? What are the long-term and short-term regional planning and policy implications for the Manitoba government? For the above reasons, research into Manitoba small-town population change is both timely and justified.

In this research paper, five major emphases will be presented in a systematic fashion. They are:

1. Review of literatures on recent nonmetropolitan growth. The path breaking work undertaken by U.S. researchers will provide some insights and perspectives for Canadian small-town study. Although some regional growth patterns in the U.S. may have somewhat different causes and effects as compared to Canada, nevertheless, the close socio-economic and demographic similarities between North Dakota and Manitoba as well as Michigan and Ontario may well mirror each other. Consequently, an overview of the U.S. situation is a necessary prerequisite for considering the Manitoba and Canada situations.
2. Examining the historical nonmetropolitan growth in Canada with special emphasis on Manitoba. To understand the current population movement, anticipate future migration trends, and formulate government policy for rural development, one should not ignore the importance of historical development of a region. Since population distribution is a reflection of socio-economic and demographic structures in a system, the understanding of temporal migration trends will enable us to discern the evolution of population changes in both metropolitan and nonmetropolitan areas. Unique local factors may also contribute to the development of migration patterns that are somewhat different from other regional migration trends. Therefore, the formulation of local development policy should be sensitive to its local needs. Without giving consideration to local factors and

historical background, one may not be able to formulate appropriate local policy.

3. Analyzing the model of small-town viability in the prairie provinces. Various projects have analyzed and characterized small-town viability at a national scale. However, some significant but limited work has been done on Manitoba. This section will focus on economic as well as non-economic factors that influence small-town growth or decline in Manitoba. Moreover, theoretical and explanatory work will be examined in the small-town viability model-building stage.
4. Determining a model for nonmetropolitan growth in Manitoba. Since the analysis adopts a quantitative approach, elaborations of methodology and statistical techniques are necessary. In addition, a detailed discussion on the selection of variables and observations will follow. Findings of nonmetropolitan growth will also be presented in depth. Finally, a calibrated nonmetropolitan growth model will be proffered for Manitoba.
5. Policy implications and future research. Much more work needs to be done on long-term regional planning for rural Manitoba. Future research should not only focus on economic expansion, but attention to the improvement of community satisfaction is a prime concern.

Collectively, then, this dissertation provides a comprehensive study of the causes and consequences of the recent small-town viability question in rural Manitoba.

THE NORTH AMERICAN NEXUS

DOCUMENTATION OF THE POPULATION TURNAROUND AND NONMETROPOLITAN GROWTH IN THE U.S.A.

For decades the urbanization of economic opportunities coupled with farm mechanization led simultaneously to an increasing concentration of population in urban areas and decreasing concentration in rural areas. With a declining need for farm labour, high rural fertility rates and economic stagnation, the employment opportunities in nonmetropolitan areas have traditionally fallen far short of rural needs. The movement off the farm and into the cities that was inherent in this process was sustainable because of the advantages to firms of location in large urban centres. There, geographic concentration allowed firms to take advantage of scale and agglomeration economies, and improved access to markets and suppliers allowed them to earn higher profits.⁹ This movement, together with natural increase in population and international migration, fed the development of the national urban economy.¹⁰

Although there was nonmetropolitan population revival occurring in the 1970s, there is recent evidence, however, of a new trend (1980-1983) in which metropolitan areas are growing more rapidly and gaining net

⁹ James A. Chalmers and Michael J. Greenwood (1977), "Thoughts on the Rural to Urban Migration Turnaround," International Regional Science Review, vol. 2, no. 2, p. 167.

¹⁰ Peter A. Morrision and Judith P. Wheeler (1978), "Rural Renaissance in America? The Revival of Population Growth in Remote Areas," Population Bulletin, vol. 33, no. 2, April, p. 3.

migrants at a higher rate than is the nonmetropolitan territory. If this trend goes on, then the past notion of nonmetropolitan population turnaround and revival of small towns can no longer serve as guides for understanding future population movement and small-town growth in the U.S.A. Therefore, these two contradictory phenomena deserve better attention and detailed investigation if appropriate regional policies need to be formulated.

Early Migration and Industrialization in the U.S.A.

Historically, population movement has followed the path of industrial development. In the pre-industrial era in North America, the population of towns was very small, and manufacturing industries were clustered around water-fronts for river or sea transportation. In the early industrial era, new factories had to locate close to the city where business activities, labour supplies, raw materials, and internal markets were available. The rapid development of the North American railroad network in the middle and late nineteenth century reinforced the advantages of central areas in most urban concentrations. As noted by Pred, the railroad was particularly influential in the evolution of manufacturing districts near the core of midwestern metropolises.¹¹ New manufacturing technology continued to increase at an exponential rate throughout the nineteenth century, resulting in an increasing scale of operation of factories that continually required more land on which to expand. Consequently, many small factories were forced to amalgamate or close down. At the same time, the larger factories could not find enough

¹¹ A. Pred (1964), "The Intrametropolitan Location of Manufacturing," Annals of the Association of American Geographers, vol. 54, pp. 165-180.

cheap space in the traditional railroad terminal or water-front locations, and thus, were forced to decentralize. The rate of decentralization was, however, limited by the general lack of low-cost urban transit facilities, which kept many manufacturers close to the traditional work and residential areas around the CBDs (Central Business Districts). The era of late industrial development (1920s to 1960s), is characterized by the decentralization of manufacturing activity within metropolitan areas. This was made possible by two major factors. First, innovations in public transportation permitted the urban areas to spread. Secondly, the provision of cheap industrial land, particularly by railroad companies, allowed firms to overcome their site limitations.¹² During this period the rate of decentralization varied quite considerably between metropolitan areas, for the many factors that encouraged the centrifugal movement of manufacturing activity were counterbalanced by an equally large number of centripetal forces that encouraged the retention of industrial activity in areas close to the centre of the city.¹³ Factors such as existing city infrastructures, transportation, and locational advantages remained as incentives for urbanization.

The so-called post industrial era, from the mid-1960s onward, has been characterized by several new features. The first is the declining overall contribution of manufacturing as a generator of employment in

¹² M. Yeates and B. Garner (1980), The North American City, San Francisco: Harper and Row Publishers, pp. 343-375.

¹³ For a comprehensive list of centrifugal and centripetal forces affecting the location of manufacturing activity in the Mid-1950s see Kitagawa, E. M., and D. J. Bouge, Suburbanization of Manufacturing Industry Within Standard Metropolitan Statistical Areas. Oxford, OH: Scripps Foundation, 1955.

the North American economy. The second is the creation of new manufacturing employment by multinational corporations. The third is the acceleration of decentralization of manufacturing employment in metropolitan areas. Since the above factors are directly or indirectly related to population reversal and nonmetropolitan growth, they will be discussed in depth later.

Thus far, upon reviewing the courses of industrial development, one could notice a close relationship between migration pattern and economic development. For instance, in the middle industrial era, as metropolitan urbanization was developed side-by-side with industrial centralization, the dominant migration pattern was from hinterland to central city. By way of contrast, in the post-industrial era the acceleration of industrial decentralization was accompanied by metropolitan out-migration.

Recent Metro and Nonmetro Population Trends in the U.S.A.

It is undeniable that some metropolitan areas experienced slower growth rates than their nonmetropolitan counterparts in the 1970s. However, the population turnaround does not mean that metropolitan areas have shifted from population growth to decline, or that nonmetropolitan areas similarly have switched from decline to growth.¹⁴ Not only have

¹⁴ Glenn V. Fuguitt and Paul R. Voss (1979), Growth and Change in Rural America, Washington D. C., The Urban Land Institute. The authors commented that some individual metropolitan areas have experienced some population losses in recent years, and the number of such areas appears to be increasing. Only one of the 25 largest SMSAs declined in size between 1960 and 1970 (Pittsburgh), while nine registered population decline between 1970 and 1975: New York, Los Angeles--Long Beach, Philadelphia, St. Louis, Pittsburgh, Newark, Cleveland, Seattle--Everett, and Cincinnati (U.S. Bureau of Census, 1977: Table 3). Likewise, the shifting of net migration has resulted in a switch

both sectors witnessed continuous growth but also it is still the case that metropolitan areas annually absorb the largest increment of growth. For example, U.S. metropolitan counties captured 63.2 percent of growth between 1970 and 1975, at the height of the 'turnaround'. Since 73 percent of the population was metropolitan in 1970, however, these areas received less than their proportionate share of growth.¹⁵

The net migration pattern in the U.S.A. from 1970 to 1974 evinced the fact that nonmetropolitan counties adjacent to metropolitan areas had the highest gain in net migration (3.6 %). The nonadjacent counties accounted for a 2.3 % increase. The lowest increase applied to the remaining metropolitan counties. In terms of percentage gain in net migration, they only accounted for 0.3 %.¹⁶ Therefore, it would be misleading to assume that there was widespread abandonment of urban and suburban territory. On the contrary, it would be more accurate to say that the growth was congregated on the metropolitan fringe.

Nonmetropolitan population decline was forecast by all the U.S. official projections made during the 1960s. But the change from decline to gain showed up in the 1973 county population estimates, and by that time the change was apparent across the nation.¹⁷ Obviously, population turnaround did not happen in a short period of time. One may then ask,

from decline to growth for a large number of individual nonmetropolitan counties.

¹⁵ Ibid., pp. 3-4.

¹⁶ Calvin L. Beale (1976), "A Further Look at Nonmetropolitan Population Growth Since 1970," American Journal of Agricultural Economics, vol. 58, no. 5, p.954.

¹⁷ John Long (1980), "Population Decentralization in the United State," U.S. Bureau of the Census Monograph, Washington, D.C.: U.S. Government Printing Office.

'how could this phenomenon have gone on without notice?'. Morrison and Wheeler suggest the possible explanation for this invisible trend:¹⁸

The onset of population decline has taken most of the residents of affected SMSAs unawares, largely because during the last decade the effects on metropolitan growth of two distinct demographic trends canceled each other out. Three years ago, William Alonso¹⁹ called attention to the fact people have been leaving SMSAs for some time; during the 1960s, nearly 40 percent of all metropolitan areas recorded net out-migration. At the same time, the birth rate was high and this net outflow was more than offset by natural increase; nearly all SMSAs continued to register population gains even though people were leaving. When birth rates dropped in the 1970s, natural increase was no longer sufficient to offset out-migration, and the previously unnoticed trend became apparent in many places...

Frisbie hypothesized that population turnaround was partially due to technological progress. With the aid of new technology, rising productivity was made possible in the nonmetropolitan economy. This productivity functioned both to attract and to retain population. Consequently, both declining nonmetropolitan out-migration and increasing nonmetropolitan in-migration were responsible for the 1970s pattern of nonmetropolitan population growth.²⁰ The remaining component of differential population is natural increase.²¹ But as the current levels of natural increase are quite low in both metropolitan and nonmetropolitan areas, variations in population growth can be largely attributed to variations in net migration.

¹⁸ Peter A. Morrison and Judith P. Wheeler (1978), op. cit., p. 8.

¹⁹ William Alonso (1973), "Urban Zero Population Growth," Daedalus, vol. 102, no. 4, pp. 191-206.

²⁰ W. Parker Frisbie (1975), "Components of Sustenance Organization and Nonmetropolitan Population Change: a Human Ecological Investigation," American Sociological Review, vol. 40, pp. 773-784.

²¹ Peter A. Morrison (1975), The Current Demographic Context of National Growth and Development. Santa Monica: The Rand Corporation, p. 5514.

Vining and Kontuly also documented a comparable reversal in net migration patterns in some other developed countries such as Japan, Sweden, Norway, Italy, Denmark, New Zealand, and Belgium.²² Growth of rural areas proximate to urban regions was also evident in the United Kingdom,²³ Canada,²⁴ and Australia.²⁵

RECENT NONMETROPOLITAN POPULATION TREND BY REGIONS IN THE U.S.A.

The increased return movements of people from large cities to small towns and the decreased out-migration from nonmetropolitan areas to metropolitan centres put a new complexion on U.S. population inquiries. Using data from the 1975 Current Population Survey, Tucker confirmed that in 1970-1975 there was a reversal of the traditional net migration between metropolitan and nonmetropolitan areas. There was net in-migration of 1,600,000 persons to nonmetropolitan areas, in contrast to net out-migration of 350,000 persons from these areas. Reversal was due to a 23 % increase in the the number of out-migrants from SMSAs, but of almost equal importance was a 12 % decrease in the number of movers

²² Daniel R. Vining and Thomas Kontuly (1977), "Population Dispersal from Major Metropolitan Regions: An International Comparison." Regional Science Research Institute Discussion Paper, No. 100 (September), Philadelphia.

²³ Roy Drewett, John Goddard, and Nigel Spence (1976), "Urban Britain: Beyond Containment," pp.43-79 in Brian J. L. Berry (ed.), Urbanization and Counterurbanization, Urban Affairs Annual Reviews, vol. II, Beverly Hills, Calif: Sage Publications, Inc.

²⁴ Roderic P. Beaujot (1978), "Canada's Population: Growth and Dualism," Population Bulletin 33(2), April. Washington, D.C.: Population Reference Bureau, Inc.

²⁵ L. S. Bourne and M. I. Logan (1976), "Changing Urbanization at the Margin: The Examples of Australia and Canada." pp. 111-143 in Brian J. L. Berry (ed.), op. cit.

from nonmetropolitan territory.²⁶

In this section, examination of population changes between 1950 and 1974 will be undertaken. In particular, the geographic basis and selected factors associated with differential growth and migration will be examined. In the 1940s and 1950s, rapid urbanization expanded to the West and South owing to the war-inspired decentralization of defence spending. On the other hand, with few exceptions, most nonmetropolitan counties experienced population decline. Examples of these exceptions were: the Pacific Coast states, where resource-based industries, expansion of new irrigated land, and rapid growth of smaller cities offset rural agriculture; Florida; and the heart of 'megalopolis', where local decentralization was already occurring. From 1950-1960, growth had shifted to suburban countries around the large metropolitan areas in the Northeast. Central county losses prevailed in many industrial states with large metropolitan areas. Traditional nonmetropolitan losses were dominant in 24 mainly peripheral states and in so-called "sunbelt" states. By the mid-sixties, suburban dominance became more common (10 states). Nonmetropolitan losses remained dominant in 22 states. In the late 1960s, central metropolitan losses had become dominant in 23 states east of the Rockies. Nonmetropolitan gain prevailed in 12 northeastern states and in 6 western and "sunbelt" states but losses prevailed in the other states.

²⁶ C. Jack Tucker (1976), "Changing Patterns of Migration between Metropolitan and Nonmetropolitan Areas in the United States: Recent Evidence," Demography, vol. 13, p. 435.

As intimated, however, population reversal became more apparent in the 1970s. Dramatic nonmetropolitan gains occurred in 22 states although they were not dominant in other states. Suburban growth continued to be important but was more likely to be dominant in peripheral than in northeastern states. Central metropolitan losses became dominant in 12 northeastern states and occurred in 15 other states.²⁷

To explore these state variations, Beale and Fuguitt classified nonmetropolitan counties of the U.S. into 26 regions by grouping together State Economic Areas reasonably similar in economy, history, physical setting, settlement patterns and culture.²⁸ These regions are shown in Figure 1. Figures 2 and 3 are used to show annual rates of nonmetropolitan population change and net migration between 1950 and 1974 respectively. The bars shown for each region refer to their "nonmetropolitan" areas only.

To make the map of net migration more meaningful, I will regroup the 26 regions into 3 main categories. The first category includes the regions experiencing continuous in-migration. The second category embraces those regions displaying continuous out-migration while the last category incorporates the regions which demonstrate a reversal from

²⁷ Richard L. Morrill (1980), "The Spread of Change in Metropolitan and Nonmetropolitan in the United States, 1940-1976," Urban Geography, pp. 118-129.

²⁸ Calvin L. Beale and G. V. Fuguitt (1975), "Population Trends in Metropolitan and Nonmetropolitan Cities and Villages in Subregions of the United States." Centre for Demography and Ecology Working Paper 75-30.

Figure 1

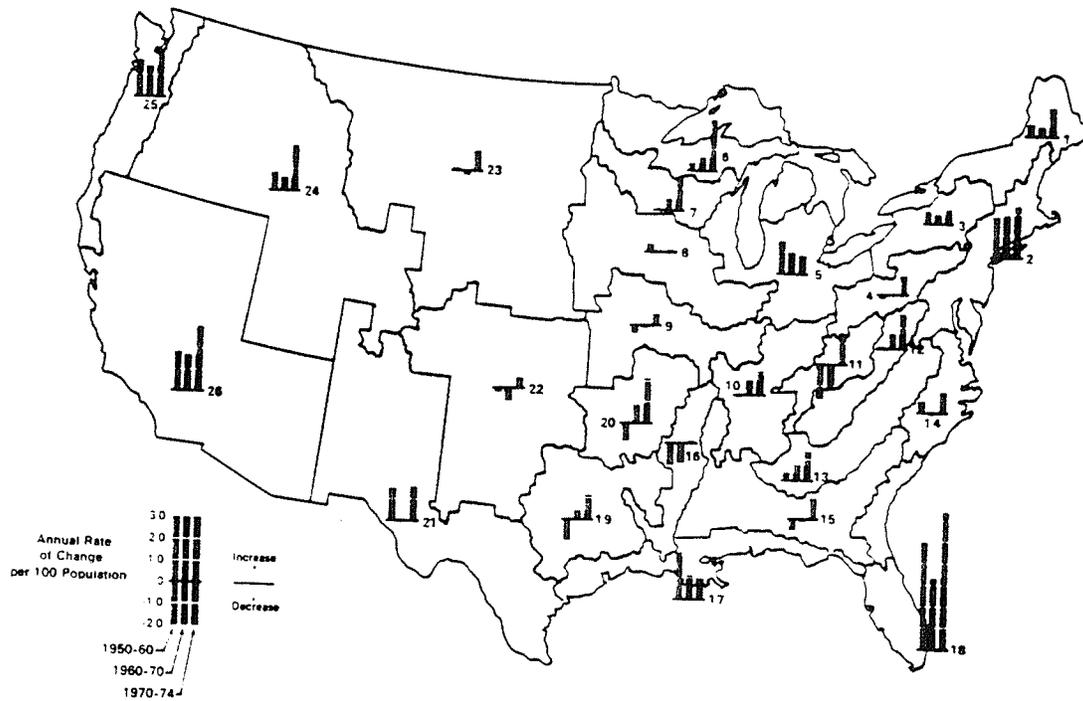
Regions for the Analysis of U. S. Nonmetropolitan
Population Change



Source: adapted from C. L. Beale and G. V. Fuguitt. The New Pattern of Nonmetropolitan Population Change. CDE Working Paper 75-22 (Madison, Wis.: Centre for Demography and Ecology, University of Wisconsin, 1975).

Figure 2

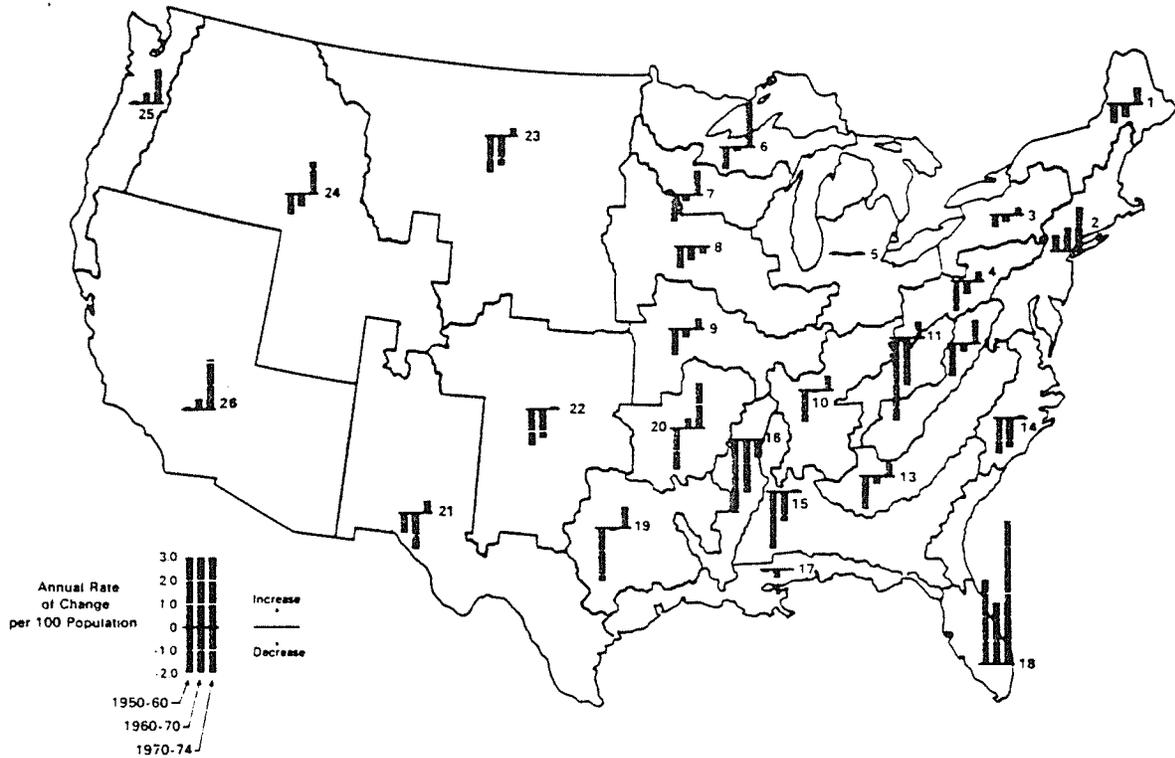
Annual Rates of Nonmetropolitan Population Change for
26 U.S. Regions: 1950-60, 1960-70, 1970-74



Source: see Figure 1

Figure 3

Annual Rates of Nonmetropolitan Net Migration for
26 U.S. Regions: 1950-60, 1960-70, 1970-74



Source: see Figure 1

out-migration to stability or in-migration.

1. Continuous In-migration Regions. The Northeastern Metropolitan Belt (No.2), Florida (No.18), Northern Pacific Coast (No.25), and the Southwest (No.26) all had rapid nonmetropolitan net in-migration increase between 1950 and 1974. The Northeastern Metropolitan Belt was an exporter of population to the South and the West during 1970-1974. However, nonmetropolitan counties within this region showed an increase of net in-migration. The Northern Pacific coast has resource-based industries and with the expansion of new irrigated land and rapid growth of smaller cities, it offset the loss of rural farm population. Traditionally, the Southwest, especially California, has been the primary destination of western migration. From the Gold Rush in 1849 to the great exodus from the Dust Bowl in the 1930s to a huge migration of people seeking aerospace jobs and bungalows in the San Fernando Valley during and after World War II, in-migration has been as characteristic of California as its benign sun, scalloped coastline and pragmatic style of living.²⁹ Florida started decentralization in the 1940s and continues to serve as a favourite retirement colony. According to Biggar,³⁰ elderly migrants were highly attracted towards three states -- Florida, California and Arizona -- which together received three-quarters of all those migrants.

²⁹ Lindsey Robert (1978), "Young are Swelling a New Migration to California," New York Times, Feb. 19, pp. 1 and 65.

³⁰ Jeanne C. Biggar (1980), "The Sunning of America: Migration to the Sunbelt," Population Bulletin, vol. 34, p. 19.

2. Continuous Out-migration Regions. The Central Corn Belt (No.8), still undergoing considerable agricultural adjustments, was one of the two regions which experienced net out-migration in the post-1970 period. The Mississippi delta region (No. 16), with a large black population, was another area of rapid out-migration in the 1950s. By the 1970s this area was still experiencing a net migration loss, but at a considerably reduced rate over the earlier time.

3. Reversal from Out-migration to Stability or In-migration Regions. There are a number of regions that had their population shift from considerable out-migration in the earlier periods to a modest gain of in-migration for the later time periods. The regions which experienced such major population turnaround are the Southern Interior Uplands (No. 10), East Texas and Adjoining Coastal Plain (No. 19), Ozark-Ouachita Uplands (No. 20), Northern New England-St. Lawrence (No. 1), Upper Great Lakes (No. 6), Southern Appalachian Coal Fields (No. 11), and the Rocky Mountains, Mormon Valleys and Columbia Basin (No. 24).

The predominantly white areas in the Middle South (No.s 10,19,20) were well along in their shift from agriculture by 1960. During the succeeding decade they had rapid nonagricultural economic growth, being major beneficiaries of the decentralization trend of manufacturing that took place in the 1960s. The Ozark-Ouachita Uplands obtained the spin-off from the extensive development of recreation and retirement districts.

Prior to 1960, all these areas had a substantial population loss. Another two areas shifting from net out-migration to steady net in-migration were the Northern New England-St. Lawrence region (No. 1) and Upper Great Lakes region (No. 6). The growth of the former region was induced by the expansion of resort-related activity. In addition to the increased retirement and recreation development, the latter region also exhibited some gain in manufacturing and mining. As a result, net in-migration in this region was two to three times greater than the upper New England region. Prior to 1970, the Upper Great Lakes region had lost population as a result of the exhaustion of timber and mining resources.

Migration turnaround may have resulted from the expansion of energy-related industries. Energy-related migrations were found in the Southern Appalachian region (No. 11) and the Northern Great Plains region (No. 23) as well as the Rocky Mountains region (No. 24) in the 1970-1974 period. The increasing energy exploitation activities coupled with industrial decentralization, recreation opportunities, and expanding transportation networks have spurred in-migration into nonmetropolitan areas of these two regions. The rest of the regions had switched from decline to growth in the post 1970 period. Although their nonmetropolitan population gains were not to be so spectacular as other regions, nevertheless, out-migration in these regions slowed down rapidly in the 1960s.

The existence of pervasive nonmetropolitan growth is made clear in the research done by Beale and Fuguitt. They showed that, first, nonmetropolitan population grew in all 26 regions between 1970 and 1974, with only two regions experiencing lesser growth than in the 1960s and that, secondly, there was an orderly progression in 22 of the 26 regions towards diminishing net out-migration and increasing net in-migration over the years. During the 1960s, there were only 5 regions showing net in-migration. However, by the early 1970s, the number of regions with net in-migration increased to 24.

DYNAMIC FACTORS FOR NONMETROPOLITAN GROWTH IN THE U.S.A.

There are many factors involved in the post-1970 population reversal trend in the U.S.A. The following explanations are most often cited in the population and small-town study literature. They exhibit varying levels of specificity and lack mutual exclusivity, and yet, at the same time, many of them are highly interrelated. What is more, although most researchers provide some statistical data, seldom do they attempt to sort out the extent to which each of the factors is contributing to the population turnaround. Nevertheless, each of them offer some insight into population redistribution. In order to lessen the complexity of understanding the phenomenon, each factor will be evaluated separately (although it may or may not associate with other factors).

1. Continued Growth of Metropolitan Centres and their Expansion into Adjacent Nonmetropolitan Counties

The idea is that urban-to-rural migrants are not seeking to escape urbanity, rather, they are looking for the best of both worlds -- country living with urban services.³¹ This is presumed to be particularly true for those migrants who move to adjacent nonmetropolitan counties.

In the U.S.A., the adjacent counties contain 51 % of the total nonmetropolitan population, and their net in-migration increased by 3.6 % from 1970 to 1974. This rate of growth is somewhat higher than that of the nonadjacent counties which increased by 2.3 % during the same period.³² It seems that Americans have a strong desire to live in rural area but within 30 miles (i.e. commuting zone) of a big city. This hypothesis is sustained by a national opinion survey, which disclosed that 55 % of respondents preferred to live within 30 miles of a large city.³³ These data reinforce the notion that most people "want" to have the best of the urban and rural environments and achieve this goal by living out, but not way out, of a large city.³⁴

Only one-sixth of recent migrants who moved to nonmetropolitan communities continued to work in metropolitan areas, indicating a general severing of metro economic ties by most migrants. Higher

³¹ George H. Dailey and Rex R. Campbell (1980), "The Ozark-Uplands: Growth and Consequences," in John M. Wardwell and David L. Brown (eds.), New Directions in Urban-Rural Migration. New York: Academic Press, p. 242.

³² Ibid., p. 254.

³³ Calvin L. Beale (1976), op. cit., p. 954.

³⁴ Gordon F. De Jong (1977), "Residential Preference and Migration," Demography, vol. 14, p. 175.

education was positively associated with commuting in metro areas, but education was negatively associated with commuting in non-metro areas. Commuting of non-metro household heads to metro jobs also yielded mean income levels above those generally obtainable in non-metro employment.³⁵

2. Decentralization of Manufacturing in Pursuit of Lower Land and Wage Cost

Factors such as decentralization of manufacturing industries from metropolitan areas and construction of interstate highways have been the major contributing forces to adjacent nonmetropolitan growth. The expansion of industrial decentralization of the 1960s was carried on into the 1970s. Rural and other nonmetropolitan areas added 1.8 million manufacturing jobs, or 56 % of the U.S. increase between March 1962 and March 1978. But more than half of the gain occurred by March 1967, and all the remainder before 1974 (presumably reflecting the recessionary effects of the 1973 oil pricing crisis³⁶).

The balance between centralization and decentralization may be a function of level of development such that metropolitan concentration occurs until the agglomeration economies become out-weighted by congestion and related diseconomies, after which nonmetropolitan recovery occurs.³⁷ Technological advances in

³⁵ Gladys K. Bowles and Calvin L. Beale (1980), "Commuting and Migrations Status in Nonmetro Areas," Agricultural Economics Research, vol. 32, pp. 8-20.

³⁶ John long (1980), op. cit.

production processes and in transportation and communication systems have lessened constraints on location for manufacturing and other industries. With the construction of interstate highways and more use of truck transportation, manufacturers have been able to locate at greater distances from metropolitan areas. At the same time, they have maintained the ability to ship their finished products quickly and economically to markets in those areas.³⁸ Decentralization of this kind is particularly beneficial for light industries.

The availability of low-cost labour is probably one of the most important factors in influencing industry to locate in nonmetropolitan counties.³⁹ For instance, the labour cost in the Southern nonmetropolitan region is significantly cheaper than the Northeastern metropolitan belt. The importance of labour availability has arisen, in part, because of high labour costs in metropolitan areas, and these increased costs have contributed to industrial decentralization. Furthermore, manufacturing plants locating in nonmetropolitan areas are typically oriented to low-skilled or medium-skilled labour. As a result, routinization of production processes occurs.⁴⁰ This routinization enables the "filtering down" of industries from

³⁷ Richard L. Morrill (1980), op. cit., p. 118.

³⁸ Steven R. Kale and Richard E. Lonsdale (1979), "Factors Encouraging and Discouraging Plant Location in Nonmetropolitan Areas," in Richard E. Lonsdale and H. L. Seyler (eds.), Nonmetropolitan Industrialization, Washington, D.C., V. H. Winston and Sons, pp. 47-56.

³⁹ Ibid. (1979), pp. 47-56.

⁴⁰ Ibid. (1979), pp. 47-56.

metropolitan to nonmetropolitan areas and brings about a "spatial division of labour". Some manufacturers feel that nonmetropolitan employees possess a stronger "work ethic" than their counterparts in metropolitan areas and are thus more dependable. The absence of labour unions is also considered a contributing factor to productivity by many nonmetropolitan employers. The possibility of avoiding labour unions remains a highly attractive consideration to these employers, and unionization of manufacturing employees has not yet occurred in many nonmetropolitan counties.⁴¹ Furthermore, many factories have increased their scale of operations as a result of continued advances in manufacturing technology. Consequently, they require more land on which to expand. Where the zoning ordinance of the metropolitan areas failed to set aside enough land for manufacturing, relocation of manufacturing plants to nonmetropolitan areas was more likely to occur.

