The NRE Field Sites:
an analysis using taxfiler data

A REPORT

for

The New Rural Economy Project of
The Canadian Rural Revitalization Foundation

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DRAFT

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1. Introduction

This report documents the socio-economic structure and trends in a sample of 33 Canadian rural communities. It is based on information from the taxfiler data prepared by Statistics Canada's Small Area and Administrative Data Division. It provides an opportunity to demonstrate the utility of this data and at the same time advance our understanding of community change in rural areas. The taxfiler data is used to address the following five questions.

1.1. Are rural communities in the sample generally similar or is there a wide variation in socio-economic outcomes among them?

1.2. Do the factors that were used to define the sampling frame for the NRE project actually explain the difference in socio-economic structures and outcomes of the sampled rural communities?

1.3. Are all rural communities showing the same general trend over time, or are some communities changing direction, speeding up, or slowing down in terms of their development trajectories?

1.4. Are there recommendations for policy attention to be derived from the assessment of these rural community socio-economic profiles?

1.5. Given that the data are derived from (and constrained by) information available from the taxation form of individuals, are there additional variables or alternative calculations that could be provided that would improve the assessment of socio-economic structures and trends for rural communities?

2. The Selection of Sites

In 1997, the *New Rural Economy Project* (NRE) of the *Canadian Rural Revitalization Foundation* (CRRF) selected a sample of 32 rural and remote sites across Canada (Reimer, 1995, 1997, 1999b). As indicated in Appendix 1, they were selected using a sampling frame that allows comparisons on five dimensions reflecting major conditions faced by communities in the rural context:

- whether they are strongly linked to the global economy or not,
- whether the local economy is stable or fluctuating,
- whether the community is adjacent to a major urban centre or not,
- whether the community has a high level of institutional capacity or not, and
- whether the community is 'leading' or 'lagging' on several economic indicators.

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[1] I wish to thank Cindy Bryant for the work she has done preparing this data and Statistics Canada for the support they provided for this research.

Using 1991 CSD-level census data, one community was identified for each cell of the sample frame. As we learned more about each site from the field work, several of the assignments were changed, producing the distribution indicated in Appendix 1. Blenheim is also included in the taxfiler analysis at the request of our site team in Ontario. It is the data from these 33 sties that we use to answer our second research question.

3. The Selection of Variables

The variables selected from the taxfiler data are chosen to reflect the socio-economic structure and outcomes of the rural communities. The structure variables identify conditions that provide the basic economic and social resources of the communities and constrain the options available for local development. The outcome variables reflect the results of economic and social processes affecting the direction of this development.

It is clear that the classification of structure and process variables will remain equivocal. From one perspective, for example, the level of employment can be interpreted as a basic structure of a community, while from a second, it may be seen as an outcome. Our decisions in this regard are significantly influenced by the availability of trend information in the taxfiler data: the outcome variables are those that reflect changes from 1994 to 1997 as provided by the tax files. The structure variables, on the other hand are taken from the 1996 data in order to provide compatibility with the 1996 CSD data available from the census. The resulting classification of variables is provided in Appendix 2.

4. Question 1: Socio-economic Variation

Question 1: Are rural communities in the sample generally similar or is there a wide variation in socio-economic outcomes among them?

The first question could best be answered by comparing the sampled sites within a larger number of communities. Indeed, this is an important objective of the NRE plan, but one that requires resources beyond our means at this point. Instead, we have proceeded with a strategy that is both systematic and pragmatic. The NRE sites have been selected to provide comparisons on some of the most critical processes affecting rural communities today. We feel confident that this sample contains examples of the full range of experiences and characteristics to be found in rural Canada.

Appendix 2 provides the basic descriptive statistics for the structure and outcome variables in the 33 sites. They demonstrate the considerable variation to be found in the sites. The populations of the sites, for example, range from 250 to 9,500 people. They include average ages from 22 to 43 years, labour force participation rates of 14% to 84%, and per capita incomes from $3,155 to over $25,000. To represent this variation in a useful way is a formidable task. For this reason, we employ various data reduction techniques to make the information more manageable.

Our first step is to use factor analysis. This technique scans for high interrelations between the variables to reduce redundancies. They can be represented as underlying dimensions or 'factors' that represent the patterns of inter-correlations found in the data. The technique is designed to identify the factors in a way that makes them as distinct as possible.

4.1. Structure variables

Factor analysis shows that about 85.1% of the variation in the structure variables can be explained by five factors (cf. Appendix 3).

- The first factor reflects *low income levels*, with communities ranking high on the factor representing those that are low in income levels. Mobert, for example, a First Nations community in Northern Ontario is the community with the highest level on this factor (indicating low incomes) and the three BC forestry towns of Mackenzie, Tumbler Ridge, and Port Alice have the lowest levels (indicating high incomes) (cf. Figure 1). From the matrix of coefficients in Appendix 3, we also find that low incomes are associated with high levels of dependency and "economic dependency ratios" (EDR)[2] for those with no pensions.

- The second factor reflects variations with respect to the *percentage of non-family persons*[3] and age. Those sites that are high on this dimension have a high percentage of non-family persons as well as a high average age. Those that are low on the factor have a low percentage of non-family persons and a high percentage of children under 15 years of age. Springhill, NS and St. Roch de Mékinac, QC are highest on this dimension and Arctic Bay, NU, Rhineland, MB, Mackenzie, BC, and Tumbler Ridge, BC are very low (Figure 1).

- The third factor reflects the levels of *employment insurance* demands within the various sites. It also indicates that high demands on employment insurance are associated with low levels of population dependency. Néguac, NB, Winterton, NF, and Twillingate, NF, and are highest on this factor whereas Arctic Bay, NU, Blenheim, ON, and three prairie sites (Spalding, SK, Rhineland, MB, Okanese, SK) are lowest (Figure 2).

- The fourth factor reflects differences in *family structure*. Sites that are high on this dimension have a high proportion of husband/wife (including common-law) families. Those that are low have a high proportion of lone-parent families (and high levels of social assistance dependency). Four prairie sites (Girouxville, AB, Rhineland, MB, Wood River, SK, Ferintosh, AB) are highest on this dimension (Figure 2). The First Nations site Mobert, ON, is clearly an outlier on this factor with a high proportion of lone-parent families while Okanese, SK, and Springhill, NB are the next lowest.

The scatterplots in Appendix 3 give an indication of the distribution of the field sites with respect to the four structure factors. Leading and lagging sites are also distinguished in the figures. In Figure 1, for example, we find that the lagging sites tend to be located in the upper right hand quadrant of the box. The results highlight the significant variation in the characteristics of the field sites.

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[2] The economic dependency ratio "is the number of transfer payment dollars received as benefits in a given area, compared to every $100 of employment income for that same area. For example, where a table shows an Employment Insurance (EI) dependency ratio of 4.69, it means that $4.69 in EI benefits were received for every $100 of employment income for the area." (Statistics Canada, 1999)

[3] Non-family persons are those who are living alone or living in a household without being immediate relatives of other household members

Following from this analysis, cluster analysis was conducted to identify those specific field sites that are similar or different (cf. Appendix 3). The technique calculates an index of similarity between sites based on the structure variables, then clusters them according to their similarity or difference on that index. The clusters are represented in Appendix 3 in the form of a dendrogram displaying the clusters and the relative distances between them. As shown in the dendrogram, there is considerable similarity among the communities based on the structure variables (most of the communities are combined close to the left hand side of the dendrogram where the differences between them are slight). On the other hand, the three BC communities in the NRE sample (Tumbler Ridge, Mackenzie, and Port Alice) are left out of this major cluster until a much later stage in the process.

In order to identify the most important distinguishing characteristics of these clusters, we conducted discriminant analysis using the variables included in the cluster analysis. Our focus was on the distinction between the last three clusters formed. The discriminant analysis identified two functions that differentiated those clusters.

The discriminant function coefficients indicate that the most important discriminating characteristics are related to income and labour force participation. The first function primarily differentiates Mobert, ON from the three BC sites (Mackenzie, Tumbler Ridge, and Port Alice) based on the proportion of non-family persons with high incomes (Figure 3). The three BC sites have a high proportion of such persons whereas Mobert is relatively low with respect to this characteristic.

The second discriminating function primarily differentiates Mobert from the largest cluster. In this case, Mobert is distinguished by a very high dependence on social assistance from all sources ($62 for every $100 of employment income).

4.2. Outcome variables

Similar analysis was conducted for the outcome variables (cf. Appendix 4). The factor analysis identifies four factors that explain 84.8% of the total variance.

- The first factor reflects several variables linked to increases in *income and the labour force*. *Increases in per capita income*, the *gross labour force*, *total income*, *employment income*, the *labour force participation rate* are all associated. They are also related to a decrease in economic *dependence on child tax benefits*. Exeter and Carden in southern Ontario are ranked high on this factor, as are Hussar, AB and Benito, MB (Figure 4). On the other hand, the First Nations communities of Indian Brook, NS and Mobert, ON are low on this dimension, along with Twillingate, NF.

