Social Enterprises
Knowledgeable Economies
and Sustainable Communities

Measuring and Mapping the Impact of Social Economy Enterprises

The Role of Co-ops in Community Population Growth

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A research report prepared for the Northern Ontario, Manitoba, and Saskatchewan Regional Node of the Social Economy Suite

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Entreprises sociales
économies intelligentes
et communautés durables

Measuring and Mapping the Impact of Social Economy Enterprises:
The Role of Co-ops in Community Population Growth

Research Report Prepared for the Co-operatives Secretariat

by

Chipo Kangayi[1]
M. Rose Olfert[2]
Mark Partridge[3]

[1] Graduate Student at the University of Saskatchewan and student under Cluster 4 of the Linking Learning and Leveraging Social Economy Project. Email chk559@mail.usask.ca
[2] Professor, Agricultural Economic Department, University of Saskatchewan. 51 Campus Drive, Saskatoon, SK, S7N 5A8, Canada, Email: rose.olfert@usask.ca (**Contact person**)
[3] Professor, Department of Agricultural, Environmental and Development Economics, The Ohio State University, 2120 Fyffe Road, Columbus, OH 43210, USA, Email: partridge.27@osu.edu

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Executive Summary

This report is a summary of the empirical research work undertaken to measure and map the impact of the social economy (co-operatives) on the economic vitality and quality of life in the communities in which they operate. The metric for this assessment in the research reported here is the community population change attributable to the presence of co-operatives. The research specifically focused on four main areas: a) assessing the impact of co-operatives on community population change; b) identifying spatial variations in the impact of co-operatives; c) differentiating how the different types of co-operatives impact local communities; and d) provision of the visual depiction of incidence and impact of co-operatives.

Co-operatives data used for this research, provided by the Co-operatives Secretariat, was from their 1992 annual mail survey and complete Canadian co-operative registration information. Communities are approximated by Consolidated Census Subdivisions (CCS) of which they are approximately 2,400 in Canada. Community characteristics, including economic conditions, amenities, and the stock of social capital are taken to be the bases of the location decisions by firms and households, as manifested in community population size and growth. In this context, co-operatives are taken to be an example of social capital, a positive attribute that makes communities attractive to firms and households. Models with the 1991-2001 percent change in population as the dependent variable and community characteristics as explanatory variables was used to assess the contribution of co-ops (given all other community characteristics) to community population growth and retention.

In general, most of the results from both rural and urban communities were consistent with theoretical predictions. Communities with favourable socio-economic factors had higher population growth (lower decline). Factors such as higher local employment rates, shares of aboriginal populations, and entrepreneurship exerted a positive influence. Proximity to larger urban centres, as well as their size, was a strong positive influence for rural communities. In contrast, higher dependence on primary sectors resulted in lower population growth.

Finally, given the set of socio-economic and spatial attributes of the communities, we found that at the national level, there is no evidence that co-ops, as a proxy of social capital, influenced population growth. There is however some variation in the results at the regional level, and for different co-op types/industries. For example there is some evidence that co-op activity in surrounding communities has a positive impact on rural communities in BC, and that co-op membership in urban communities in Quebec is positively related to population growth. An examination by co-op type, revealed a positive influence only of consumer co-op membership in rural communities. By industry category, retail co-op membership was positively related to population growth in urban communities. Membership in housing co-ops in surrounding communities was a positive influence in rural communities, and membership in 'Other' service co-ops in surrounding communities was a positive factor for urban communities.

The results suggest that there may be scope for co-ops to examine ways of enhancing their social capital role in their communities, specifically developing mechanisms that respond to evolving community needs. Future research may also focus on additional ways of measuring the impact of co-ops in their communities.

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1. Introduction

1.0 Context

Globalization and economic restructuring have given rise to economic and quality of life changes across communities in Canada, resulting in a redistribution of population as both households and firms move to more amenable places. As a result population growth has varied among communities, ranging from rapid growth to serious decline. Many rural and small town areas in Canada are experiencing population decline,[4] especially those dependent on primary sectors (Bollman and Mendelson, 1998; Agriculture/Agri-Food Canada, 2002; Nagy et al, 2004).

The long term decline of rural communities is, however, not universal, as some rural areas fare relatively well. It is thus important to examine the basis of rural community population growth based on accepted theoretical foundations and empirical studies. The dynamics of these population changes are key issues to policymakers whose role is to predict and manage these flows, particularly in the case of population outflows or stagnation (Partridge et al, 2007).