3. Increased Employment in Service Occupations

The service sector is the fastest growing sector in the U.S. economy. In nonmetropolitan areas, service industries grew even faster than the rate of population increase. In fact, service growth accounted for 74 % of the net gain in nonmetropolitan employment between 1970 and 1977.⁴² Moreover, while the service sector was systematically shrinking in smaller places, nevertheless, the index of Central Place Tendency for service

⁴¹ Ibid. (1979), pp. 47-56.

⁴² Mark D. Menchik (1981), "The Service Sector," in Amos H. Hawley and Sara M. Mazie (eds.), Nonmetropolitan American in Transition. University of North Carolina Press, pp. 231-254.

(service gap) between the largest and the smallest areas was reduced from 1.63 to 1.39 between 1970 and 1977.⁴³

The sharp increase in service occupations among the rural residents induced greater household income and buying power which, in turn, translated into improvement of local infrastructures. Growth in the local service sector can absorb unemployed local workers forced out of agriculture or manufacturing industries.

Service-sector activities that serve business can make them more efficient, attract new firms and induce existing ones to stay. The resulting economic opportunities help to reduce out-migration and attract in-migration. Furthermore, the expanded service sector can enhance the quality of rural life.⁴⁴ Despite the fact that the service sector is the fastest growing industry, most of its activities are non-basic, that is, they are community-serving rather than community-forming.⁴⁵ They also have a pronounced preference for established and growing urban centres. Even when serving a largely nonmetropolitan area, they are likely to be concentrated in the most populated place of that region.⁴⁶ Therefore, government should provide at least some

⁴³ The index of central place tendency is the number of employed persons per thousand residents for the largest areas (metro areas of a million or more) divided by that figure for the smallest areas (nonmetro counties with no place of 2,500 or more persons). Source: U.S. Bureau of Census, Current Population Reports, pp. 20-21, 88-89.

⁴⁴ Mark D. Menchik (1981), op. cit., pp. 47-56.

⁴⁵ For detailed discussion of function for basic and non-basic activities, see M. Yeates and B. Garner (1980), op. cit., pp. 73-94.

⁴⁶ Richard E. Lonsdale and H. L. Seyler (1979), op. cit., p. 10.

essential services to under-privileged towns and villages in order to deter out-migration and improve the quality of life.

The increase of service employment in rural areas can be considered as a factor contributing more to the retention of local residents than the attraction of new in-migrants. Based on the theory of the "dual labour market" which asserts that many service-sector industries offer secondary labour market jobs with low income and little economic advancement, one may argue that the role of this factor in terms of attracting in-migrants will diminish in the future.⁴⁷ Moreover, the basic and non-basic activities are interdependent with each other. Without sufficient support from the primary, secondary and some basic service industries, the non-basic service industry cannot survive by itself. Therefore, we should not overestimate the contribution of this factor in terms of attracting new in-migrants and reviving small towns.

4. Early Retirement Coupled with Higher Retirement Incomes

Early retirement coupled with secure income sources has allowed retirees to choose the place they have longed to live in. New sources of income such as the federal Supplement Security income programme have enhanced their purchasing power. With a steady income assured regardless of location, retirees comprise a floating population of consumers whose presence in an increasing service oriented society creates jobs wherever they go.⁴⁸

⁴⁷ D. M. Gordon (1972), Theories of Poverty and Underemployment: Orthodox, Racial, Dual Labor Market Perspectives, Lexington, Mass.: D.C. Heath.

Between 1965 and 1970, there was only some 6 % of total interstate migration accounted for by persons aged 60 or over.⁴⁹ Apparently, most retirees do not move, but those who do move go disproportionately to nonmetropolitan areas.⁵⁰ Furthermore, the major reasons for leaving original residences claimed by the elderly migrants were related to health and climate.⁵¹ Therefore, one may suppose that areas blessed with favourable climates and pleasant environments are those which receive a disproportionate share of elderly migrants. In fact, as recounted, elderly migrants were highly directed towards the three states of Florida, California and Arizona. Together they received over three-quarters of all these migrants between 1965 and 1970.⁵² Other states with a noticeable influx of retirees were Upper Michigan, Missouri, Arkansas, New Hampshire, New Mexico and Oregon.

5. Increased Per Capita Disposable Real Income and Pursuit of Leisure Activities

The initial cost of moving is not cheap when we consider the associated expenses such as finding a better permanent home and liquidating fixed assets. However, the long term aggregate benefits obtained through relocation (including personal

⁴⁸ Peter A Morrison and Judith P. Wheeler (1978), op. cit., p. 19.

⁴⁹ Jeanne C. Biggar (1980), op. cit., p. 19.

⁵⁰ Calvin L. Beale (1976), op. cit., p. 955.

⁵¹ Steve L. Barsby and Dennis R. Cox (1975), Interstate Migration of the Elderly, D.C. Heath, Lexington, MA., p.11.

⁵² Jeanne C. Biggar (1980), op. cit., p. 19.

satisfaction, financial gain, or both) may exceed the monetary loss in the initial period. Since persons with higher incomes are better able to bear the initial costs, we would expect them to display greater mobility and choice of new residences. A study by Lichter confirmed that both metropolitan and nonmetropolitan migrants were disproportionately composed of higher socio-economic status groups than their comparable (but stayer) local residents.⁵³

Rapid growth in real income or affluence in the last two decades has been accompanied by a change in the nature of demand for higher-order goods. It also expands the array of choices available to households in selecting residential locations. With more disposable income, one can spend more time in pursuit of recreation, leisure, and other outdoor activities. Many of these activities are, by their very nature, nonurban. Indirectly, the increase of real income has promoted the notion of pleasure hunting or living which, in turn, has driven some consumer-serving activities into nonmetropolitan areas. The shift of consumer-serving firms reinforces the subsequent relocation of other service and small retail establishments, as well as later nonmetropolitan-bound migrants. In addition, lower land costs beyond the metropolitan periphery serve to make the decentralization process economically more attractive to firms and households.

⁵³ Daniel Lichter, Tim B. Heaton, and Glenn V. Fuguitt (1979), "Trends in Selectivity of Migration between Metropolitan and Nonmetropolitan Areas: 1955-1975," Rural Sociology, vol. 44, no. 4, Winter: pp. 645-667.

6. Increased Enrollments in Nonmetro Colleges and Universities

The growth of college towns in rural areas reflects the demand for higher education among young people. The expansion of the national education system has been diffused to regional and local levels. Therefore, nonmetropolitan counties assumed a new and larger role for educating people around their areas. The emergence of senior colleges or universities in nonmetropolitan centres provided a new stimulus for local economic and population growth. An expanding student body, faculty, and support personnel generated a greater economic base for such communities. Consequently, they also enhanced the cultural environment of such communities, making them more attractive for further development.

A recent study by Fuguitt and Voss found that nonmetropolitan counties with a four-year state college or university programme experienced higher levels of population growth from 1950 to 1975 than those nonmetropolitan counties without such institutes. During the 1960 to 1970 period, the annual net migration rates were 1.1 and -6.5 for counties with and without state college or university respectively.⁵⁴ However, the migration gap between these two types of counties was narrowed drastically in the 1970 to 1975 period. Although counties with state colleges had an annual migration rate at 8.0 % in the 1970s, counties without state colleges had reversed their population trend from a net loss of 6.5 % in the 1960s to a net gain of 5.9 % in the 1970s. After passing through the peak college enrollment period between

⁵⁴ Glenn V. Fuguitt and Paul R. Voss (1979), op. cit., p. 13.

1960 and 1970, population gain has slowed down markedly in the 1970s. In brief, one can conclude that the educational factor had played a more significant role for nonmetropolitan growth in the 1960s than the 1970s. More importantly, the establishment of senior colleges or universities functioned as an intervening opportunity factor to deter out-migration, especially among the young people in the nonmetropolitan counties, rather than attract young migrants from metropolitan areas.

7. Growth of State Governments

State governments have a major effect on the shape of nonmetropolitan development. The role of government is important for influencing both economic and quality-of-life factors. The persistence of economically-depressed areas, the presence of poverty in less-urbanized areas, and the perceived rural-urban disparities in other aspects of well-being have promoted an enlarged role for governments in taxing, expenditure, regulatory development, and services policies and practices. Newly-created planning offices have infiltrated into every state and exerted their influence on community development. According to Hansler,⁵⁵ the objectives of new programmes were designed to:

- (a) foster economic development of depressed areas or regions;
- (b) eradicate poverty and improve health, education, and welfare of citizens;
- (c) attain better distribution of population through better-balanced rural-urban growth; and
- (d) give citizens a better voice in decisions that affect their lives.

⁵⁵ Richard Hansler (1974), "The Emergence of Area Development," in George Brinkman (ed.), The Development of Rural America. Lawrence; The University of Kansa, p. 17.

The Rural Development Act of 1972 provided various forms of social and economic assistance significant for smaller communities which, for its part, generated new employment opportunities, improved the quality of life, and reduced the need for out-migration in the more disadvantaged areas.⁵⁶

Examining the data provided by Stinson,⁵⁷ one can see that the governments put some effort into reducing rural-urban inequality. In metropolitan counties, per capita expenditures only rose from \$ 348 to \$ 349 from 1972 to 1977. On the other hand, per capita expenditure grew from \$ 240 to \$ 263 (9.5 % increase) in nonmetropolitan counties during the same period. Although there still remains an \$ 86 difference between the two areas, this does not mean that services are on the average one-third better or more available in metropolitan areas . It may be inferred, rather, that the relative needs are different in the two areas. For instance, metropolitan counties had to spend 2 to 3 times more on protection, sewer, environment, and housing budgets than their rural counterparts due to associated urban problems. Conversely, more government expenditure was spent to promote local education, highway infrastructures, health institutions, and protection in the nonmetropolitan areas.

8. Levelling off of Loss of Farm Population

⁵⁶ Richard E. Lonsdale and H. L. Seyler (1979), op. cit., p. 7.

⁵⁷ Thomas F. Stinson (1981), "Fiscal Status of Local Governments." in Amos H. Hawley and Sara M. Mazie (eds.), op. cit., p. 748.

Net out-migration rates were positively correlated with percentage of population engaged in agriculture. The higher the proportion of population engaged in agricultural activities, the higher the net out-migration rate. The effect of net out-migration from the areas most dependent on farming was reflected in loss of total population, a 10.7 % loss from 1960 to 1970 for counties with 30 % or more employed in agriculture. However, these same areas had net out-migration rates reduced to less than 1 % from 1970 to 1974.⁵⁸ The diminution of the rural migrant pool, as employment in agriculture nears a minimum, has played a role in reducing the rural-urban migration stream.⁵⁹

According to the 1978 annual sample survey collected in the Census of Population,⁶⁰ about 900,000 people held multiple-jobs with at least one job in agriculture. Although the number of multiple-job workers has declined somewhat (1,070,000 in the 1960s), it has not fallen as rapidly as total agricultural employment. The economic spin-off effects of population reversal and industrial decentralization in the 1970s have provided an alternative means for living especially among those part-time farmers. Thus with more secure income, less part-time farmers tended to move away from their rural communities. At the same time, the release of excess farm workers has contributed to a potential worker pool, which attracted the newly decentralized

⁵⁸ Calvin L. Beale (1976), op. cit., p. 954.

⁵⁹ John M. Wardwell and David L. Brown (1980), op. cit., p. 76.

⁶⁰ Larry G. Blackwood and Edwin H. Carpenter (1978), "The Importance of Anti-Urbanism in Determining Residential Preferences and Migration Pattern," Rural Sociology, vol. 43, p. 32.

manufacturing or service industries.

9. Rise of Anti-urbanism and Change of Residential Preferences

Anti-urbanism may be defined as the salient negative orientation towards large centres of population.⁶¹ In fact, fewer and fewer people seem to want to live in big cities if they can afford to move. The above statement is confirmed by five Gallup Surveys conducted from 1966 to 1976. The findings indicate that only 13 % of the population preferred to stay in cities in 1976 as compared to 22 % in 1966.⁶² The reasons for change are related to environmental push and pull factors. Push factors are usually found in cities where crime, drugs, pollution, school troubles, fiscal matters and so on prevail. In addition to the absence of the above urban disamenities, country living offers greater outdoor recreation and cultural activities, lower cost of living, slower pace of life, better atmosphere to raise children, greater community satisfaction and individual privacy, and better social relationships.

Unfortunately, it is very hard to quantify to what extent anti-urbanism has contributed to the recent migration turnaround. Nevertheless, one can still estimate the relationship by using surrogate variables such as population density and metro-nonmetro classification. According to Beale's report, the highest rates since 1970 have occurred in the counties with the lowest

⁶¹ Ibid. (1978), p. 32.

⁶² Don A. Dillman (1979), "Residences, Quality of Life, and the Population Turnaround," American Journal of Agricultural Economics, vol. 61, Dec., p.962.

population densities.⁶³ Thus, people seem to be desiring and achieving separation from heavily populated areas. Using metro-nonmetro classification and subjective quality-of-life variables to measure residential preference, a number of researchers discovered that more and more people preferred to live in nonmetropolitan areas in recent years.⁶⁴ In general, their findings indicate that residential preferences are contributing to population turnaround and the recent nonmetropolitan growth.

10. Narrowing of Traditional Gaps in Urban and Rural Life Styles

In the under-developed countries, urban and rural areas are still very distinguishable from each other. However, urban and rural places are becoming more alike in countries such as the U.S.A. and other Western nations. The rise of rural-urban convergence resulted from the diminishing differences in employment and cultural opportunities, real income levels, socio-economic components, and life styles between urban and rural residents.

The introduction of rural postal service, the all-weather surface road, the spread of car ownership among rural residents, the linkage of local telephone companies with the Bell system, the rural electrification programme of the 1930s, and television, have together brought most nonmetropolitan areas within daily

⁶³ Calvin L. Beale (1976), op. cit., p. 954.

⁶⁴ Don A. Dillman (1979), op. cit., pp. 960-966; Calvin L. Beale (1976), op. cit., pp. 953-958; Gordon F. De Jong (1977), op. cit., pp. 169-178; and Glenn V. Fuguitt and James J. Zuiches (1975), op. cit., pp. 491-504.

access to metropolitan centres. The consequent diffusion of urban influences over the countryside has been manifested in the standardized consumers services, an increasing amount of nonagricultural employment, and a modernization of rural areas.⁶⁵ The joint effects of modern transportation as well as telecommunications have promoted the spread of urban values to more remote areas and thus created more homogeneous communities across the rural landscape. In short, as life styles in nonmetropolitan areas have become increasingly urbanized, the distance restraints on the general centrifugal drift of urban population have been relaxed and the population turnaround movement faced fewer cultural impediments.

11. More Long-distance Commuting

The high rate (87 %) of automobile ownership among nonmetropolitan households and the expansion of the automobile transportation system have effectively enlarged labour markets accessible to the nonmetropolitan population. Long-distance commuting has deterred out-migration for many nonmetropolitan residents and has enabled many metro-nonmetropolitan migrants to enjoy the amenities of rural living while retaining their economic opportunities in metropolitan areas.⁶⁶ According to the 1975 housing survey,⁶⁷ the number of residents travelling to work

⁶⁵ Robert O. Richards (1978), "Urbanization of Rural Areas," in Handbook of Contemporary Urban Life. by David Street and Associates, chapter 18. San Francisco, Calif.: Jossey-Bass.

⁶⁶ Arthur Saltzman and Lawrence W. Newlin (1981), in Amos H. Hawley and Sara M. Mazie (eds.), op. cit., p. 260.

⁶⁷ U.S. Bureau of the Census (1979), The Journey to Work in the United States: 1975. Washington, D.C.: U.S. Government Printing Office.

within metro areas was two times higher among nonmetropolitan residents as compared to metropolitan residents (2 million versus 1 million). The median distance (4.6 miles) travelled to work by non-metro households was well below that travelled by metro heads (7.6 miles) in 1975.⁶⁸ This shorter commuting distance is due in part to the fact that economic opportunities within non-metro communities were expanding at the expense of metro areas. However, more nonmetropolitan household heads commuted long distance (i.e. 30 miles or more each way) than their metropolitan counterparts, 7.7 % for the former and 5.6 % for the latter. Moreover, metro-nonmetropolitan migrants are the most likely group to commute in such fashion. These long-distance commuters are not necessarily better educated than those non-commuters although they tend to earn moderate to above-average incomes. This seems logical, as the payoff from low-income jobs does not tempt people to incur the cost of commuting.⁶⁹ In sum, the relatively cheap gasoline and lower gasoline consumption for highway driving help long-distance commuting as well as population redistribution.

12. Revival of Energy and Mining Industries

The energy and mining industries in nonmetropolitan areas had experienced declining employment for decades up to the late 1960s. However, energy crises reversed the fate of these industries and helped bring about a boom in the 1970s, with employment increasing by 13.7 % (55,000 jobs) from 1970 to

⁶⁸ Gladys K. Bowles and Calvin L. Beale (1980), op. cit., pp. 8-20.

⁶⁹ Ibid., pp. 8-20.

1978.⁷⁰ As a result of available job opportunities, a large number of migrants have moved to those energy-supply regions, most notably the Northern Great Plains and Appalachia. Together, these migrants represented sources of change for rural communities in the 1970s. For instance, as consumers, they induced much greater demand on housing, local business, and government services. Thus, income per capita has been raised for the nonmetropolitan residents as it has for the in-migrants.⁷¹

13. Completion of Interstate Highway system

Both industrialists and residents have benefited from the completion of interstate highways. For the industrialists, it means more alternative ways of transporting goods and materials, expanding external markets, and the options of relocating firms to areas where cost of production is cheaper. For the residents, it means more job opportunities and greater access to consumer markets and freedom of movement. Therefore, one may assume that there is a positive correlation between the completion of interstate highways and economic growth of the regions adjoining the highways. A recent study by Fugitt and Ross indicates that nonmetropolitan counties with interstate highways experienced greater rates of net in-migration than those counties without interstate highways between 1970 and 1975.⁷² However, an earlier

⁷⁰ Claude C. Haren (1979), "The Decentralization of U.S. Employment, 1969-1976." Paper presented at the Southern Regional Science Association, Nashville, Tenn., April.

⁷¹ Irving Hoch (1981), "Energy and Location," in Amos H. Hawley and Sara M. Mazie (eds.), op. cit., p. 322.

⁷² Glenn V. Fugitt and Paul R. Voss (1979), op. cit., p. 13.

study (1973) by Hansen contradicts the above finding. He concludes that, "Nonmetro counties experiencing population decline during the 1950s but population growth during the 1960s had no advantage over other counties in terms of access to highway, suggesting the explanation for their population reversal is unrelated to the availability of major highways."⁷³ In sum, this factor for population turnaround is ambivalent. For some regions, however, industrialists may take advantage of this factor to promote decentralization.

14. Lower Cost of Living in Rural Areas

While metropolitan residents enjoy higher incomes, their nonmetropolitan counterparts enjoy lower costs of living. In general, cost of foods and commercial services is cheaper in rural areas. Furthermore, public services like water supply, sewer provision and police protection are also available at a cheaper cost.

An increasing number of older people, provided with sources of retirement income which are not tied to particular locations, are returning to their places of origin or seeking pleasant and low-cost environments in which to live.⁷⁴ Alternatively, in the period of both high inflation and slow economy in the 1970s, it may be that many of the recent nonmetropolitan in-migrants are "stagflation refugees", fleeing the combination of high prices

⁷³ N. M. Hansen (1973), The Future of Nonmetropolitan America: Studies in the Reversal of Rural and Small Town Population Decline. Lexington, Mass.: Lexington Books.

⁷⁴ William Alonso (1977), op. cit., p. 173.

and high unemployment rates in metropolitan areas. For such people, the lower cost of living in nonmetropolitan areas would be appealing, particularly among the unemployed metropolitan workers who originally left a nonmetropolitan birthplace to seek their fortunes in the cities.⁷⁵

SUMMARY

This section contains strong evidence in support of the multi-dimensional cases for nonmetropolitan growth. The identified dimensions can be classified as economic or non-economic inducement to small-town growth. Economic factors promote financial status of rural communities. On the other hand, non-economic factors cultivate socio-psychological well-being of rural residents. Both of them are complementary to each other and act together to reinforce growth. Some researchers claim that non-economic factors contribute more to nonmetropolitan growth. In my opinion, economic development will always be crucial for the overall well-being of small communities. The pursuit of social well-being or quality-of-life alone cannot promote economic well-being, but the pursuit of economic opportunities can promote both social and economic well-being for individuals as well as communities.

⁷⁵ Kevin F. McCarthy and Peter A. Morrison (1973), "The Changing Demographic and Economic Structure of Nonmetropolitan Areas in the 1970s," Paper presented at the annual meeting of the Population Association of America, St. Louis, Mo., April.

THE REVIVAL OF SMALL TOWNS IN CANADA DURING THE 1970S

INTRODUCTION

The revival of American small towns in the 1970s has been well documented in the previous chapter. Let us now turn our attention to the contemporary Canadian settlement pattern. In this chapter, a parallel study of small town viability and rural economy of Canada will be performed. In particular, regional variations in Canada, on the one hand, as well as similarities and differences between the United States and Canada, on the other, will be highlighted. This exercise should pin down causal agents that are both comparable to those in the U.S.A. and also that derive from unique Canadian circumstances.

THE PERSISTENCE OF CANADIAN SMALL TOWNS

After decades of rural exodus due to urbanization, the 1981 Canadian Population Census indicates the revival of rural small towns. According to it, nearly one-fifth of the nation's population lives in towns and villages (see Table 1). Although it is still true that urban areas had experienced greater absolute population growth during the 1971-1981 period, nevertheless, for the very first time in more than one hundred years the rate of population growth is greater in rural areas than in urban areas (see Table 2). This unanticipated population turnaround phenomenon occurred after the historically high rural depopulation

Table 1

Canadian Population Trends, 1951 - 1981

Year	Total Population (000's)	Urban Population (000's)	Rural Population (000's)	Urban Population as % of Total Population	Rural Population as % of Total Population
1851	2435	319	2116	13.1	86.9
1861	3228	510	2718	15.8	84.2
1871	3689	675	3014	18.3	81.7
1881	4326	1008	3318	23.3	76.7
1891	4832	1440	3392	29.8	70.2
1901	5427	1894	3533	34.9	65.1
1911	7208	3013	4195	41.8	58.2
1921	8789	4166	4623	47.4	52.6
1931	10377	5448	4929	52.5	47.5
1941	11506	6409	5097	55.7	44.3
1951	14010	8742	5268	62.4	37.6
1961	18238	12712	5526	69.7	30.3
1971	21565	16411	5154	76.1	23.9
1981	24354	18436	5918	75.7	24.3

Source: for 1851 - 1971, Canada Year Book (1974), Table 4.11;
for 1981, Statistics Canada C5 92-901 / 1981, Table 7.

Table 2

Changes of Population Living in Canadian
Urban and Rural Areas, 1851 - 1981

Period	Change of Urban Population (%)	Change of Rural Population (%)	Change of Total Population (%)
1851-1861	59.9	28.4	32.6
1861-1871	32.4	10.9	14.3
1871-1881	49.3	10.1	17.3
1881-1891	42.9	2.2	11.7
1891-1901	31.5	4.2	12.3
1901-1911	59.1	18.7	32.8
1911-1921	38.3	10.2	21.9
1921-1931	30.8	6.6	18.1
1931-1941	17.6	3.4	10.9
1941-1951	36.4	3.4	21.8
1951-1961	45.4	4.9	30.2
1961-1971	29.1	-6.7	18.2
1971-1981	12.3	14.8	12.9

Source: see Table 1

period between 1961-1971. Although the proportion of the population living in rural areas has been decreasing drastically from 1851 to 1971, it is more accurate to say that more and more people actually lived in towns and villages except for the 1961-1971 period (see Table 1). Moreover, figures for the 1971-1981 period indicate that more people lived in rural areas than at any time in the past.

In addition to the above evidence which points to the revival of small towns during the 1971-1981 period, Hodge and Qadeer also collected two other indicators to demonstrate the persistence of growth in small towns; namely, the change in commercial establishments and the growth in housing stock.⁷⁶ Performance in these indicators is compared for each of the major regions of Canada and for the country as a whole (see Table 3). There are three distinctive features of towns and villages revealed by the data in Table 3. First, both housing and commercial sectors are experiencing higher rates of growth than population in towns and villages across all regions of the country. Secondly, even in regions of low population growth, as in Ontario and the Atlantic region, the small towns and villages experienced substantial growth in housing and commerce. Thirdly, there is considerable variability in the set of growth rates in the different regions, that is, the latter two observations are a reflection of differences within individual communities. Some communities experienced greater growth in stores than in their housing stock or population, while others experienced the exact reverse.⁷⁷ Overall, these indicators also tend to substantiate the

⁷⁶ G.D. Hodge and M.A. Qadeer (1983), Towns and Village in Canada: the Importance of being Unimportant, Toronto and Vancouver: Butterworth and Co., p.35.

⁷⁷ Ibid. (1983), pp. 35-36.

Table 3

Comparison of Changes in Population, Housing Stock,
and Commercial Establishments in Canadian Towns and
Villages, 1971 - 1981

	Percentage Change in			
	Population	Housing Stock	Retail Firms	Total Commercial Firms
Canada	16.7	41.3	32.2	40.5
Atlantic	-0.2	17.5	31.3	40.1
Quebec	21.9	39.1	20.3	23.8
Ontario	1.2	27.7	11.2	16.2
Prairies	34.9	66.7	45.9	52.9
British Columbia	12.0	59.6	62.6	80.4

Source: Adapted from G.D. Hodge and M.A. Qadeer (1983),
"Towns and Villages in Canada: The Importance of being Unimportant",
Toronto and Vancouver: Butterworth and Co., p. 35.

persistence or "staying power" of small rural communities.

RECENT METRO AND NONMETRO POPULATION TRENDS IN CANADA

The foregoing section hints of the revival of small towns in Canada. However, it does not provide information concerning proportional population share and regional variations in terms of growth and decline among the rural communities. To assess these two dimensions, shift and share analysis (SSA) is employed as a means to display rapidly growing, sluggish, stagnant and declining populations in various provinces.⁷⁸ It allows for disaggregation of population components into urban, rural farm and rural nonfarm and indicates whether their growth or decline is due to "structural" or "residual" factors. In this context, the growth of population groups in a province is considered (1) in relation to growth of that particular population group in the nation as a whole, (2) in relation to the growth of all population groups in the nation, and (3) in relation to the growth performance of population groups in the region. Thus, for a province, we may consider the growth of all population groups to be some functions of:⁷⁹

1. Total Shift for settlement i (TS_i); is the total amount by which the particular population group has grown or declined. Positive TS indicates a population gain in excess of the "fair share" in the study period. In contrast, negative TS indicates a shortfall

⁷⁸ D. Todd (1986), Prairie Small-town Futures: the Development Dilemma, Discussion paper submitted to Health and Welfare Canada.

⁷⁹ Geoffery J.D. Hewing (1977), Regional Industrial Analysis and Development, London: Methuen and Co. Ltd., pp. 67-95.

in the "fair share".

2. Proportionality Shift for settlement i (PS_i); is that aspect of TS_i which can be attributed to the settlement having an over-represented allocation of fast-growing population groups in the case of positive PS_i or slow-growing population groups in the case of negative PS_i .
3. Differential Shift for settlement i (DS_i); is TS_i minus PS_i or that aspect of the total shift which cannot be ascribed to structural factors. Positive DS implies population gain due to "inherent advantage" of geographic influences: all population groups (including slow-growth ones) perform well here. On the contrary, negative DS implies population loss due to "inherent disadvantage" of geographic influences. For example, isolated location of settlement makes all population groups (including fast-growing ones) under-perform here.
4. Observed Growth for settlement i (OG_i) represents the actual number of people gained or lost in a particular population group.
5. Regional Share for settlement i (RS_i) indicates what degree of population gain or loss a settlement should have if it conformed to its expected share at base year of all settlement population. If RS is less than OG , then the settlement performed better than its counterparts. On the other hand, if RS is greater than OG , then the settlement performed poorly relative to other settlements.

It is very important to note that only the data displayed under "observed growth" represent the actual population gain or loss. All

other data in the SSA are measures of "what would have happened if the regions and population sectors conformed to their expected shares". In other words, the former indicates "absolute" growth or decline; while the latter represents "relative" growth or decline in relationship to the base average growth rate.

The data displayed in Table 4 represent the distribution of population by urban, rural farm and rural non-farm categories from 1971 to 1981. For their part, the data reported in Table 5 represent the results of a SSA of population distribution among the provinces during the 1971-1981 period. In computing the various growth components, reference was made to the growth performance of comparable population groups in the whole of Canada.

With the exception of Alberta and British Columbia, all other provinces had gained population below the national growth rate (12.87%) during the 1971-1981 period (see Table 4, column 6). The actual population gains and losses are shown in column (5) of Table 5. At the aggregate level, each province gained population during this ten-year period. In absolute terms, Ontario gained the largest number of people (922,000); followed by Alberta (609,860), British Columbia (575,445), and Quebec (410,650). New Brunswick, Nova Scotia, Newfoundland, Saskatchewan, and Manitoba had modest gains in population. The median value of population gain for these five provinces was 45,585. The remaining province, Prince Edward Island, had the smallest gain in population (10,870). At the disaggregated level, the rural farm sector

Table 4

Distribution of Canadian Population by Urban,
Rural Farm and Non-farm Areas, 1971 - 1981

Province	Population Sector	Population 1971	Population 1981	Percentage Change in	
				Population Sector	Provincial Population
NFL.	U (1)	298800	332900	11.41	8.73
	F (2)	4525	1925	-57.46	
	N (3)	218775	232860	6.44	
P.E.I.	U	42780	44515	4.06	9.74
	F	21130	12015	-43.14	
	N	47725	65975	38.24	
N.S.	U	447405	466845	4.35	7.41
	F	26270	17680	-32.70	
	N	315290	362915	15.11	
N.B.	U	361150	353220	-2.20	9.75
	F	25565	14970	-41.44	
	N	247845	328210	32.43	
QUE.	U	4861240	4993840	2.73	6.81
	F	305300	186360	-38.96	
	N	861215	1258205	46.10	
ONT.	U	6343630	7047035	11.09	11.97
	F	363640	279825	-23.05	
	N	995840	1298250	30.37	
MAN.	U	686445	730660	6.44	3.84
	F	130410	96390	-26.09	
	N	171390	199190	16.22	
SASK.	U	490630	563165	14.78	4.54
	F	233335	180255	-22.75	
	N	202280	224890	11.18	
ALB.	U	1196250	1727545	44.41	37.46
	F	236025	190755	-19.18	
	N	195590	319425	63.31	
B.C. (4)	U	1682450	2176120	29.34	25.71
	F	73600	59665	-18.93	
	N	481775	577485	19.87	
Total		21568310	24343180	12.87	

- (1) Urban Population Sector
(2) Rural Farm Population Sector
(3) Rural Non-farm Population Sector
(4) Including the Yukon and Northwest Territories

Source: For 1971, Statistics Canada CS 92-755 / 1972;
for 1981, Statistics Canada CS 92-901 / 1981, Table 7.