- The second factor links *increases in population* with increases in the number of *persons in husband/wife families*. The Ontario sites of Mobert, Exeter, and Blenheim, have the greatest increases on this dimension whereas Tumbler Ridge, BC, Upper Liard, YT, and Wood River, SK have the smallest (Figure 4).

- The third factor associates decreases in the *average age* of the sites with increases in *population dependency* and the *number of persons under 15 years of age* (Figure 5). Rhineland, MB, Belleterre, QC, Alfred (North Plantagenet), ON, and Okanese, SK have the highest values on this dimension (and therefore the oldest and least dependent populations). Exeter, ON, Tumbler Ridge, BC, and Upper Liard, YT are the lowest three (indicating a young average age and high age dependency).

- The fourth factor associates increases in the number of *lone-parent families* with

decreases in the *median income*. Exeter, ON, Indian Brook, NS, Belleterre, QC, and Ferintosh, AB are all high with respect to this factor (Figure 5). Carden, ON, Wood River, SK, Spalding, SK, Winterton, NF, and Girouxville AB are all low on this dimension.

The scatterplots of these factors are provided in Appendix 4. They show that factors one and two (changes in income, labour force, and family characteristics) yield a pattern of variation where most sites are relatively the same with three or four outlier communities. On the other hand, the sites are more widely dispersed on factors three and four (changes in age and lone-parent characteristics).

Initial calculations using cluster analysis yielded several clusters, with sites combining throughout the full range of distances (cf. dendogram). The details of this clustering revealed some interesting patterns, however. The first 20 or so sites clustered into about 5 or 6 clusters that were rather similar. The last 7 sites were included one at a time with considerable distances between them. This suggests that there is considerable variation between some sites. This conclusion is supported by a closer look at the locations of the clusters as they formed (cf. dendrogram and Figure 6). There is little regional clustering in this process. For example, the first cluster included sites from Québec, Ontario, BC, and Manitoba. The second large cluster included sites from Ontario, Saskatchewan, and Manitoba. The BC site of Tumbler Ridge was early on clustered with one from the Yukon, Newfoundland, and Nova Scotia.

4.3. Summary - Question 1

In summary, this initial analysis suggests that the rural communities in the NRE sample display considerable variation in several respects. First, the sites vary considerably within many of the variables we considered. For example, per capita incomes for the sites ranged from $3,200 to $25,000; per capita dependence on government transfer payments ranged from $985 to $4,479; the change in labour force participation rate from 1994 to 1997 ranged from -31.6 to 11.3; and the change in number of persons in lone-parent families ranged from -42.9 to 66.7. Second, the sites continue to vary even when inter-correlations between individual variables are reduced. The factor analysis shows that incomes, population, the age structure, and family characteristics all differentiate the sites to a considerable degree. Third, there is variation across regions. Instead of clustering by geographical region, it is their economic and social structure that form the basis of their similarity. Finally, there are several sites that remain relatively unique in the face of all the similarities considered. Several of the Aboriginal sites appeared as outliers on many of the variables, the BC communities show special characteristics on labour force and income variables, and a couple of the Ontario communities appear noticeable for their income and family features.

5. Question 2: The NRE Sampling Frame Dimensions

Question 2: Do the factors that were used to define the sampling frame for the NRE project actually explain the difference in socio-economic structures and outcomes of the sampled rural communities?

If the five dimensions of the NRE sampling frame reflect important characteristics and processes, they should differentiate the rural sites on both structure and outcome variables. The

taxfiler data provides the means to test these claims. To do so, we utilize analysis of variance techniques to identify those dimensions that produced significant differences in the structure and outcome variables (Appendix 5). This technique allows us to compare the sites on each of the five dimensions and to determine if their structure or outcome variables are significantly different. We use a generous cutoff level of significance of .08 in order to be inclusive.

5.1. Global vs. Local

The first dimension compares those sites that are highly integrated with the global economy and those that have a more locally-oriented economy. Both structure and outcome variables were differentiated with respect to this dimension. Globally connected sites were more likely to have a higher percentage of people in husband-wife families, per capita incomes, median incomes for lone-family persons, and increases in the labour participation rate between 1994 and 1997. They are also more likely to have fewer persons in lone-parent families.

5.2. Stable vs. Fluctuating

This dimension compares those sites that have relatively stable economies with those that are more fluctuating. In this case, none of the structure variables showed a significant difference whereas one of the outcome variables did. Sites with relatively stable economies were more likely to have larger increases in their population dependency ratios for persons less than 15 or greater than 65 years of age between 1994 and 1997.

5.3. Adjacent vs. Not-adjacent

No structure variables were differentiated with respect to this dimension, whereas two outcome variables were. Those sites that are adjacent to major metropolitan centres were more likely to have an increase in the total number of persons between 1994 and 1997. Although adjacent sites experienced a decrease in the number of persons under 15 years of age, the decrease was smaller than sites that were farther from metropolitan centres.

5.4. High vs. Low Institutional Capacity

This dimension differentiates several of the structure variables. Those sites with high capacity have a greater percentage of husband/wife families and a higher average age. In addition, they have a lower percentage of persons in lone-parent families, and lower levels of dependency on social assistance.

Among the outcome variables, high capacity sites show decreases in the number of persons in lone-parent families plus larger decreases in dependency on child tax benefits than low capacity sites.

5.5. Leading vs. Lagging

There are a large number of significant differences based on the distinction between leading and lagging sites. This is not unexpected since several of the variables used to identify these sites in 1991 are reflected in the taxfiler data (Reimer, 1999a). For example, leading sites have much higher per capita incomes and a larger percentage of that income coming from employment. In addition, they have larger populations, a higher percentage of husband/wife families, and higher median incomes for non-family persons. Lagging sites, on the other hand have a higher employment insurance rates, population dependencies, per capita government transfer payments, and economic dependency ratios.

Looking at the outcome variables, we find that leading sites have experienced about a 10% increase in per capita incomes between 1994 and 1997, whereas lagging sites have an increase of only 3.9% (this is below the consumer price increase of 5.5% between 1994 and

1997). Both types of sites have experienced a decrease in child tax benefits, but the decrease was much larger in leading sites than those which are lagging.

5.6. Question 2: Summary

These results support the value of the five dimensions at the basis of the NRE sampling frame. In all cases, they provide some differentiation by structure or outcome variables. In addition, they identify important variables and issues related to the tax filer data. For example, these data hint at the following issues.

- The Global/Local dimension differentiate sites on the basis of family, labour, and income considerations. Globally connected sites appear to have improved income characteristics as well as a larger proportion of husband/wife rather than lone-parent families. Since they also experienced increases in the labour force participation ratio, this distinction may represents a bifurcation of family types on this dimension and thereby family fortunes.
- The Stable/Fluctuating dimension appears to differentiate on the basis of age and age-dependency. Further research is required to determine whether stable sites provide advantages for the elderly or whether these data reflect the advantages of fluctuating economies for the young.
- The Adjacent/Not-Adjacent dimension is related to population size variation, especially with respect to the young. It suggests a closer look at migration patterns is in order, especially with respect to movement from remote, to adjacent, to urban centres. Elaboration of the tax filer database may facilitate this objective.
- The Institutional Capacity dimension provides another perspective on the experience of various types of families. The analysis suggests that lone-parent families may not only be disadvantaged on income, but with access to social institutions as well.
- The Leading/Lagging dimension continues to reflect important differences in income that are associated with family and age structure. The results reinforce the suggestion that both institutional and income benefits are becoming less evenly distributed, with leading sites getting more and lagging getting less. Verification of these trends and analysis of the reasons for them should be a high priority for future work.

In general, the five dimensions reflect important differences in the field sites, raising questions for future investigation with respect to several issues. Some of them are identified below.

- To what extent do the global/local and stable/fluctuating dimensions reflect differences in the resource base of the sites, especially with respect to agriculture?
- Are stable economies a reflection of slow growth?
- What advantages or disadvantages accrue to the elderly and young by virtue of their residence in regions with stable or fluctuating economies?
- What are the processes leading to the decline of lone-parent families in high capacity sites?
- What disadvantages to the lone-parents and children may arise from this trend?
- What processes lead to increases in elderly persons and incomes of lone-parent families in leading sites?
- To what extent are rural sites becoming bifurcated into the haves and have nots – and why?

6. Question 3: Trends

Question 3: Are all rural communities showing the same general trend over time, or are some communities changing direction, speeding up, or slowing down in terms of their development trajectories?

Answers to this question can be found in the previous analysis of outcome variables. Each of these variables is constructed to reflect changes from 1994 to 1997 and therefore can be interpreted with these trends in mind. Using the factor analysis from section 4.2 above as a method of reducing the number of changes to consider, we have found the following trends in the sites considered. Graphs reporting these trends can be found in Appendix 6. They have been selected to represent the most significant comparisons identified by the analysis of variance in section 5 above.