In seeking to understand what makes some communities relatively more attractive, policy makers and researchers from across many disciplines have developed a strong interest in the role of Social Economy Enterprises (SEEs). This focus has been stimulated by the need for governments to look for alternative service delivery mechanisms where traditional public service provision no longer has the capacity to continue efficiently (Restakis and Lindquist, 2001). Along with economic factors that drive population growth, there is growing interest in whether the social economy plays a role. SEEs have been portrayed as deliverers of public services, arising due to the decay of systems that cater to the basic needs of communities. SEEs are perceived to better serve communities largely due to how they conduct their activities as compared to other forms of businesses.

In general, SEEs are purported to have the ability to address multiple objectives –social, economic, environmental and cultural. For instance, they build on and produce social capital; promote social cohesion in communities and they also redirect their surpluses in the pursuit of social and community goals (Gui, 2001; OECD, 2003; Levesque et al, 2004). As Putnam (1993) describes, social capital generates social networks, trust and a sense of belonging which enhance the quality of life within communities. The ties and norms that constitute social capital are often created as by-products of other social activities and then transferred from one setting to the other. However in the absence of appropriate reinforcements, social capital can be inherently nontransferable. SEEs such as co-operatives are such reinforcements. They help create and retain social capital within communities through giving groups the capacity to form networks to produce goods and services, and at the same time they building on the existing social capital levels within communities.

In the context of this research we take co-operatives to be a form of SEEs and as a manifestation of social capital. For instance through allowing people to come to work together towards a common goal, co-ops help promote trust, inclusion and equity among citizens (The Co-operative Secretariat, 2005).

[4] Population retention and growth is a concern for cities, towns and rural municipalities across Canada, and population change is one of the best available indicators of economic prosperity (Ferguson et al, 2007).

1.1 Purpose

In light of the developments discussed above, an in-depth understanding of the role of co-operatives in community growth and vitality is thus of practical as well as academic interest. Our major interest in undertaking this research is to investigate how the social capital built and used by social economy enterprises, co-ops in our case, influence population growth. The population that a particular community can attract or sustain has strong implications for the survival and vitality of the community.

The primary focus of this research is to investigate the statistical relationship between co-op activity, as measured by our data, and community population growth. This will be in addition to accounting for all other factors affecting community population growth. Our objectives are:

1) Evaluate the impact of co-operatives on population change in the communities in which they are situated.
2) Provide an understanding of how the impact of co-operatives varies spatially.
3) Conduct an assessment of how the different types of co-operatives impact local community population growth.
4) Provide visual depictions of the incidence and impact of co-operatives.

We hypothesize that *communities with higher levels of co-op activity (social capital) grow faster or decline more slowly than those with lower levels*. Another important hypothesis is that *various co-op types or industry categories may have different effects on communities.*

The research presented herein is part of a larger project-Linking learning and Leverage (Social Enterprises, Knowledge Economies and Sustainable Communities) funded by the Social Sciences and Humanities Research Council of Canada, that is examining how social enterprises can be used to build more respectful relationship with the community, the environment and other organizations.

1.2 The Relationship between SEEs, Co-ops and Social Capital

Three major terms-Social Economy Enterprises (SEEs), Co-operatives and Social Capital will be used throughout the research. It is thus imperative to provide some working definitions as well as a brief description of how these are linked in this research.

Social Economy Enterprises (SEEs)

Social Economy Enterprises are businesses comprising co-operatives, credit unions, mutual insurers, not-for profit corporations and unincorporated associations that are democratically governed by their members or stakeholders to produce and deliver goods and services in the market place (PRI, 2005; Quarter, 1992).