Table 5

Classification of Population Growth Performance in Canada,
1971 - 1981

Province	Population Sector	Differential Shift [Col. 1]	Proportionality Shift [Col. 2]	Total Shift [Col. 3]	Regional Share [Col. 4]	Observed Growth [Col. 5]
NFL.	U (1)	-2773	-1569	-4342	38442	34100
	F (2)	-1389	-1793	-3182	582	-2600
	N (3)	-52037	37975	-14061	28146	14085
	T (4)	56199	34613	-21585	67170	45585
P.E.I.	U	-3544	-225	-3769	5504	1735
	F	-3460	-8373	-11833	2718	-9115
	N	3826	8284	12110	6140	18250
	T	-3178	-314	-3492	14362	10670
N.S.	U	-35771	-2350	-38121	57561	19440
	F	-1560	-10410	-11970	3380	-8590
	N	-47667	54728	7061	40564	47625
	T	-84998	41968	-43030	101505	58475
N.B.	U	-52497	-1897	-54394	46464	-7930
	F	-3754	-10131	-13884	3289	-10595
	N	5457	43021	48479	31886	80365
	T	-50794	30994	-19799	81639	61840
QUE.	U	-467292	-25531	-492823	625423	132600
	F	-37240	-120978	-158218	39278	-118940
	N	136700	149490	-286190	110800	396990
	T	-367832	2981	-364851	775501	410650
ONT.	U	-79418	-33317	-112734	816139	703405
	F	13497	-144096	-130599	46784	-83815
	N	1432	172859	174290	128120	302410
	T	-64489	-4554	-69043	991043	922000
MAN.	U	-40492	-3605	-44100	88315	44215
	F	878	-51676	-50798	16778	-34020
	N	-24000	29750	5750	22050	27800
	T	-63616	-25531	-89148	127143	37995
SASK.	U	11990	-2577	9413	63122	72535
	F	9362	-92461	-83100	30020	-53080
	N	-38526	35112	-3414	26024	22610
	T	-17174	-59926	-77101	119166	42065
ALB.	U	383674	-6283	377392	153903	531295
	F	17892	-93527	-75636	30366	-45270
	N	64721	33951	98671	25164	123835
	T	466287	-65859	400427	209433	609860
B.C. (5)	U	286051	-8836	277214	216456	493670
	F	5761	-29165	-23404	9469	-13935
	N	-49900	83627	33727	61983	95710
	T	241912	45626	287537	287908	575445

- (1) Urban Population Sector
(2) Rural Farm Population Sector
(3) Rural Non-farm Population Sector
(4) Provincial Total Population
(5) Including the Yukon and Northwest Territories

Source: Derived from Census of Canada, Catalogue No. 92-755 / 1972
92-901 / 1981, Table 7.

exhibited population losses in every province. The leading provinces with such population losses were Quebec (118,940), Ontario (83,815), Saskatchewan (53,080), Alberta (45,270), and Manitoba (34,020). The remaining provinces had low-to-modest population losses in the rural-farm sector ranging from 2,600 to 13,935 with the median number of 8,590 people. With regard to the actual urban population distribution, nine out of ten provinces experienced population growth (the exception was New Brunswick). The three leading provinces were Ontario, Alberta and British Columbia. The remaining provinces (except New Brunswick) had low-to-modest gains in urban population ranging from 1,735 to 132,600. The striking finding of this analysis is the simultaneous growth of rural non-farm population sectors across Canada. More importantly, rural non-farm population sectors in seven provinces had even grown at a much higher rate than their urban counterparts (see Table 4, column (5)). After reviewing the data in Table 2 and column (5) of Table 4, a tentative conclusion tends to confirm that the revival of small towns had occurred during the 1971-1981 period.

The sources of regional variations in terms of "relative" population growth or decline are depicted by the total shift vector (TS) in Table 5, which can be further decomposed into differential and proportionality shifts. At the aggregate level, only Alberta and British Columbia gained more than their 'fair share'. For example, Alberta and British Columbia together gained nearly 700,000 more people than their initial share (see Table 5, column 3). At the disaggregated level, the rural-farm population sectors of all provinces suffered population loss. Similarly, the urban population sectors of all provinces except Alberta,

British Columbia, and Saskatchewan also suffered population decline. Yet, in contradistinction, the rural non-farm population sectors of all provinces except Newfoundland and Saskatchewan had gained population. In brief, TS data indicated that the gaining of population in the rural non-farm sectors was at the expense of other population sectors, especially the rural farm-sector.

A negative proportionality shift indicates that the growth in the population sector as a whole is less than the growth rates in all population sectors due to over-representation of slow-growing population sectors. In fact, the urban and rural farm population sectors across Canada had experienced slow growth rates during the 1971-1981 period (at the disaggregated level). A negative DS, meanwhile, implies that the growth rate in the population sector in the province is less than the growth rate in that population sector in the nation as a whole due to inherent locational disadvantages. Unlike the PS, the DS shift of population sectors varies from one province to another. For instance, Newfoundland, Nova Scotia, Manitoba, Saskatchewan and British Columbia had locational disadvantages for the fast-growing rural non-farm population sector. Since the joint effect (sum) of DS and PS equals the TS, we can identify the regional variations for different population groups in the provinces. In the case, of Newfoundland and Saskatchewan, the negative TS' of the rural non-farm population sectors are the result of population loss due to inherent locational disadvantages. In the cases of Prince Edward Island, New Brunswick, Quebec, Ontario and Alberta, the positive TS' of the rural non-farm population sector are the result of population gain due to both inherent locational advantages

and the fast-growing population in this sector. However, the positive TS' of the rural non-farm sector in Nova Scotia, Manitoba and British Columbia are due to the fast-growing population in this sector rather than the locational factor. In short, except for Newfoundland and Saskatchewan, the rural non-farm population sector had experienced population gain which was owing to the fast-growing population in this sector and the locational advantages surpassing the locational disadvantages.

With regard to the population exchange among various sectors in different provinces, a "simplified" population flow diagram is constructed based on the TS data. Since the data register changes over a ten-year period, they will not be able to account for the intermediate population flow between 1971 and 1981. Nevertheless, the "relative" exchange of population can be measured at the end-period (1981). Figure 4 represents the percentage for "relative" gain or loss of population by province and settlement in the 1971-1981 period. The figure on the left-hand-side depicts the areas with relative population loss, while the figure on the right-hand-side describes the areas with relative population gain. Since the data are measured in relative terms, the amount of population loss (-100 %) would equal the amount of population gain (+100 %). Obviously, rural farm settlement had the heaviest relative loss of population which accounted for 42 %. While the settlements in some provinces lost a considerable amount of population, urban areas in Alberta and British Columbia received a disproportionate share of population. The relative loss of population in the urban sectors was limited to 6.5 %. Notably, the rural non-farm settlements in

Newfoundland and Saskatchewan deviated from the national population trend in the 1971-1981 period. Together, these two provinces lost slightly over 1 % of expected population share. Nevertheless, the overall rural non-farm settlements in Canada had a relative population gain of 49 %. In fact, the rural non-farm sector was the only population recipient, the other two population sectors were population losers.

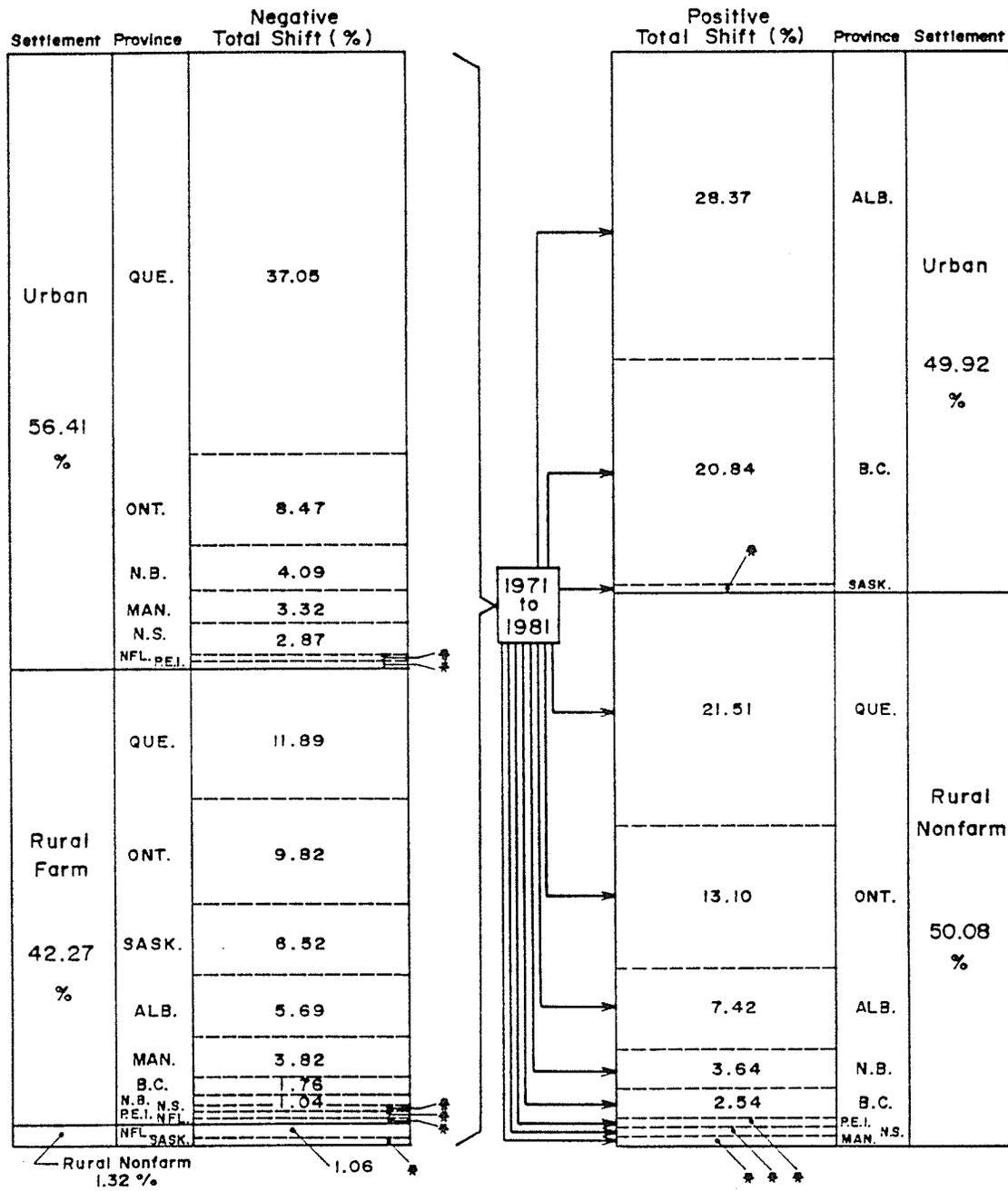
Examination on Figure 4 indicated that both urban and rural farm population sectors in Quebec and Ontario were the leading losers. Together, these two population sectors recorded a relative loss of 67.23 % in national share (i.e. $37.05 + 8.47 + 11.89 + 9.82$). On the other hand, the rural non-farm sector in the two provinces only absorbed 33.61 % (i.e. $21.51 + 13.10$) of the national population share. Therefore, the difference was probably accounted for by migrant streams from these two provinces to the fast-growing urban sector in Alberta and British Columbia. To explain this phenomenon, one may hypothesize that there was not enough 'intervening opportunities' provided by the adjacent rural non-farm sector in Quebec and Ontario. In the case of Quebec, the outflow of human resources and financial capital were in part due to the revival of separatism under the premiership of Rene Levesque in the second half of the 1970s.⁸⁰ At the same time, Alberta and British Columbia experienced a tremendous "urban" growth in the industrial sectors during the 1971-1981 period. Of the 18 industrial groups, 16 of them in these two provinces recorded positive total share values.⁸¹ With

⁸⁰ Rowland Mans (1978), op. cit., pp. 11-15.

⁸¹ Except personal services industry and manufacturing industry in food

Figure 4

**Relative Change of Canadian Population
by Province and Type of Settlement, 1971-1981**



Source: Derived from Table 5, column 3 (Total Shift)

regard to the relative loss of urban and rural populations in all other provinces, they were probably absorbed within their own provinces in the adjacent rural non-farm sectors during the 1971-1981 period (see Figure 4).

DYNAMIC FACTORS FOR SMALL-TOWN REVIVAL IN CANADA

Canada is an urban country and the distribution of urban places and population is uneven. Over two-thirds of Canada's population, and a large proportion of its economic activities, are found within the 137 urban places of greater than 10,000 persons.⁸² And most of these urban places are situated along the southern border from the east to west coast. One-fifth of the population live in towns and villages and the remaining population are scattered in isolated rural areas. Since the Canadian population size is only one-tenth of the American and, as industrial activities are concentrated, one can expect different combinations of factors affecting the revival of small towns in Canada. The following explanations are thus generalizations of small-town revival.

1. Continued Growth of Metropolitan Areas and their Expansion into Adjacent Rural Areas

and beverages, all other industries in the urban sector of these two provinces had received disproportional employment growth. Source: derived from 1971 Census of Canada, Catalogue No. 92-921, Table 2 and 1981 Census of Canada, Catalogue No. 94-741, Table 3A.

⁸² Michael D. Ray (1976), Canadian Urban Trends, vol. 1, Toronto: Copp, Clark Co.

For several decades, Canadian settlement studies presumed that the proximity of small centres to a large city was the major explanation of rural small-town and village growth. A recent study indicates that almost 72 percent of the small centres located within thirty miles of a metropolitan area experienced some degree of population growth in the 1961-1971 period. There is then a sharp drop in this growth experience beyond thirty miles. In all successive zones (see Table 6), the proportion of growing towns and villages, registered on the average, around 50 percent.⁸³

In addition to the above finding, Statistics Canada also reported that most small-town growth occurred near the major urban areas during the 1976-1981 period. Rural population increased nearly 481,000, and 45 % of this increase occurred within census metropolitan areas and census agglomerations (see Table 7). If this had been distributed in the same proportions as the 1976 rural population, an increase of 107,000 people would have been expected within these areas. What actually happened was an increase of more than twice this number (217,000).

This phenomenon implies that a good proportion of new immigrants in these rural areas may still retain their jobs in nearby metropolitan areas. In addition, the industrial decentralization process reaches these areas first before it further diffuses (if at all) to other isolated rural areas. In short, urban-to-rural

⁸³ G.D. Hodge and M.A. Qadeer (1983), op. cit., p. 76.

Table 6

Proportion of Canadian Towns and Villages
 Growing in Population Relative to
 Metropolitan Areas, 1961 - 1971

Distance to Nearest Metropolitan Areas (Miles)					
0-30	31-60	60-100	101-150	151-200	over 200
71.9 %	52.8 %	47.9 %	45.8 %	49.5 %	56.0 %

Source: Adapted from G.D. Hodge and M.A. Qadeer (1983), Towns and Villages in Canada: The Importance of being Unimportant", Toronto and Vancouver: Butterworth and Co., p. 76.

Table 7

Changes in Rural Population, Canada and Provinces,
1976 - 1981

	Population Change			Percentage Change		
	Total	Outside CMAs (1)/ CAs (2)	Within CMAs (1)/ CAs (2)	Total	Outside CMAs (1)/ CAs (2)	Within CMAs (1)/ CAs (2)
Canada (3)	480846	264021	216825	8.9	6.3	18.0
NFL.	8562	3737	4825	3.8	1.9	16.5
P.E.I.	6108	1201	4907	8.5	2.2	28.8
N.S.	20184	11288	8896	5.6	4.6	7.6
N.B.	28412	14875	13537	9.0	6.1	19.5
QUE.	176435	94039	82396	13.9	9.2	33.8
ONT.	84919	34746	50173	5.7	3.5	10.2
MAN.	329	-2795	3124	0.1	-1.0	12.2
SASK.	-1549	-2076	527	-0.4	-0.5	4.4
ALB.	65628	52888	12740	14.8	12.9	38.3
B.C.	89694	53994	35700	17.4	15.7	20.9

(1) Census metropolitan area - main labour market of a continuously built-up area having 100,000 or more population.

(2) Census agglomeration - main labour market area of a continuously build-up area having between 10,000 - 99,999 population.

(3) Includes Yukon and Northwest Territories which contain no CMAs or CAs.

Source: 1981 Census of Canada, Catalogue No. 93-901 to 93-912, Table 2 and 5.

migrants in the adjacent metropolitan orbit can take advantages of country living as well as metro employments and services.

2. Decentralization of Manufacturing Industries into Rural Areas

The growth of rural manufacturing industries in the 1970s had a positive economic effect on small-town revival. Across Canada, the industrial SSA indicated that rural areas had a relative gain of 76,784 manufacturing jobs during the 1971-1981 period. By way of contrast, urban areas had a relative loss of 183,061 manufacturing jobs (see Table 8).

Reasons for industrial decentralization include the following. First of all, technological advances in production enables a spatial division of labour to come about. In other words, a branch-plant economy with less rigid requirements of labour skills can be operationalized in rural areas. Secondly, the reasonably well-equipped transportation system in rural areas enables the delivery of finished products to consumer markets without much delay. Thirdly, Canadian federal and provincial governments have encouraged private manufacturers to locate their plants in rural areas as a consequence of providing financial incentives, job training, and improvement of selected basic infrastructures.⁸⁴ And last, but not least, is the availability of relatively cheap labour which attracts industrialists to locate their plants in rural areas. For instance, in 1971, the

⁸⁴ Canada, Canadian Council on Rural Development (1973), Regional Poverty and Change, (Compiled by Gunter Schramm), Ottawa: Queen's Printer, pp. 130-160.

Table 8

Shift and Share Analysis of Canadian Manufacturing
Employment Growth, Urban and Rural,
1971 - 1981

Province	Total Shift					
	Urban		Rural			
	Food and Beverage	All other Manufacturing Employment	Farm		Non-farm	
			Food and Beverage	All other Manufacturing Employment	Food and Beverage	All other Manufacturing Employment
NFL.	3370	225	-7	-37	9037	127
P.E.I.	-141	-76	-293	-22	338	344
N.S.	-1367	-2488	-162	-262	1224	1328
N.B.	-1896	-5305	-197	-323	2650	3292
QUE.	-12278	-65974	-1321	-4228	6406	40265
ONT.	-16198	-86567	-2226	-5528	151	21091
MAN.	-4429	-5957	-387	-533	211	1733
SASK.	-2922	2169	-182	140	80	1240
ALB.	-2934	20182	-437	-298	281	3993
B.C. (1)	-493	18	-404	-692	-879	1271
Total	-39288	-143773	-5616	-11783	19499	74684

(1) Including the Yukon and Northwest Territories

Note: The sum of positive total shifts for all industrial employment during this period was 1,154,871.

Source: Derived from 1971 Census of Canada, Catalogue No. 92-921, Table 2 and 1981 Census of Canada, Catalogue No. 94-741, Table 3A.

mean annual salary and wage for manufacturing workers was considerably lower in non-CMAs as compared to their CMA counterparts. Their annual employment incomes were \$ 7,308 and \$ 7,532 respectively.⁸⁵

3. Increased Employment in Service Occupations

In general, as the economy of a nation advances to a more mature stage, its growth in service industries will surpass its manufacturing industries. During the 1971-1981 period, Canada experienced such growth at a national level. The service industries had a relative gain of 625,260 jobs, where urban areas had accounted for 456,204 services jobs and rural areas had also gained 169,056 service occupations (see Table 9). Although the MAs were ahead of their rural counterparts in terms of receiving a larger, disproportionate share of service employment, the growth rate for service industries in rural areas was faster than the metropolitan situation. The growth rates were 96.9% and 65.8% for rural and metropolitan areas, respectively, from 1971 to 1981 (see Table 10).

The rapid expansion of service industries has no doubt improved the quality of rural life. Not only can they enhance community satisfaction among the rural residents, but new service activities can also increase the attractiveness of small towns to other related business sectors. As a result, economic multiplier

⁸⁵ Census of Canada (1971), Catalogue No. 31-209, Table 1 and 7.

Table 9

Shift and Share Analysis of Canadian Service
Employment Growth, Urban and Rural,
1971 - 1981

Province	Total Shift for Community, Business and Personal Service Industries		
	Urban	Rural	
		Farm	Non-farm
NFL.	9410	-133	6029
P.E.I.	353	-492	2853
N.S.	7018	-424	9614
N.B.	1904	-347	10843
QUE.	112332	-1732	65704
ONT.	133887	-2780	47032
MAN.	7163	-471	3857
SASK.	5936	873	410
ALB.	89305	-315	12326
B.C. (1)	88896	287	17637
Total	456204	-5534	176305

(1) Including the Yukon and Northwest Territories

Note: The sum of positive total shifts for all industrial
employment during this period was 1,154,871.

Source: Derived from 1971 Census of Canada, Catalogue
No. 92-921, Table 2 and 1981 Census of Canada,
Catalogue No. 94-741, Table 3A.

Table 10

Comparative Service Employment Growth
Rates for Canadian Urban and Rural Areas,
1971 - 1981

	Number of People Employed in Service Industries		Percentage of Service Employment Growth
	1971	1981	1971-1981
Urban Areas	1745455	2894715	65.84
Rural Areas	295935	582530	96.84

Source: 1971 Census of Canada, Catalogue No. 92 - 921, Table 2
and 1981 Census of Canada, Catalogue No. 94 - 741.

effects of considerable magnitude can be generated in small towns. Yet, while it might seem logical for urban and rural areas to focus their efforts on the more rapidly growing sectors of the national economy, it is not practical for rural areas to over-emphasize the development of service industries owing to their non-basic nature. Since rural areas usually have locational disadvantages and scattered population distribution, it requires a much greater population threshold to support the same service sector in a rural area as opposed to an urban area. As stated earlier, non-basic service industries only play a secondary role for economy improvement. Diversification of economic activities drawn from the basic sector is deemed necessary if long-term growth is to be sustained in rural areas.

4. Early Retirement Coupled with Higher Retirement Incomes

The federal and provincial initiatives in income insurance came with the introduction of the Canada Pension Plan (CPP) and Quebec Pension Plan (QPP) in the mid-1960s. They also provided for survivor benefits for a widow or widower and dependent children when the contributor dies prematurely, a disability benefit to contributors forced to retire early because of disability and benefits for their dependent children. As of June 1980, the maximum retirement pension payable under CPP or QPP was \$245. Between 1970 and 1979 there was a sharp increase in expenditure on retirement insurance programmes with a per capita increase from \$3 to \$76 (see Table 11).

Table 11

Income Insurance under the Canadian Pension Plan
and Quebec Pension Plan, 1970 - 1979

Year (1)	Retirement Pensions \$ '000,000	Disability and Survivors Benefits \$ '000,000	Total CPP OPP \$ '000,000	% of Total Social Security Expenditures	Per Capita \$	Per Capita Increase %	Total Beneficiaries CPP / OPP '000	Increase in Benefi- ciaries %
1970	23	41	64	0.7	3	--	195.3	145.0
1971	53	69	122	1.2	6	90.6	317.2	62.4
1972	84	110	194	1.6	9	59.0	435.8	37.3
1973	114	166	280	2.0	13	44.3	530.8	21.8
1974	157	225	382	2.3	17	36.4	676.2	27.4
1975	225	298	523	2.5	23	36.9	807.9	18.7
1976	392	399	791	3.2	35	51.2	1058.4	31.8
1977	596	513	1109	4.0	48	40.2	1150.8	8.7
1978	816	618	1434	4.6	61	29.3	1308.6	13.7
1979	1055	748	1801	5.1	76	25.6	1429.8	9.3

(1) Fiscal Year ending March 31

Source: Canada Year Book, 1981

With retirement income guaranteed regardless of location, retirees can choose the place which is suitable for their life style. During the 1971-1981 period, rural areas in Canada had a relative gain of 38,808 old people aged 65 years and above (see Table 12) which implies that the trend found in the U.S.A. applies to Canada as well. Also noteworthy is the trend for old people in rural farm areas to relocate to nearby towns where more community services and social ties could be found. The presence of aging populations obviously stimulates the growth of service industries. In essence, they form a group of consumers and create jobs for the younger population.

5. Increased Per Capita Disposable Real Income and Pursuit of Leisure Activities

The incomes of rural people have grown steadily over the past three decades, although not as fast as their urban counterparts.⁸⁶ As the data shows in Table 13, the fast-growing segment of the rural population is the non-farm group whose occupations are of urban type, that is, manufacturing, construction, trade, finance, insurance and real estate services as well as public administration and defence. In addition, according to a recent study, more and more rural households have two wage earners.⁸⁷ Therefore, the purchasing power of rural consumers has been increased dramatically. With more disposable income, consumers can satisfy their taste for higher order or

⁸⁶ G.D. Hodge and M.A. Qadeer (1983), op. cit., pp. 88-90.

⁸⁷ Ibid. (1983), pp. 88-90.

Table 12

Shift and Share Analysis of Canadian Young
and Old Population Growth, Urban and Rural,
1971 - 1981

Province	Total Shift					
	Urban		Rural			
	Young (1)	Old (2)	Farm		Non-farm	
			Young	Old	Young	Old
NFL.	-10612	6393	-2952	-233	-15383	1411
P.E. I.	-5053	1302	-10615	-1210	11322	802
N.S.	-46547	8610	-10392	-1561	3450	3736
N.B.	-58898	4659	-12564	-1310	43095	5490
QUE.	-576955	86132	-149988	-8099	261190	25350
ONT.	-239704	129582	-119722	-10727	152396	22300
MAN.	-58660	14838	-47546	-3204	3423	2392
SASK.	-839	10454	-78815	-4189	-6277	2946
ALB.	349210	28669	-70516	-5023	92922	5759
B.C. (3)	210109	62732	-21865	-1423	24535	5597
Total	-437947	353371	-524975	-36977	570743	75785

(1) Aged 64 and below

(2) Aged 65 and over

(3) Excluding the Yukon and Northwest Territories

Note: The sum of positive total shifts for all age groups during this period was 999,900.

Source: Derived from 1971 Census of Canada, Catalogue No. 92-715, Table 8 and 1981 Census of Canada, Catalogue No. 92-901, Table 6.

luxury goods and services. A noticeable increase in such business as sporting-goods shops, food stores, restaurants, music stores, taverns, and jewellery shops in rural areas may be the result of this phenomenon.⁸⁸ In short, the increase of real income has induced more consumer-serving industries to deploy their investment into those fast-growing rural areas.

6. Expansion of the Education System in Rural Areas

The progress of a society depends on technological advancement. Technological advancement, in turn, depends on the extension of education programmes to the people. While the job market for teachers was saturated in most urban areas during the 1970s, it was obviously not the case in the rural areas. Between 1971 and 1981, rural areas received a disproportionate gain of 19,436 education and related jobs (see Table 14). This achievement may be in part due to the diffusion of provincial education systems to local levels as well as the tight educational job market in urban areas. The 'knock-on' effect of such investment is a better cultural environment and greater economic base for further development of such communities.

7. Growth of Government Interest in Rural Areas

The problem of economic disparities between urban and rural areas has been a matter of concern in the last three decades in most Western nations. From this concern emerged a variety of

⁸⁸ Ibid. (1983), pp. 88-90.

Table 13

Shift and Share Analysis of Canadian Industrial
Employment Growth, Urban and Rural, 1971 - 1981

Industry	Total Shift			
	Urban	Rural		Total
		Farm	Non-farm	
Agriculture	3892	-207243	18013	-185247
Forestry	2268	-3162	-49	-994
Fishing and trapping	1766	-349	875	2291
Mines quarries and oil wells	16184	-188	6187	22183
Manufacturing: food and beverage	-39289	-5619	19501	-25406
Manufacturing: all others	-143774	-11787	74687	-80874
Construction	-6111	-8983	30179	15084
Transportation and storage	-23425	-4857	14290	-13991
All other transportation communication and utilities	23778	-466	13771	37082
Retail	86499	467	58082	145049
Other trade	55569	332	29609	85511
Finance insurance and real estate	103001	1606	31167	135776
Education and related services	-29488	-6923	25729	-10682
Health and welfare services	100110	1190	57400	158701
Personal services	-54298	-4265	-2885	-61449
Accommodation and food services	173670	641	38091	212403
Other services	266221	3820	56245	326827
Public administration and defence	-13550	-2802	30857	14504

Source: Derived from 1971 Census of Canada, Catalogue No. 92-921, Table 2 and 1981 Census of Canada, Catalogue No. 94-741, Table 38.

Table 14

Shift and Share Analysis of Canadian Education
Employment Growth, Urban and Rural,
1971 - 1981

Province	Total Shift		
	Urban	Rural	
		Farm	Non-farm
NFL.	1782	-57	1162
P.E.I.	-163	-252	423
N.S.	-291	-310	1108
N.B.	-1922	-306	1768
QUE.	-8287	-1736	11373
ONT.	-28886	-2243	6239
MAN.	-2409	-649	350
SASK.	-2272	-399	-1125
ALB.	3002	-985	1820
B.C. (1)	10012	15	2609
Total	-29488	-6922	25729

(1) Including the Yukon and Northwest Territories

Note: The sum of positive total shifts for all industrial employment during this period was 1,154,871.

Source: Derived from 1971 Census of Canada, Catalogue No. 92-921, Table 2 and 1981 Census of Canada, Catalogue No. 94-741, Table 3A.

special government programmes to deal with it. In Canada, the efforts of the federal government to assist with the economic and social development of people living in rural or depressed areas began in the late 1950s. The first specific area-development programme (that of the Area Development Agency of 1963) was designed to reduce unemployment in rural areas by means of industrial decentralization. The federal government, however, earlier developed the Agricultural and Rural Development Act (ARDA) programme in order to improve the efficiency and productivity of agriculture and the use of other resources, while making some provisions for moving marginal farmers to other activities. The next phase in federal policy was the implementation of the Fund for Rural Economic Development (FRED) after 1966. FRED programmes created a federal provincial planning mechanism and (to some extent) joint implementation machinery which mobilized both federal and provincial institutions, policies and financial resources and staffs in a manner designed to improve the economic growth and social infrastructures of the areas involved. With the establishment of the Department of Regional Economic Expansion (DREE) in 1969, the federal government became involved in research and development for regional planning as well as implementation for various major economic and social programmes.

The objective of DREE planning policy was to assist in stimulation and dispersion of economic growth and the reduction of regional disparities without generating an unacceptable

reduction in the rate of national economic growth. This policy promoted job creation, employment security, high productivity and higher labour-force participation rates, and reduction of relatively high underemployment in rural areas.⁸⁹

To achieve the above objectives, the government used approaches such as: (i) creation of new permanent jobs by means of providing incentives to private business so as to make investment more attractive in rural areas; (ii) improvement of basic infrastructure (i.e. roads, schools, housing, industrial parks, water and sewer systems, etc.) to sustain and further stimulate growth in selected rural communities; and (iii) launching a variety of programmes such as training, counselling, special agriculture, fishing, mining and tourism development to improve rural labour skill and income. Furthermore, special assistance was made available to people in rural areas so that they could gain access to the new job opportunities created, and to improve their living standards and quality of life in general.⁹⁰ Regardless of the limitations in some of the programmes, they certainly have contributed to attracting some people to the rural areas, and to the retention of rural residents who might otherwise have migrated to urban centres.⁹¹ Examining the SSA data in Table 15, one can see that rural areas

⁸⁹ Canada, Canadian Council on Rural Development (1973), op. cit., pp. 130-160.

⁹⁰ Ibid. (1973), p. 131.

⁹¹ Ira M. Robinson (1981), Canadian Urban Growth Trends: Implications for a National Settlement Policy, Canada: University of British Columbia Press, p. 50.

had a disproportionate gain in government-related jobs to the extent of nearly 1.9 times as many as their urban counterparts during the 1971-1981 period. The number of jobs gained by rural and urban areas were 105,451 and 57,071 respectively.