- Increases in the *labour force participation rate* (Figure 10) are associated with increases in *per capita income* (Figure 13). Thirteen of the 33 sites reported an increase in the participation rate. Twenty of them reported an increase in per capita median income that was greater than the increase in the consumer price index between 1994 and 1997 (5.5%).
- Increases in *population* (Figure 8) are associated with increases in the number of *husband/wife families and children*. They are also associated with decreases in the *median income of non-family persons*, however. Fifteen of the 33 sites had an increase in population over the four years considered. Six of the 15 showed a decrease in the median income of non-family persons.
- Decreases in the *average age* of residents in the sites (Figure 7) is associated with an increase in *population dependency* (Figure 11) and the number of persons *under 15 years of age* (Figure 9). Twenty-five of the sites reported an increase in the average age. Only seven reported an increase in the number of children under 15 years of age.
- Increases in *dependence on employment insurance and pensions* is associated with increases in *lone-parent families* (Figure 12) as well as declining *median incomes*. Only two sites reported an increase in EDRs for employment insurance, fourteen indicated increases in EDRs for pensions, and ten reported increases in the number of lone-parent families.

7. Question 4: Policy Recommendations

These results are suggestive rather than conclusive. For that reason, the identification of policy recommendations must address the directions for further investigation, rather than specify programs or policies. These directions include the following.

The diversity of rural Canadian communities is apparent from this analysis. Specific communities emerge as special in both the analysis of structure and outcome. We see, for example, that the Aboriginal communities of Indian Brook, Mobert, and Arctic Bay often occur as outliers in the distribution of data. This is most apparent on variables such as population change, changes in the distribution of age, and labour force participation. The identification of the reasons for their special status is of pressing concern.

The diversity is also apparent through such communities as Tumbler Ridge, Mackenzie, and Port Alice. These sites emerged from the cluster analysis as particularly special for their unusual population and income characteristics. The reasons for these characteristics are to some

extent unclear, but further research is likely to reveal important insights into the organization and changes taking place in resource-based economies.

Several other sites appear to have special characteristics. Exeter, Belleterre, Hussar, Blissfield, and Cap à l'aigle, for example, all emerge as outliers in some of the comparisons examined. Discussions with the researchers and residents associated with each of these sites are likely to yield important explanations for their special status.

The investigation of these differences will be enhanced by the inclusion of a wider range of data than is found in the tax filer information. Some of this additional information can be derived from the CSD database prepared as part of the NRE project. Field work will supply an additional source.

8. Question 5: Modifications of Taxfiler Data

The taxfiler data provides an important source of information for analyzing small areas. This is crucial for research on rural communities since so much of the variation is lost by aggregating to larger units of analysis.

The taxfiler data is also useful since it permits trend analysis. As we delve deeper into the processes behind many of these statistics, the importance of trend analysis increases. For this reason alone, the taxfiler database provides an crucial resource.

Its limitations, however, remain frustrating. The information it contains remains limited to income and some demographic variables and its level of analysis is essentially individual. For this reason, further integration of the taxfiler data with the NRE field data and the CSD-level rural Canada database holds considerable promise. This report provides a modest beginning for such work and it needs expansion in a couple of directions to build on this basis.

First, we can integrate the taxfiler data with the census-based information in the CSD-level database. This will allow us to consider, for example, the role of the industrial base, ethnicity, and housing in the analysis even if it can only be done as a reflection of the community level. Our research to date indicates that this is a significant component in our understanding of the local economy and society.

Second, we will use the rich fieldwork data collected in each of the sites to build information regarding the institutional, social, political, and cultural context of the communities in which these people live. In this way, we hope to understand the local conditions behind the trends identified. By analyzing the individual-level data of the taxfiler within the community-level information from our field work, we expect to identify those local conditions that are most important for the options and choices of the local population.

The taxfiler database also holds promise for another type of analysis that is sorely needed in the rural context: migration. The movement of individuals from one location to another and the identification of the characteristics of the movers is crucial to understanding rural change. To date, we have only very indirect or expensive techniques for assessing patterns of movement. However, more specific and reliable information is needed to assess such questions as the following.
- Where does the pattern of movement from remote, to adjacent, to metropolitan residence occur?
- Where is rural to urban migration taking place, and where is the migration from urban to rural?

- What types of people are moving between and among rural and urban locations?
- To what extent are there migration streams (forward and backward) between and among rural and urban locations?
- Under what conditions do these streams change?

This type of analysis requires the construction of a longitudinal database within a sufficiently long period to reflect the migration patterns. Our previous investigation of the taxfiler data suggests that this might require the analysis over 5 to 10 years in order to amass sufficient cases to show patterns and maintain confidentiality. We are now in a position where this can be pursued.

9. References

Reimer, Bill
1999b "A Sample Frame for Rural Canada: Design and Evaluation." Presentation to the International Regional Science Association, November 10-14.
Reimer, Bill
1999a "Leading and Lagging Census Subdivisions in Rural Canada." Paper presented to the Statistics Canada Economic Conference, 1999 (Probing the New Economic Realities), March 23-24.
Reimer, Bill
1997 "The NRE Rural Sample Site Database - Information and Rationale." Report to the New Rural Economy Group of the Canadian Rural Restructuring Foundation, 21p.
Reimer, Bill
1995 "A Sampling Frame for Non-Metropolitan Communities in Canada." A report to the Canadian Rural Restructuring Foundation, 27p.
Statistics Canada
1999 "Postal Area Profiles: Users Guide" Small Area and Administrative Data Division, Product Number 89C0021.

Appendix 1: The NRE Sample

The NRE Sample	June 1999	sgrid9.wpd		Cell	Lagging	Cell	Leading
Low Global Exposure	Stable Economy	Not adjacent	Low capabilities	0		1	
Low Global Exposure	Stable Economy	Not adjacent	High capabilities	2	Springhill, NS (1211008) Twillingate, NF (1008028)	3	Girouxville, AB(4819048) Arctic Bay, NT (6104018) Cap a L'Aigle, QC (2415040) Humphrey, ON (3549001)
Low Global Exposure	Stable Economy	Metro adjacent	Low capabilities	4	Indian Br 14, NS (1208014) Ferintosh, AB(4810004)	5	
Low Global Exposure	Stable Economy	Metro adjacent	High capabilities	6	Tweed, ON (3512031) Okanese82,SK (4706815)	7	Alfred, ON (3502031)
Low Global Exposure	Fluctuating Econ	Not adjacent	Low capabilities	8	Pic Mobert S,ON (3558061)	9	Upper Liard, YT (6001032) Lot 16, PE (1103028)
Low Global Exposure	Fluctuating Econ	Not adjacent	High capabilities	10	Benito, MB (4620043) Neguac, NB (1309038)	11	
Low Global Exposure	Fluctuating Econ	Metro adjacent	Low capabilities	12	Carden, ON (3516036)	13	
Low Global Exposure	Fluctuating Econ	Metro adjacent	High capabilities	14		15	
High Global Exposure	Stable Economy	Not adjacent	Low capabilities	16	Belleterre,QC (2485065)	17	
High Global Exposure	Stable Economy	Not adjacent	High capabilities	18	Spalding, SK (4714028)	19	Port Alice, BC (5943017)
High Global Exposure	Stable Economy	Metro adjacent	Low capabilities	20	St.RdeMekinac,QC(2435045)	21	
High Global Exposure	Stable Economy	Metro adjacent	High capabilities	22	Winterton, NF (1001332) Armagh, QC (2419035) Hussar, AB (4805019)	23	St. Damase, QC (2454015) Mackenzie, BC(5953033)
High Global Exposure	Fluctuating Econ	Not adjacent	Low capabilities	24	Blissfield, NB (1309021)	25	Tumbler Ridge,BC (5955003)
High Global Exposure	Fluctuating Econ	Not adjacent	High capabilities	26	Ste. Francoise ,QC (2411030)	27	Wood River, SK (4703042)
High Global Exposure	Fluctuating Econ	Metro adjacent	Low capabilities	28		29	Rhineland, MB (4603036)
High Global Exposure	Fluctuating Econ	Metro adjacent	High capabilities	30		31	Usborne, ON (3540001)