Social Capital

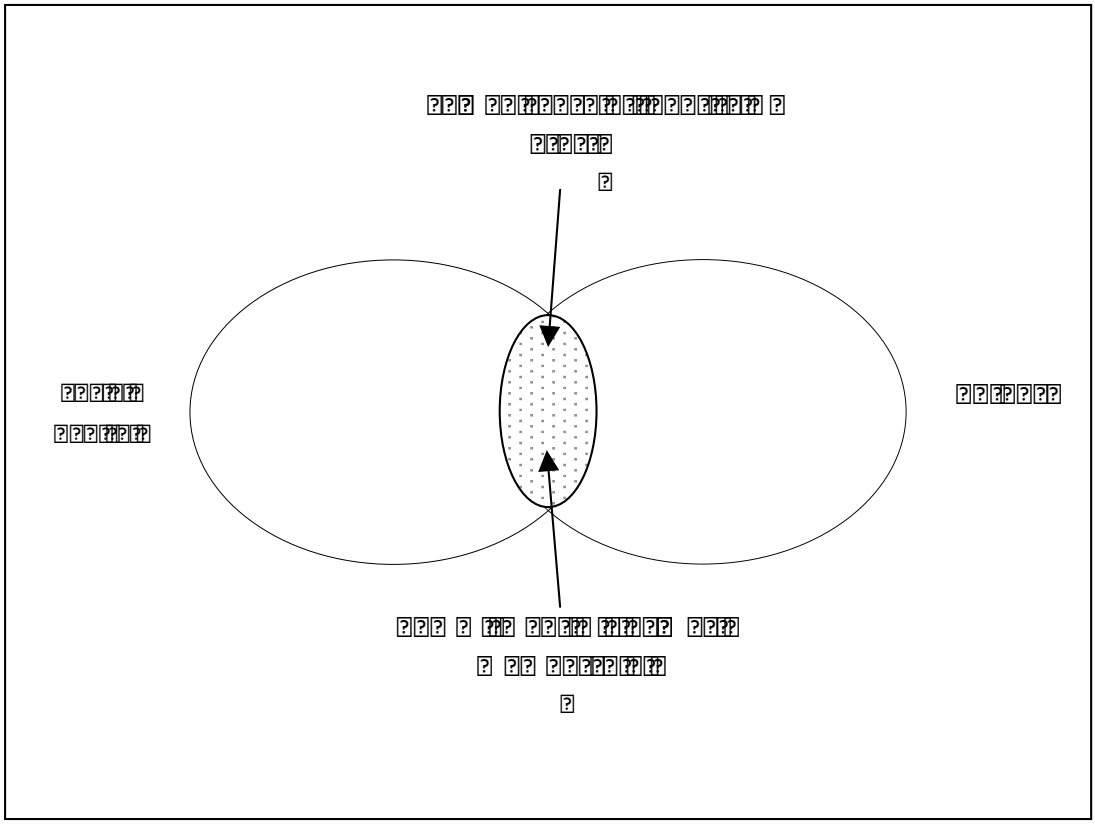
Our definition of social capital is taken from Coleman (1990). He defines social capital as organizations, structures and social relations that are built by the people themselves, independent of the state or the corporate sector.

Co-operatives.
According to Gertler (2001) a co-operative is any business or service that is jointly owned and democratically controlled by its members for their mutual benefit.

These working definitions help define the premises on which we base the propositions made in this research. As elaborated in the first section, social economy enterprises are social capital reinforcements. They help create and retain social capital within communities through giving groups the capacity to form networks to produce goods and services, and at the same time they build on the existing social capital levels within communities (Westlund, 2006). Thus, we take co-ops as manifestations of social capital and vehicles that facilitate the development of networks that help retain and enhance a community's social capital. Social capital improves the attractiveness of the community for households and businesses.

However, in using this premise, caution has to be exercised. Although there are volumes of literature on the concept of social capital, there is neither a universal measurement method nor a single underlying indicator commonly accepted by the literature (Glaeser et al, 1995). As illustrated by figure 1 below, the intersection or the dotted portion of the Venn diagram indicates the commonality between the concept of social capital and co-operative activity, such as the networks, trusts and the cohesion. These are enhanced by using co-ops or belonging to a co-op (membership). There may be other co-op attributes, for instance co-ops as a source of employment for their members or even the community at large, that we may not construe as social capital, and as such may limit how our results can be interpreted. Similarly, there may be aspects of social capital that are not represented by co-ops.

Figure 1: Linkages between Social Capital and Co-op Activity



1.3 Selected Literature

The relative attractiveness of a community for households and businesses will be reflected in its population growth, especially through net in-migration. Population size and growth itself will determine the ability of the community to provide a range of private and public goods and services, feeding back to community attractiveness. For this reason, researchers, policy analysts, governments and community development partners are keenly interested in the community attributes that make it attractive to households and businesses. In the U.S. and Canada many studies have investigated the roles of a variety of factors from economic, amenity, social capital and non-economic factors. As one of the potentially influential factors, social capital is of interest and probably under-studied at least in part because it is very difficult to measure and to quantify its influence. An example of a study that examined its impact, Flora (1998) found that social capital leads to healthy communities, i.e., the relationships built by people in communities makes them safe places to live as well as providing 'a sense of belonging'.

The literature reporting on empirical analysis of the economic factors is relatively well-developed. The probability of finding employment, the size of the local labor force, population size as indicative of market potential, industry structure, demographic composition and the spatial proximity of larger centers are all common factors found to impact community population growth and retention in a variety of ways (Ferguson et al 2007; Glaeser et al 1995; Partridge et al, 2006, 2007; Rappaport 2004). Further, these studies have also shown that non economic attributes such as availability of up-scale shopping centers and places of recreation are drivers of population growth.