8. Levelling-off of Loss of Farm Population

It is a well-known fact that the urbanization underway prior to the 1960s was positively correlated with farm mechanization in North America. Even in the 1971-1981 period, agriculture in Canada had a relative loss of 185,247 jobs in comparison with other industrial sectors (see Table 13 and 16). Fortunately, the expansion of all other industries except personal services and forestry in rural areas absorbed the laid-off farm workers. Somewhat surprisingly, was the relatively moderate gain of agricultural workers in the adjacent rural non-farm areas in eight provinces. Because agriculture is a declining industry in manpower terms, this phenomenon may lead one to attribute it to the increasing popularity of multiple jobs held by the farming population.

9. Rise of Country-style Living

Similar to the residential preferences evinced by Americans and the Western Europeans, Canadian became more and more oriented towards country-style living during the 1970s. Gallup polls taken in Canada in 1974 and in 1981 consistently indicated that about 10 % more of the population preferred farm and small-community

Table 15

Shift and Share Analysis of Canadian Government
Employment Growth (1), Urban and Rural,
1971 - 1981

Province	Total Shift		
	Urban	Rural	
		Farm	Non-farm
NFL.	6683	-163	5189
P.E.I.	-1303	-374	2148
N.S.	-7134	-306	5880
N.B.	-6141	-312	7713
QUE.	43792	-1210	45711
ONT.	-49904	-5309	25357
MAN.	-2713	-1050	1455
SASK.	-2626	808	538
ALB.	26113	-553	8581
B.C. (2)	50302	-64	11412
Total	57070	-8535	113986

(1) The government employment sector includes public administration and defence, education, health and welfare service occupations.

(2) Including the Yukon and Northwest Territories.

Note: The sum of positive total shifts for all industrial employment during this period was 1,154,871.

Source: Derived from 1971 Census of Canada, Catalogue No. 92-921, Table 2 and 1981 Census of Canada, Catalogue No. 94-741, Table 3A.

Table 16

Shift and Share Analysis of Canadian Agriculture
Employment Growth, Urban and Rural,
1971 - 1981

Province	Total Shift		
	Urban	Rural	
		Farm	Non-farm
NFL.	210	-386	-59
P.E.I.	250	-3191	575
N.S.	275	-2706	997
N.B.	-61	-2641	635
QUE.	-1136	-30359	7656
ONT.	-1147	-46535	7968
MAN.	197	-24315	693
SASK.	-478	-48275	-4932
ALB.	1546	-43233	3279
B.C. (1)	4235	-5603	1200
Total	3892	-207243	18013

(1) Including the Yukon and Northwest Territories.

Note: The sum of positive total shifts for all industrial employment during this period was 1,154,871.

Source: Derived from 1971 Census of Canada, Catalogue No. 92-921, Table 2 and 1981 Census of Canada, Catalogue No. 94-741, Table 3A.

living to city living. In answer to the question about the "preferred" place of living, on both occasions, 21 % of the respondents opted for the city, while 31 to 32 % expressed a desire to live in a small-town. Moreover, in 1981, while 21 % of city dwellers expressed a preference for small-towns, only 4 % of small-town residents wanted to live in a city.⁹² Although we do not know to what extent the subjective factor has contributed to the revival of population growth in rural small-towns, we know that recent urban-to-rural migrants have some common characteristics and preference for country-style living. In addition to economic factors, they were attracted by the rural values of a peaceful, friendly, and simple way of life.⁹³

10. Narrowing of Traditional Gaps in Urban and Rural Living Standards

In recent years, the diffusion of transportation, communication, education, cultural and health facilities, and other social and economic infrastructures to rural areas reduced the gap in the living standard between urban and rural areas. The consolidation of the above public services, improvement of rural electrification, and rise of automobile ownership made it economically feasible for people as well as firms to move closer to non-metropolitan amenities.⁹⁴ According to Goldberg and Webster, the diminishing differences of socio-economic infrastructures have become a growth component for small towns,

⁹² Canadian Institute of Public Opinion (1981), The Gallup Report, Toronto: Mimeographed 2.

⁹³ G.D. Hodge and M.A. Qadeer (1983), op. cit., p. 131.

⁹⁴ Ira M. Robinson (1981), op. cit., pp. 47-49.

because they offered in-migrants and existing rural residents, not immediate employment, but special life style and amenity opportunities. They postulated the "people-first" approach or the "supply-based model of development". In this model, they assumed that the development cycle sketched out above is not necessarily linear but could be entered at any point and activated by attracting people first rather than jobs. New in-migrants attracted to an area for reasons of life style and amenities create effective demand for the urban centre's products soon after they arrive or spur the development of new business and industries, thereby creating new jobs, which, in turn, continues the process of economic development.⁹⁵

This model may be applicable in the case of retirement or resort towns where sufficient in-migrants overcome a threshold size necessary for generating new jobs. However, rural areas with locational disadvantages, little or poor industrial mix, insufficient labour market and poor infrastructure are scarcely likely to attain such a crucial threshold.

11. More Long-distance Commuting

It is not surprising to know that automobile ownership among rural households is higher than it is among urban households. Unlike urban areas, public transportation in rural areas is almost non-existent. To carry out daily activities, access to a private automobile is almost a must for rural residents.

⁹⁵ Michael A. Goldberg and Douglas B. Webster (1979), "The Atlantic Provinces: Canada's New Amenity Region", Contact, vol. 11, no. 2, pp. 91-111.

According to the 1971 census, 83 % of rural households owned two cars, as compared with 76 % of urban households.

In terms of travelling patterns, rural residents do not display much differences as compared to city dwellers, particularly, sub-urban dwellers. Both groups expect to live, work, and shop in different places, and they spend a fair portion of their time travelling from one functional area to another. Therefore, as Hart commented: "why should anyone expect dwellers in the country to be any different?"⁹⁶ The decline of Central Business Districts (CBDs) and the rise of regional shopping centres have altered the shopping patterns of urban consumers in most North American cities. A parallel to that trend in rural areas is the emergence of the "dispersed city". Here, different centres have specialized in one or two functions and operate as elements of an interlinked system of places, usually places of equal standing.⁹⁷ Although each centre functions individually, they work together in a complementary way for the rural economic landscape as a whole. The emerging of dispersed cities has offered job opportunities to rural residents. Yet, the work places in rural areas are likely to be more distant from workers' homes, the median commuting time required was 43 minutes.⁹⁸ Among all small centres in 1971, the average distance travelled by

⁹⁶ The "dispersed city hypothesis" as applied to small centres is expressed by Hart: "Today many villages are dominated by a single function, and their residents drive to other villages to obtain the other goods and services they require." John Fraser Hart (1975), The Look of the Land, Englewood Cliffs, N.J.: Prentice Hall, p. 168.

⁹⁷ Ibid. (1975), p. 168.

⁹⁸ Fred A. Dahams (1980), "The Evolving Spatial Organization of Small

out-commuters was 22.4 miles.⁹⁹

The above findings have two major implications. First, they show not only that small-town commuters have travel behaviour similar to that of city commuters, but also that most of those who cannot, or choose not to, work in their own town are able to find jobs within an hour's drive of home. Secondly, as 80 % of the towns and villages of Canada lie well beyond a half-hour drive of metropolitan areas, it is apparent that rural regions themselves must provide the bulk of employment opportunities for small-town residents.¹⁰⁰

12. Revival of Energy and Mining Industries

Canada's mineral industry is the single largest contributor to the country's exports. In addition to crude petroleum and natural gas, principal export items are copper, nickel, lead, zinc, and their products, as well as iron ore, primary iron and steel. During the energy crises in the 1970s, exploitation of mineral resources, especially the oil and gas industries, had attracted massive capital inflows from the United States. In terms of national employment growth, the mining industries received a disproportionate gain of 22,183 jobs. Of these 22,183 new jobs, 5,999 and 16,184 were taken by rural and urban residents respectively (see Table 17). However, the energy and mining industries had only a marginal effect on small-town revival. For

Settlements in the Countryside -- An Ontario Example", TESG (Journal of Economic and Social Geography), 71:5, p. 305.

⁹⁹ G.D. Hodge and M.A. Qadeer (1983), op. cit., p. 93.

¹⁰⁰ Ibid. (1983), pp. 91-98.

instance, the greatest relative gain of mining jobs was limited to 6,539 in Alberta. The rural areas in other provinces experienced little gain or even some loss in this industrial sector.

13. Improvement of Transportation Infrastructure

The model of central places developed by Christaller was forthcoming with the transport principle where centres were to be "placed" on transport routes.¹⁰¹ Theoretically, therefore, one would expect the growth of small towns along the Trans-Canada Highway to be faster than the others, not so well placed. Over time, the development of new secondary routes linked to major routes have a significant influence upon service functions. The new routes enable the hinterland population to gain access to more job opportunities as well as shopping needs. Existing industrial towns are being provided with more labour as well as consumer demand. The industrialists may be able to reduce the cost of production by means of locating new or existing plants closer to the source of raw materials on the new convenient transportation links (e.g., food processing). Indeed, rural residents received a much higher disproportionate share of transportation employment than their urban counterparts during the 1971-1981 period (see Table 18). Unfortunately, not all the towns with improved transportation infrastructures will derive economic benefits. Basically, the infrastructures will

¹⁰¹ W. Christaller (1966), Central Places in Southern Germany (translated by C. W. Baskin), Englewood Cliffs: Prentice - Hall Inc., pp. 72-74.

Table 17

Shift and Share Analysis of Canadian Mining
Employment Growth, Urban and Rural,
1971 - 1981

Province	Total Shift		
	Urban	Rural	
		Farm	Non-farm
NFL.	-371	-10	207
P.E.I.	43	1	58
N.S.	-1755	-71	-97
N.B.	-661	-43	309
QUE.	-5548	-718	2630
ONT.	-10221	-251	-3039
MAN.	-3712	-293	-24
SASK.	1910	131	705
ALB.	33429	1115	5244
B.C. (1)	3071	-47	194
Total	16184	-188	6187

(1) Including the Yukon and Northwest Territories.

Note: The sum of positive total shifts for all industrial employment during this period was 1,154,871.

Source: Derived from 1971 Census of Canada, Catalogue No. 92-921, Table 2 and 1981 Census of Canada, Catalogue No. 94-741, Table 3A.

mainly help those towns within commuting distance of the core city and do little to improve the economic prospects of those in more distant rural areas.

14. Lower Cost of Living in Rural Areas

In general, costs of food and shelter are cheaper in rural areas than urban areas. For instance, the value of houses bought by rural Manitoban between July and November of 1982 was on the average \$ 4,153 cheaper than those bought in metro Winnipeg.¹⁰² Although the price for houses varies from one province to the other, houses located in urban areas are generally more expensive due to higher land values. Residential property tax charged in cities is relatively higher as well. What is more, rural residents tend to grow their own vegetables and fruits for domestic consumption which reduces their living costs relative to their urban counterparts. Further, the availability of mutual assistance is far more popular among rural residents than urban dwellers. This kind of mutual assistance involves exchange of labour services and voluntary community services.¹⁰³ As the nature of entertainment in rural areas is more of an out-door kind, it can be obtained at a cheaper cost than the in-door oriented entertainment of cities. In rural areas, the absence of materialistic values is regarded as a traditional virtue. Although rural residents have the same choices to purchase

¹⁰² Adison Lee (1983), The Canadian Home Ownership Stimulation Program and Housing Market in Manitoba, 1982. Unpublished BA Honour's Thesis, the University of Winnipeg, Geography Department, p. 63.

¹⁰³ G.D. Hodge and M.A. Qadeer (1983), op. cit., pp. 136-137.

Table 18

Shift and Share Analysis of Canadian Transportation
Employment Growth, Urban and Rural,
1971 - 1981

Province	Total Shift		
	Urban	Rural	
		Farm	Non-farm
NFL.	-3306	-129	-113
P.E. I.	-382	-289	356
N.S.	-2764	-270	-610
N.B.	-5115	-236	1081
QUE.	-8255	-1059	11591
ONT.	-1152	-2025	12066
MAN.	-3836	-753	295
SASK.	-830	-23	-1436
ALB.	19939	22	4199
B.C. (1)	6056	-559	630
Total	352	-5324	28061

(1) Including the Yukon and Northwest Territories.

Note: The sum of positive total shifts for all industrial employment during this period was 1,154,871.

Source: Derived from 1971 Census of Canada, Catalogue No. 92-921, Table 2 and 1981 Census of Canada, Catalogue No. 94-741, Table 3A.

higher-order goods and services as their urban counterparts, the majority of them simply choose not to do so.

The lower cost of living in rural areas acts as a powerful pull factor for some urban-to-rural migrants, especially the retired and unemployed who were seeking attractive or cheaper living environments.

SUMMARY

Similarities and Differences of Non-metropolitan Growth between the United States and Canada

Although both the U.S.A. and Canada experienced non-metropolitan growth at the national level between 1971 and 1981, factors affecting rural small-town growth varied from one region to another. The following summarizes the regional variations across the continent, but, equally important, it highlights themes common to all regions within North America.

1. The location of human settlements is always influenced by geographic proximity to places where economic activities and favourable environments are concentrated. The expansion of metropolitan growth usually stimulates nearby rural towns before proceeding further to distant rural areas. Furthermore, time forms a constraint which is likely to restrict access to job opportunities, goods and services, and confine them to the commuting zone of a city. Consequently, urban-to-rural migrants who want to take advantage of both rural residential environments and urban amenities are more likely to live in rural communities

within the commuting zone. One would expect that there were minimum regional variations between the two countries in this respect.

2. The decentralization of manufacturing industries improved the rural economy of both countries in general. However, manufacturing in the U.S.A. is much better developed than in Canada. With a strong capital base, advanced technology, abundant resources, and adequate labour supply, the manufacturing industries in the U.S.A. can decentralize their operations into rural America much easier than Canadian industry can transfer to rural Canada. To make matters worse for the latter, decentralization of Canadian manufacturing is restricted by factors such as imported technology, foreign investment, distance to the central domestic market, localized natural resources, and a relatively poor transportation network between urban and rural areas. Basically, the decentralization of manufacturing industries has benefited small-towns in America rather than in Canada. In Canada, this factor had a far greater effects on small-town growth in Quebec and Ontario than in any of the other provinces (see Table 8).
3. The booming service sector was a universal phenomenon across the North American continent during the 1971-1981 period. When countries are in good economic position, they can afford to promote more services to their citizens, especially to those areas which previously had been ignored. In the case of America, the service gap between urban and rural areas was reduced drastically in the 1970s. At the same time, Canada had also

extended various services to her rural residents. In general, both countries promoted higher living standards for their rural residents by means of boosting more service employment as well as infrastructural improvements in rural areas. Because service industry played an important role in both retaining and attracting people in small towns; therefore, the universal expansion of service employment in non-metropolitan areas (see Table 9) had little regional variations among the rural areas of the two countries.

4. The higher retirement income programmes offered by both countries encourage retirees to seek a peaceful life in the countryside. In America, the states located in the "sun-belt" zone offer suitable climate for elderly migrants. Consequently, a disproportionate number of interstate elderly migrants are attracted there. The climate in Canada is more uniform except for the province of British Columbia where the climate in winter is less severe. Although elderly migrants may be tempted to move to this province, they are being discouraged by the high living costs in this area. Therefore, the growth of small-towns in Canada was partly a result of old people opting for local moves: from rural farm to rural non-farm areas; and partly because more old people stayed in their rural non-farm areas. In short, elderly migrants in the U.S.A. are more mobile than their Canadian counterparts. Across Canada, there was no apparent evidence to suggest that regional variations existed. All ten provinces in Canada had a relative gain of older people in rural areas (see Table 12).

5. The steady rise of real income in North America in the 1970s occurred as a result of greater labour force participation and lower real costs of production. Consequently, the proportion of income spent on basic necessities was considerably reduced. With more disposable real income, consumers can afford to pursue leisure activities in various attractive urban and rural areas. However, not all rural areas have the same potential for out-door recreation activities. Therefore, one would expect small towns located close to recreation or tourist sites to benefit more from the development of consumer-serving industry. In the U.S.A., regions with such noticeable potential are Hawaii, the North Pacific Coast, Upper and Lower Great Lakes, Arizona and Florida. Areas with comparable advantages in Canada are limited to the West Coast and Great Lakes regions. In general, small towns located in the interior part of North America are relatively unaffected by this factor. Therefore, we may conclude that this factor produces a strong regional bias for small-town growth.
6. The diffusion of national and sub-national education systems to rural areas deterred out-migration. Indirectly, this factor generated cultural and business activities for rural communities. In short, this factor facilitated rural development in both countries regardless of geographic location.
7. In the last three decades, governments in the U.S.A. and Canada have dedicated themselves to the promotion of the socio-economic well-being of rural residents. A variety of measures have been used in order to reduce regional disparities. In general, the absolute growth of rural areas has been achieved. Nevertheless,

the relative economic position of rural communities that are distant from growth centres and lack human and natural resources remained unchanged.

In the U.S.A., this problem may not be so serious since their population, existing infrastructures, natural resources, and diversified economy are more evenly distributed. On the other hand, Canada has not yet been able to develop a stable economy in the rural communities with locational disadvantages situated in the Atlantic and Prairie regions. Obviously, this factor for small-town growth is very selective. The effectiveness of government plans varies greatly from one area to another, depending on the machinery of implementation, the degree to which local people can be persuaded to become involved, and the adequacy of the funding arrangements.

8. The excess farm workers from the declining agricultural industry have been absorbed by the decentralized manufacturing and services industries in rural areas. Because of the revival of other aspects of the rural economy, excess farm workers could stay in rural communities without migrating to cities.

Evidently, the U.S. migrant pool from farm areas has been stabilized. On the other hand, the record in Canada is far more uneven. Saskatchewan, for example, has the largest farm area and a farm labour force which is still adjusting to secular changes. Consequently, urbanization in this province is still progressing apace, being fuelled with migrants mainly from its rural areas.

9. Gallup polls taken both in the U.S.A. and Canada indicated that more people change their residential preferences towards country-style living than used to be the case ten years ago. Although we know there is an association between this factor and the recent small-town revival, we do not know how many people moved to rural areas because of their changed preferences. One may also expect that this factor varies from one area to another. To make a conservative estimation, urban areas with deteriorating environments such as high crime rates, serious pollution, and dense population will provoke more people to change their preferences and therefore live out in the country side. In the case of America, urban areas located in the Northeastern Metropolitan Belt may be used as an example. While in Canada, one may expect that higher percentages of urban population had changed their residential preference in Ontario and Quebec than their urban counterparts in other provinces.
10. Rural-urban convergence resulting from the diminishing differences in technology and communication, employment and cultural opportunities, transportation infrastructures, living standards, real income levels, and life styles between urban and rural areas have supported the growth of small-towns in North America generally. Since the U.S.A. has a population size ten times as much as Canada, its transportation network is more evenly developed. With the aid of a well-developed transportation network; physical, time, and cultural distances are being shortened. Therefore, less variations of urban-rural differences are expected in the U.S.A. On the other hand, population

settlements in Canada are mainly located along the southern boarder. Towns located in the northern parts remain relatively isolated and thus receive less urban influences. As a result, one may expect the existence of more urban-rural differences between the northern and southern settlements in Canada.

11. The high rate of automobile ownership among non-metropolitan households and the provision of all-weather roads in rural areas enable rural residents to live and work in different places. Various research findings have indicated that job-commuting is a feasible means to maintain income for living in rural areas.

Both American and Canadian rural residents have a similar job-commuting pattern. However, the median commuting distance for the rural American commuters was four times shorter than their Canadian counterparts; 4.6 miles¹⁰⁴ for the former and 20 miles¹⁰⁵ for the latter. This finding is reflective of the sparser settlement and poorer economic standing of Canada in comparison with the U.S.A.

12. The energy crisis in the 1970s induced growth in rural areas with abundant energy resources. However, the distribution of energy-supply towns in rural areas is limited to a few regions in both the U.S.A. and Canada. In the U.S.A., the most notable regions are the Northern Great Plains and Appalachia whereas in Canada, the leading province is Alberta. Therefore, one can conclude that the revival of energy and mining industries as one of the growth components for small-town has a strong regional

¹⁰⁴ Gladys K. Bowles and Calvin L. Beale (1980), op. cit., pp. 8-20.

¹⁰⁵ G.D. Hodge and M.A. Qadeer (1983), op. cit., p. 100.

bias.

13. The improvement of the highway system no doubt has extended the mobility of rural residents. As discussed previously, some towns grew at the expense of others because of the newly-created transportation routes which modified the existing collection points and thus by-passed certain towns. Hence, one may hypothesize that small towns adjacent to the new collection points may receive more growth than isolated towns.
14. In general, residents in non-metropolitan areas enjoy lower costs of living as compared to dwellers in metropolitan centres. Since this factor is quite consistent among rural communities, one can therefore expect little regional variations. However, there are a few possible exceptions including some mining and retirement towns which experienced a sudden influx of immigrants and a sharp increase of economic activities during the 1970s. As a result, both inflation and the cost of living have risen to create local difficulties in these communities.

THE POPULATION TRENDS AND ECONOMIC STRUCTURES: RURAL MANITOBA

INTRODUCTION

The dynamics of small-town population change in the U.S.A. and Canada involve a wide variety of complex factors. Of these factors, some have strong regional biases, while others may, or may not, be applicable to a particular region. To understand the small-town viability question in Manitoba, one has to examine its unique attributes. In comparison with the U.S.A. and other Canadian provinces, Manitoba has peculiarities in terms of history, politics, geography, population and economic structures. In this Chapter, discussion will focus on the background to the rural settlement system and those growth factors which had the same bearing and relevance to Manitoba.

A HISTORICAL OVERVIEW OF RURAL MANITOBA POPULATION TRENDS AND ECONOMY

Economic Trends

Initially, Manitoba was an area rich in furs, and it was the fur trade that led to exploration and development of the region by Europeans. By 1800, the increasing number of traders and personnel for the forts created a requirement for a permanent supply of food, which led to the development of agriculture as grains, vegetables, and cattle began to be raised near the post.¹⁰⁶ At the turn of this century, the

¹⁰⁶ E.A. Whitecomb (1982), A Short History of Manitoba, Ontario: Canada's Wing, Inc., p. 17.

successful development and implementation of farm techniques constructed a foundation for an export trade in primary agricultural products.¹⁰⁷ Moreover, the building of a railway network across the Prairies created the means to transport surplus grain to oversea markets. However, the subsequent development of competitive service centres elsewhere in Western Canada conspired to reduce the functions of wholesaling and transportation held by Manitoba-based enterprises. During the 1930s, the economic depression and drought on the Prairies resulted in a drop in grain market prices and abandonment of farms. These conditions cried out for economic diversification. From 1940 to 1955, the climate of opinion in Manitoba favoured manufacturing as a means for economic diversification. However, manufacturers in Ontario and Quebec held more comparative advantages than Manitoba. They occupied strategic central locations with respect to the Canadian markets, their proximity to the U.S. markets and coal supplies, their large and skilled labour force, their abundant resources and diversified transportation system, and their general attractiveness to both domestic and foreign investment, have in conjunction hindered the development of manufacturing industries in Manitoba. Moreover, the discovery of oil in Alberta in 1947 and potash resources in Saskatchewan, combined with the rapid economic development of British Columbia, have further decreased Manitoba's relative position in the West.¹⁰⁸ Consequently, the Manitoba economy entered the 1970s confronted with a new and increasingly competitive environment. As a result, these external factors have limited the

¹⁰⁷ L. A. Sarbit and G. W. Bryn (1980), Spatial Aspects of Structural Change in Central Place System: Southern Manitoba 1961-1971, Toronto: York University, Geography Monographs, No. 4, p. 1.

¹⁰⁸ Ibid., p. 3.

province's industrial expansion and diversification. Nevertheless, agriculture still performs its traditional function of export production, but to an increasing degree it is to diversifying crop production that the province turns. Also, in providing raw materials for processing and manufacturing industries, which in turn, export the processed and finished products, the primary sector remains of overriding importance. As of 1960, agriculture and agriculture-related activities were the largest income and employment generators, although their contribution to the economy had declined over time.¹⁰⁹

Population Trends

According to Laut, "the beginning of Canadian history was not caused by the beaver, but a myth -- the North-West-Passage -- a short way round the world to bring back the spices and silks and teas of India and Japan. It was this quest, not the lure of the beaver, that first brought men into the heart of New World Wilds by way of Hudson Bay."¹¹⁰ The continued search for a northwest sea to the Orient; the compelling desire to maximize the great gains from the fur trade; and the imponderable human trait which has further driven men to explore the depths of the continent, led to incursions into Manitoba.¹¹¹ In 1670, King Charles II of England granted a charter to the Hudson's Bay Company which received "all the land, countries and territories upon the coasts

¹⁰⁹ Manitoba, Committee on Manitoba's Economic Future (1963), Manitoba C.O.M.E.F. Report, 1962-1975, Government of Manitoba, Vol. III, pp. 1-6.

¹¹⁰ A. Laut, The Adventures of England on Hudson Bay, Glasgow Brook and Company.

¹¹¹ C. B. Davison (1938), The Population of Manitoba, Preliminary Report, Province of Manitoba: Economic Survey Board.

and confines of the seas, straights, bays, lakes, and rivers."¹¹² While the Hudson's Bay Company rested content with establishing seven or eight forts along the coast and a few inland, French traders were pushing deeper into the interior, thus competing with that company for furs, and exploring new territory. By 1731, the French explorer, La Verendrye had discovered the Red River to the mouth of the Assiniboine, the site of the present City of Winnipeg; not to speak of Portage La Prairie, Lake Manitoba, Lake Winnipeg, and the mouth of the Saskatchewan River (on the present site of The Pas). With the conquest of Canada by the British in 1763, there opened a new era in the history of Manitoba.

Although there were some pioneers in exploration and leading fur traders, the wide stretches of prairie land remained uninhabited in the early days of the nineteenth century. Before 1867 population growth in Canada West was sparse, by 1871 Manitoba had a population of only 25,000 in the Red River Valley.¹¹³ It was not until 1870 there that any considerable influx of settlers moved into Manitoba.

To encourage settlement, the Dominion Government in 1872 passed the "Homestead Act" providing for the free grant of homesteads -- 160 acres of Dominion land -- and the title to the land could be obtained after three years of residence and by compliance with certain regulations concerning specific improvements to the property. As a result of this generous provision, numbers of Canadians were enticed to come to Manitoba from eastern Canada. Among them, the Anglo-Saxon English speaking people settled the good land in the south-west of the province.

¹¹² M. MacWilliam (1928), Manitoba Milestone, Dent and Sons.

¹¹³ W. L. Marr (1980) Canada: An Economic History, Canada: Gage Publishing Limited, p. 172.

Immigration continued at high levels up to 1914. At the same time, economic hardship, along with political and religious prosecutions had driven Eastern European immigrants to resettle in Manitoba in search of economic betterment, together with political and religious freedom. Under such conditions, the diverse cultural mosaic was formed in Manitoba. The geographic location of different ethnic origins can be summarized as follows; beginning with the Germans. German-speaking Mennonites came to Manitoba in the thousands in the 1870s, settled down in the area around Steinbach, Altona, and Morden. Following the Mennonites, the Icelanders selected the shores of Lake Winnipeg around a town they named Gimli. The Jews, escaping the heavy religious restrictions imposed by the Russian authorities, migrated to Winnipeg in 1882. Unlike the Mennonites, many Scandinavians did not settle in any particular area, spreading over various parts of the province. Between 1889 and 1890, about 6,500 Ukrainians arrived in the northern portion around Brokenhead, Shoal Lake, Russell, Sifton and Ethelbert -- the rougher, wooded and interlake areas since most of the government land in the southern section of the province was occupied. Several thousand Polish people also arrived during the same year. Concurrently, French Canadians migrating to Manitoba, formed pockets of settlement throughout the province but concentrated in the area of St. Boniface in Winnipeg.

After World War I, immigration commenced again. Under the Soldier Settlement Board, the Canadian government aided returned soldiers to settle in Manitoba. During the 1920s a steady stream of European and British immigrants flowed into Manitoba. However, between 1931 and 1941, Canadian authorities tightened immigration regulations and reduced their

efforts to attract people to Canada: a consequence of the depressed economy. It was not until the 1950s that Canada once again experienced large-scale net and gross migration. This began after the Second World War when many thousands of Europeans moved to Canada. However, in the years from 1958 to 1961, net immigration fell as European economic condition improved while Canada's unemployment rate rose to over 7 per cent. However, starting in 1962, job opportunities in Canada improved relative to those in Western Europe, resulting in rising levels of net immigration from Europe to Canada, and Manitoba was a beneficiary of this process.¹¹⁴

Apart from the population history of Manitoba, one of the important issues is the distribution of population between rural and urban areas. Table 19 shows the breakdown of rural and urban population from 1881 to 1971. In a period of ninety years, the total population increased more than fifteen-fold; that is, from 62,620 to 988,245. However, the growth pattern between rural and urban areas are uneven. From 1881 to 1941, rural Manitoba experienced a population growth from 52,015 to 407,871 with an average annual rate of increase of 3.43 per cent. During the same period, urban areas also experienced an absolute growth of population from 10,245 to 321,873. However, the rate of increase was higher than its rural counterpart; namely 5.75 per cent. These figures intimate that new settlement in Manitoba has occurred at a faster pace outside the rural areas, although both rural and urban areas were growing in absolute terms. The years from 1941 to 1971 witnessed a remarkable change in the rural-urban population distribution. After

¹¹⁴ E. A. Whitecomb (1982), op. cit., pp. 1-60; C. B. Davison (1938), op. cit., pp. 1-36; W. L. Marr (1980), op. cit., pp. 172-178.

reaching its peak in 1941, rural population started to decline in both absolute and relative terms. On the other hand, urban areas grew very rapidly at the expense of rural areas. For the first time, in 1951 the proportion of population in urban areas exceeded rural areas; that is to say, 56.6 per cent in urban areas as compared to 43.4 per cent in rural areas. The rural population fell from 407,871 in 1941 to 301,800 in 1971; and the urban population increased from 321,873 in 1941 to 686,445 in 1971.

In summary, before 1941 the rural-urban balance in Manitoba's population had changed but little. However, the population growth of Manitoba since 1941 has witnessed a remarkable degree of urbanization. As a result of this urbanization, the problem of rural depopulation began to emerge. In the next section, I will discuss the recent government policy directed towards rural development and the changed issue of rural depopulation.

Table 19

Manitoba Population Trends, 1881 - 1971

YEAR	Total Population	Urban Population	Rural Population	Urban Population as % of Total Population	Rural Population as % of Total Population
1881	62260	10245	52015	16.46	83.54
1886	108640	29833	78807	27.46	72.54
1891	152506	41008	111498	26.89	73.11
1901	255211	70436	184775	27.60	72.40
1906	355688	138090	227598	37.76	62.24
1911	461394	200365	261029	43.43	56.57
1916	553860	241014	312846	43.52	56.48
1921	610118	261616	348502	42.88	57.12
1926	639056	278858	360198	43.64	56.36
1931	700139	315969	384170	45.13	54.87
1936	711216	310927	400289	43.72	56.28
1941	729744	321873	407871	44.11	55.89
1946	726993	337401	389592	46.41	53.59
1951	776541	439580	336961	56.61	43.39
1956	850040	510583	339457	60.07	39.93
1961	921704	588807	332897	63.88	36.12
1966	963066	646048	317018	67.08	32.92
1971	988245	686445	301800	69.46	30.54

Source: for 1881 - 1951, Census Branch, Dominion Bureau of Statistics;
for 1961 - 1971, Statistics Canada CS 92-536 / 1971.