Appendix 2: Descriptive Statistics for Selected Variables

Table 1: Structure Variables	N	Minimum	Maximum	Mean	Std. Deviation
comm. Total Persons 1996	32	250.00	9560.00	2136.56	2318.05
% comm. #persons in husband/wife family 1996	32	25.81	92.19	75.24	11.97
% comm. #persons in lone-parent family 1996	31	3.75	59.68	11.33	10.94
% comm. # persons non-family 1996	32	6.25	20.97	13.74	3.71
% comm. #persons under 15 years of age 1996	32	11.94	45.16	23.13	7.34
% comm.65+ years 1996	30	0.56	26.42	13.44	7.00
Comm. Average Age 1996	32	22.00	43.00	35.26	5.73
Comm. Per Capita Income 1996	32	3155.00	25016.00	14580.01	4529.73
% Comm. Employment Income 1996	32	14.37	92.61	63.70	15.13
Comm. Self-Employ. Income- %employ. 1996	27	1.00	46.00	14.14	13.39
% comm. investment income 1996	29	0.75	11.13	5.07	2.66
Community Participation Rate - Total 1996	31	14.00	83.50	66.52	19.46
Community Employment Insurance Rate - Total 1996	31	6.00	58.00	25.31	15.42
Community Population Dependency %>15 and 65+yrs 1996	32	27.96	47.17	35.59	5.33
Comm. EDR employment insurance 1996	31	1.25	28.57	7.38	7.57
Comm. EDR Child Tax Benefits 1996	32	0.62	109.25	6.22	18.91
Comm. EDR (OAS,CPP/QPP & other) pensions 1996	30	0.46	51.60	19.24	12.91
Comm EDR (GST/HST) Credits 1996	30	0.14	34.52	2.52	6.12
Comm. EDR Workers Compensation 1996	24	0.36	2.86	1.36	0.66
Comm. EDR Social Assistance total 1996	31	0.00	340.57	16.43	61.14
Comm. EDR Provincial Tax Credits/FA total 1996	19	0.23	1.86	0.91	0.49
Comm. EDR - Total with No Pension 1996	32	4.31	567.97	52.25	96.65
Comm. Per Capita government transfer payments 1996	32	985.00	4479.00	2851.64	973.76
Comm. Per Capita - Other Pensions 1996	28	53.00	1567.00	619.53	421.36
% Comm. Husband/Wife Families 1996	32	16.00	80.00	58.22	12.14
% Comm. lone-parent families 1991	25	3.68	48.00	11.15	9.44
Comm. lone-parent families, median total income 1996	21	5900.00	36500.00	19442.86	7102.50
Comm. Non-family Persons, Median Total Income 1996	32	5000.00	53300.00	17125.00	10180.94
Valid N (listwise)	10				

Table 2: Outcome Variables	N	Minimum	Maximum	Mean	Std. Deviation
Change in comm. Total Persons 94-97	30	-14.40	16.70	0.41	5.99
Change comm. #persons in husband/wife family 94-97	29	-23.80	50.00	0.15	11.97
change community #persons in lone-parent family 94-97	28	-42.90	66.70	-1.27	26.24
change comm. #persons Non-family 94-97	28	-22.20	33.30	5.93	13.50
Change comm. #persons under 15 years of age 94-97	30	-22.70	11.30	-5.61	9.45
Change Comm. 65+ years 94-97	28	-9.50	50.00	10.41	15.13
Change Comm. Average Age	30	-3.00	8.10	3.37	2.63
Change Comm. Total Income 94-97	30	-19.70	44.40	7.20	10.54
Change Comm. Per Capita Income 94-97	30	-23.50	29.20	6.86	9.05
Change Comm. Employment Income 94-97	30	-25.90	49.90	8.59	14.71
Change comm. Median income - Total 1996	30	-50.00	42.30	5.69	15.88
Change comm. self-employ. income - % employ. 94-97	26	-80.00	85.70	-0.29	35.76
Change comm. investment income 94-97	28	-35.40	46.80	4.98	18.04
Change comm. Gross Labor Force - total 94-97	30	-28.60	21.10	1.53	9.09
Change comm. Participation Rate total 94-97	29	-31.60	11.30	-0.63	7.96
Change comm. Employ. Insurance Rate 94-97	29	-50.00	22.00	-23.35	15.73
Change comm. Pop. Dependency %>15 and 65+yrs 94-97	30	-10.50	13.92	-1.02	5.61
Change comm. EDR employment insurance 94-97	28	-61.60	63.80	-31.62	24.96
Change comm. EDR Child Tax Benefits 94-97	30	-40.40	41.40	-10.70	17.63
Change comm. EDR (OAS, CPP/QPP & other) pensions 94-97	29	-22.04	3.59	-5.28	6.48

Table 2: Outcome Variables	N	Minimum	Maximum	Mean	Std. Deviation
Change Comm. EDR (GST/HST) Credits 94-97	23	-34.10	39.10	-12.38	17.12
Change Comm. EDR Workers Compensation 94-97	17	-58.50	69.70	-4.08	32.68
Change Comm. EDR Social Assistance total 94-97	29	-68.20	34.20	-22.55	24.15
Change comm. EDR Provincial tax Credits/FA 94-97	18	-23.10	1350.00	188.41	417.84
Change 94-97 Comm. Lone-parent Families, Median Total Income	19	-37.70	47.60	3.37	17.57
Change 94-97 Comm. non-family persons median total income	30	-21.10	21.60	4.70	10.77
Valid N (listwise)	10				

Appendix 3: Selected Results for Structure Variables

Table 3: Pattern Matrix from Factor Analysis of Structure Variables (28 cases)

	Component			
	1	2	3	4
% of variance explained	37.8	25.8	13.8	7.7
comm. Total Persons 1996	-0.325	0.026	-0.213	-0.010
% comm. #persons in husband/wife family 1996	-0.088	-0.298	0.022	0.954
% comm. #persons in lone-parent family 1996	0.137	-0.157	-0.014	-0.899
% comm. # persons non-family 1996	-0.068	0.932	-0.019	-0.425
% comm. #persons under 15 years of age 1996	0.023	-0.702	-0.332	-0.409
Comm. Average Age 1996	0.324	0.719	0.073	0.442
Comm. Per Capita Income 1996	-0.897	0.143	-0.053	0.189
% Comm. Employment Income 1996	-0.793	-0.332	-0.185	0.033
Community Participation Rate - Total 1996	0.177	0.238	-0.163	0.592
Community Employment Insurance Rate - Total 1996	0.030	0.058	0.912	-0.182
Community Population Dependency %>15 and 65+yrs 1996	0.818	-0.122	-0.642	0.158
Comm. EDR employment insurance 1996	0.173	-0.037	0.944	0.139
Comm. EDR Child Tax Benefits 1996	0.642	-0.364	-0.050	-0.560
Comm. EDR Social Assistance total 1996	0.290	-0.176	0.108	-0.772
Comm. EDR - Total with No Pension 1996	0.664	0.133	0.347	-0.302
Comm. Per Capita government transfer payments 1996	0.522	0.507	0.402	0.091
% Comm. Husband/Wife Families 1996	-0.021	-0.322	0.047	0.956
Comm. Non-family Persons, Median Total Income 1996	-0.819	-0.195	-0.047	0.054

Extraction Method: Principal Component Analysis.   Rotation Method: Oblimin with Kaiser Normalization.

Figure 1: Scatterplot of Stucture Factors 1 and 2

Figure 2: Scatterplot of Structure Factors 3 and 4
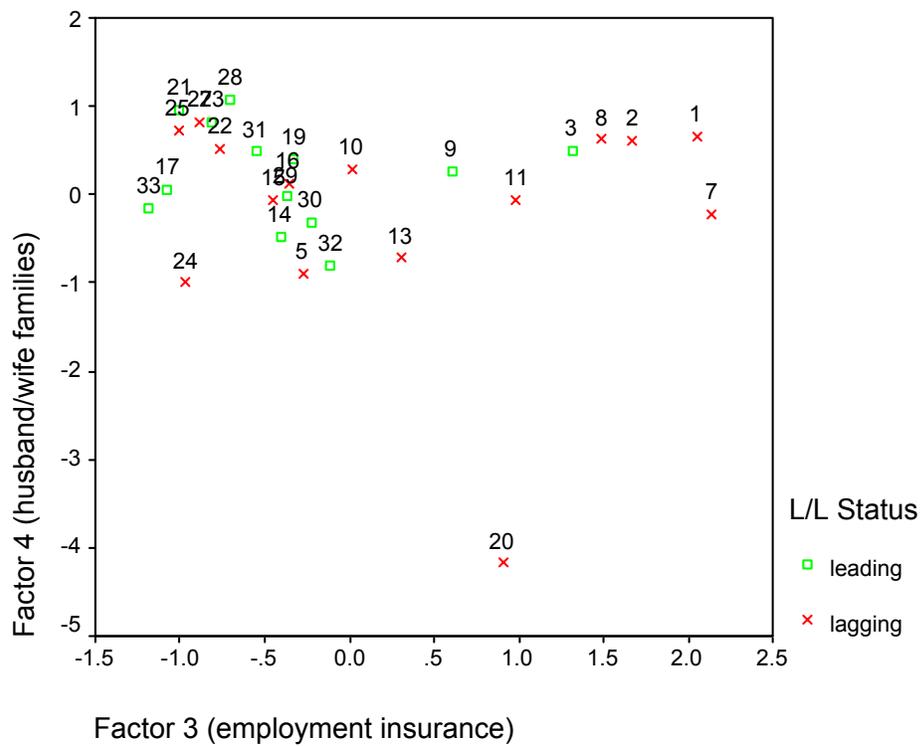
Dendogram of Cluster Analysis for Structure Variables

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* * * * * * H I E R A R C H I C A L   C L U S T E R   A N A L Y S I S * * * * * *

 Dendrogram using Average Linkage (Between Groups)