There is also a growing literature addressing the importance of co-operatives in the health and vitality of communities in which they are situated (Fairbairn et al, 1990; Simbandumwe et al, 1991; Gittel and Vidal, 1998). However, a quantitative empirical analysis of the impact of co-ops on population change is generally lacking. The research reported here is thus contributing to the literature by providing an econometric analysis of the impact of co-ops, our proxy for social capital, on population change. Our research approach is unique in that we combine a set of already known population growth determinants with co-operatives data to investigate the marginal influence of co-ops on population growth. In addition, this research will provide the visual incidence (intensity) of co-ops across Canada to enable our understanding of why some co-ops are in some areas and not in others.

2. Research Approach

Central to the theoretical models of population change, net migration reveals the way households respond to economic incentives and access to amenities. This is supported by empirical studies, which find that a variety of financial, economic and amenity variables explain the variations in population change across communities. For instance, population growth reflects the fact that a given community is relatively attractive to potential residents resulting in people "voting with their feet" and moving to this area. The opposite applies when an area is unattractive. An empirical approach based on an econometric estimation of the simultaneous

importance of the full range of influences on population growth, including coop activity, is desirable to separate out the various influences so that all other influences are controlled for and the net or marginal influence of co-op activity may be correctly estimated. Thus population change is modeled as a function of a range of pre-existing (prior to the population change) economic, demographic and amenity characteristics.

2.0 Data Description

The research utilizes population data and a wide range of other socio-economic variables obtained from the 1991 and 2001 Statistics Canada census data. Amenity and geography variables were obtained from Environment Canada, DMTI database, the Data Library Initiative (DLI) and the Canada Rural Economy Research Lab (CRERL[5]). Climate variables were sourced from Weather Station data from Environment Canada. All the data are aggregated at the Census Consolidated Subdivision (CCS[6]) level with use of resources from the CRERL. The period under investigation is ideal as it coincides with national census that gathers information on demographic, social and economic conditions across Canada. Further, the time span is also long enough to enable caption of population movements, firms and capital (Partridge et al, 2006).

The variables representing co-operative activity are obtained from the Co-operative Secretariat. Two types of data sets were utilized. First, a general dataset from which the Co-operative Secretariat collects information on all registered co-operatives (status of co-operatives i.e. whether they are still functional or not, the year in which the co-operative was begun and their types). This data set was used for mapping the presence and incidence of co-ops. Our analysis was based on the second dataset containing statistics obtained from the yearly annual mail survey of co-operatives (data on co-operative membership, employment, sales and asset endowments) and has a 75% response.

We perceive that there are differences in the fundamental growth between rural and urban communities. Moreover, co-operative activity seems to be prevalent in rural areas, and some studies have clearly indicated that social enterprises, particularly co-ops may have allowed many small rural communities to partially offset decline (Fulton and Ketilson, 1992; Reimer, 1997). For these reasons our model was estimated separately for rural [7] and urban CCSs.

2.1 Empirical Model

A model of community population change is estimated with CCS level data; social capital (proxied by co-operatives) is an explanatory variable along with a full range of socio-economic and amenity variables. The change in population between 1991 and 2001 is expressed as a function of 1991 economic, demographic, social capital[8] and amenity characteristics. This

[5] C-RERL has state of the art techniques to sort and standardize geo-coded data into 1996 CCS boundaries.

[6]Statistics Canada defines a Census Consolidated Subdivision (CCS) as a grouping of adjacent census subdivisions. Generally the smaller, more urban census subdivisions (towns, villages, etc.) are combined with the surrounding, larger, more rural census subdivision, in order to create a geographic level between the census subdivision and the census division

[7] In this study communities are classified as rural if they do not geographically overlap part of a census metropolitan area (CMA), or a census agglomeration (CA). Refer to footnote 16 for definitions of CA and CMA.