THE POLITICAL ECONOMY OF MANITOBA: 1948 - 1977

The evolution of rural communities in Manitoba is not entirely dependent on free-market forces. Government policy, explicitly or inadvertently, may cause differential growth or decline in terms of population and economic performance. Since 1948, there have been three different political parties governing the province. The period between 1950 and 1958 was headed by the Liberal Government; the Progressive Conservatives were in power between 1958 and 1969; and for almost a decade since 1969 the Progressive Conservative Government was replaced by the New Democratic Party. Each of these parties has influenced Manitobans in differing ways, and not last in the area of planning. Their policies towards rural development will be assessed individually in the following sections.

The Liberal Government: 1948 - 1958

The attitude toward regional economic development policy under the Liberal Regime was, in the Progressive Conservative view, simply to leave it to the "natural play of economic forces."¹¹⁵ Obviously, regional economic policy under the Liberal Party was heavily influenced by the party ideology which advocated free enterprise and minimum government intervention. Although the words "upsurge, boom, sparked" for economic expansion policy appeared regularly in the Liberal Government budget addresses, its basic policy toward regional economic development was simple and limited. The anti-interventionist orientation of Liberal policy in the 1950s is clear from the government's refusal to proceed

¹¹⁵ Honourable D. Roblin, Debates and Proceedings of the Manitoba Legislative Assembly, March 12, 1963.

with a provincial loan fund which ostensibly would have granted loans of risk capital to small businessmen where available credit was not forthcoming through normal channels.¹¹⁶ Criticism also came from the opposition party leader, Duff Roblin of the Progressive Conservative Party, who claimed that the Provincial Liberal Government was "an old lackadaisical limping administration...with a debt depression complex."¹¹⁷ Development in the province had lagged, he argued, because the necessary expenditures on social overhead capital such as roads, power facilities, transport facilities and education, had not been carried out. The Liberal government lacked a development policy and the province's growth had suffered accordingly.¹¹⁸ Chorney also supported the Conservative claim that Manitoba was a slow growth region in terms of changes in population, personal income per capita, capital investment per capita, labour income, structure of the economy, and growth in the manufacturing sector in relation to growth occurring in other provinces during the period extending from 1950 to 1958.¹¹⁹ As he concluded and is patently obvious, the Liberal provincial government of the early 1950s had a passive attitude towards intervention in the economy.

¹¹⁶ H. Chorney (1970), The Political Economy of Provincial Economic Development Policy: A Case Study of Manitoba, Unpublished Master's Thesis, The University of Manitoba, Winnipeg, pp. 45-54.

¹¹⁷ Winnipeg Free Press, March 14, 1958.

¹¹⁸ Ibid., June 6, 1958.

¹¹⁹ H. Chorney (1970), op. cit., pp. 45-54.

The Progressive Conservative Government: 1958 - 1969

After defeating the Liberal government with election promises of economic growth for the province, the Progressive Conservative Party of Manitoba became the new government between 1958 and 1969. Under the leadership of Duff Roblin, the Conservative government believed that Manitoba's depressed economy required massive government intervention. Attempts to attract and expand industry were launched, especially through the creation of the Manitoba Development Corporation. It was particularly dedicated to fostering small industry in the towns and cities outside Winnipeg in an attempt to preserve small-town viability, to balance economic development throughout the province, and to prevent Winnipeg from totally dominating the economy. The government undertook some public works projects such as water, power, and industrial parks; and connected those towns with a massive programme of trunk-road construction, something the province had needed for years.¹²⁰ In addition, the authors of the COMEF report encouraged rural planning and industrial development efforts, and advocated that they be carried out on a regional basis. More importantly, they also agreed that the process by which communities grow and decline is one that can be controlled and guided (by the government¹²¹).

It is quite clear that the policies of the Conservative government, began in 1958, represented a radical departure from the policies of the regime which they succeeded. As Chorney indicated, the Conservatives promised a development policy based on expenditures on social overhead

¹²⁰ E. A. Whitecomb (1982), op. cit., pp. 55-59.

¹²¹ L. A. Sarbit and G. W. Bryn (1980), op. cit., pp. 6-7.

capital "sufficiently in advance (of demands by existing industry) to stimulate and attract new development." The Conservative government also started "feeding the minnows" (local small enterprises) in the province of Manitoba instead of giving too much hope to "catching a full-grown whale" (large foreign corporations¹²²). In 1958, the Manitoba Development Fund was established to assist small business with limited capital, financial or human resources. This programme was in effect until 1966, when the policy changed from an emphasis upon small business to the large hoped-for economic "break-through" industries at The Pas. When this large project failed to materialize due to excessive costs and draining of money from Manitoba to large foreign firms, Roblin was forced to introduce a sales tax to help pay for his government's deficit.¹²³ For this major reason, the Conservative Party was defeated by the New Democratic Party in the 1969 election.

Under the Conservative's administration, the overall performance of the economy was relatively stable. Growth in services, mining, and trade sectors showed significant increases. However, the manufacturing sector did not perform to the extent that the government had hoped for. The government's policies and efforts were considered unsuccessful since the province's relative economic position remained unchanged as compared to other province.¹²⁴

¹²² H. Chorney (1970), op. cit., p. 41.

¹²³ E. A. Whitecomb (1982), op. cit., pp. 57-58.

¹²⁴ H. Chorney (1970), op. cit., pp. 127-128.

The New Democratic Party: 1969 - 1977

The 1969 election marked the first triumph of a quasi-socialist party in Manitoba. On the surface, the New Democrats was similar to the Conservatives in their desire for economic growth.¹²⁵ However, in terms of administration approach and development strategy, the New Democratic Party also took account of social costs and benefits rather than judging the performance of potential development projects on the grounds of gross economic indicators alone.¹²⁶ As Sarbit indicated, the New Democratic Party's approach was quite different from the Conservative. His point of view is illustrated by quoting the content of the planning document, which stated:

Should economic growth be set as a goal? The answer is yes where such growth contributes to general well-being, as it often does. Nevertheless, where it does not add to general well-being, as is sometimes the cases, economic growth must be rejected as a goal.¹²⁷

The NDP government also outlined their principles in this same planning document:

1. "First, maximization of the general well-being of all Manitobans;
2. Second, greater equality of the human condition for all Manitobans through an equitable distribution of benefits of development;

¹²⁵ L. A. Sarbit and G. W. Bryn (1980), op. cit., pp. 13.

¹²⁶ Government of Manitoba (1973), Guidelines for the Seventies, Queen's Printer, Winnipeg, Vol. 3, p. 35.

¹²⁷ Ibid., Vol. 1, p. 13.

3. Third, implementation of an effective stay option through policies and programs which will prevent Manitobans from being coerced by economic forces to leave their province or to leave the region within the province in which they prefer to live; and
4. Fourth, the promotion of public participation in the process of government; in particular, in development decisions which will affect all Manitobans in the years ahead."¹²⁸

With regard to rural development policy, the first objective further implies that economic growth is not an end in itself but a means to the goal of social well-being. Obviously, the intent was to reduce urban-rural disparities with the inclusion of social cost in the assessment procedures. The second goal was intended to create economic opportunities which would bring farm and rural non-farm income into more favourable position vis-à-vis urban wages. Realizing there was inequality between urban and rural areas, the New Democratic government wished to improve equality in terms of economic opportunities and social amenities for the rural Manitoba residents. The third object is particularly important for Manitoba in light of the fact that farm and non-farm population had decreased by 20,000 over the five-year period between 1966 and 1971. The stay option was designed to provide rural Manitobans with a choice of life style and working environment in their regions, without being forced to migrate to urban areas, by improving public investment in community facilities and other infrastructure in rural towns. The fourth object was to encourage rural Manitobans to represent themselves in the government planning processes related to health, education, social services or any of the major public areas

¹²⁸ Ibid., Vol. 1, p. 13.

directly affecting their rural communities.¹²⁹ In short, the New Democratic government was very concerned with the need to effect balanced growth among all regions. In addition, the concept of social well-being was emphasized at least as much as economic well-being. The unemployment rate is used as a proxy for well-being between the years 1971 and 1976. It is chosen to reflect the psychological well-being as well as economic welfare of Manitobans at the end of the period of concern. Other indicators such as per capita personal income and total personal income would not suffice for this purpose owing to the fact that higher income cannot simply be translated into greater satisfaction. On the other hand, people who are employed generally show greater satisfaction or self-esteem than those who are unemployed. Table 20 evinces that Manitoba was better off than Canada in terms of employment opportunities during the period. With regard to Manitoba itself, rural Manitobans enjoyed lower unemployment rates than their urban counterparts. In general, both urban and rural Manitobans had better employment opportunities in 1976 than in 1971. Based on the assumption stated earlier, the general well-being of Manitobans seems to be above the national average. Therefore, one may conclude that the New Democratic government presided over a improvement in the general socio-economic condition for Manitobans in those years.

Over the last forty years, then, the development of rural communities has been influenced by three distinct government policies. During the first period, the Liberal government had a passive attitude towards intervention in the economy, leaving the rural communities to rely on

¹²⁹ Ibid., Vol. 3, p. 36.

Table 20

Unemployment Rates: Canada and Manitoba, 1971 and 1976

Region	1971		1976	
	Total Labour Force	Unemployment Rate (%)	Total Labour Force	Unemployment Rate (%)
Canada	8813340	7.8	10261660	6.8
Urban	6968170	8.1	7915215	6.9
Rural	1845170	6.7	2346445	6.7
Manitoba	419905	6.4	460765	4.4
Urban	307960	7.3	326795	4.9
Rural	111950	3.9	133970	3.0

Source: for 1971, Statistics Canada, CS 94-703, Vol. III, Table 4;
for 1976, Statistics Canada, CS 94-801, Vol. II, Table 1.

their own physical, capital and human resources. With this kind of insensitive attitude, the problem of regional disparity continued to exist and may have even been exacerbated. During the second period, while the Progressive Conservatives believed in a considerable degree of private enterprise, they practiced considerable government intervention too.¹³⁰ The economic policy on small-business development was quite successful. However, when the policy shifted towards large-business development, it was far less successful. The New Democratic approach was more cautious towards economic development. While they accepted that economic growth was a high priority on their agenda, they did not overlook the social cost component in the formulation of socio-economic policy. Over the course of their years in power, Manitobans enjoyed a period of stable growth. With regard to employment opportunity, both urban and rural Manitobans were better off than the national average. Yet, while infrastructure for social amenities was improved in some rural areas, the problem of income disparity between urban and rural wage-earners remained. As of today, fulfillment of the goal of income equality and balanced growth between regions remains as elusive as ever.

AN OVERVIEW OF MANITOBA SMALL-TOWN REVIVAL IN THE 1970S

As a microcosm of Canada, Manitoba only constituted slightly over four per cent of the Canadian population in 1981. However, Manitoba rural non-farm areas also emulated the North American pattern from 1971 to 1981 in showing signs of nonmetropolitan population growth. Nevertheless, since the population size, economic activities and socio-economic infrastructure in Manitoba are of much smaller scale, the

¹³⁰ E. A. Whitecomb (1982), op. cit., p. 59.

factors affecting the revival of small towns in Canada or North America may or may not explain small-town growth in Manitoba. The following sections will examine the local (Manitoba) growth factors in relation to those global (Canada and the U.S.) growth factors which promoted small-town revival.

1. Continued Growth of Metropolitan Areas and their Expansion into Adjacent Rural Areas

The impact of metropolitan regions has positive effects upon nearby rural communities in terms of population and economic growth. Similar to those metropolis centres in Canada and the U.S.A., the largest provincial urban centre in Manitoba, Winnipeg, offers the highest degree of servicing functions to its rural communities. However, as a result of spatial frictions, the spill-over influence exerted by Winnipeg reduces as distance increases. Consequently, one may expect that rural communities adjacent to Winnipeg grow faster than those communities which are removed from it. In theory, this geographic factor also supports small-town revival in regions close to the major centre.

2. Decentralization of Manufacturing Industries into Rural Areas

Similar to the Canadian national trend between 1971 and 1981, manufacturing industries in Manitoba have extended their operations into rural areas. According to the SSA in Chapter 2, there was an additional 1,024 manufacturing jobs gained by the rural areas. On the other hand, there was a relative loss of 10,386 manufacturing jobs to other industries or places

experienced by the urban centres in Manitoba (see Table 8). In comparison with the number of manufacturing jobs gained by rural areas in other provinces, the decentralization of Manitoba manufacturing industries was relatively much smaller. In essence, one would expect the decentralization of manufacturing industries to have a smaller positive effect on small-town population growth in Manitoba as compared to the situation in larger, industrialised Canadian provinces.

3. Increased Employment in Service Occupation

Traditionally, access to various services in Manitoba rural areas was limited. However, with increasing expectation and lobbying from rural residents, Manitoba governments in the last twenty-five years began to address the needs of rural development. Between the 1971 and 1981, rural Manitoba service industries had a relative gain of 3,386 jobs.

As discussed earlier, service industry has a significant contribution to make to small-town growth in terms of retaining and attracting people. More importantly, in the case of Manitoba where agriculture industry continues to dispense with farm labour due to mechanization, the expansion of service industry will provide new employment alternatives for those laid-off workers. Consequently, the local economy can thus be stabilized or even improved.

4. Early Retirement Coupled with Higher Retirement Incomes

The introduction of the Canada Pension Plan and Quebec Pension Plan in the mid-1960s by the federal and provincial governments guaranteed retirees with retirement income without any restriction on location. Thus, retirees have the freedom to choose where they want to stay or live. During the 1971-1981 period, rural Manitoba had a relative loss of 812 old people aged 65 and above (see Table 12). Although this occurrence does not follow the U.S. or Canada national trend exactly, it is important to note that old people in rural Manitoba farm areas migrate to adjacent towns where health services and family ties are the major attractions. Secondly, this movement also produces a spin-off effect whereby younger people migrate to those adjacent rural non-farm communities as the demand for service occupations generated by the additional older population opens up opportunities for them.

5. Increased Per Capita Disposable Real Income and Pursuit of Leisure Activities

Steady growth of real income in rural Manitoba has prompted consumer-serving industries such as sporting, retail, taverns, jewellery, restaurants, and tourist-related businesses in the fast-growing rural areas (see Table 13). One may expect this trend to continue, since the number of two or more wage earners in rural Manitoba has been increasing.¹³¹ Moreover, with the aid of new computer technology such as Point of Sales Systems for retail business, it is possible for the distribution costs to be reduced. In turn, this allows for more selection of consumer

¹³¹ G. D. Hodge and M. A. Qadeer (1983), op. cit., pp. 88-90.

products at lower prices with products being delivered at a faster rate to the rural consumers.

6. Expansion of the Education System in Rural Areas

Unlike the U.S. and other Canadian education systems which have been effectively diffused to regional and local levels, the same cannot be said for Manitoba (or Saskatchewan). However, the data in Table 14 shows there was a relative gain of teachers in the rural non-farm areas. If the trend for teachers to obtain jobs in urban centres and rural farm areas remains difficult, the only places for Manitoba teachers would be either the rural non-farm areas or other provinces. Therefore, in contrast to the present, this factor may become more significant in the future in terms of promoting economic and population growth in small towns.

7. Growth of Government Interest in Rural Areas

As discussed earlier in this Chapter, governments have increasingly become involved in rural development. With the introduction of "Guidelines for the Seventies" by the NDP government,¹³² confidence towards the Provincial Government among the rural communities was restored. Perhaps this was not misplaced since, based on the result of the SSA data in Table 15, one can observe that rural Manitoba areas had a relative gain of jobs in the government sector. Therefore, one may assume that the growth of nonmetropolitan population is linked to the changed government regional policy.

¹³² Government of Manitoba (1973), op. cit., 3 Volumes.

8. Levelling off of Farm Population

The farm mechanization process continued apace into the 1970s across Canada. As one of the largest farming communities in Western Canada, Manitoba also suffered a heavy loss of farming population during this period (see Table 16). One may expect this phenomenon to persist until farm size becomes optimal; that is, the size of a farm must be increased to the level where it is economically viable for a farmer to continue his farming operation. Since acquiring additional farm land can be very costly, the only alternative left to a farm worker is to take on a part-time or seasonal job. However, not all the farm workers can realise this option; some laid-off workers have been displaced from the farm sector altogether.

9. Rise of Country-style Living

The growing popularity of country-style living across Canada in the 1970s evinced by the Gallup Poll,¹³³ indicated that Canadians were not totally pro-urbanization in their inclinations. Some segments of the population still hope to enjoy country-style living if there are sufficient economic opportunities to sustain the way of life in rural areas. One may suspect this subjective factor has promoted the revival of population growth in rural Manitoba, although we do not know to what extent.

10. Narrowing of Traditional Gaps in Urban and Rural Living Standards

¹³³ G. D. Hodge and M. A. Qadeer (1983), op. cit., pp. 88-90.

The level of living standard among rural communities has been markedly improved over the last twenty years. Essential services such as transportation, communications, electrification, education, cultural and health facilities, distribution, and other socio-economic infrastructures are becoming more common in rural Manitoba small towns. Although some higher order goods may not be available in most small towns, telephone order and weekend shopping trips to nearby urban centres could be achievable alternatives for rural residents. One would expect that nonmetropolitan growth in Manitoba is partly accounted for by this factor.

11. More Long-distance Commuting

The rise of automobile ownership among Canadians, particular in the rural areas, altered the economic landscape of the country-side. According to Hodge and Qadeer, the average distance for small-town commuters was greater than their city counterparts.¹³⁴ Yet the median commuting time required in rural area was less than an hour, which was considered more or less the same as in urban areas. Since most Manitoba small-town commuters could find jobs within their driving capability, one would anticipate this factor to play a positive role in nonmetropolitan population growth.

12. Revival of Energy and Mining Industries

¹³⁴ Ibid., pp. 88-90.

At the national level, the Canadian energy and mining industries had but a marginal effect on small-town revival. However, at the regional level, the differential effect was far more substantial: especially in Alberta. Unlike Alberta, Manitoba only has a small base for these industrial sectors. In fact, Manitoba had a relative loss of employment in the energy and mining industries regardless of location (see Table 17). Therefore, one can conclude that this factor did not contribute to small-town growth in Manitoba.

13. Improvement of Transportation Infrastructure

The upgrading or expanding of transportation infrastructure across the rural landscape in North America has facilitated growth in small towns, particularly for those towns within commuting distance of the core city. Small towns located in remote rural areas may not be able to take advantage of new transportation infrastructures due to the alteration of transportation routes. Therefore, one would expect towns located in proximity to the newly-established transportation nodes (collection points) to experience faster growth. On the other hand, towns by-passed by the new transportation routes may become even worse off than before. However, at the aggregate level, a better transportation system means a greater opportunity of growth for small towns owing to easier access to goods and services.

With regard to employment in the transportation sector, Manitoba had a relative loss of employees during the 1970s (see

Table 18). This phenomenon is probably due to the significant redundancies effected by railway companies. Furthermore, as most small towns in Manitoba are located at some distance from the regional urban centres, one would not expect employment generation in this sector to play any significant role in small-town population revival.

14. Lower Cost of living in Rural Areas

The cost of living varies from one region to another. Usually the bigger the city, the higher the cost of living. For instance, living costs in Toronto, Montreal and Vancouver are all higher than those applying to Winnipeg. By the same token, cost of living in an urban environment is usually higher than a rural area. With regard to this aspect, Manitoba small towns still offer cheaper housing, grocery shopping, and outdoor entertainment activities than their metro counterparts. For this reason, rural areas attract migrants from the urban centres within the province.

SUMMARY

Revival of small towns occurred across the U.S.A., Canada, and Manitoba in the 1970s. It is important to stress that this phenomenon not only occurred at the national level, but also at the provincial level. Obviously there were some common underlying forces which promoted a change in what had been an ineluctable trend of decline. By understanding the nature of these forces, planners are enabled to monitor the trend. In addition, they can adjust planning policy

according to the availability of local resources in a manner consistent with desirable development. The following summary table is a collection of tentative and descriptive findings based on the literature reviewed. It will be used for regional comparison and cross-referencing rather than model building in statistical terms.

The frequency distribution of the factors for each spatial type is illustrated by Table 21. Comparison among the three spatial types -- the U.S.A., Canada, and Manitoba -- shows Manitoba has the lowest total score. However, one should not interpret the total score obtained by a region as an indicator for the degree of small-town revival. The extent of small-town revival is the "joint effect" of geographical, physical, economical, political and socio-psychological variables. Furthermore, comparison among the three types shows that Manitoba has an equal standing in terms of political support, geographic influence, and living standards as well as the socio-psychological factor. Nevertheless, rural Manitoba has a relative shortage of capital investment in sectors such as manufacturing, transportation, education and service industries. In the case of Manitoba, the small base for the energy and mining industry did not constitute a stimulating growth factor. Problems notwithstanding, the leading edge enjoyed by Manitoba over the U.S.A. and Canada was the lower costs of living. Overall, rural Manitoba had a wide range of potential factors which can support the requirements for small-town growth.

Table 21

Comparison of Factors Affecting Small-Town Population Change
in the U.S.A., Canada, and Manitoba, 1971 - 1981

Factor	Short Title for the Growth Factor	U.S.	Canada	Manitoba
1	growth of adjacent rural areas	***	***	***
2	decentralization of manufacturing industry	***	**	*
3	increased service employment	***	***	*
4	early retirement and high retirement incomes	**	**	*
5	increased real income and pursuit of leisure activity	**	**	**
6	expansion of education system	***	**	*
7	growth of government interest	***	***	***
8	levelling off of farm population	*	**	**
9	rising of country-style living	*	*	*
10	rising of living standard	***	***	***
11	more long-distance commuting	***	**	**
12	revival of energy and mining industries	**	*	*
13	improvement of transportation infrastructure	**	*	*
14	lower costs of living	*	*	**

Note: *** high score
** moderate score
* low score

MODEL SPECIFICATION AND CALIBRATION FOR MANITOBA SMALL TOWNS, 1971-81

INTRODUCTION

The universal phenomenon of nonmetropolitan growth in the 1970s has altered considerably the regional planning policies of many states and provinces across North America. The empirical findings collected by various population-watchers have become a measuring tool for nonmetropolitan planning agencies. Yet, since each region has its own unique socio-economic nexus, a regional planning agency cannot rely on the global factors alone to carry out a comprehensive rural development planning scheme. Consequently, a regional planning agency needs to develop its own regionally-specific model which can fine tune the factors extant in a local and unique environment. In other words, those 'universal' factors having minimal effects on local nonmetropolitan growth should be removed. Moreover, new or unique local factors should also be incorporated into the planning process. In this Chapter, the formulation of a small-town viability model for rural Manitoba contains three components. They are posited below in point form.

1. An applied statistical technique (2SLS) which eliminates the simultaneity bias endemic to the data.
2. A collection of Manitoba data which captures to the unique regional context of the prairie province.

3. A number of selected global variables which may also apply to the situation in Manitoba.

THE STUDY AREA

The vitality of small towns during the 1970s was marked by the growth of population, commercial establishments and housing stock. Similar to many other small towns across North America, rural Manitoba grew at a faster rate than its urban centres (see Table 4 and 5). It is true to say that Manitoba is a single administrative region, but in terms of production activities, Manitoba needs to be further sub-divided into two distinct economic regions. In the north, the economic base largely depends on primary resource activities such as mining, forestry and trapping. While in the south, economic activities are much more diversified. The latter contains a mixture of primary, secondary and tertiary industries which range from agriculture, through manufacturing to tourist industries.¹³⁵ Differences are acute, moreover, in respect of population distribution. Thus, population in the northern region is sparsely distributed. The 1981 Census shows that population density in the northern census sub-divisions was very low. It ranged from a minimum of 0.2 to a maximum of 1.3 persons per square kilometre. In essence, the population in this region only constituted about 9 % of the provincial population.¹³⁶ By way of contrast, population settlements in the southern region are much closer to each other and, excluding Winnipeg, were of a size fully four times larger than the northern population in

¹³⁵ L. A. Sarbit and G. W. Bryn (1980), op. cit., pp. 1-20.

¹³⁶ Derived from statistics Canada, 1981. CS 93-907, Vol. 2, Table 1. Census Sub-division No. 19 to 23 are used to estimated the population of the northern region.

1981. Although the farming-oriented activities are decreasing and diversification of the economy is increasing, yet 70 % of the land located in Agro-Manitoba is still involved in agricultural production.¹³⁷ For the above reasons, rural Southern Manitoba constitutes a distinctive study area in the prairie context.

The term "Rural Southern Manitoba", used throughout this and following Chapters, will connote a specific region. The area is bounded on the south by the States of Minnesota and North Dakota, on the west by the province of Saskatchewan, and on the east by the province of Ontario. However, to the north, it is bounded only by the 52 nd parallel. Additionally, the study area does not include Winnipeg, nor the municipalities of East St. Paul and West St. Paul.

MODEL SPECIFICATION

A Priori Specification

This research aims to build a model for small-town growth in Manitoba. More particularly, the grand model will embrace subsidiary models for small-town population change, level of tertiary activity and level of manufacturing activity. Research methodology makes use of both qualitative and quantitative approaches. Subjective factors such as community satisfaction and personal preferences will be analyzed. In addition, objective factors expressing the development of various geographic locations will be incorporated as determinants in a valid model for small-town growth. Statistical and planning techniques such as shift-and-share analysis, (SSA) principal component analysis (PCA),

¹³⁷ Manitoba Department of Agriculture (1981), Agriculture Yearbook.

and two-stage least squares analysis (2SLS) will be utilized to calibrate the three subsidiary models. Finally, policy implications for small-town development will be identified for the purpose of assisting government social and economic policy implementation.

Ideally, a model should be well specified and deductively derived prior to data collection and testing. Unfortunately, some researchers test a number of alternative models before formulating their hypotheses. Therefore, variables are either added or dropped depending on how important they appear to be relative to arbitrary statistical criteria.¹³⁸ Since these approaches are based on statistical rather than theoretical criteria, the interpretation of their models is "technique dependent" and rather meaningless. On the other hand, theoretical plausibility is a matter of correct specification of the model: a specification of its variables and its mathematical form which may underplay any difficulties in obtaining numerical values for its sample data.¹³⁹

Perhaps the most important limitation to regression analysis concerns inference causal relationships. Demonstration of causality is a logical and experimental, rather than a statistical, problem. Statistics are helpful only in demonstrating that relationships occur reliably. A high multiple correlation indicates that a lot of variability is shared between one variable and a set of others, but is not to be inferred to

¹³⁸ D. P. Hauser (1974), "Some Problems in the Use of Stepwise Regression Techniques in Geographical Research," Canadian Geographer, Vol. 18, p. 148.

¹³⁹ A. Koutsoyiannis (1977), Theory of Econometrics: an Introductory Exposition of Econometric Methods, London: MacMillan Publishers Ltd., p. 365.

mean that variables are causally related; shared variability could stem from many sources, including the influence of other, currently unmeasured variables. Another problem for logical enlightenment rather than statistics is that of inclusion of variables. In other words, which dependent variable should be measured (and how), and which independent variables should be included (and how they are to be measured)? If one is striving for the highest possible multiple correlation, which independent variables should be added to the equation for the greatest improvement in prediction? The answers to these questions can be provided by theory, astute observation, or good hunches, but they will not be provided by statistics. Therefore, the regression solution itself is only as good as the selection and measurement of the variables that are used in it.¹⁴⁰ It is important to note that the intent of this research is not to make up the so-called "best prediction regression equation" without a theoretically sound a priori specification. In a model building stage, the testing of pre-formulated hypotheses and theories is of much more overriding concern to this thesis.

The Relationship between Rural Economy and Population Change

The abundance of natural resources and skilled labour makes Canada a country of great wealth. However, many small rural communities have not shared in the nation's prosperity equally with other part of the country. The small rural communities of the nation comprise the lowest-order settlements in the urban hierarchy. Agriculturally-related

¹⁴⁰ B. G. Tabachnick and L. S. Fidell (1983), Using Multivariate Statistics, New York: Happer and Row Publishers.

business and residentiary services are still important elements in the economic base of most of these communities. Among them, moreover, agriculture has been traditionally at the root of low incomes, low investment, unemployment, and underemployment. The basic difficulties for the agriculture industry include: (1) the uncertainty of decision making in agriculture both in terms of environment and market place; (2) the generally inelastic nature of demand for agricultural products which means that the total agricultural market cannot expand at a rate equivalent to that of the economy as a whole; (3) the increasing high cost of inputs necessary for improving yield and labour productivity, which results in generally higher levels of investment per unit of output than in other sectors of the economy.¹⁴¹ Although some farmers are able to keep up with farm mechanization, the farming operation become capital-intensive rather than labour-intensive. Consequently, areas heavily reliant on agricultural production are in dilemma. On the one hand, farmers without adequate capital investment are unable to raise their real income; whereas, on the other hand, farmers with capital investment are confronted with a low rate of return problem. The effects of present-day pressures on the farming economy has led to farm depopulation and regional labour market alteration. Yet, the decline of population in farming communities under the process of agricultural readjustment tends to be cumulative.¹⁴² The downward spirals of economy and population could become self-perpetuating if they are left unchecked. As the negative multiplier continues to grow and undercuts

¹⁴¹ M. Bunce (1982), Rural Settlement in an Urban world, New York: St. Martin's Press, pp. 110-111.

¹⁴² M. Clawson (1966), "Factors and Forces Affecting the Optimum Future Rural Settlement Pattern of the United States," Economic Geography, Vol. 42, p. 287.

the minimum population threshold requirement for certain businesses, high-order commercial establishments will close down first. In turn, other business establishments will be faced with reduced income as a result of decreasing business transactions. At this point, the majority of the remaining business establishments are oriented to provision of low-order functions. At the same time, the status of the small town has dropped from that of a business trade centre to that of a residential service centre. However, if the momentum of the negative multiplier effect persists and population drops below the effective operation cost for public services, community infrastructure will then be further weakened. Eventually, local private investment, public service, social and demographic structures spiral downwards simultaneously until they reach the point where the small-town population may only stabilize at a very low level.¹⁴³

There are caveats, however. Stagnation and decline can be selective rather than general. Hardship can exit in the farming sector of a rural settlement while at the same time the settlement as a whole may be supported by the prosperity of another. For example, Bunce claimed that the departure of the poorer members of agricultural society has coincided with a great expansion in the size and affluence of the remaining farm enterprises. Although some rural services contract, the active population remains because it can satisfy its retail and cultural needs in nearby urban centres.¹⁴⁴

¹⁴³ D. Todd (1983), "The Small-town Viability Question in a Prairie Context," Environment and Planning A, Vol. 15, pp. 903-916.

¹⁴⁴ M. Bunce (1982), op. cit., p. 100.

Another factor, relates to the even pace of capitalisation in agriculture. Unlike the mining industry which is more of boom and bust in nature, diffusion of farm mechanization happens over a longer period of time. Therefore, one may surmise that the tempo of farm depopulation is highly related to the diffusion rate of farm mechanization rather than to other economic factors. In addition, empirical findings collected by Hart and Salisbury show that while most small towns have lost their central-place functions, the population of many continue to grow.¹⁴⁵ The real point of their study is that the smaller (250 people or less) and remote towns tended to be the main population losers. This trend is attributed to increased daily and residential mobility in which the decline of small towns as commercial centres is unrelated to population change.¹⁴⁶

The false assumption that most small towns in the U.S.A. and Canada are dying could endanger the fate of small towns inasmuch as it could encourage neglect by regional planners. It could be even worse if this false assumption is allowed to exist in small-townners' minds. In short, it could lead them to give up hope for their community. Fortunately, rural people do not migrate until they perceive acute disparities occurring between rural and urban opportunities.¹⁴⁷ There is evidence to suggest that communities with strong social and family ties, religious beliefs, and attachment to the land, can withstand economic crisis

¹⁴⁵ J. F. Hart and N. E. Salisbury (1965), "Population Change in Middle Western Villages: A Statistical Approach," Annals Association of American Geographers, Vol. 55, p. 141.