                                  Rescaled Distance Cluster Combine

        C A S E              0         5        10        15        20        25
    Label              Num   +---------+---------+---------+---------+---------+

    LOT 16               3    ─┐
    ARMAGH              10    ─┤
    ALFRED              14    ─┤
    SPALDING            25    ─┤
    FERINTOSH           27    ─┤
    RIVIERE-MEKINAC     11    ─┤
    STE-FRANCOISE        8    ─┤
    TWILLINGATE          2    ─┤
    NEGUAC AREA          7    ─┤
    BELLETERRE          13    ─┤
    BENITO              22    ─┤
    WINTERTON            1    ─┤
    SPRINGHILL           5    ─┤
    TWEED               15    ─┤
    OKANESE             24    ─┤
    CAP-A-L'AIGLE        9    ─┤
    GIROUXVILLE         28    ─┤
    CARDEN              16    ─┤
    UPPER LIARD         32    ─┤
    PARRY SOUND         19    ─┤
    WOOD RIVER          23    ─┤
    ARCTIC BAY          33    ─┘
    BLENHEIM            17    ─┐
    RHINELAND           21    ─┤
    MOBERT              20    ─┘
    PORT ALICE          29    ─┐
    MACKENZIE           30    ─┤
    TUMBLER RIDGE       31    ─┘
```
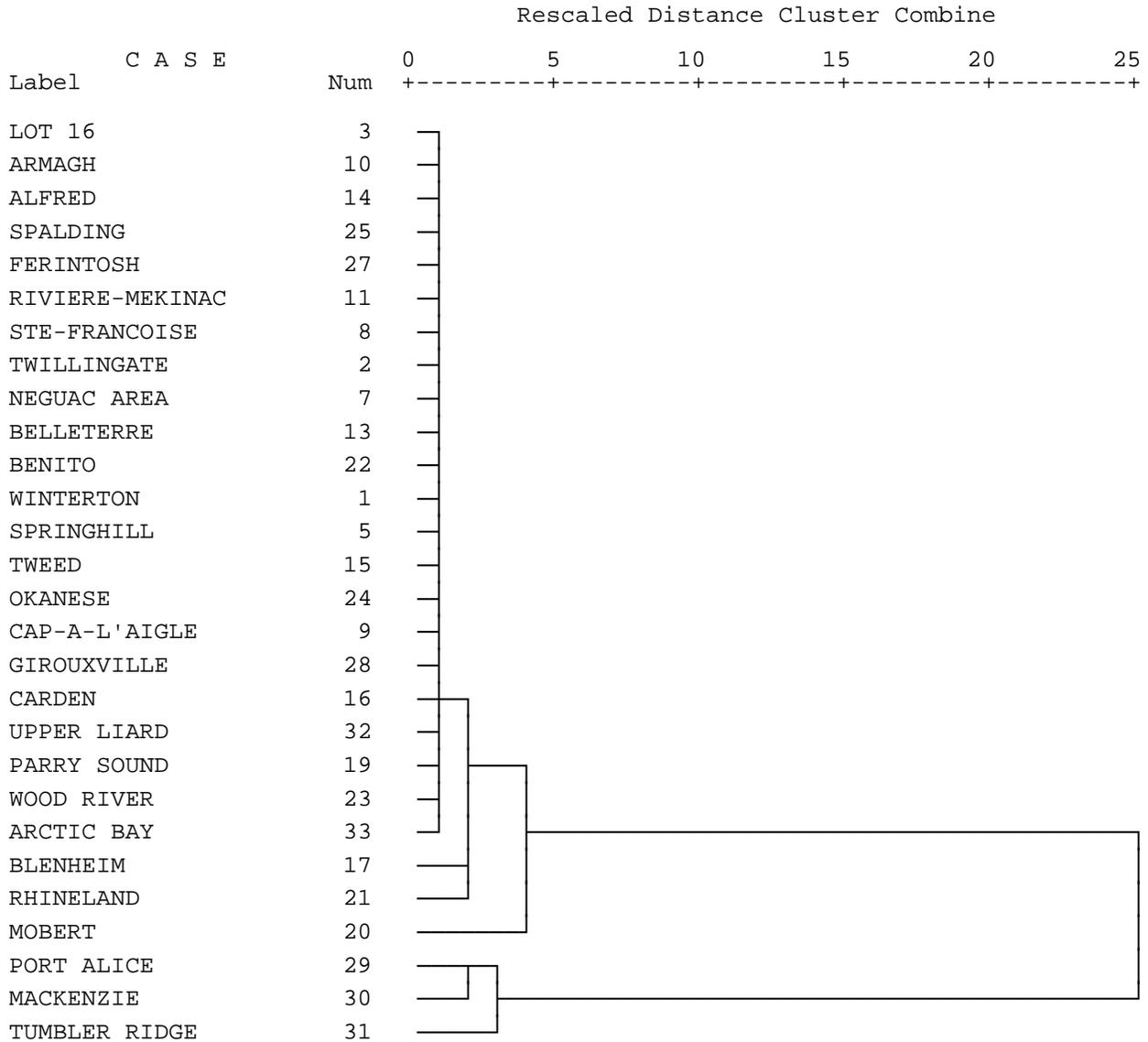
Selected Results of Discriminant Analysis - Structure Variables

Table 4: Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	30.818	68.9	68.9	.984
2	13.932	31.1	100.0	.966

a First 2 canonical discriminant functions were used in the analysis.

Table 5: Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 2	.002	147.924	6	.000
2	.067	64.883	2	.000

Table 6: Standardized Canonical Discriminant Function Coefficients

	Function	
	1	**2**
Community Participation Rate - Total 1996	.810	-.314