[8] While data for other independent variables is for 1991, it is assumed that 1992 for co-ops is closely comparable with 1991 conditions.

specification of population change being influenced by pre-existing (1991) conditions helps mitigate problems of statistical endogeneity. Equation 1 specifies how the general population change model is represented in this research.

$$\%\Delta P_{2001-1991} = f(Agglom_{1991}, Econ_{1991}, Amen_{1991}, SoC_{1992}, e) \quad (1)$$

Where, $\%\Delta P$, the dependent variable, is the percentage change in population between 1991 and 2001; **Agglom** is a vector containing variables that represent the influence of agglomeration factors. Agglomeration economies refer to the economic benefits of large urban centers in achieving more efficient production and providing a greater array of consumer goods and services. The presence of agglomeration economies, or nearby access to an urban center, will contribute to the attractiveness of the community as a place to live and do business. Variables representing agglomeration economies include distances to urban areas of different sizes (to represent access) as well as population size measures. In the results sections below these variables are denoted as the distance from the center of a given rural CCS to the center of the nearest Census Metropolitan Area (CMA[9]), **Dist_cma_100k**; the incremental distance from a CMA to a larger urban center of 250,000 people (**Incre_dist_250k)**; the incremental distance from an urban center of 25,000 people to an urban center of 500,000 people (**Incre_dist_500k)**; own (if it is an urban CCS)/nearest urban center population size (**Nearest/own_cma_pop**); own CCS population (**own_ccspop**); as well as the surrounding urban population size (**pop_surr**). *A priori*, the distance measures are expected to be inversely related to population growth. In other words, more remote places are less attractive to residents and firms. Agglomeration economies or access to the nearest urban center have been shown to be of primary importance to population retention and growth (Partridge et al, 2007). For rural areas, access to urban-based agglomeration economies through commuting to jobs or to access higher order goods and services is key.

The **Econ** vector constitutes the most important control variables used in this research. These are fundamental components of the model because relative attractiveness of a community will be partially based on pre-existing economic conditions. A variety of economic variables describing conditions in the community, such as employment rate, unemployment rate, and industry structure, represented by the share of people employed in each of agriculture, other primary and manufacturing industries are included to capture their contribution to community population growth. Also included under economic variables are a number of demographic and human capital variables. These include the share of the labor forces self employed in non-farm businesses, the share of people with an aboriginal ancestry, the share of people who are below the low income cutoff, the per capita total income received from all sources, the percentage of population over 15 years old that fall into six education attainment categories, that is, individuals with less than grade 9 to those that have a graduate degree.

From the full set of education variables investigated, we included the share of population with a university degree (**share_unidegree**). Education is an important variable representing the investments in human capital. Variations in education levels reflect differences in the type and

[9] A census metropolitan area (CMA) or a census agglomeration (CA) is an area consisting of one or more adjacent municipalities situated around a major urban core. To form a CMA, the urban core must have a population of at least 100,000. To form a CA, the urban core must have a population of at least 10,000. Accessed at http://www12.statcan.ca/english/census01/Products/Reference/dict/geo010.htm

skills level of the labor force, potentially the willingness to re-locate, as well as susceptibility to being laid off during adverse economic market shocks. We expect firms to be attracted to a higher quality labor pool contributing to population growth in places with higher levels of education. This may be offset by the fact that a more highly educated labor force is also more costly to firms and the fact that the education levels must match the skill requirements of the local labor demand.

The economic variables in the final specification included employment measures such as the employment rate (**employ_rate)**; percent employed in agriculture (**share_agric_employ**); the share of population employed in each of other primary industries (**share_prim_employ**) and manufacturing industries (**share_man_employ**). We expect the employment rate to be positively related to population growth as it indicates the percentage of the labor force that is actively engaged in the labor market, consisting of a combination of the percentage that are actively pursuing employment and their probability of finding employment. The share of people employed in the agriculture and other primary industries is expected to lead to population decline as a high dependence on these sectors limits employment prospects. This is due to the productivity increases in these sectors that have occurred as more and more labor is shed in favor of more efficient capital-intensive production techniques. The share of people employed in the manufacturing industries may have an ambiguous effect on population growth, depending on the king of manufacturing. That is: if the industry is dominated by routine manufacturing activities, we expect a negative relationship with population growth largely due to the loss of employment as labor saving technologies are made use of. On the other hand, as Bollman and Prud'homme (2006) indicate the general decline in the cost of transporting goods implies that remote places such as rural areas may have the ability to compete with urban areas in locating manufacturing firms, suggesting a positive influence on population growth.

The share of population engaged in self employment other than agriculture (**%nonfarm_self_employ**) was included to proxy for entrepreneurship. We expect this variable to be positively related to population growth as greater local entrepreneurship can be a way to increase local income-earning opportunities and this make them more attractive locations for households. This is an important variable to be added on the rural model because many rural economies rely on the primary sector, which have experienced employment losses (Partridge, 2002 and Ferguson et al, 2007). Lastly, the economic vector included the share of aboriginal populations (**share_aborig**). As postulated by Bollman (2006) and others, aboriginal populations are the fastest growing in Canada, thus positively influencing economic growth (agglomeration economies). Unlike most of the other factors discussed here, this is a 'natural increase' component of population change. The **Econ** vector is a fundamental component of the model because the location decisions (including migration) will be based, in part, on economic conditions. Economic theory implies individuals/households make an implicit cost-benefit calculation when considering a change of location, such that the most favorable option is chosen.