¹⁴⁶ Ibid., p. 141.

¹⁴⁷ M. Bunce (1982), op. cit., p. 106.

better than those not so blessed.¹⁴⁸

The situation described in the preceding paragraphs indicates the determination of small towns to survive. A group of regional planners¹⁴⁹ believe that certain small towns can be revitalized as growth centres through economic diversification, investment in the manufacturing sector, and the provision of social services, transportation infrastructure, all managed via well-developed regional policies. In theory, the above strategy is beneficiary to rural regions on a whole. However, the growth process can also be selective. For instance, small towns located adjacent to metropolitan areas or major regional centres tend to be recipients of more benefits than those handicapped by remote locations. Manufacturing with capital-intensive modes of production employs fewer workers while manufacturing of the labour-intensive kind employs more, but less well-paid labour. Although limits may be thus imposed on the magnitude of the positive multiplier, personal income may improve sufficiently to stabilize or even attract population. With regard to social service, it is, quite simply, essential to rural life. Without such provision, quality of life in rural area will substantially decrease. Unlike other private investments which are profit oriented, implementation of social services are geared to equity or welfare considerations. Since the sources for the operation cost derive from tax-payers and the political arena, their size and distribution are vulnerable to lobbying and interference. Last but not least, transportation plays an increasingly important role for the extension of

¹⁴⁸ Ibid., p. 126.

¹⁴⁹ P. Cloke (1979), op. cit. R. E. Lonsdale and H. L. Sayler (1979), op. cit. G. D. Hodge and M. A. Qadeer (1983), op. cit. and G. F. Summers (1976), op. cit.

regional labour markets and domestic consumer markets. With the improvement of transportation infrastructure, firms previously restricted to urban areas can now move to rural environments without suffering labour-force penalties.

Regardless of the complicated selection process, rural areas blessed with any one of the above stimuli could benefit from further growth through positive multiplier and spin-off effects. By the same token, the size of population growth and economic upswing depends on the size of the positive multiplier effect.

Figure 5 provides a simulated cumulative model for the rural economy and population change. In the initial stage, surplus farm labourers are absorbed by new or expanding manufacturing industry in a nearby town. Since the expansion of transportation infrastructure provides greater mobility for the labourers, they can work at the nearby town but continue to live in their home town. In this case, their home town benefits from the secondary positive multiplier effects. On the other hand, if they choose to live and work in the nearby town, then the benefits will go disproportionately to the nearby town. However, the expansion of consumer markets will provide a regulator mechanism which tends to stabilize population in the home town.

MODEL CALIBRATION

Unlike most physical science studies, social science researches always involve more than just the physical factors alone. In a study of man, land, and environment relationships such as is entailed in this thesis, no less than physical, economical, social, political, and psychological factors must be taken into account. Some of these factors can be classified as objective factors. For instance, both physical and economic components are classified under this category. The other dimension which contains social values, personal perceptions and preferences, and political beliefs is more of a subjective nature. The former is usually tangible and can be expressed either in physical or monetary units. The latter, meanwhile, tends to be less tangible and its measuring units may be transformed and expressed in a number of different ways; for instance, absolute or relative numerical value, ranked value, discrete value, index score, principal component score, or any other meaningful mathematical scores. Furthermore, the interaction effect between subjective and objective factors adds complexity to this analysis. In other words, the interdependent relationship among the population change, manufacturing and service activities in rural Manitoba is dynamic rather than static. Consequently, a model has to be structured in such a way as to be able to discern the degree of overlapping between population change and economic structures. In essence, this model should be able to disentangle the joint effects produced by a combination of factors; that is, it must be capable of separating and explaining the interdependent relation between population change and economic structures. At the same time, it has to account for

variance contributions to each system equation (i.e. population change, manufacturing activity, and tertiary activity) separately. Equally, the critical factors germane to Rural Southern Manitoba may well be applicable to other prairie provinces, or to explanations of small-town viability at large.

In this study, fifty-eight small towns located in Rural Southern Manitoba are subjected to analysis. Their population size ranges from a minimum of 474 to a maximum of 36,242, which well represents a continuum in the rural settlement hierarchy. As indicated earlier, it was the dynamics of population growth which sparked interest in the question of small-town viability in a prairie setting. Moreover, the ready availability of data representing both subjective as well as objective factors makes feasible the operationalising of this research. Although some of the variables discussed in the literature review are not incorporated in the analysis owing to the sheer lack of availability; nevertheless, enough variables survive to adequately represent the subjective and objective dimensions required of model specification. The following section will focus on the system equation identification and variable justification.

EQUATION IDENTIFICATION AND VARIABLE JUSTIFICATION

The application of statistical analysis has been widely adopted by many physical and social scientists. One of the most common statistical techniques to analyze causal relationships between phenomena is regression analysis. There are, however, several different types of regression techniques for different types of data or causal

relationships. For instance, the application of ordinary least square (OLS) to a single equation assumes, inter alia, that the explanatory variables are truly exogenous, that the disturbance term is random and that there is one-way causation between the dependent variable Y and the explanatory X's. If this is not so, that is, if the X's are at the same time determined by Y, then the assumption that the mean disturbance equals zero is violated. Consequently, application of OLS techniques in that context would yield biased and inconsistent estimates.¹⁵⁰

The basic premises for model used in this thesis rest on the assumption that small-town population change in Rural Southern Manitoba is a function of tertiary as well as manufacturing employment. However, service centres provide dual functions: first, they serve consumer needs for the rural settlement, and secondly, they provide services for manufacturing industry if there is any. By the same token, as Lonsdale and Seyler suggested, manufacturing can provide a long-term solution to strengthen the economic base of rural areas.¹⁵¹ Should manufacturing employment increase, tertiary activities will expand and the rural depopulation may disappear as well. However, manufacturing is not truly independent either of population change or tertiary activity. Manufacturing activities rely on the supply of labour as well as the level of attractiveness offered by tertiary industry in the trade area.¹⁵² As Todd pointed out, a declining service and infrastructure base will offer few attractions to relocating manufacturing firms.¹⁵³

¹⁵⁰ A. Koutsoyiannis (1977), op. cit., p. 331.

¹⁵¹ R. E. Lonsdale and H. L. Sayler (1979), op. cit., pp. 1-10.

¹⁵² J. M. Wardwell (1980), op. cit.

¹⁵³ D. Todd (1983), op. cit., pp. 903-916.

Obviously, we have a two-way causation in this model and the function cannot be treated in isolation as a single equation model (OLS), but belongs to a wider system of equations which describe the relationships among all the relevant variables. In this model, we have a situation where population change is a function of tertiary and secondary activities; tertiary activity is a function of population change and manufacturing; and secondary activity is a function of population change and tertiary activity. Therefore, it is not acceptable to use a single-equation model for the description of the relationships among population change, tertiary and secondary activities which contains simultaneous-equation bias. This latter is the bias resulting from a reciprocal interaction between the level of population change and the two economic variables.

Since the application of OLS to a model like the one advocated herein yields biased and inconsistent estimates, we need to apply other methods of estimation which give better estimates of the parameters. To overcome the simultaneity-bias problem, the two-stage least squares (2SLS) regression technique is used. It is also essential because this study involves over-identified structural equations. The order condition of the equations will be deliberated later in this Chapter.¹⁵⁴ In the meantime, the requisite procedures of the technique need clarification. The initial step of the 2SLS is the computation of the OLS regression of endogenous variables in the model. These equations are the reduced-form equations of the endogenous variables. By definition, the exogenous

¹⁵⁴ Two-stage least squares is a statistical procedure for computing the coefficients of the structure equation in a simultaneous system of equations. The parameters of a structural equation can be estimated only if the equation is exactly identified or over-identified.

variables are determined independently of endogenous variable, so the reduced-form equation is not subject to simultaneous equation bias. To be more specific, the reciprocity (simultaneity-bias) between the small-town population change and the two economic variables is eliminated through the mathematical transformation intrinsic to the 2SLS procedure.

So far, the system equations are incomplete without the inclusion of subjective factors. Figure 6 summarizes both the subjective and objective variables employed in this model. In the beginning, we treated the two economic variables as exogenous since they are governed by the small-town population environment. However, they are not truly independent because of their direct or indirect linkages with each other in the system as a whole. Therefore, in a technical sense, they cannot be regarded as exogenous variables; rather, they must be treated as endogenous variables to the system. Consequently, each of them need to have their own set of explanatory variables.¹⁵⁵

The three system equations, including subjective and objective factors, can be rewritten in reduced-form equation format as follows:

$$Y_1 = X_2Y_2 + X_3Y_3 + B_4X_4 + B_5X_5 + B_6X_6 + B_{11}X_{11} + B_{12}X_{12} + B_{13}X_{13} + B_{17}X_{17} + B_{21}X_{21} + B_{22}X_{22} + B_{23}X_{23} + B_{27}X_{27} + E_1 \quad (1a)$$

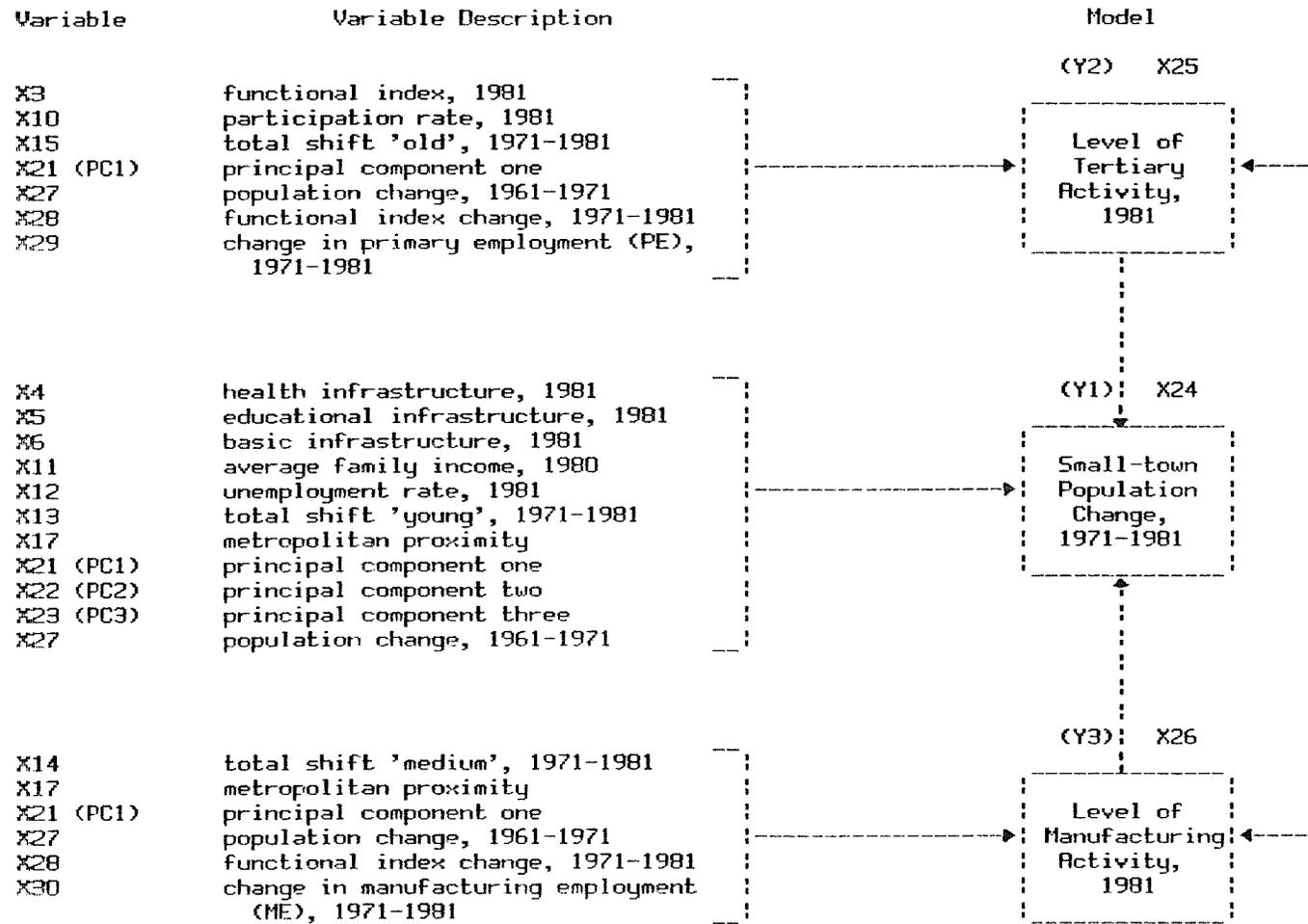
$$Y_2 = X_3Y_3 + B_3X_3 + B_{10}X_{10} + B_{15}X_{15} + B_{21}X_{21} + B_{27}X_{27} + B_{28}X_{28} + B_{29}X_{29} + E_2 \quad (1b)$$

$$Y_3 = X_2Y_2 + B_{14}X_{14} + B_{17}X_{17} + B_{21}X_{21} + B_{27}X_{27} + B_{28}X_{28} + B_{30}X_{30} + E_3 \quad (1c)$$

¹⁵⁵ D. Todd (1983), op. cit., p. 908.

Figure 6

A Basic Economic and Population Change Model
for Rural Southern Manitoba Small Towns, 1971-1981



Definitions of independent variables are provided in Table 22 while Table 23 provides an elaboration of subjective variables.

In the first system equation, the target dependent variable -- population change 1971-1981 (Y1) -- is a function of socio-economic, geographic, political, and personal subjective factors. The rationales for choosing these independent variables are debated below.

1. Level of Tertiary Activity (Y2)

Over the last two decades, service industry has been growing at a faster rate although most services are "non-basic" in nature. The re-allocation of service employment has brought new-comers to stay in nonmetropolitan areas. Directly, this phenomenon has promoted prosperity in small towns since additional population and commensurate support activities are gained. Indirectly, it has imposed a stabilization effect on rural depopulation since more services are provided for the stayers. Therefore, one may assume that small towns favoured by an increase in service employment will experience some degree of population growth.

2. Level of Manufacturing Activity (Y3)

Manufacturing can offer an alternative economic base to rural communities, especially those affected by farm mechanization in their adjoining farm populations. Unlike service industry, manufacturing acts as a community-forming mechanism rather than a community-serving component. In nonmetropolitan area, the mode of

Table 22

Variable Identification

Variable	Description	Definition
Y1 (X24)	population change, 1971-1981	$(\text{population 1981} - \text{population 1971}) / \text{population 1971} \times 100$
Y2 (X25)	level of tertiary activity, 1981	$(\text{tertiary employment} / \text{total employment}) \times 100$
Y3 (X26)	level of manufacturing activity, 1981	$(\text{manufacturing employment} / \text{total employment}) \times 100$
X3	functional index, 1981	$\text{index} = [(\text{number of outlets of commercial function } i) \times (\text{total of } i \text{ in set of towns})]$
X4	health infrastructure, 1981	$\text{index} = \text{total score for facilities available (hospitals, clinics, etc)} / \text{maximum score possible}$
X5	educational infrastructure, 1981	$\text{index} = \text{total score for facilities available (schools, colleges, etc)} / \text{maximum score possible}$
X6	basic infrastructure, 1981	$\text{index} = \text{total score achieved for utilities, transportation, protection, and administration facilities available} / \text{maximum score possible}$
X10	participation rate, 1981	$(\text{gainfully employed} / \text{eligible for employment}) \times 100$
X11	average family income, 1980	average family income recorded in 1980
X12	unemployment rate, 1981	$(\text{number of unemployed} / \text{total labour force}) \times 100$
X13	total shift 'young', 1971-1981	total shift for young population at the age of 19 or below
X14	total shift 'medium', 1971-1981	total shift for adult population between the age of 20 and 54

continue...

Table 22 (cont'd)

Variable	Description	Definition
X15	total shift 'old', 1971-1981	total shift for old population at the age of 55 or over
X17	metropolitan proximity	distance to Winnipeg from small town in Km
X21 (PC1)	principal component one	a socialization-participation control dimension
X22 (PC2)	principal component two	a production-consumption support dimension
X23 (PC3)	principal component three	a dichotomized low-order retail versus health-professional service dimension
X27	population change, 1961-1971	$((\text{population } 1971 - \text{population } 1961) / \text{population } 1961) \times 100$
X28	functional index change, 1971-1981	functional index 1981 - functional index 1971
X29	change in primary employment (PE), 1971-1981	$((\text{PE } 1981 - \text{PE } 1971) / \text{PE } 1971) \times 100$
X30	change in manufacturing employment (ME), 1971-1981	$((\text{ME } 1981 - \text{ME } 1971) / \text{ME } 1971) \times 100$

Table 23

Subjective Variable Associations

Variable	Description	Loadings *		
		PC1	PC2	PC3
Z1	Percentage of respondents preferring small towns for grocery shopping	0.260	0.281	-0.704
Z2	Percentage of respondents preferring small towns for liquor, lumber, and banking needs	0.196	0.441	-0.064
Z3	Percentage of respondents preferring small towns for furniture, appliances, clothing, and cars	0.266	0.435	-0.107
Z4	Percentage of respondents preferring small towns for veterinary, dental, and legal requirements	0.121	0.450	0.318
Z5	Percentage of respondents preferring small towns for health-care facilities	0.281	0.299	0.560
Z6	Index of degree of satisfaction	0.398	-0.222	-0.058
Z7	Index of feelings of future potential	0.397	-0.140	-0.135
Z8	Index of involvement in community affairs	0.384	-0.270	0.060
Z9	Index of participation in community organizations	0.341	-0.222	0.220
Z10	Index of leadership quality	0.386	-0.234	0.018
Variance		50.920	27.320	7.540
* PC1, PC2, and PC3 represent the three components.				

Source: D. Todd, "The small-town viability question in a prairie context", Environment and Planning A, 1983, volume 15, p. 910.

production is more likely to be oriented towards labour-intensive technology as a result of the availability of low-cost, less skilled and scarcely militant workers. Regardless of the small economic multiplier effect generated by some manufacturing industries, they may all combine to boost the participation rate and total family income. Furthermore, the slow process of technological change in rural manufacturing industry can enhance the absorption role of the sector in taking the surplus farm labourers. Relative to service industry, one may expect manufacturing to have a greater positive effect on population growth. Moreover, its basic nature also consolidates the economy over the long run: a factor which may attracts people to stay. However, it is important to note that the presence of "branch plant" manufacturing firms may have less positive effects on population growth than local manufacturing firms. This is a corollary of their capital investment decisions being made by parent firms outside the regions and, therefore, being less sensitive to the region's needs.

3. Health Infrastructure (X4)

The provision of public health-care systems enhances the social amenity of small towns. Perhaps it is more important to those towns with "aging population" than towns composed of younger populations. As people grow older, they become more susceptible to disease. Often, their motive for migration is health related. The presence of hospital or clinics, particularly those institutes which provide geriatric medical service, will,

conversely, encourage them to stay. At the same time, older people have more social attachments to a place than the younger population. Their inclination to migrate is further undermined by their personal sentiment attached to the people and places they know. In general, people feel more secure if medical service is within their reach in case of emergency. Therefore, one may presume that the better the health facilities, the greater the possibility for population growth. However, regional variation may occur according to the age composition of small towns.

4. Educational Infrastructure (X5)

The provision of educational facilities such as schools and colleges provides training opportunity for young adults and teenagers. Unlike health organizations which tend to serve greater numbers of older people, educational institutes support mainly the younger population. Therefore, they are particularly beneficial to communities with a high percentage of child-bearing families. However, the role of the community school is not limited solely to serving pupils. In some cases where town halls are not available, schools can be used as social arenas for public events such as local folk festivals, town meetings, sport tournaments, and other social gatherings. In brief, educational facilities attract families with school age children. The presence of newly-established school may symbolize the growth of a small town. Where schools are the only places for social gatherings, they may become more important in terms of stabilizing the existing population. It is also worthwhile to

note that over the last few years, some university and certificate programmes have been conducted through these local communities. Therefore, one may surmise that the role of schools has become increasingly important, particularly, of course, to those rural residents at the age of thirty-five and below.

5. Basic Infrastructure (X6)

The basic infrastructure of communities is composed of three sub-groups: utilities, transportation services, protection and administration services. The utility category encompasses electricity, natural gas, telephone, sewage and water services; transportation includes such as road, rail, air, bus and truck services; protection and administrative includes judicial, fire fighting, ambulance, and provincial administrative services. Each service is, wherever possible, ranked according to availability and quality. The index value achieved by a town represents a composite score of various available services. In this study, basic infrastructure is used to measure the dimension of basic living standard in relationship to small-town population change. It is hypothesized that the higher the living standard, the greater the potential for population growth.

6. Average Family Income (X11)

Unlike some other economic indicators which emphasize the aggregate performance of economic activities, the average family income variable is carefully chosen to reflect the economic well-being of individual families in the region. Thus, this income component is presumed to be directly associated with

population growth. However, one may argue that an increasing average income resulting from higher wages may displace jobs and population to other areas typified by low wages. This theory could be more applicable if the population settlement is located in an urban environment. Since nonmetropolitan areas are lacking extensive locational advantages, the wages in rural areas are unlikely to exceed their urban counterparts. The narrowing of the income gap between rural and urban areas could possibly contribute to a rise in the participation rate and part-time employment rather than higher wages in rural areas.

7. Unemployment Rate (X12)

While the previous income variable measures the economic well-being of individual families, the unemployment rate variable has dual measuring functions. First, it indicates the volume of surplus labour which can be inferred to be a measurement of economic well-being of individual workers rather than individual families. Secondly, it reflects the psychological well-being of the labour force. The saying "you can be poor and yet can be happy" is unlikely to be applicable to those unemployed. Unemployed people are not necessarily poor, they are more likely to be young, have less working experience, and have been laid off due to technological change. People who are unemployed tend to suffer from social stigma and low self-esteem rather than poverty. The frustration of searching for an elusive meaningful job and their inability to change the depressed economy in their surrounding environment may motivate them to migrate. Although it

is easy to understand the inverse relationship between high unemployment rate and population growth, the relationship may not be linear. Conceivably, one may argue that a high unemployment rate has less negative effect on community population as the bulk of it approaches retirement age. On the other hand, a community consisting of a large number of young adults is shaken to its roots when chronic high unemployment prevails.

8. Total shift of Young Population (X13)

"Children symbolize growth" and "our future lies in the hands of our children" are two of the traditional expressions of our cultural values. In most areas, the gain of one child is considered more valuable than the gain of one older adult from the perspective of population growth. It is simply because children can multiply children. The 'total shift of young population' coefficient is used to monitor those rural communities gaining or losing a disproportionate share of population aged 19 and below. One may assume that communities receiving more than their "fair share" of young population are better off than those communities experiencing growth of older population. The relationship between the TS young coefficient and small-town population growth is, therefore, expected to be positive.

9. Metropolitan Proximity (X17)

This is a measure of straight-line distance to the regional metropolis, Winnipeg. The inclusion of this spatial variable is justifiable in order to test the concept of "frictional effect"

in the rural settlement system of Manitoba. Rural isolation is believed to be negatively related to population growth since it is less favourable for economic diversification. However, the situation in rural Manitoba may deviate from the general assumption. Other factors such as improvement of transportation infrastructure, rising automobile ownership, longer travelling distance to work, and formation of new 'bedroom' communities may have obliterated the locational disadvantages in the 1970s. Verification of the negative relationship between spatial separation and population growth remains to be confirmed after the calibration of the model.

10. Principal Components One, Two, and Three (X21, X22, X23)

From the sociological view point, small-town population growth or decline also involves subjective factors such as personal preferences and community satisfaction. Unlike objective factors, there is no standard set of reference to measure subjective factors. For instance, intangibles such as cooperation between small communities, progressiveness, leadership, local pride, personal preference and perception about one's economic, political, and living environments are among the many factors that may be taken into consideration. In addition, there is a lack of concurrence between objective economic indicators and subjective components. At best, one could argue that the levels of economic performance would be mirrored by the expression of subjective opinion, which in turn, would encourage or discourage population growth.¹⁵⁶ The existence of so many unknown dimensions

¹⁵⁶ Ibid., p. 908.

related to subjective factors can jeopardize the effectiveness of this research. Moreover, the problem of multicollinearity tends to arise with a dramatic increase of variables in the system equation. To alleviate this problem, principal component analysis is resorted to. This statistical procedure can convert the subjective variables into "new" orthogonal (independent) components and thus eliminate the problem of multicollinearity in subjective factors.¹⁵⁷ What is more, it can also reduce a large number of independent (subjective) variables into a relatively few meaningful dimensions which, in turn, can reduce the complexity of regression analysis as well as aid in the interpretation of the results.

Since the construction of a new set of subjective indicators is beyond the scope of this thesis, subjective indicators established by Warren are adopted in this study.¹⁵⁸ The actual information about the subjective variables was collected from a 5 % survey of rural Manitoba opinion conducted in 1971.¹⁵⁹ According to this survey, ten subjective variables relating to Manitoba small towns are constructed (see Table 23). The first three variables, Z1, Z2, and Z3, reflect feelings about local systems of production, distribution, and consumption; Z4 and Z5

¹⁵⁷ For an application of principal component analysis in regression modelling, see S. T. Wong (1963), "A Multivariate Statistical Model for Predicating Mean Annual Flood in New England," Annals Association of American Geographers, Vol. 53, pp. 298-311.

¹⁵⁸ R. L. Warren (1963), The Community in America, Chicago: Rand McNally.

¹⁵⁹ Manitoba Department of Industry and Commerce (1975), Regional Analysis Program, Southern Manitoba, 2 Volumes, Winnipeg, Manitoba.

are expressions of social support; Z6 and Z7 represent socialization; Z8 and Z9 indicate social participation; and Z10 is a measure of social control.¹⁶⁰

After the ten subjective variables are exposed to principal component analysis, three significant components emerged with a cumulative variance of 85 %. Together, the three components are able to highlight aspects of all ten original sources of variation. The variances accounted for by the three significant components are 51, 27, and 8 % respectively. The labelling of each component depends on the magnitude of loadings. The high loadings (Z6 to Z10) in the first component represent a socialization-participation-control dimension. In the second component, the high loadings (Z2 to Z4) can be labelled as a production-consumption-support dimension. The last significant component with a high positive loading (Z5) on the one hand, and a high negative loading (Z1) on the other, signifies a dichotomized low-order retail versus health-professional dimension.

After the exploration of principal component analysis methodology, let us turn back to the question of variable justification for the subjective components in relationship to population growth. Some researchers have claimed that despite the economic hardship and poor physical environment in some rural areas, personal preferences, strong social ties, and community satisfaction may override the possibility of out-migration, even

¹⁶⁰ D. Todd (1983), op. cit., p. 911.

if this means some pecuniary penalty.¹⁶¹ Moreover, people do not move simply because of a sluggish economy. The probability of moving is greater if these people recognize there are more opportunities somewhere else. Although one may argue that the perception of individuals does not necessarily represent objective reality, often people make decisions based on their own set of references and experience. The three principal components representing the individuals' satisfaction at aggregated (community) level are then used for testing the relationship between the subjective factors and population growth. It is postulated that the higher the perception scores achieved by the small towns, the greater the potential for population growth regardless of the existence of some reality distortion.

11. Population Change 1961-1971 (X27)

The lagged small-town population change indicator can provide some insights into the current town population level. While one may expect small-town population to fluctuate, it is unusual to expect population trends to deviate drastically from past experience. Basically, the continuation of traditional population pattern will prevail unless the economic structure and subjective factors deteriorate sharply in a relative short period of time. It is also possible for population sub-groups among the early

¹⁶¹ R. W. Marans and W. Rodgers (1975), "Toward an Understanding of Community Satisfaction" in Metropolitan America in Contemporary Perspective, A. H. Hawley and V. P. Rock Eds, CA: Sage, Beverley Hills, pp. 299-352; W. J. Groudy (1977), "Evaluations of Local Attributes and Community Satisfaction in Small Town," Rural Sociology, Vol. 42, pp. 371-382; T. J. Kuz (1978), "Quality of Life, an Objective and Subjective Variable Analysis," Regional Studies, Vol. 12, pp. 409-417; and D. Todd (1983), op. cit., pp. 903-916.

out-migrants to provide potential migrants with information regarding alternative new environments. Therefore, areas experiencing population growth tend to grow even further. On the other hand, areas experiencing population loss may well continue to decline due to feedback impacts.

Factors believed to influence the tertiary activity endogenous variable in the second system equation are somewhat different from the first system equation although it contains both subjective and objective components. Accordingly, an elaboration of independent variables is called for.

1. Level of Manufacturing Activity (Y3)

Growth in the local manufacturing sector can absorb unemployed local workers leaving agricultural industry and generate additional demand from the service sector. However, the service sector is heterogeneous, and can be further sub-divided into three main categories: business, public, and personal services. Services provided by accountants, lawyers, real estate agents and the like fall under the classification of business service. Hospital, fire and protection, library, postal office and other government service can be considered as public service. Restaurant, grocery, cinema, jewellery and clothing stores can be styled as personal service. Of the three different types of services, the manufacturing sector tends to rely for the most part on the business service whereas public service is of secondary importance to manufacturing. It seems logical, to

suppose that manufacturing has the least impact on the personal service sector. Therefore, one may expect manufacturing to stimulate employment growth in the tertiary sector particularly in those areas with a greater variety of business and public services. However, if the manufacturing industry is oriented to producing consumer products, wholesale and retail service centres will receive benefits as well.

2. Functional Index (X3)

The functional index is a computation of the importance of the town as a commercial centre in the hierarchy of central places. To determine the functional index, 38 selected activities within 5 miles of any settlement of more than 50 persons in Rural Southern Manitoba are chosen. There are two steps required to derive the value of the functional index. First, a "centrality value" which is a measure of the centrality of a service will be calculated. The central value ('Ct') for activity 't' is a function of 't' divided by 'T'. For its part, 't' is one outlet of activity 't', while 'T' is the total number of outlets of activity 't' in the entire study area. The second step is to multiply the 'Ct' by the number of outlets of that particular activity present in a settlement. This procedure is repeated for all the activities present in a centre. The sum total of these indices for a centre gives the functional index for that centre.¹⁶² In essence, this variable represents the spatial-economic dimension of small towns. One may assume that

¹⁶² Example of functional index calculation can be seen in the Manitoba Department of Industry and Commerce (1975), op. cit., Vol. 2, pp. 30-31.

the higher the central function, the greater the number of employment in the tertiary sector.

3. Participation Rate (X10)

Besides capital investment, human resources are of vital importance. In general, service industries are more labour intensive than manufacturing industries. The increasing of labour participation especially among the female population has promoted expansion in the tertiary sector. The availability of labour was essential for industries, particularly in the rural service sector, in the 1970s. However, advances in office automation technology had just began to make a credible impact in the early 1980s and this development may pose a threat to the labour-intensive services industry. In the long run, this variable may become less of critical importance in rural labour markets. For our study period, we feel secure in anticipating that there was a positive correlation between participation rate and level of tertiary activity.