Comm. EDR Social Assistance total 1996	.744	.768
Comm. Non-family Persons, Median Total Income 1996	-.980	0.711

Figure 3: Scatterplot of Structure Discriminant Functions
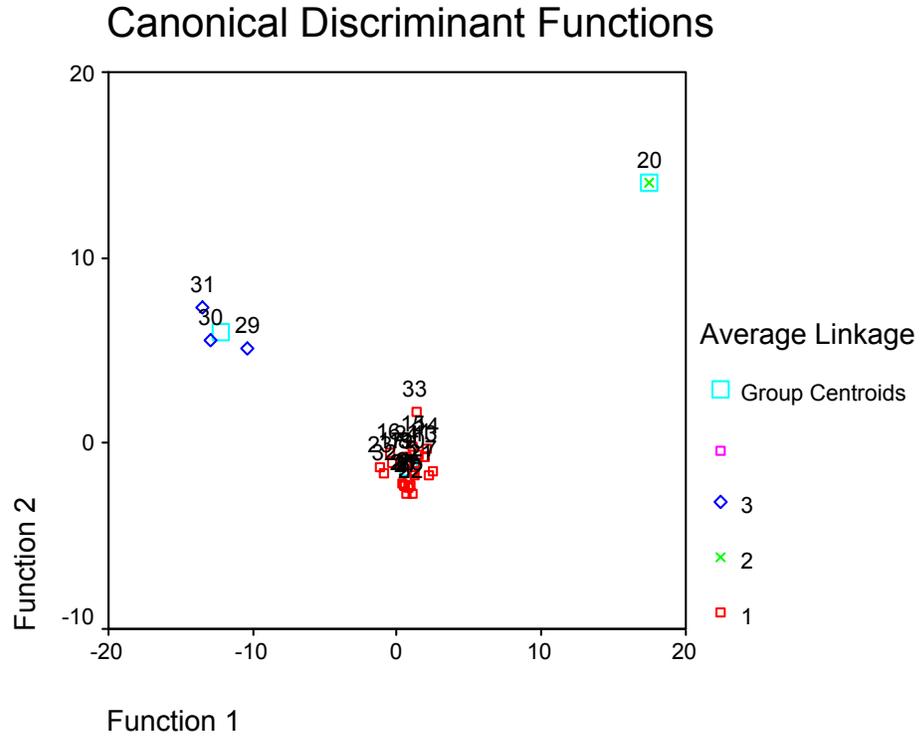
Appendix 4: Selected Results for Outcome Variables

Table 8: Pattern Matrix from Factor Analysis of Output Variables (27 cases)

	Component			
	1	**2**	**3**	**4**
% of variance explained	39.6	24.1	12.4	8.7
Change in comm. Total Persons 94-97	0.083	0.889	0.165	0.147
Change comm. #persons in husband/wife family 94-97	0.110	0.868	0.131	-0.270
change community #persons in lone-parent family 94-97	0.155	-0.092	0.060	0.961
Change comm. #persons under 15 years of age 94-97	-0.161	0.538	0.646	0.141
Change Comm. Average Age	-0.185	0.003	-0.868	-0.086
Change Comm. Total Income 94-97	0.906	0.343	-0.056	0.131
Change Comm. Per Capita Income 94-97	0.918	-0.201	-0.175	0.015
Change Comm. Employment Income 94-97	0.899	0.212	-0.051	-0.032
Change comm. Median income - Total 1996	0.422	-0.025	-0.032	-0.680
Change comm. Gross Labor Force - total 94-97	0.911	0.296	0.150	-0.014
Change comm. Participation Rate total 94-97	0.808	-0.301	0.280	-0.126
Change comm. Pop. Dependency %>15 and 65+yrs 94-97	-0.382	-0.030	0.658	0.008
Change comm. EDR Child Tax Benefits 94-97	-0.763	0.289	0.272	0.174
Change 94-97 Comm. non-family persons median total income	0.020	-0.759	0.448	-0.154

Extraction Method: Principal Component Analysis.   Rotation Method: Oblimin with Kaiser Normalization.

Figure 4: Scatterplot of Outcome Functions 1 and 2
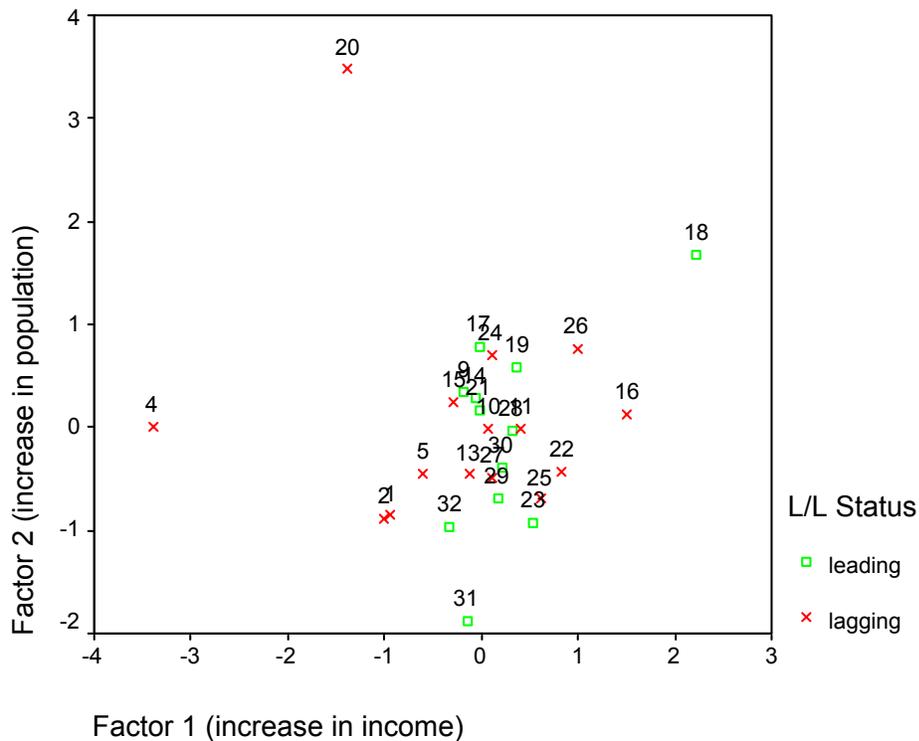
Figure 5: Scatterplot of Outcome Functions 3 and 4
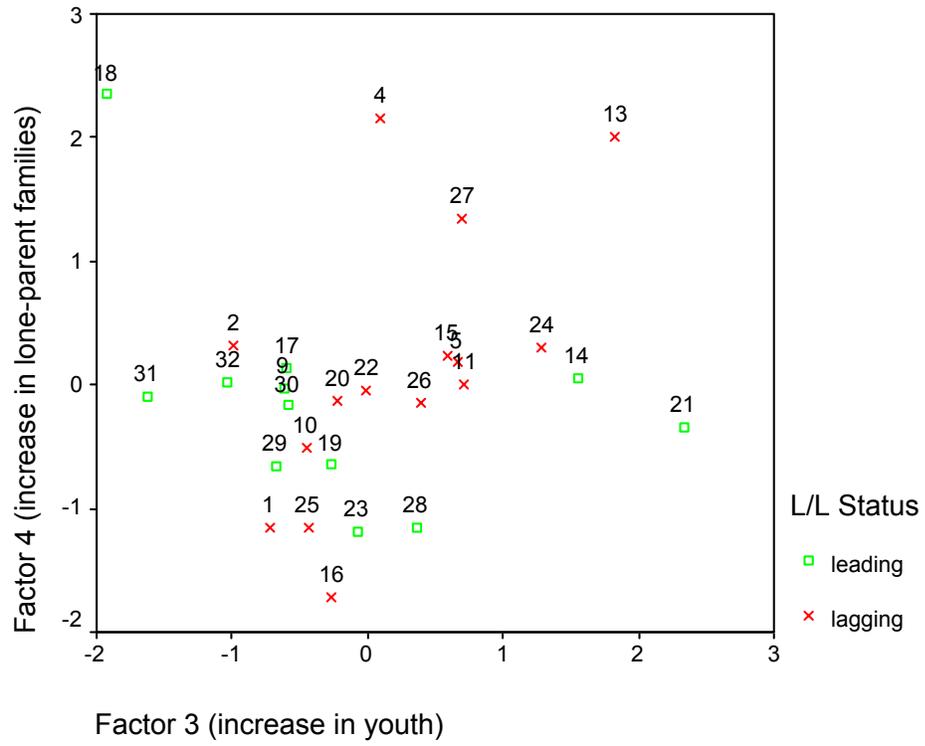
Dendogram of Cluster Analysis for Output Variables