The **Amen** vector is a combination of climate/weather such as hours of January sunshine, annual variables such as precipitation, mean January temperature and average July relative humidity and physical amenities such as public safety, health related as well as recreational activity variables. Only July relative humidity (**july_rh**) and the average January temperature (**jan_temp**) are included in the final specification. In addition to the 'natural' amenities referred to above, a broad set of 'built' amenities were considered for the model. These were chosen to

represent ways in which individuals in the community may interact and have a joint interest in community facilities. We considered the per capita numbers of police stations, acute care hospitals, cinemas, golf courses, long term acute care hospitals, outpatient clinics, educational institutions and tourism sites, as well as their respective distance measures. Of these, the per capita number outpatient clinics (**percapita_outpatient_clinic**) and the per capita number of cinemas in the CCSs (**percapita_cinema**) were adopted for the final base model. In general, it is expected that positive amenities such as shopping and recreation centers are positively related to population growth. On the other hand, we expect negative amenities in a community such as high crime rates to act as repellent forces as households consider these a deterrent to human safety. The amenity variables are taken as important control variables since studies have shown the increasing importance of amenities to population location decision (Rappaport, 2004; Ferguson et al, 2007). However there might be a limited response to natural amenities variables since Canada's population is crowded along its more climatically and topographically hospitable borders (Partridge et al, 2007).

In addition to all other variables, provincial 'dummies' are also included in the models to control for factors that vary by province, such as differences in legislation or regulation.

2.1.1. The Key Co-op Variables. One of the major hypotheses to be tested is whether the presence of co-ops in communities, controlling for the economic, geographic and amenity variables, will be positively related to subsequent population growth. Thus, the co-op activity in a community will be included in the **SoC** vector. The presence of social capital is often explained by the density of civic, religious, sports and recreational organizations in a given community (Putnam, 1993). Thus for our analysis we make use of the per capita number of co-ops within a given CCS as well as some spatial co-op variables such as per capita number of co-ops within 100km or 200km of a the community as a proxy for the social capital attributes of a community. Westlund (2006) ascertains that affiliation in organizations such as co-operatives can be synonymous to investment in human capital. Club/social organization affiliation yield economic and social returns for the individuals in the form of jobs, wages and a sense of belonging within communities. Along these lines other co-operative variables to anchor these propositions were employed such as variables measuring the share of population engaged in fulltime or part-time co-op employment, per capita membership of surrounding[10] CCS, per capita assets and per capita co-op members. Out of the broad set of co-operative variables that we explored for possible explanatory power, the per capita own CCS co-op membership (**percapita_mem**) and membership from the surrounding CCS (**percapita_mem_surr**) were chosen to best represent a measure of the intensity of co-op activity in the community. Other measures were tested and proved inferior representations.

One of the innovative elements of the analysis is to assess whether co-ops in different regions or particular types of co-ops have different effects on their community population growth. Depending on the regions, there seems to be different reasons for certain regions to have a proliferation of a certain types of co-operative[11]. Therefore, our analysis was also done by region and by arranging data by type of co-operatives (e.g. worker, consumer and producer) as

[10] We use the concept of the surrounding CCS attributes e.g. per capita membership of surrounding CCSs, to capture spillover effects from the conditions in neighboring CCSs.

[11] Appendix 1 illustrates the distribution of co-ops across Canada. It is apparent that the majority of the co-ops are more densely concentrated in the Western region especially in Saskatchewan as well as in Central Canada.

well as by industry category (e.g. agriculture, retail and service co-ops) to test for differing impacts of co-operatives. We hypothesize that various co-ops types/industries may have different impacts on the communities in which they serve. For example, general retail co-operatives may have different impact in small towns than co-ops dedicated to supplying farm inputs.

3. Results and Interpretation

We present the results of this research in four ways, each trying to capture the marginal effects of co-op social capital in particular specifications. First, findings from an analysis encompassing all the co-operatives in Canada (note that due to data limitations the analysis does not include co-ops in the northern Territories) are provided. These results represent the base model as specified in our research approach. Then we present results from each of the regressions by regions, by co-op type and by industry category.