4. Total Shift of Old Population (X15)

The disproportional gain of older population at retirement age will increase the demand for consumer goods as well as health-care related employment. The presence of additional old people or the shift towards an aging population in a community will inevitably alter the demand patterns of existing consumption-oriented businesses. Instead of competing for jobs, retirees will create jobs for the younger population in the service sector which has increasingly shifted to meet their

needs. Therefore, it is reasonable to suspect that the gain of old population by a community has a positive effect on the level of tertiary activity.

5. Principal Component One (X21)

In the first system equation, we have clarified how the three subjective components affect population change. However, the case for community satisfaction affecting the level of tertiary activity is much less apparent. The locations of nonmetropolitan service industry tends to concentrate in market centres where potential interaction of population is highest. Subjective considerations such as community satisfaction is of secondary importance to many business owners. Nevertheless, the expression of community satisfaction and optimistic outlook from the residents adds a marginal positive effect on business operations: they suggest, after all, a long-term stable market. Therefore, in addition to other objective economic variables, areas with strong subjective feeling about their communities may attract business investment.

6. Population Change 1961-1971 (X27)

The role of the tertiary sector is to provide services to the general population. However, it is quite difficult and expensive to obtain current population data in rural areas. To estimate the level of service activity for the near future, businesses may have to resort to use of the latest available population census. Areas registered with positive population change can increase the confidence of business organizations. On the contrary, areas

marked by declining population will possibly restrain further business investment.

7. Functional Index Change 1971-1981 (X28)

The agglomeration of service industries provides benefits to rural consumers. The increasing trend of multi-purpose trips among the rural residents has inspired the development of more concentrated trade areas. Unlike service industries in urban areas, rural business establishments are acting more as complements to each other rather than directly competing against each other. Any duplication of service only leads to the reduction of "normal profit" and thus reduces the chances of being successful. As an outcome of this rural 'cartelisation' of the market, it is less likely that a new firm will attempt to enter the same consumer market. Another factor, the small population threshold in rural areas, generally discourages the entrance of new firms with similar services. In some cases, low-order business has the advantage of "localized monopoly" and customer loyalty may still enable it to stay in an isolated area. In brief, towns with increasing centrality will further enhance service employment. In contrast, towns faced with declining centrality may slowly wither away.

8. Primary Employment Change 1971-1981 (X29)

As the foregoing discussion made clear, rural areas that are still experiencing active farm mechanization will produce surplus labour. One of the alternatives for the laid-off workers is service employment. Therefore, one may expect that areas with

declining employment opportunity in the primary sector will direct the labour supply to the service industry. In other words, the expected sign between the level of tertiary activity in 1981 and change of primary employment in preceding years is inversely related.

The last system equation, that concerning the manufacturing activity endogenous variable, has incorporated three different independent variables supplementary to those contained in the tertiary activity system equation. The variables in question are total shift of 'medium' population (X14), metropolitan proximity (X17), and change of secondary employment (X30). In addition to these new variables, other variables extracted from the tertiary activity equation that are pertinent to the manufacturing activity equation will be further assessed below.

1. Level of Tertiary Activity 1981 (X25)

The interdependent relationship between tertiary and manufacturing activities has been deliberated in the second system equation section. However, the relationship between these two sectors is unequal in terms of job creation. While manufacturing is likely to create more jobs for the service sector, the reverse is much less common. It is because manufacturing has higher productivity for labour and higher requirements of capital per unit of output than the service sector. As of today, automation is much more common in factories rather than in offices. Therefore, differential employment growth

rates between the two sectors are expected. The former tend to have a slower employment growth rate, whereas the latter seems to have a faster growth rate in employment. Nevertheless, the principle of interdependence holds, that is, manufacturing industries are still being lured to areas with variety of service support and vice versa.

2. Total shift of the 'Medium' Population (X14)

The disproportionate gain of adult population between the ages of 20 and 54 will increase the supply of labour to the manufacturing industry. According to the supply and demand theory, as the supply increases, so will prices be shifted downwards. Yet, the increase of labour will also deter organized labour activities. Traditionally, unionised labour is more militant than its non-union counterparts. Consequently, manufacturing industries (especially those that are labour-intensive) looking for cheaper production costs may well be attracted to areas with ample supplies of labour. At the same time, manufacturers can likewise enjoy the benefits of a less militant labour force. Finally, the increase of labour also provides a higher probability of obtaining properly qualified industrial workers. Therefore, it seems eminently sound to suppose that the increase of working population has a positive contribution to make towards the level of manufacturing activity.

3. Metropolitan Proximity (X17)

This geographic variable has a greater impact on manufacturing than service industry as a result of the inherent cost incurred

with the transportation of finished products. Although the freight-rate is curvilinear (decreasing accumulated transport costs with increasing distance), the actual transport cost may become restrictive for certain manufacturing industries. High transport costs are especially telling for those manufacturing industries which suffer no weight loss in the production process and, in consequence, they would refrain from locating in remote sites. Another disadvantage of isolated rural areas is the absence of domestic consumer market. It would, therefore, be logical to expect that towns located in remote areas are less likely to receive the benefits of economic diversification. If the aggregated advantage offered by factors such as labour, facilities for business operation, financial assistance and favourable subjective indicators cannot offset the actual cost of transportation, nonmetropolitan manufacturing industry will tend to locate closer to the regional metropolis. Under these hypothetical conditions, one would expect an inverse relationship between metropolitan proximity and nonmetropolitan manufacturing employment.

4. Population Change 1961-1971 (X27)

The lagged small-town population change variable is treated as an indicator for the potential future development. Conventionally, it has been used as a crude indicator for growth or decline. Often, the public service sector uses this indicator to assess the need for implementation or maintenance of service programmes. By the same token, the private manufacturing sector

may use it to appraise the potential expansion or contraction of business operations. Therefore, areas with signs of population gain are regarded as auspicious for business expansion. In contradiction, areas with signs of population decline may inhibit further business investment.

5. Functional Index Change 1971-1981 (X28)

For years, many large and medium-sized cities have enjoyed some of the benefits of agglomeration economies. With the diffusion of manufacturing industries into nonmetropolitan areas in recent years, rural manufacturers have just started to enjoy similar benefits, albeit on a smaller scale. In essence, agglomeration economies induces higher output per capita. Therefore, one may expect that the higher the positive change in functional index value, the greater the chance for the area to bring in manufacturing investment.

6. Change in Manufacturing Employment 1971-1981 (X30)

On the premise that "success breeds success", a lagged measure of manufacturing activity is also included.¹⁶³ The preceding record of manufacturing allows for feedback effects of secondary employment change during the period of 1971-1981 onto the level of manufacturing activity which has materialized by 1981. Similar to the service sector, manufacturing industries in nonmetropolitan areas are more of complements to each other, tolerating co-existence rather than competition. Furthermore, existing manufacturers may also ensure that adequate

¹⁶³ D. Todd (1983), op. cit., pp. 903-916.

infrastructure is extant and available for use by newer manufacturing plants. In sum, areas with a good track record in manufacturing will still offer an inducement for new manufacturing industries.

In conclusion, the predetermined variables included in this model are multi-dimensional. The objective and subjective factors contain elements of economics, sociology, psychology, politics, and geography; all of which are vital to this research in terms of model building and regional understanding. On the surface, it seems that political influence has not been incorporated into the model. Actually, the level of activity in education, health-care, transportation, public administration and other public service sectors is directly under the influence of the provincial government. The declaration of a "Stay Option" by the NDP government was a progressive recognition of rural development by the politicians.¹⁶⁴ Undoubtedly, a strong political will on the part of the government to promote development has had some positive impact on rural life, although it may be difficult to quantify.

METHOD OF ANALYSIS

Before jumping into the discussion of empirical findings, four standard research procedures relating to 2SLS need to be clarified. They are: first, the assumptions of 2SLS; secondly, the order condition for variable identification; thirdly, operational procedures for 2SLS; and, lastly, the testing procedures for 2SLS.

¹⁶⁴ Policies for rural development can be seen in Government of Manitoba (1973), op. cit., 3 Volumes.

Assumptions of Two-Stage Least Squares

1. Assumptions of Model Specification

The incurring of measurement error in the observations of independent variables, X_i , would lead to biased estimates of the regression coefficients if the classical regression model was used.¹⁶⁵ However, any test of the degree of measurement error is clearly made difficult because the amount of error is unknown. In fact, for most purposes, it is frequently assumed that measurement error is much less significant than errors resulting from incorrect equation specification, so the former is generally ignored.¹⁶⁶ However, the specification of the model is taken to be correct in so far as the exogenous variables are concerned. Put otherwise, we assume knowledge of all the exogenous (predetermined) variables of the system, irrespective of the equation in which they appear.¹⁶⁷

2. Assumptions about Sample Populations

It is assumed that the sample is large enough, and in particular that the number of observations is always greater than the number of predetermined variables in the structural system. If the sample size is small in relation to the total number of exogenous variables, it may not be possible to obtain significant estimates of the reduced-form coefficients when applying OLS at

¹⁶⁵ R. J. Johnston (1963), Econometric Methods, pp. 5-6.

¹⁶⁶ E. Malinvand (1966), Statistical Methods of Econometric, Amsterdam, p. 362.

¹⁶⁷ A. Koutsoyiannis (1977), op. cit., p. 391.

the first stage. If the sample size is small, one might try to reduce the number of exogenous variables by applying the method of principal component analysis.¹⁶⁸ If a sample is large enough, then the parameters of the model accede to asymptotic properties; that is to say, as a sample size tends towards infinity its density tends to converge towards a given function, and that function is asymptotic or the limiting distribution of the distribution from which the sample is drawn. Should the sample have a limiting distribution which conforms to the probability limits of the normal distribution, then the sample and its parameter estimates are said to be asymptotically normally distributed. As a result, the asymptotic expectation (mean) of any variable will be zero and its asymptotic variance will approach zero. This is one of the conditions necessary for 2SLS to have consistent parameter estimation.¹⁶⁹

3. Assumptions of Pattern of Disturbances

The disturbance term U of the original structure equations must satisfy the usual stochastic assumptions of zero mean, constant variance and zero covariance. Otherwise the reduced-form error terms V_i 's will not possess these characteristics and hence the whole method will be called into question.¹⁷⁰ In other words, if this assumption is not fulfilled, a considerable bias is introduced into the estimation of the regression coefficients.

¹⁶⁸ Ibid., p. 391.

¹⁶⁹ D. Todd (1979), "An Introduction to the Use of Simultaneous-equation Analysis in Geography, Concepts and Techniques in Modern Geography, No. 21, London: Headley Brothers Limited.

¹⁷⁰ A. Koutsoyiannis (1977), op. cit., p. 391.

Consequently, the form of the specification of the relationship between X_i and Y should be changed, or an alternative equation should be used.

4. Assumptions of the Absence of Autocorrelation

The error term of the reduced-form equation V_i must satisfy the usual stochastic assumptions; that is (a) V has zero mean, constant variance, and zero covariance, and (b) V must be independent of the exogenous variables of the whole structural model. The assumptions of zero mean, constant variance and zero covariance for V_i are fulfilled as soon as the random terms of all structural equations (U 's) satisfy these conditions, because V_i is an exact linear function of the structural U 's.¹⁷¹ If the values of U are serially independent, then the values of U are independent of each other and their covariance, accordingly, is zero. If this assumption is not satisfied, autocorrelation is said to be present. Although the presence of autocorrelated disturbances does not prevent the derivation of an unbiased estimate of the regression coefficients, it does lead to two serious consequences, especially if the autocorrelation is high. First, the estimates of regression coefficients have an unduly large and inaccurately estimated variance, and, secondly, the procedures for statistical inference are inapplicable. The presence of autocorrelation may be detected using Durbin-Watson d statistics. If testing reveals that a set of data is autocorrelated, two types of solutions may be helpful. In the

¹⁷¹ H. Thiel (1961), Economic Forecast and Policy, 2nd edn., North-Holland, p. 230.

first place, since the autocorrelation probably results from an error in the linearity specification or from measurement error or from the effect of a variable excluded from the model, an attempt may be made to eliminate it by transforming the data or by introducing further independent variables into the model.¹⁷² Secondly, one of the several complex methods available for the computation of the regression coefficients may be used, though their application is generally made difficult by the fact that, an estimation of, or assumptions about, the form of autocorrelation function must be made.¹⁷³

5. Assumptions of the Absence of Multicollinearity

It is assumed that the independent variables, X_i , are linearly independent of each other. If this assumption is not satisfied and the independent variables are thus multicollinear, the result is that the individual regression coefficients for each variable are not identifiable: in fact, the closer the linear correlation between the independent variables, the less the certainty with which these coefficients may be identified. This imprecision in the estimate of the regression coefficients is generally revealed by the occurrence of high measurement error, it can happen that standard errors are low despite the presence of multicollinearity. In this case, confluence analysis may be necessary to reveal the existence of the multicollinearity.¹⁷⁴

¹⁷² G. E. V. Leser (1966), Econometric Techniques and Problems, p. 9.

¹⁷³ R. J. Johnston (1980), Multivariate Statistical Analysis in Geography, New York: Longman, pp. 179-187.

Because multicollinearity makes the regression quite unidentifiable, it is important, if the aim is to estimate the regression equation, to reduce it as much as possible. Either further data may be sought,¹⁷⁵ or certain variables may be omitted from the model. If the latter solution is adopted, care must be taken in interpreting the resulting equation, for it cannot be assumed that an omitted variable has no effect: it is simply that its separate effect could not be isolated.¹⁷⁶ It may be added, however, that, if the purpose of regression analysis is only to predict the value of Y corresponding to a set of Xi values, then the multicollinearity is not a serious problem, provided that the intercorrelations continue unchanged into the future.¹⁷⁷ Alternatively, as suggested by Wong, principal component analysis can be a satisfactory solution to the problem of multicollinearity, notably when the components themselves can be interpreted as meaningful dimensions.¹⁷⁸

Order Condition for Variables

To determine which statistical technique is most suitable for model-building, one has first to establish the order condition for variable identification. The conditions for identification are strictly algebraic and apply to the parameters in the structural model. The

¹⁷⁴ Ibid., pp. 201-207.

¹⁷⁵ Ibid., p. 207.

¹⁷⁶ G. E. V. Leser (1966), op. cit., p. 28.

¹⁷⁷ Ibid., p. 28.

¹⁷⁸ S. T. Wong (1963), op. cit., pp. 298-311.

problem of identification is said to occur in those situations where any set of ways -- that is, several hypotheses -- can be coined to account for a given set of relationships. The problematic aspect arises when one tries to disentangle the single 'best' hypothesis from the multiplicity of possible explanations. Thus, the object of the exercise is to determine, for each equation in a model, a set of parameters which is compatible with the preferred hypothesis for that equation. In pragmatic terms, the problem of identification summarizes to a question of whether the observations will enable the researcher to measure each and every equation in the simultaneous system. Any structural equation is said to be identifiable only if all its parameters are identifiable.¹⁷⁹ However, not all identified system can be statistically estimated, due to data deficiencies. For instance, the sample may be small relative to the number of parameters which one wants to estimate. If a relationship is under-identified its parameters cannot be statistically estimated by any econometric technique. If a relationship is just-identified the most appropriate method of estimation is the indirect least squares (ILS) method. If an equation is over-identified the method of ILS cannot be applied because it does not give unique estimates of structural parameters.¹⁸⁰ In such cases, 2SLS is resorted to. Accordingly, any equation that excludes less than $G - 1$ variables is under-identified, where G equals the total number of endogenous variables in a set of system equations. Any equation excluding exactly $G - 1$ variables is just-identified; and an equation deleting more than $G - 1$ variables is over-identified.¹⁸¹

¹⁷⁹ D. Todd (1979), op. cit., p. 15.

¹⁸⁰ A. Koutsoyiannis (1977), op. cit., p. 366.

The order condition is exemplified as follows.

For an equation to be identified the total number of variables (endogenous and exogenous) excluded from it must be equal to or greater than the number of endogenous variables in the model less one. Given that in a complete model the number of endogenous variables is equal to the number of equations of the model, the order condition for identification is sometimes stated in the following equivalent form.

For an equation to be identified the total number of variables excluded from it, but included in other equations, must be at least as great as the number of equations of the system less one.¹⁸²

Let G = total number of equations (total number of endogenous variables)

K = number of total variables in the model (endogenous and predetermined)

M = number of variables, endogenous and exogenous, included in a particular equation.

Then the order condition for identification may be expressed as

$$(K - M) \geq (G - 1)$$

$$[\text{excluded variables}] \geq [\text{total number of equations} - 1]$$

In our case (see Figure 6 and equations (1a), (1b), and (1c)), the system contains 3 equations with 31 variables, 3 endogenous and 28 predetermined variables.

(A) For the first equation we have:

$$G = 3 \quad K = 31 \quad M = 14$$

(B) For the second equation we have:

$$G = 3 \quad K = 31 \quad M = 9$$

¹⁸¹ D. Todd (1979), op. cit., p. 18.

¹⁸² A. Koutsoyiannis (1977), op. cit., p. 352.

(C) For the third equation we have:

$$G = 3 \quad K = 31 \quad M = 8$$

Results of order condition for identification are: $17 > 2$, $22 > 2$, and $23 > 2$ for the first, second, and third equations respectively. In essence, all the 3 system equations in this general model are over-identified.

The order condition for identification is necessary for a relation to be identified, but is not sufficient; that is, it may be fulfilled in any particular equation and yet the relation may not be identified.¹⁸³ Although the rank condition for identification may be applied to further test the identification requirement, this presupposes technical knowledge of determinantal structure which simply may not exist in the model-building stage. In practice, therefore, the order criterion is usually applied as a surrogate for the sufficient condition, as well as being, in its own right, the necessary condition.¹⁸⁴

Operational Steps for 2SLS

The 2SLS method has been developed by Theil and Basmann.¹⁸⁵ It is a single-equation method, being applied to one equation of the system at a time. It has provided satisfactory results for the estimations of the

¹⁸³ Ibid., p. 353.

¹⁸⁴ D. Todd (1979), op. cit., p. 18.

¹⁸⁵ H. Theil (1953), Estimation and Simultaneous Correlation in Complete Equation Systems, the Hague: Central Planning Bureau; R. L. Basmann (1957), "A Generalized Classical Method of Linear Estimation of Coefficients in a Structural Equation," Econometrica, Vol. 25, pp. 77-83.

structural parameters and has been accepted as the most important of the single-equation techniques for the estimation of over-identified models. To facilitate the discussion of this relatively complicated statistical model, the operations involved in 2SLS are summarized below.

1. Select one endogenous variable from those in the model to act as the target dependent variable. In our model, small-town population change 1971-1981 is regarded as the first target dependent variable. The tertiary and manufacturing variables are the second and third target dependent variables respectively.

2. (First stage of 2SLS) Determine the OLS estimates of the reduced form equations for the remaining endogenous variables in the equation using all the predetermined variables in the model (i.e. in all equations, not just the one of interest). In our case, the two remaining endogenous variables are the tertiary and manufacturing activities. All other predetermined variables are on the right hand side of the system equations (see equations (1a), (1b), and (1c)).

3. Replace the observed values for these remaining endogenous variables by their estimated values from step (2). In other words, the estimated values of Y_2 and Y_3 (\hat{Y}_2 and \hat{Y}_3) generated by the OLS procedure are being substituted into the subsequent 2SLS procedure.

4. (Second stage of 2SLS) Perform OLS regression of the first target dependent variable (Population Change) on a set of variables made up of the reduced-form parameters for the remaining endogenous variables (step 3) and the original, observed values for those predetermined variables present in the equation of interest.

5. Repeat steps 1-4 for the other target dependent variables (tertiary and manufacturing activities) in the model.

Testing Procedures for 2SLS

There are a number of hypotheses relating to the assumptions and the soundness of the equations which need to be tested. Strictly speaking, the usual significance tests (t and F) are invalid with 2SLS due to their unknown distributions. Therefore the R^2 for 2SLS solutions are not appropriate.¹⁸⁶ Nevertheless, if the sample is large enough, it is admissible to maintain that the unknown distributions are asymptotically normal. The tests for normality in the disturbance terms are then subjected to chi-square tests. In addition, testing for autocorrelation will be done by Durbin-Watson d statistics. The testing procedures for various statistics are presented as follows.

(1) Test of Chi-squares:

Ho: the disturbance term is not asymptotically normal

Ha: the disturbance term is asymptotically normal

If $X^2 \text{ cal} \geq X^2 \text{ cri}$, reject Ho

If $X^2 \text{ cal} < X^2 \text{ cri}$, accept Ho

(2) Test of partial regression coefficients:

Ho: variable X_i does not significantly improve the model once variables X_{j-i} (other variables) have been included

Ha: variable X_i significantly improves the model containing variables X_{j-i}

If $t \text{ cal} \geq t \text{ cri}$, reject Ho

If $t \text{ cal} < t \text{ cri}$, accept Ho

¹⁸⁶ D. Todd (1983), op. cit., p. 912.

$$t \text{ cal} = B / \text{Std. Error}$$

$$\text{d.f.} = N - M$$

where N = number of observations

M = number of variables included in the regression equation

(3) Test of multiple regression coefficient of determination (R^2):

H_0 : there is no statistically significant linear relationship between the dependent and independent variables

H_a : there is a statistically significant linear relationship between the dependent and independent variables

If $F \text{ cal} \geq F \text{ cri}$, reject H_0

If $F \text{ cal} < F \text{ cri}$, accept H_0

$$\text{where } F = (@Y2 / M - 1) / (@U2 / N - M)$$

@Y2 = the sum of regression squares

@U2 = the sum of residual squares

N = number of observations

M = number of variables

$$\text{d.f.} = (M - 1, N - 1)$$

(4) Test of autocorrelation by Durbin-Watson d statistics. This procedure is used to test whether the residual values are serially correlated. Residual values are the differences between the observed values of the independent variables, Y_i , and the predicted values of the same Y_i . In theory, the residual values should be randomly distributed. Therefore, one should not be able to predict the values based on the preceding or succeeding residuals. If the residuals are not randomly distributed, the model will be defined as inappropriate. The hypotheses are as follows:

d will be significant (i.e. residuals are serially correlated) if it is either $< d_1$ or $4 - d < d_1$

d will be insignificant (i.e. residuals are not serially correlated) if it lies between d_u and $4 - d_u$

d will be inconclusive otherwise

The equation of Durbin-watson d statistics is as follows:

$$d = \frac{\sum_{i=1}^n (\Delta Z_i)^2}{\sum Z^2}$$

where: Z = the residuals from the regression equation

Δ = the sum of difference between various Z variables

K' = number of independent variables

N = number of observations

EMPIRICAL FINDINGS

In addition to the general model which included the 58 towns, there will be three sub-models included for discussion. Since the operating process of 2SLS involves the use of the OLS method, an OLS control model is also being analyzed in conjunction with the general model. Furthermore, two sub-models with slightly different perspectives will also be analyzed. The sub-model (a) will focus on towns with populations greater 1,000 only. The intention of setting up this sub-model is to understand how the selected variables interact with higher population thresholds. The sub-model (b) will only focus on towns with

disproportionate gains in the population group between the age of twenty and fifty-four. In essence, this sub-model attempts to highlight the influences which promote towns to attract the working population group.

The major function of performing an OLS in a 2SLS analysis is to obtain the estimated values of the parameters: the estimated values which in turn will be used to replace the actual observed values in the 2SLS operation. Therefore, the OLS control model is a pre-requisite procedure to eliminate simultaneity bias. At the same time, it is used to test the validity of system equations and parameters for the subsequent 2SLS analysis through the verification of hypotheses testing related to multiple regression assumptions. The coefficients of determination (R^2) in Table 25 indicate that the chosen explanatory variables have accounted for one-third to three-quarters of variance for the three OLS dependent variables. With regard to the F tests for the three OLS equations, all of them are highly significant at the 0.01 level. The chi-square tests for normality in the disturbance terms are also significant. Importantly, the economic activity equations are more significant (0.01 level) than the population change equation (0.05 level). The results of Durbin-Watson d tests indicate that both tertiary and manufacturing sector equations are devoid of serial correlation problems. However, the same test for the population change equation cannot prove or disprove the presence of serial correlation in the data. On the whole, however, the testing of the statistical assumptions fulfilled the requirements of subsequent 2SLS analysis.

Turning to the general model (see Table 24), the variance accounted for by the selected explanatory variables has been reduced from 58 % in

the OLS to 43 % in the 2SLS for the population change equation. However, the coefficients of determination for the two economic equations remain almost unchanged. With regard to the normality tests, the significance level for the first system equation has been improved from 0.05 in the OLS to 0.01 in the 2SLS. The significance levels for the other two system equations remain the same as before. Finally, the results of Durbin-Watson d statistic tests in the 2SLS model are identical to the OLS. Therefore, the statistical assumption tests for the general model are considered satisfactory. More importantly, the general model is able to identify those explanatory variables which make significant contributions towards an understanding of small-town viability in Rural Southern Manitoba.

Of the thirteen predetermined variables analyzed by the 1971-1981 population change equation (see equation 1a, Table 24), seven of them are significant: three at the 0.01 level, three at the 0.05 level, and one at the 0.10 level. With the exception of the basic infrastructure variable, all six other variables conform to the postulated relationships. The indication of population gain is strongly reflected by the disproportionate share of young population under the age of twenty. Such a finding implies that towns with high natural birth rates and a large number of child-bearing families are the population growth centres. Of the two economic variables (tertiary and manufacturing) incorporated into the population analysis, only the latter is considered a beneficial contributor towards population growth.

Table 24

Results for the General Model Equation System

Explanatory Variable	Variable Description	Dependent Variable (a)		
		Population Change, 1971-1981 [Equation (1a)]	Tertiary Activity, 1981 [Equation (1b)]	Manufacturing Activity, 1981 [Equation (1c)]
Y2 (X25)	level of tertiary activity, 1981	0.449 (0.610)		-0.849 (-5.504) ***
Y3 (X26)	level of manufacturing activity, 1981	1.826 (2.604) ***	-0.830 (-4.326) ***	
X3	functional index, 1981		-762.73 (-1.179)	
X4	health infrastructure, 1981	-0.333 (-0.533)		
X5	educational infrastructure, 1981	-0.057 (-0.083)		
X6	basic infrastructure, 1981	-1.201 (-2.011) **		
X10	participation rate, 1981		-0.067 (-0.463)	
X11	average family income, 1980	-0.001 (-0.376)		
X12	unemployment rate, 1981	-2.447 (-2.041) **		
X13	total shift 'young', 1971-1981	0.071 (3.653) ***		
X14	total shift 'medium', 1971-1981			0.005 (1.055)
X15	total shift 'old', 1971-1981		0.006 (0.568)	
X17	metropolitan proximity	0.003 (0.136)		-0.012 (-2.008) **
X21 (PC1)	principal component one	2.799 (2.940) ***	-0.012 (-0.033)	-0.073 (-0.245)

continue...

Table 24 (cont'd)

Explanatory Variable	Variable Description	[Equation (1a)]	[Equation (1b)]	[Equation (1c)]
X22 (PC2)	principal component two	2.660 (1.654) *		
X23 (PC3)	principal component three	-0.556 (-0.159)		
X27	population change, 1961-1971	0.311 (2.313) **	-0.025 (-0.364)	-0.064 (-1.473) *
X28	functional index change, 1971-1981		-17.480 (-1.826) **	-5.047 (-2.592) ***
X29	change in primary employment (PE), 1971-1981		-0.002 (-0.302)	
X30	change in manufacturing employment (ME), 1971-1981			0.003 (0.273)
	R^2	0.430	0.756	0.774
	\hat{R}^2	0.261	0.716	0.442
	F	***	***	***
	χ^2	16.75 / 4 d.f. ***	18.91 / 1 d.f. ***	15.41 / 2 d.f. ***
	d	1.37	2.09	2.27
	d _l	1.30		
	d _u	1.69		
	d result	indeterminate	no serial correlation	no serial correlation
	n = 58			

Note: (a) t ratios are given in parentheses; significant levels: * = 0.10, ** = 0.05, *** = 0.01.

This finding confirms Lonsdale's hypothesis which states that manufacturing acts as a community-forming mechanism rather than a community-serving component.¹⁸⁷ In essence, manufacturing industry produces greater spin-off effects than service industry. Besides the economic performance, the two subjective factors also emerged significantly. The first subjective factor, represented as a socialization-participation-control dimension, appeared with higher significance (0.01 level) than the second subjective factor (0.10 level) which represented a production-consumption-support dimension. The first subjective factor amounts to the sense of belonging, feelings of hope, community satisfaction and leadership which together play a major role leading towards population growth. The second significant subjective factor explains the satisfaction expressed by the communities which can access the basic residential and other professional services. Since towns experiencing population gain during the study period had disproportionate shares of young population, subjective concerns about health-care facilities therefore emerged as being insignificant. From the lagged population change variable (X27), one may conclude that the population gain or loss during the 1971-1981 period was the consequence of patterns established in the preceding years. By comparing the unemployment rate with average family income variables, one can observe that unemployment has a greater negative impact on population growth. The former is statistically significant and inversely related to population gain, while the latter is not statistically significant. In other words, low average family income does not necessarily induce out-migration. Yet, by way of contrast, high unemployment does

¹⁸⁷ R. E. Lonsdale and H. L. Sayler (1979), op. cit., p. 10.

discourage people staying in towns where job opportunities are limited. The unexpected negative relationship between basic infrastructure and population growth may indicate that towns experiencing population gain were not those with high standards of living. This phenomenon is also hinted at by the absence of metropolitan proximity as a significant variable in terms of population growth. As discussed earlier in the variable justification section, factors such as improved transportation, rising automobile ownership, longer travelling distance to work, and formation of bedroom communities, could possibly account for this phenomenon. The absence of health infrastructure as a significant variable for the population change equation, (1a), implies that the booming communities are not retirement towns which attract older population groups. Finally, the education infrastructure variable is also insignificant in the equation (1a). This phenomenon may lead one to assume that the alternative of networks of school-bus transportation services have been developed: that is, instead of reallocating school buildings in an expensive way, students were being transported at a fraction of the cost.

With regard to equation (1b), the level of tertiary activity equation contains two significant explanatory variables. They are manufacturing employment, with a very high significance (0.01 level) and change of functional index between 1971 and 1981, with a moderate level of significance (0.05 level). However, both explanatory variables contradict what we might expect in terms of relationships with the tertiary activity variable. The negative regression coefficient of the manufacturing variable opposes the theory of mutual dependence between

service and manufacturing sectors. What could have happened in rural Manitoba was the spatial division of labour: that is to say, towns traditionally functioning as service centres retain their servicing operations and leave no room for manufacturing expansion (and vice versa in the case of manufacturing towns.) Secondly, the exhausted rural labour market cannot provide sufficient human resources to serve two different types of industries at the same location. If towns seriously engage in one of the two industries, they do not have sufficient labour to attract the other industry. Under this circumstance, the two industries are becoming mutually exclusive. The inverse correlation between the change in functional index and tertiary activity appears somewhat surprising. The negative coefficient states that upgraded commercial hierarchy of a town does not necessarily guarantee better employment opportunity in the service sector. This finding warrants some deliberation. First, it could possibly be due to expansion of service by means of capital-intensive rather than labour-intensive processes. Secondly, the allocation of government funding has been used largely to improve the physical environment rather than job creation. Hence, it may have an adverse effect on service employment.