```
* * * * * * H I E R A R C H I C A L   C L U S T E R   A N A L Y S I S * * * * * *

 Dendrogram using Average Linkage (Between Groups)

                                 Rescaled Distance Cluster Combine

         C A S E           0         5        10        15        20        25
    Label            Num   +---------+---------+---------+---------+---------+

    CAP-A-L'AIGLE      9
    BLENHEIM          17
    ARMAGH            10
    PARRY SOUND       19
    RIVIERE-MEKINAC   11
    MACKENZIE         30
    BENITO            22
    HUSSAR            26
    ALFRED            14
    TWEED             15
    OKANESE           24
    RHINELAND         21
    TUMBLER RIDGE     31
    UPPER LIARD       32
    TWILLINGATE        2
    SPRINGHILL         5
    SPALDING          25
    GIROUXVILLE       28
    WOOD RIVER        23
    PORT ALICE        29
    WINTERTON          1
    CARDEN            16
    BELLETERRE        13
    FERINTOSH         27
    MOBERT            20
    EXETER            18
    INDIAN BROOK/MICMAC 4
```
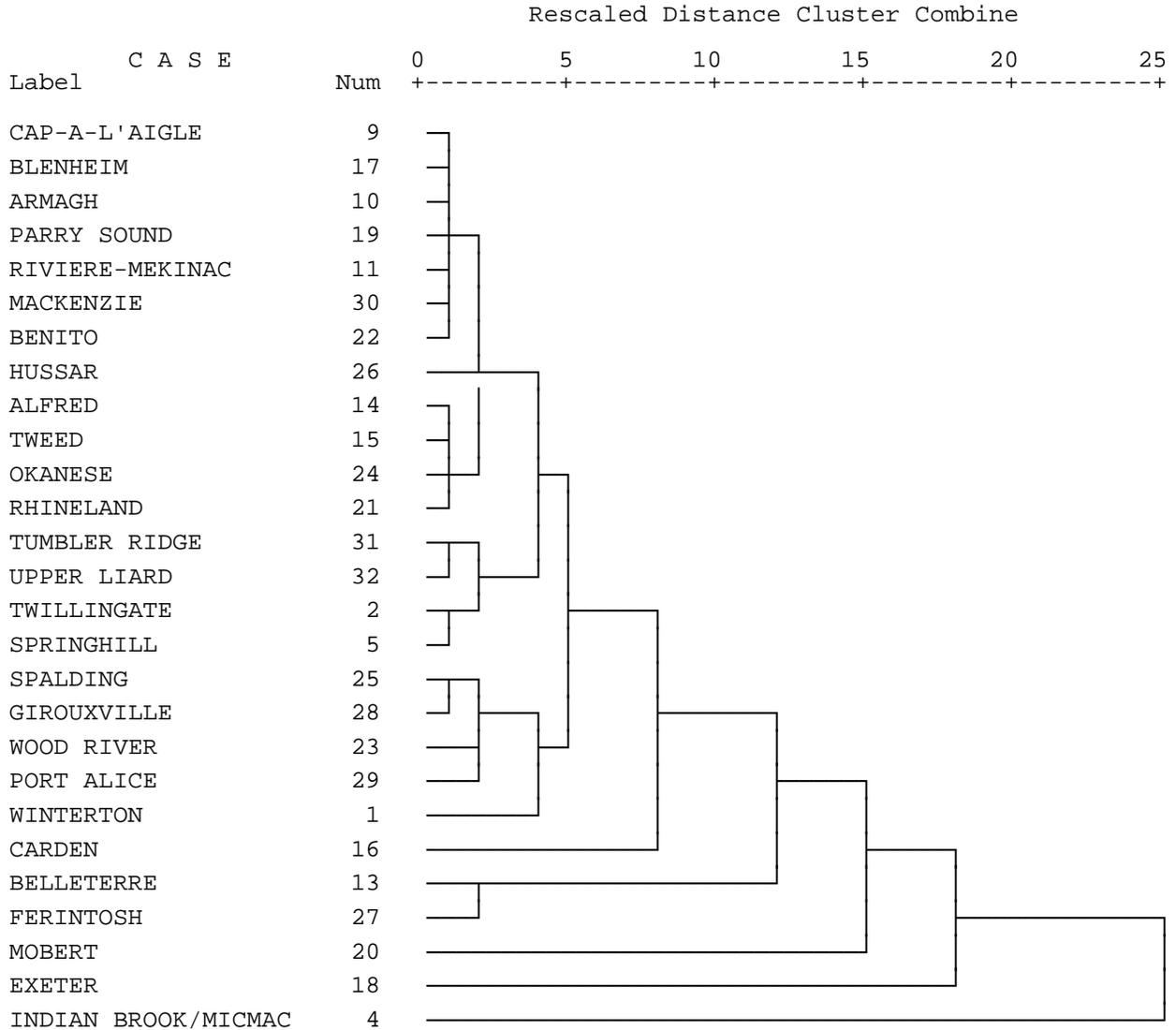
Selected Results from Discriminant Analysis - Outcome Variables (5 Clusters)

Table 9: Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	31.639	50.2	50.2	.985
2	26.359	41.8	92.0	.982
3	3.422	5.4	97.4	.880
4	1.628	2.6	100.0	.787

a First 4 canonical discriminant functions were used in the analysis.

Table 10: Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 4	.000	189.568	24	.000

2 through 4		.003	118.115	15	.000
3 through 4		.086	50.280	8	.000
4		.381	19.807	3	.000

Table 11: Standardized Canonical Discriminant Function Coefficients

	Function			
	1	2	3	4
Change in comm. Total Persons 94-97	11.267	21.178	1.765	.802
Change comm. #persons in husband/wife family 94-97	2.411	-2.974	-.017	-.136
change community #persons in lone-parent family 94-97	.352	-1.220	-.264	.859
Change Comm. Total Income 94-97	-16.175	-22.499	-3.112	-1.054
Change Comm. Per Capita Income 94-97	10.847	15.135	1.627	0.306
Change comm. Participation Rate total 94-97	-.131	.266	1.073	0.475

Table 12: Functions at Group Centroids

	Function			
Average Linkage (Between Groups)	**1**	**2**	**3**	**4**
1	-.709	.109	.538	-.371
2	-2.775	19.726	-4.176	1.328
3	1.850	-3.776	.825	3.899
4	-9.433	-12.570	-6.501	-.207
5	24.114	-1.997	-2.802	-0.766

Unstandardized canonical discriminant functions evaluated at group means

Figure 6: Scatterplot of Outcome Discriminant Functions

Canonical Discriminant Functions
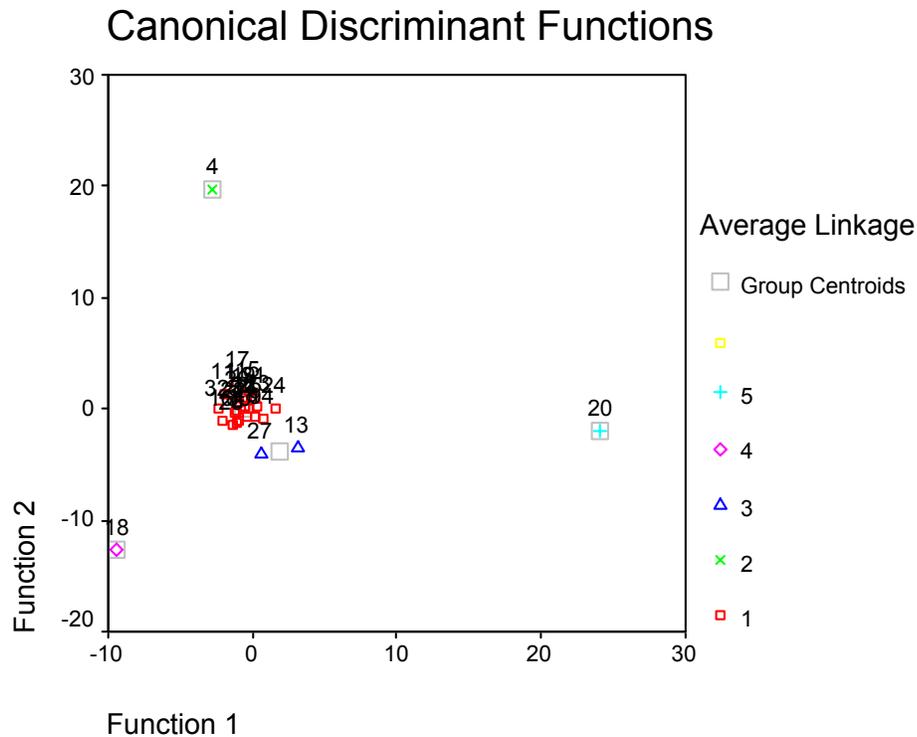
Appendix 5: Selected ANOVA Results

Table 13: Structure Variables	Sig.	Mean	N	Mean	N	Mean	N
Global/Local Dimension		local		global		Total	
% comm. #persons in husband/wife family 1996	0.022	70.48	16	80.00	16	75.24	32
% comm. #persons in lone-parent family 1996	0.031	15.37	16	7.02	15	11.33	31
Comm. Per Capita Income 1996	0.013	12649.03	16	16510.99	16	14580.01	32
% Comm. Husband/Wife Families 1996	0.023	53.42	16	63.02	16	58.22	32
Comm. Non-family Persons, Median Total Income 1996	0.016	12881.25	16	21368.75	16	17125.00	32
High/Low Capacity Dimension		low		high		Total	
% comm. #persons in husband/wife family 1996	0.055	69.26	10	77.96	22	75.24	32
% comm. #persons in lone-parent family 1996	0.099	16.03	10	9.09	21	11.33	31
Comm. Average Age 1996	0.041	32.22	10	36.64	22	35.26	32