In reading the results in Tables 1 and Appendix Table 3 to 5 there are two things to note: 1) the sign and 2) the asterisk(s). In the sign we see the *direction* of the relationship between the variable on the left hand side of the equation, which we refer to as the dependent variable. In our case, the percent change in population is our dependent variable. On the right hand side of the equation are the independent variables or explanatory variables such as the economic variables and co-op membership per capita. If the sign is negative we report that there is an inverse relationship between the dependent and the independent variables i.e. as the independent variable increases, the dependent variable decreases by the magnitude of the value of the coefficient of the variable on the right hand side. A positive sign means as the independent variable increases the dependent variable also increases by the value of the co-efficient of the variable on the right hand side.

The asterisks signify how statistically significant the right hand variable is in explaining the change in the dependent variable. Any values whose t statistics (the number in parenthesis, below the co-efficient) are less than 1.69 are not statistically significant. In other words regardless of the sign we have little confidence that they influence population growth in a *'statistically significant'* way. An asterisk, i.e. *, **, *** denotes statistical significance at 10%, 5% and 1% levels respectively. Where asterisks appear, we are confident that the variable has a statistically significant positive (or negative) influence on population growth.

3.0 Co-op Activity Population Impacts, All co-ops across Canada

Table 1 below illustrates the rural and urban community results for the model specified by equation 1. The base models[12] explain 32 and 48 percent of the variation in rural and urban community population change respectively between 1991 and 2001, as shown by the R-squared values.

In both the rural and urban samples, the negative and significant distance variables[13] suggest that the farther away a CCS is from an urban center, the lower is its population growth. For instance, for a one kilometer greater distance that a rural community is located from the core

[12] Note that in presenting these results we grouped the vectors into Agglomeration (distance and geography), Economic (demographic and economic), Amenity (weather and physical) and lastly Social Capital (all co-operative variables) for ease of interpretation.

[13] See Appendix Table 1 for variable definition and description

Table 1: Rural and Urban 1991-2001 Population Change Regression Models[a,b]

Explanatory Variable[c]	Rural Model	Urban Model
Constant	-0.02004 (-0.33)	-0.20068 (-2.56)**
Dist_cma_100k	-0.0002 (-4.01)***	-0.00029 (-4.32)***
Incre_dist_250k	-0.00007 (-1.66)*	-0.00011 (-2.29)**
Incre_dist_500k	-0.00023 (-2.85)***	0.00009 (0.58)
Nearest/own_cmapop_91	1.64E-08 (2.18)**	1.52E-08 (2.35)**
Pop_surr_91	2.80E-07 (3.93)***	-9.46E-09 (-0.84)
Own_ccspop_91	5.44E-07 (0.51)	-8.02E-08 (-1.61)
Share_aborig	0.15736 (1.68)*	0.32286 (2.05)**
Share_unidegree	0.09429 (0.5)	-0.07118 (-0.46)
Employ_rate	0.25442 (5.70)***	0.3441 (3.93)***
Share_agric_employ	-0.41137 (-7.32)***	-0.4468 (-2.21)**
Share_prim_employ	-0.52944 (-4.89)***	0.21609 (0.83)
Share_manu_employ	-0.26793 (-3.50)***	-0.26696 (0.4)
%nonfarm_self_employ	0.06685 (0.73)	0.5148 (2.11)**
july_rh	-0.00003 (-0.09)	0.00093 (1.98)*
jan_temp	0.00262 (2.61)**	-0.0021 (-1.97)*
percapita_cinema	334.43 (1.95)*	34.69 (0.9)
percapita_outpatient_clinic	10.40 (0.63)	-133.53 (-0.76)
percapita_member	-0.00879 (-1.02)	-0.01513 (-0.48)
percapita_mem_surr	-0.03992 (-2.04)**	0.03688 (0.92)
Prov_dummies	X	X
Observations	1995	510
R-squared	0.3163	0.4786

[a]Northern Territories are excluded from the sample; [b]Robust t statistics in parentheses. They are adjusted for regional clustering of the error terms by Census Divisions (correction for heteroskedasticity) * , ** and *** denote significance at 10%, 5% and 1% respectively. X denotes that provincial dummies are included in the model.
[c]See Appendix Table 1 for variable definitions.

of the nearest CMA (urban center of 100,000), population growth is reduced by about 0.022 percentage points. An additional negative effect is evident for the additional distance to the nearest CMA of 250,000 people, and again for the incremental distance to a centre of greater than 500,000. The population size of the nearest CMA has a positive and significant impact, suggesting that urban size is also important for the population growth of nearby rural areas. We also found strong evidence in support of the influence of surrounding area conditions on community population growth. That is, the population size of the CCSs that shares a border with a community has a positive impact on its growth. Population size is one of our major variables since it is the basis for demand thresholds for different business sectors (Stabler et al, 1992).