The manufacturing activity equation (1c) in the general model records four significant explanatory variables. Of these four variables, only the distance variable conforms to our stated hypothesis, the rest of them appear in a converse fashion. Once again, the interdependent relationship between manufacturing and tertiary activities appears to mirror the finding of equation (1b). This phenomenon reinforces the

notion of localized development of two different industries. As discussed in equation (1b), it is possibly because of 'crowding-out' effects: that is, the surrounding labour market can only accommodate one type of industry instead of two. Another possibility is the lack of integration between the two industries. While the tertiary sector delivers basic services to rural residents, the manufacturing sector engages in producing industrial or consumer products for distant markets. Geographically, both industries may locate in the same general area, but yet function independently with minimum interaction.

As with equation (1b), the controversial sign of the relationship depicted by the change of functional index also surfaced in the manufacturing activity equation. By the same token, one can assume that capital-intensive projects for upgrading commercial activity do not induce job creation in either manufacturing or services. The lagged population change between 1961 and 1971 appears contradictory to what we have expected. There are two possible reasons accounting for this phenomenon. First, as indicated by the low significance level (0.10 level), this phenomenon could possibly have arisen from the occurrence of random error in the equation. Secondly, the "Stay Option" introduced by the NDP government in the 1970s may have given higher priority to communities experiencing population decline. Consequently, government subsidies were given to those manufacturers who promised to create jobs in these communities. Unfortunately, this assumption cannot be quantified without appropriate government statistics. Finally, the expected frictional effect of distance is confirmed by the negative coefficient applying to the metropolitan proximity variable at a

moderate level (0.05 level). In essence, manufacturing industries located in remote areas incur higher transportation costs and encounter smaller domestic consumer markets than their urban competitors. Consequently, the decentralization of manufacturing industry decreases as distance from the major centres increases.

Thus far, the first subjective factor (PC1) in equation (1b) and (1c) has failed to emerge as a significant variable in terms of economic development. It implies, therefore, that business operations are based on economic criteria rather than the subjective opinion expressed by the rural residents or workers. Moreover, the fact that other expected relationships do not show up as significant determinants leads one to question the degree of change in the socio-economic environment. For instance, the insignificant relationship between the change in primary employment and service activity may well indicate that rural farm populations are no longer an essential determinant for service operation.¹⁸⁸ As exposed in the raw data set, only 9 % of the working population in 1981 was engaged in primary activities. Similarly, the first-order correlation between manufacturing activity and the change in primary employment (-0.007) hints at the irrelevance of declining rural farm population to the presence of manufacturing in small towns.¹⁸⁹ It seems, therefore, that the structure of the rural Manitoba economy has been shifted closer to an urban economy. Overall, though, the evaluation of these three model equations provides some insights for policy formulation in the next chapter.

¹⁸⁸ D. Todd (1986), op. cit.,

¹⁸⁹ Ibid.

By comparing the general and control models, one readily notes that the set of significant variables are different (see Tables 24 and 25). Although the significant variables appearing in equation (1b) and (2b) are the same, the remaining equations are slightly different. For instance, the explanatory variables representing the unemployment rate and subjective component two appear as significant in equation (1a) but insignificant in equation (2a). On the contrary, tertiary employment is considered as a significant explanatory variable in equation (2a) but it is invalid in equation (1a). Similarly, the total shift for adult population between 20 and 54 is regarded as a significant variable in the OLS equation but failed to emerge as an expected significant variable in the 2SLS equation. These disparities derive from the structural differences between the two statistical techniques. Recall from the earlier discussion in this Chapter that the 2SLS method involves the inputs of estimated coefficients from the two endogenous variables (i.e. tertiary and manufacturing) into equation (1a); one endogenous variable (i.e. manufacturing) into equation (1b); and one endogenous variable (i.e. tertiary) into equation (1c). Therefore, the computational results of the 2SLS equations are partly related to the estimated values of the endogenous variables and partly explained by the actual values of the other explanatory variables. On the other hand, the OLS method only counts on the actual values of the explanatory variables (which contain simultaneity bias in this case) for computation. Consequently, the degree of similarity between the two statistical techniques in terms of computational results depends on the estimated coefficients generated by the OLS procedure in the first place. If the residual values (i.e. actual values - estimated values)

are great, one would expect a lower degree of similarity between the two models. As a cautious step, it is important to use the control model to check the validity of the endogenous variables used in the 2SLS model. If major differences are found between the two sets of computational results, one should carefully re-examine the model specification related to the endogenous variables. In some cases, problems can be easily solved by data correction, data transformation, outlying observation deletion, or outlying variable deletion. Provided that the OLS assumptions are met, one should also incorporate those insignificant variables from the OLS output into the 2SLS computational procedure. Otherwise, variables that are potentially significant will be missed out in the 2SLS modelling procedure.

In the sub-model (a), only those towns with population greater than 1,000 are analyzed (see Table 26). Since we have increased the population threshold value, there were only 25 towns eligible for analysis. In comparison with the general model, there were no new significant variables added in this sub-model. Nevertheless, the number of significant variables has been reduced in equations (3a) and (3c). For instance, the total shift for the young population group and the variable for the lagged population change in 1961-1971 are the only pair which have significant relationships in the 1971-1981 population change equation. The interpretation of these significant variables in this sub-model is similar to the general model, although caution should be taken given their level of significance. What is more important for

Table 25

Results for the Control Model Equation System

Explanatory Variable	Variable Description	Dependent Variable (a)		
		Population Change, 1971-1981 [Equation (2a)]	Tertiary Activity, 1981 [Equation (2b)]	Manufacturing Activity, 1981 [Equation (2c)]
Y2 (X25)	level of tertiary activity, 1981	0.684 (2.295) **		-0.718 (-10.510) ***
Y3 (X26)	level of manufacturing activity, 1981	1.255 (3.831) ***	-0.913 (-9.350) ***	
X3	functional index, 1981		-763.670 (-1.124)	
X4	health infrastructure, 1981	-0.370 (-0.622)		
X5	educational infrastructure, 1981	-0.239 (-0.369)		
X6	basic infrastructure, 1981	-1.071 (-1.974) **		
X10	participation rate, 1981		-0.019 (-0.162)	
X11	average family income, 1980	0.001 (0.584)		
X12	unemployment rate, 1981	-1.372 (-1.259)		
X13	total shift 'young', 1971-1981	0.083 (4.769) ***		
X14	total shift 'medium', 1971-1981			0.007 (1.731) **
X15	total shift 'old', 1971-1981		0.010 (1.028)	
X17	metropolitan proximity			-0.012 (-2.069) **
X21 (PC1)	principal component one	1.779 (2.303) **	-0.113 (-0.331)	-0.204 (-0.711)

continue...

Table 25 (cont'd)

Explanatory Variable	Variable Description	[Equation (2a)]	[Equation (2b)]	[Equation (2c)]
X22 (PC2)	principal component two	1.265 (0.890)		
X23 (PC3)	principal component three	-1.659 (-0.538)		
X27	population change, 1961-1971	0.287 (2.223) **	-0.044 (-0.723)	-0.068 (-1.636) *
X28	functional index change, 1971-1981		-17.367 (-1.680) **	-4.378 (-2.484) ***
X29	change in primary employment (PE), 1971-1981		-0.003 (-0.401)	
X30	change in manufacturing employment (ME), 1971-1981			0.008 (0.998)
	R^2	0.582	0.759	0.788
	\hat{R}^2	0.471	0.720	0.758
	F	5.228 / 57 d.f. ***	19.314 ***	30.706 ***
	χ^2	12.42 / 5 d.f. ***	23.04 / 1 d.f. ***	11.59 / 2 d.f. ***
	d	1.285	2.125	2.158
	d_t	1.37		
	d_u	1.69		
	d result	indeterminate	no serial correlation	no serial correlation
	n = 58			

Note: (a) t ratios are given in parentheses; significant levels: * = 0.10, ** = 0.05, *** = 0.01.

Table 26
Results for the Sub-Model A (a)

Explanatory Variable	Dependent Variable (b)		
	Population Change, 1971-1981 [Equation (3a)]	Tertiary Activity, 1981 [Equation (3b)]	Manufacturing Activity, 1981 [Equation (3c)]
Y2 (X25)			-0.643 (-2.698) ***
Y3 (X26)	0.065 (0.084)	-0.640 (-2.496) ***	
X6	-1.011 (-1.064)		
X12	-1.966 (-0.780)		
X13	0.086 (3.672) ***		
X17			-0.019 (-2.580) ***
X21 (PC1)	0.005 (0.004)		
X27	0.326 (1.376) *		
X28		-6.406 (-2.058) **	-0.850 (-0.286)
X29			
X30			
R ²	0.515	0.678	0.793
\hat{R}^2	0.353	0.649	0.763
F	***	***	***
χ^2	10.78 / 1 d.f. ***	9.51 / 1 d.f. ***	11.19 / 4 d.f. ***
d	1.832	2.345	1.965
d _i	1.10		
d _u	1.43		
d result	no serial correlation	no serial correlation	no serial correlation
n = 25			

Note: (a) this sub-model only includes towns with population size greater than 1,000.
 (b) t ratios are given in parentheses; significant levels: * = 0.10, ** = 0.05, *** = 0.01.

analyzing this sub-model is the notice of diminishing explanatory power of variables that were previously found to be significant in the general model. They are the basic infrastructure, unemployment rate, principal components one and two, and level of manufacturing activity variables. Thus, if we only consider larger towns (i.e. population greater than 1,000) in the Rural Southern Manitoba region, population growth in the 1970s tended to occur in areas which received disproportionate shares of the young population group and positive population change during the lagged period. However, all other explanatory variables, regardless of their subjective or objective nature, are irrelevant as town size grows larger than 1,000 people.

The tertiary employment activity equations in both models are identical. Neither the appearance of explanatory variables nor the levels of significance have been dropped or increased. It implies that the explanatory variables are consistent regardless of the size of population in the study area.

In the manufacturing employment activity equation (3c), only the variables for tertiary activity and the distance decay function remain significant. However, the level of significance for the latter has been increased further to the 0.01 level. We can then assume that the explanations in the general model also apply to areas with higher populations. However, the change of functional index in the 1961-1971 period no longer has the same kind of negative influence as we expected for areas with smaller populations in terms of manufacturing employment. At the same time, the lagged population change variable also disappeared along with its inverse relationship. Recall earlier discussion in the

general model: had the NDP government subsidized manufacturing industry, the locations for those establishments were probably the small population centres characterised by population loss in the previous period.

The coefficients of determination in this sub-model remains very stable as compared to the general model. The first, second, and third system equations account for 52, 68, and 79 % of variance respectively. The chi-square tests for normality in the disturbance term are all significant, implying no violation in the linearity assumption. Finally, the autocorrelation tests have confirmed the non-existence of serial correlation. In comparison with the general model, the 1971-1981 population change equation has even become better; that is, it has graduated from an indeterminate status to a status without the problem of serial correlation. Overall, this sub-model is able to highlight the relevant explanatory variables for model-building to prairie towns with greater populations.

The sub-model (b) only calibrates observations registered with positive total shift of the population group between the ages of 20 and 54 (see Table 27). In this case, 24 towns qualified for the subsequent 2SLS analysis. Comparison between this sub-model and the general model does not indicate any newly-formed significant explanatory variables in the sub-model. Again, a smaller number of significant variables appeared in the sub-model relative to the general model. Yet, variation of significance levels also occurred in each equation of the sub-model. In equation (4a), four significant explanatory variables -- the basic infrastructure, total shift of young population group, manufacturing

employment activity, and lagged population change -- are the replications of their equivalent parameters in the general model. What are missing, however, are the first two subjective factors and the unemployment indicator. These findings imply that towns entertaining disproportionate gains of population between the ages of 20 and 54 were not affected by the subjective factors as postulated. Moreover, the negative implications of unemployment also disappeared. Together, the absence of these three factors further suggests that towns with disproportionate gains of working population are mainly benefited by the presence of community-forming (manufacturing) industry in addition to the traditional factors.

Equation (4b) has the same connotation as the equations (1b) and (3b). One may then assume that the elements affecting the tertiary employment across the Rural Manitoba region are virtually the same regardless of differences in population characteristic.

It is interesting to find that the distance-decay function offers no barrier in the manufacturing equation (4c) whereas towns did experience disproportionate gains in the working population. This could mean that the presence of relatively strong gains of labour in these towns has offset the disadvantage of remote locations. In essence, manufacturing industries in these towns are more concerned with labour supply. Their products may also be less affected by transportation cost and domestic consumer markets. The absence of a negative coefficient for the lagged population change variable may reflect the lack of government subsidy for manufacturing industries in these self-sufficient or 'booming'

Table 27
Results for the Sub-Model B (a)

Explanatory Variable	Dependent Variable (b)		
	Population Change, 1971-1981 [Equation (4a)]	Tertiary Activity, 1981 [Equation (4b)]	Manufacturing Activity, 1981 [Equation (4c)]
Y2 (X25)			-1.074 (-9.482) ***
Y3 (X26)	1.243 (1.657) *	-0.853 (-10.060) ***	
X6	-1.973 (-1.866) **		
X12	-2.933 (-1.078)		
X13	0.091 (4.004) ***		
X17			-0.009 (-1.230)
X21 (PC1)	1.157 (0.589)		
X27	0.601 (2.252) **		
X28		-3.916 (-2.792) ***	-3.930 (-2.465) **
X29			
X30			
R^2	0.411	0.922	0.924
\hat{R}^2	0.204	0.914	0.913
F	***	***	***
χ^2	14.71 / 1 d.f. ***	2.15 / 1 d.f.	9.38 / 4 d.f. *
d	2.071	1.780	1.710
d_i	1.08		
d_u	1.43		
d result	no serial correlation	no serial correlation	no serial correlation
n = 24			

Note: (a) this sub-model only includes towns registered with positive total shift for the population group aged 20 to 54.
 (b) t ratios are given in parentheses; significant levels: * = 0.10, ** = 0.05, *** = 0.01.

towns. As always, competition for labour supply between the rural tertiary and manufacturing industries leads to a dichotomized situation where local labour can only support one type of industry. Finally, the inverse relationship between the change of functional index and manufacturing is the result of the suspected capital-intensity of commercial projects.

In terms of statistical evaluation, equation (4b) has violated the assumption of asymptotical normality although other statistical parameters in this equation are normal. In order to test the normality assumption again, one has to use a larger population sample. Meanwhile, this equation should not be treated as a valid model. With regard to the rest of the equations in this sub-model, no major statistical assumption has been infringed. In fact, the coefficient of determination for the manufacturing equation has even been improved to 92 %.

SUMMARY AND CONCLUSIONS

SUMMARY

This research traces the factors affecting the small-town population change from 1971 to 1981 in Rural Southern Manitoba. In addition, the level of manufacturing and tertiary activities are also analyzed to give a better understanding of man-land relationships in a prairie setting. Altogether, the three models offer a comprehensive account of important subjective and objective elements which affect small-town growth. The sound theoretical, methodological, and statistical contributions enable the reader to understand clearly the complex interrelationship between population change and economic structures.

Six particular objectives have been accomplished in this work. First, this thesis offers a detailed literature review of small-town population turnaround across the U.S.A., Canada, and Manitoba. Secondly, by use of the shift-and-share analysis as the measures of population change and various types of employment activities in Manitoba, it is possible to monitor the population and economic trends more realistically. Thirdly, the 2SLS statistical technique employed in this thesis is able to disentangle the complex joint effects produced by a combination of factors regardless of their subjective or objective nature. In other words, the technique is proven capable of separating and explaining the interdependent relationship between small-town population change and

economic structures. Fourthly, the inclusion of principal component analysis in conjunction with the subjective factors enhance the understanding of human interaction with the environment. Fifthly, two sub-models are developed and interpreted to account for the variations in population characteristics in small-town modelling. Lastly, a valuable contribution might be made by applying the research methods of this thesis to rural communities in other prairie provinces or regions with similar population and economic structures.

The computational results obtained from the general model and sub-models display, for the most part, a consistent direction of signs among the significant explanatory variables. Moreover, even with variations in the family of models, several significant variables have appeared repetitively throughout the three models. This further suggests that these repetitive significant variables are useful indicators for regional planning purposes. The following are the highlights of significant variables in each equation. In respect of the 1971-1981 population change equations, the disproportionate gain of young population group and the lagged population change in the 1961-1971 period are considered valuable indicators. Furthermore, the manufacturing variable also contributed substantially to the maintaining of population growth since it registered as a significant variable in two of the models. Unfortunately, the subjective variables make only limited contributions towards the population equation of the general model. It seems, therefore, that they are more important for towns with smaller population size. Nevertheless, they remain as vital components for stabilizing population thresholds in small towns and should not be

discarded in small-town planning processes. With regard to the level of tertiary activity equations, they tend to suggest the need for labour-intensive approaches to upgrade the commercial environment. This is a corollary of the fact that capital-intensive investments have negative impacts which undermine the employment opportunities in the service sector. The prevalence of crowding-out effects in the two economic equations also hint at the need for better co-ordination in human resource development between tertiary and manufacturing industries. Finally, the appearance of distance-decay effects in the two valid manufacturing equations indicates the need for economic diversification before further decentralization of manufacturing industry can be achieved.

In short, the three statistical models have made some significant contributions in terms of understanding the crucial issues of small-town viability and economy in the Rural Southern Manitoba. In the following sections, we shall look into the formulation of planning policies targeted at small-town development.

POLICY IMPLICATIONS FOR SMALL-TOWN DEVELOPMENT

The following generalizations of policy implications are not intended to be public policy statements, but rather research findings which convey ideas relevant to existing policy or the need for the future policy. The aims of such policy implications are manifold; namely, to achieve a balanced population distribution and economic growth; to increase stability of the rural communities; to achieve greater equality of income; to reduce unemployment; to upgrade the quality and

availability of basic services; to improve community satisfaction and the related issues of rural development. The policy implications are derived from the empirical findings of the discussed statistical models as well as those global factors relevant to the rural settings in Manitoba.

Policy Implications for Population Growth

According to the empirical findings, communities registered with population growth are not retirement towns which attract older population groups. Consequently, health infrastructure is not emerging as a significant factor towards population growth. Therefore, the provision of medical facilities in rural area should not be placed too high on the government planning agenda. Nevertheless, the age composition of rural community changes over time. Government planning agencies should monitor the population composition from time to time and thus ensure adequate medical attention will be given as needs arise. In addition, health planning officials should take progressive steps to improve the health-care delivery system in rural areas. For instance, advanced communications technology should be developed to gain instant access to the latest knowledge about current diagnosis and treatment. By substituting communications for transportation, patients can be looked after at a local hospital instead of being transferred to metro centres. In smaller communities where clinics or hospitals cannot be established economically, alternative solutions such as health aides or community health workers should be provided as a means of linkage to the medical care system. Education related to health maintenance through holistic

medicine and self-care should also be advocated and delivered to rural residents by the health care workers. Efficient medical transportation networks and mobile medical units should also be provided to remote towns where local medical facilities are absent.¹⁹⁰

Although we hypothesized the existence of a positive relationship between education infrastructure and population growth, our findings indicated that this expectation cannot be substantiated for the study period. This is not to say that the hypothesis should be totally rejected. Re-examination of the general model shows that those communities which experienced population growth also gained disproportionate shares of the younger population group below the age of twenty. Essentially this young generation need to be educated in order to enter the future labour markets. These phenomena imply that expansion of education facilities (physical buildings and utilities) may not be necessary to induce population growth as well as improve education standard. Rather, an alternative approach should focus on mobilizing existing resources to improve the rural educational delivery system. For instance, town halls can be used for adult education training centres; better co-ordinated school-bus transportation networks can be developed for transporting pupils. Furthermore, university short courses, certificate programmes, and industrial training sessions should be encouraged to be conducted at local communities. During the 1970s, population growth occurred more frequently in towns with lower standards of living. This phenomenon is also supported by the absence of metropolitan proximity as a significant variable in terms of population growth. Altogether, these two indicators signify that towns which

¹⁹⁰ A. H. Hawley and S. M. Mazie (1981), op,cit.,

experienced population growth were in remote areas. Although the living standards were low among these remote communities, they were able to continue to grow. In the long run, as the population size increases to a certain threshold, the communities will then demand the provision of better living standards from the local government. Meanwhile, this factor should not be considered as a high priority in the planning processes owing to the opportunity costs involved. If these communities continue to grow beyond certain population thresholds, the government should then become involved in longer-term planning for the improvement of living standards in those areas. At the same time, since we know that metropolitan proximity is not the deciding factor for small-town growth in the case of Manitoba, planners should enlarge their visions to plan for the small towns across Rural Southern Manitoba as a whole rather than just focusing on the towns adjacent to Winnipeg. For instance, development of bedroom communities and improvement of public transportation network should be encouraged. Furthermore, rural residents can also organize better car-pool system for shopping and working trips. Whenever possible, school buses should be utilized for providing transportation services to the elderly, handicapped and home-makers. From the results of the general model, one can observe that unemployment constituted an impediment for population growth. Therefore, job creation for those depressed areas is urgently needed. First, government subsidies for job creation programmes should be carefully allocated according to the seriousness of unemployment. Secondly, job searching skill seminars should also be introduced to those unemployed. Thirdly, co-ordination for employment opportunities between government officials and the private sector should be enhanced to function

properly. Finally, long-range development strategies, involving a number of industries and not only manufacturing, should be created in order to begin solving the area-wide problems of unemployment and economic stagnation. This would probably require expanded funding of regional planning bodies.¹⁹¹

The analysis of average family income component did not furnish any conclusive explanation for small-town population growth. Further analysis is needed to understand its implications for population growth. In the meantime, the hypothesis for this factor should not be withheld from the planning procedures since it may stabilize small-town population. The appearance of the TS 'young' component as a highly significant variable for population growth indicates that towns associated with population immersed in the family-forming cycle were the population growth centres. However, age compositions of rural communities change over time. If the government wants the rural population to continue to grow, higher birth rates should be encouraged. However, the government should not neglect the family support agencies such as day-care centres, children's hospitals, family planning and counselling services, if this approach is adopted. In order to stabilize regional population growth, the government may also assist new immigrant families to locate to areas where imbalances of age composition exist. The positive contributions of subjective factors towards population growth imply that community involvement is essential for policy making. Community leadership and satisfaction are derived through the processes of participation. The participation in political events, community

¹⁹¹ G. F. Summers, S. D. Evans, F. Clemente, E. M. Beck, and J. Minkoff (1976), Industrial Invasion of Nonmetropolitan America: A Quarter Century of Experience, New York: Praeger Publishers. pp. 1-11.

affairs, and public hearings for regional development helps local residents become more cohesive. The direct effects of such participation gives community members the sense of belonging, feelings of hope, as well as community satisfaction. The indirect effects may result in better planning for local needs, allow the voicing of concerns, and cooperation between the government and local residents. Thus it could further facilitate the implementation of community projects. Therefore, wherever possible, encouragement of such activities should be organized directly for both community leaders and local residents.

Comparison between the two economic activity variables (manufacturing and tertiary), postulated for population growth was forthcoming with mixed signals. Only the former is considered a beneficial contributor to population growth in the case of rural Manitoba. It is not surprising to find such a relationship existing in a rural setting since the majority of manufacturing industries are of the basic kind. The manufacturing industry serves as a key ingredient in the community-forming mechanism. It consolidates the population base in the region by means of fostering economic growth. To encourage population growth, government should promote employment opportunities in the manufacturing sector instead of the tertiary sector. This is not to say, however, that tertiary employment opportunities should be discarded as a stimulus for population growth; rather, they should be treated as a secondary role in the regional development process. In other words, promotion of service industry should come after the establishment of a solid manufacturing industry in the region. As we discussed earlier, service industry conforms more to the community-serving role. Therefore,

it should be acting as a complement to the manufacturing sector, and together they capture and retain population. In terms of policy implications, government should encourage both the local manufacturing firms and multinational branch plants to increase their operational activities. However, caution should be taken to promote the commitment of capital re-investment back into the region. Furthermore, employment policy should also be adjusted according to the local needs as well as social well-being criteria. For instance, job creation programmes should be matched with the local labour skill and resources, environment protection laws should not be infringed by new manufacturing firms, and strain on a community's public services should be minimized by the manufacturing firms whenever possible.¹⁹² A comprehensive co-ordination among human, capital, and natural resources is needed to maximize the positive effects of such business ventures and rural development.

The lagged population change variable has appeared repetitively throughout the three models with a positive significant relationship with the population change endogenous variable. It can be used as a means rather than an end for formulating population policies. For instance, it can be used as an early indicator to depict towns with population loss. In essence, it provides regional planners with the means for identifying the root of the problems in the early stage before the small-town decline proceeds further beyond the hope of revival.

¹⁹² Ibid., pp. 1-6.

Policy Implications for Manufacturing Development

From the empirical findings, one can observe that the distance-decay effects form spatial barriers for the decentralization of manufacturing industry. To reduce such adverse effects, manufacturing industry needs to be diversified. For instance, the development of light manufacturing industries (electronics, home appliances, clothing, office equipment, furniture, and sport equipment etc.) should be given more preferences than the traditional industries such as food processing and farming equipment. In addition, manufacturing plants should be located close to the major highways for shipping their products as quickly and economically as possible. The absence of the TS 'medium' population as a significant variable indicates that the supply of labour is supported by the working population resident in the nearby bedroom communities. Nevertheless, a comprehensive survey of labour profiles and markets should be conducted in the early planning stage of industrial location. Information regarding the size and skill levels of potential employees as well as supply and demand of labour force should be well documented for various types of manufacturing industries.¹⁹³ The negative relationship between the manufacturing and tertiary activities appearing in the findings implies that a better co-ordination in terms of human resources between the two industries is needed. Otherwise, neither the manufacturing nor tertiary industries will be able to take full advantage of agglomeration economies. In the areas where population showed decline, regional planning agencies should investigate the underlying causes of such phenomenon. The manufacturing plants should be located to a central location whereby a group of declining small towns

¹⁹³ Ibid., pp. 1-6.

can be benefited. This approach will minimize the incurred economic and social costs of residential re-location. In principle, priorities in terms of expanding employment opportunities in manufacturing industry should be given to a group of declining small towns in the same general area. Alternatively, job creations in manufacturing may also be located in the key settlements (growth centres) where adjacent depressed communities can be benefited (see Figure 5 and earlier discussion on this topic).

The contradictory sign of relationship depicted by the change of functional index in the manufacturing activity equation implies that capital-intensive projects do not induce manufacturing jobs. Usually, capital-intensive projects employ a large number of workers in the initial stage. However, once the construction phase of the project is finished, only a small number of production and maintenance workers will be required. Therefore, the government should carefully weight the pros and cons between the capital-intensive and labour-intensive projects. Whenever possible, capital-intensive projects should be substituted by labour-intensive projects if the total cost (fixed costs plus variable costs) for the two modes of productions are more or less the same. This is owing to the fact that labour-intensive projects have a greater multiplier effect on the rural economy since workers are also consumers. Income generated through employment is therefore being passed to other sectors of the economy as well. The insignificance of the subjective factors implies that investment in manufacturing should follow the economic criteria which seems more reliable in the case of Manitoba. Besides these policy implications, provincial and federal politicians

should also pay attention to the changing economic structures of the developing countries in the Far East, aided by the 'offshore' location of U.S. enterprises. Although this phenomenon may be good for Canada in terms of keeping inflation down, it prevents industrial growth and raises unemployment in the rural areas. Legislation to protect the local young manufacturing industries are therefore urgently needed. Otherwise, more jobs will be lost and, consequently, the revival of small-town growth will be abrogated.

Policy Implications for Tertiary Employment

Similar to the policy implications for manufacturing development, tertiary employment should be encouraged wherever possible. However, unlike the manufacturing industry, the tertiary sector tends to employ a higher percentage of female workers. Therefore, the majority of job creations in the service sector should be targeted to the female population. Examination of the first-order correlation matrix table indicates that there is a statistically-significant correlation between the participation rate and tertiary employment (0.34). Nevertheless, the average participation rate was relatively low (53.4 %) in 1981. Assuming that most household heads are male, we may expect an even lower participation rate among those of the female population that are potentially employable. Therefore, policy implications for tertiary employment expansion should not neglect the training provision for the older women who may re-enter the labour force after raising their children. At the same time, to assist women with young children to join the labour force, day-care centres may also be needed. The inverse correlation between the change in functional index and tertiary

employment also hints at the adverse effects of capital-intensive projects. Similar to the policy implications mooted for manufacturing development, governments should consider the opportunity cost very carefully if socio-economic well-being is the main target for advancement. With regard to the other insignificant predetermined variables in the tertiary activity equation, they are not applicable for policy formulation. Further investigations for those variables are needed before any conclusive recommendations can be made.

In sum, the revival of small towns in Rural Southern Manitoba has been an encouraging phenomenon to the provincial government and rural residents. From the government standpoint, it underwrites the hope of achieving a balanced regional growth within the province. The problems of urban and rural discrepancies, rural out-migration, uncontrolled urban sprawl, and the unwanted adverse socio-economic conditions generated by the processes of urbanization, have long been disruptive for regional planning. From the literature reviews and empirical findings of the statistical models, one can conclude that Rural Southern Manitoba has a great potential for population growth. Influential factors such as strong political will, ample supply of labour, low costs of living, and high subjective community satisfaction are definite assets in the desire to promote further growth. However, shortcomings abound, such as poor human resource management between manufacturing and tertiary sectors, insufficient labour-intensive commercial projects, inadequate manufacturing diversification activities, inadequate labour force training programmes for the female population in the tertiary sector, insufficient training programmes for the young male population

in the manufacturing industry, and under-funded regional planning bodies. These areas of weakness can certainly be improved if the government is willing to take rectifying action. However, increasing competition from the developing countries in the Far East has threatened the possibility of continued revival for rural Manitoba small towns. In addition, the current world-wide price war in agricultural products has seriously undermined the agricultural economy in this prairie province. Yet, the upcoming free trade agreement with the U.S.A. may have an undetermined adverse effect on the low-skilled labour market in the rural areas. Since there are so many uncontrollable external factors, there are no "hard and fast" solutions to ensure continued growth and development in the rural areas. At best, regional planners can only provide appropriate theories and guidelines for rural development. In practice, the provincial government must commit itself to take on the challenge. With sufficient funding and better administrative bodies in regional planning, industrial expansion branches, and social servicing agencies, a higher chance of successful operation in terms of maintaining stability and growth for the rural Manitoba communities can be achieved.

CONCLUSIONS AND FUTURE RESEARCHES

In conclusion, rural Manitobans had been blessed by a period of stable population growth and economic prosperity during the 1970s. Overall, rural Manitoba is equipped with a wide range of natural, capital and human resources to sustain further growth. To make the best use of such resources, continued researches in topics related to

agricultural economy, rural community life, nonmetropolitan industrial location, small-town labour force characteristics, delivery system in rural social and health services, nonmetropolitan transit system, rural education system and the like should be called forth.

With regard to the planning technique (SSA), statistical methods (2SLS and PCA) and selected variables (subjective and objective components), they have proven themselves as valid research tools in studying the small-town context in Manitoba. If one were to reassess the models again, one would be tempted to include the same variables as employed in this study simply because those variables represent the subjective and objective dimensions adequately in a rural small-town setting such as Manitoba. Nevertheless, the subjective opinion survey conducted in 1971 needs to be updated. Furthermore, outlying cases which have standardized scores of above or below 3.00 in the raw data set will be recoded as 3.00 to reduce extreme variations. Alternatively, the entire distribution of such a variable may be transformed in a log form to remove non-linearity. By the same token, towns that do not conform to the general population characteristics and economic structures in the rural Manitoba setting may also be excluded from the analysis. Finally, plots of residual values for the three endogenous variable equations will be displayed on maps to enhance the understanding of the spatial relationships.

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