Comm. EDR Social Assistance total 1996	0.099	42.73	10	3.90	21	16.43	31
% Comm. Husband/Wife Families 1996	0.062	52.32	10	60.90	22	58.22	32
Leading/Lagging Dimension		lagging		leading		Total	
comm. Total Persons 1996	0.069	1438.24	17	2928.00	15	2136.56	32
% comm. #persons in husband/wife family 1996	0.069	71.64	17	79.32	15	75.24	32
% comm. # persons non-family 1996	0.055	14.92	17	12.41	15	13.74	32
Comm. Per Capita Income 1996	0.001	12215.62	17	17259.65	15	14580.01	32
% Comm. Employment Income 1996	0	54.78	17	73.81	15	63.70	32
Community Employment Insurance Rate - Total 1996	0.068	30.19	16	20.12	15	25.31	31
Community Population Dependency %>15 and 65+yrs 1996	0.067	37.20	17	33.76	15	35.59	32
Comm. EDR employment insurance 1996	0.029	10.20	16	4.37	15	7.38	31
Comm. EDR - Total with No Pension 1996	0.081	80.23	17	20.54	15	52.25	32
Comm. Per Capita government transfer payments 1996	0.001	3368.41	17	2265.96	15	2851.64	32
Comm. Non-family Persons, Median Total Income 1996	0.007	12717.65	17	22120.00	15	17125.00	32

Table 14: Outcome Variables		Mean	N	Mean	N	Mean	N
Global/Local Dimension		local		global		Total	
Change comm. Participation Rate total 94-97	0.09	-3.22	14	1.79	15	-0.628	29
Change comm. EDR Child Tax Benefits 94-97	0.038	-3.64	14	-16.87	16	-10.695	30
Stability/Fluctuating Dimension		fluctuating		stable		Total	
Change comm. Pop. Dependency %>15 and 65+yrs 94-97	0.03	-3.91	11	0.65	19	-1.02	30
Adacency Dimension		not adj		adjacent		Total	
Change in comm. Total Persons 94-97	0.045	-1.7667	15	2.58	15	0.41	30
Change comm. #persons under 15 years of age 94-97	0.025	-9.4	15	-1.83	15	-5.61	30
High/Low Capacity Dimension		low		high		Total	
change community #persons in lone-parent family 94-97	0.033	13.82	9	-8.42	19	-1.27	28
Change comm. EDR Child Tax Benefits 94-97	0.055	-2.02	10	-15.04	20	-10.70	30
Leading/Lagging Dimension		lagging		leading		Total	
Change Comm. Per Capita Income 94-97	0.056	3.93	16	10.21	14	6.86	30
Change comm. EDR Child Tax Benefits 94-97	0.029	-4.23	16	-18.08	14	-10.70	30

Appendix 6: Selected Trends

Figure 7: Average age increases in both high and low capacity sites

Average Age by Institutional Capacity
NRE Sample - taxfiler data
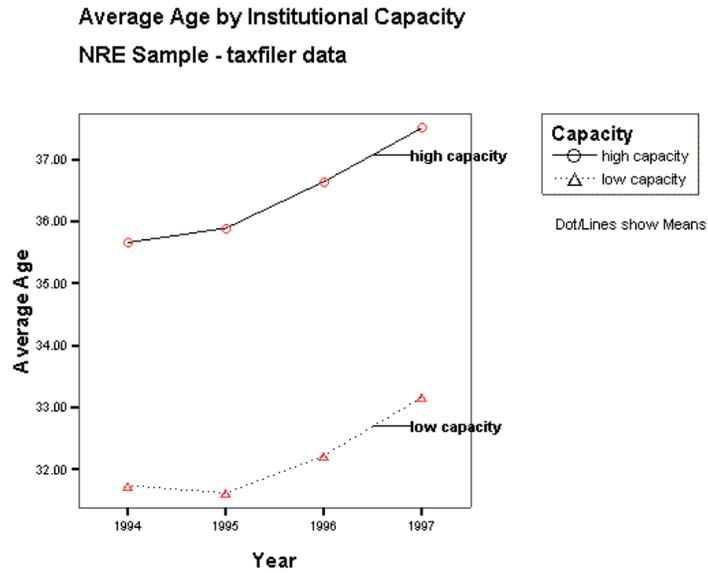
Figure 8: Higher populations in metro-adjacent sites and growing in both

Average Total Persons by Metro Adjacency
NRE Sample - taxfiler data
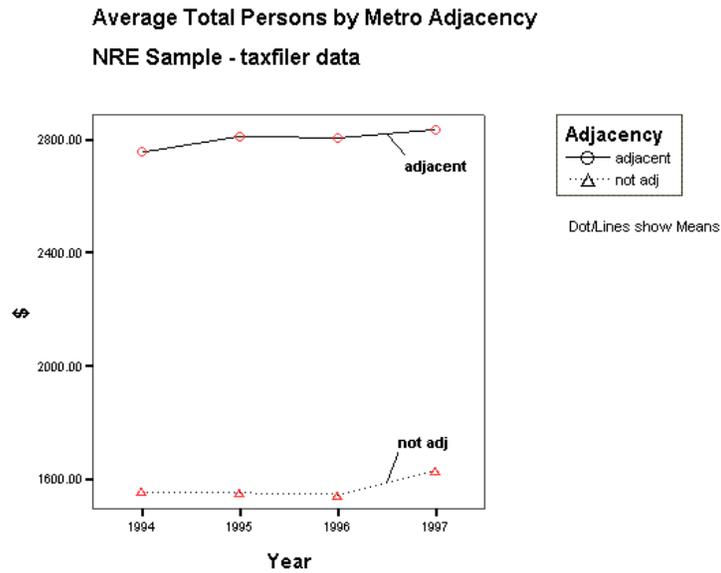
Figure 9: Greater number of young people in metro-adjacent sites

Average Number of Persons < 15 by Metro Adjacency

NRE Sample - taxfiler data
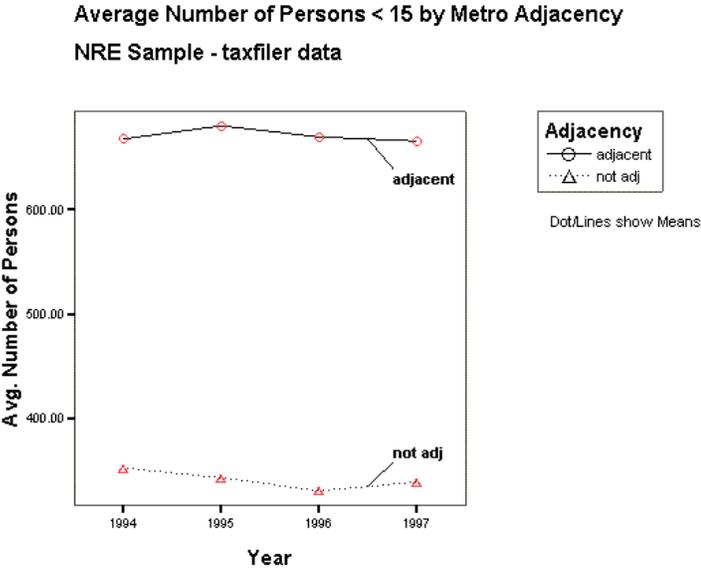
Figure 10: Participation rates higher in global sites and increasing

Average LF Participation Rate by Global Status

NRE Sample - taxfiler data
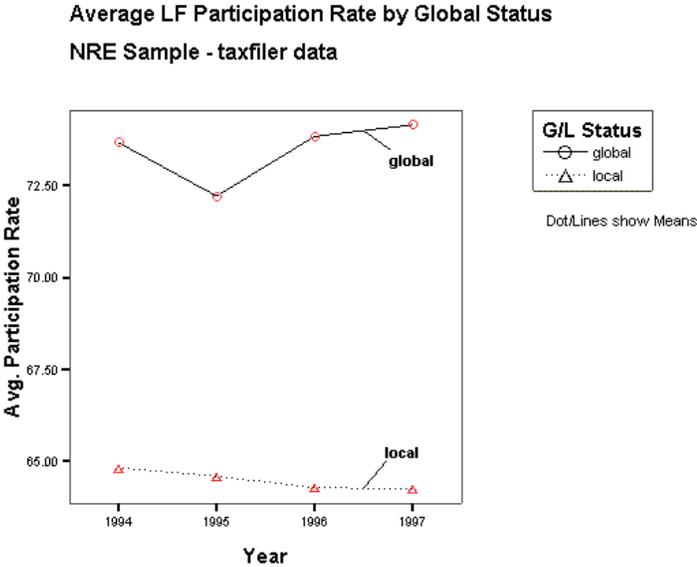
Figure 11: Dependency ratios decline for both stable and fluctuating sites, but at different times

Average Pop. Dependency Ratio by Stability Status

NRE Sample - taxfiler data
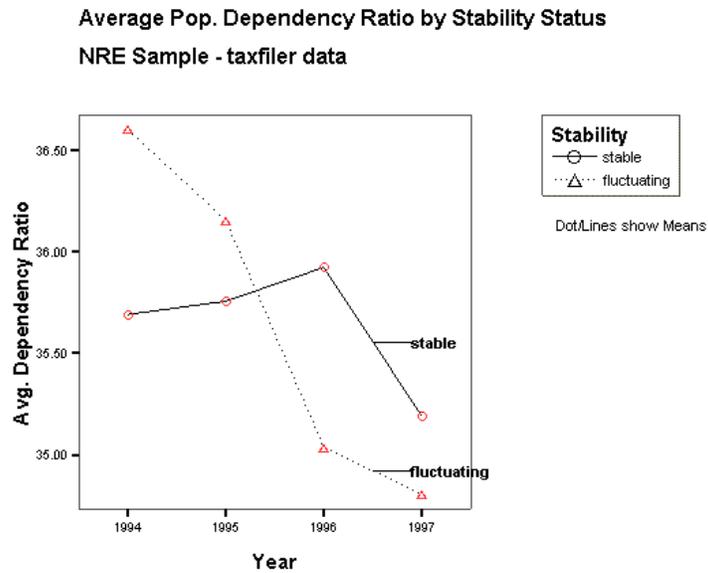
Figure 12:Lone-parent families decline for high capacity, increase for low capacity

Average Number in Lone-Parent Fam. by Capacity

NRE Sample - taxfiler data
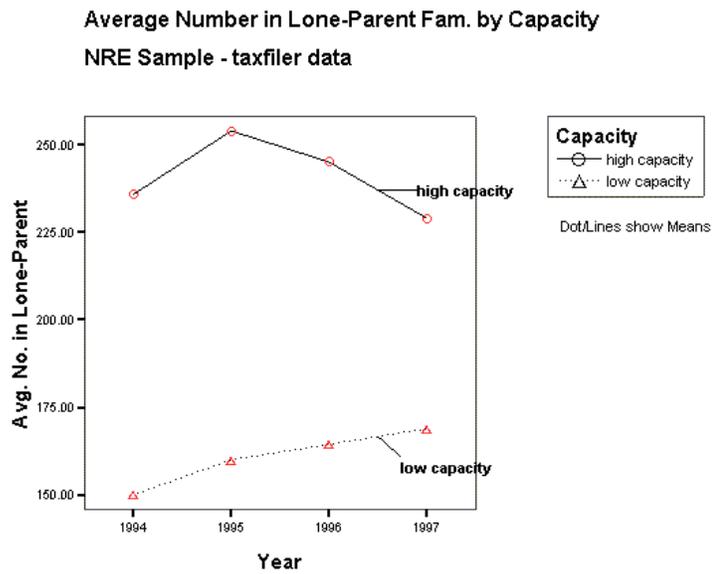
Figure 13: Per capita incomes increase for leading sites, less so for lagging sites

Average Per Capita Income by Leading/Lagging Status

NRE Sample - taxfiler data