With regard to the economic variables, we find the impact of the employment rate was as expected for both samples. Higher employment rates are strongly significant and positive factors in community population growth. For instance, we find that for every 1 percent increase in the employment rate rural and urban populations grew by 0.25 and 0.34 percent points respectively. In line with our theoretical model, the prospects of finding a job in the destination region are an important factor in the location decision by households.

The share of people employed in the agriculture sector is inversely related to population growth. Long term and continuing labor saving technological changes have resulted in less and less labor (and thus population) being required to produce a constant or even growing level of output. Similarly, and also as expected, the share of people employed in other primary sector is also negative and significant for the rural sample, though insignificant in the urban sample. All primary sectors are characterized to some degree by the same labor saving technologies as the agriculture sector. The influence of the share of people employed in the manufacturing industry is negative and significant for the rural sample and insignificant for urban communities. Possible explanations could be drawn from three trends that have occurred in the manufacturing sector. One is increased mechanization through the adoption of labor-saving technologies. The second is the decline in this sector as consumer demand has shifted to services; and third labor intensive segments of the sector have re-located to low labor-cost countries. The share of total employment that is non-farm self employment, our measure of entrepreneurship, is significant for the urban sample, implying the importance of local entrepreneurship. In the rural sample this variable is positive but not significant.

Education does not emerge as a strong predictor of population growth, as we hypothesized in previous sections. Although we estimated a number of other education variables, the highest level of educational attainment of university[14] was the most successful in the model. Still, this variable was insignificant in both rural and urban samples. A possible explanation is that the role of education may be absorbed in some of the other variables such as the employment rate or industry structure.

Our results show that the share of the population reporting an aboriginal identity is positive and significant in determining population growth for both the rural and urban samples. These results, though reflecting higher rates of natural increase rather than net-migration, are consistent

[14] Coulombe (2004) argue that measuring education attainment is a poor proxy for human capital. http://www.statcan.ca/english/research/89-552-MIE/89-552-MIE2004011.pdf

with other research findings. Bollman (2006) suggests that the aboriginal populations are a source of population growth, especially for the rural areas.

With regard to amenity variables, a number of other representations of amenities, as described in previous sections, were investigated for explanatory power. Only July relative humidity and January temperature offered any explanatory power. The climatic variables in our model suggest that in the rural areas, January temperatures seem to be highly related to population growth. As would be expected, communities with higher January temperatures are more attractive places to live. July relative humidity was insignificant in rural community population growth and unexpectedly positive for urban communities. In the urban sample the results suggest that lower January temperatures are more attractive. These findings are counter-intuitive. However, other work such as Ferguson et al (2007) finds that the presence of natural amenities such as mountains and pleasant weather are not primary drivers of population growth in Canada. As a possible explanation, Ferguson et al (2007) argue that the lack of variability in Canada's weather renders unclear empirical results. Apart from that Canada's settlements are crowded along it's more climatically and topographical hospitable borders, therefore there might be a limited response to natural amenity variables.

As for 'built' amenity variables, out of the set we proposed, the only variables that offered any explanatory power were the outpatient clinics and cinemas. Worth mentioning, however, is that the per capita RCMP stations were significant and positively related to population growth. We did not adopt this variable in our base model because there are differences in the RCMP responsibilities across provinces, especially in Ontario**.** The per capita outpatient clinics are not significantly related to population growth in either rural or urban communities. However, we note that per capita number of cinemas in a CCS positively affect population growth in rural areas. Intuitively, this might suggest that the absence of upscale shopping centers and state of the art entertainment centers in most rural communities, particularly remote ones might result in cinemas being viewed as places were households go to find entertainment or to socialize. The effect is however absent for urban areas.

3.0.1. The Key Co-op Variable Results. With regard to the co-op activity social capital variables, a number of measures of co-op activity were attempted as outlined in section 3. Appendix Table 2 describes these variables and their outcomes in successive regressions, along with reasons why these alternate co-op measures were not suitable. Membership in co-operatives per capita is taken to be the best representation of social capital in a community. Our choice of social capital variables are also informed by past research on the role of social capital (e.g. Flora 1998; Debertin and Goetz, 1997). For instance, in undertaking co-operative work or being a member of a social group, people make investments in their communities by getting to know or helping their neighbors. These investments result in the formation of "social capital."

In the estimated models presented in Table 1, per capita co-op membership, however, does not have a significant influence on population change in either rural or urban communities. Indeed the direction of influence is mostly negative. Co-op membership in surrounding communities is also insignificant for urban communities, but highly significant and, contrary to expectations, a negative influence for rural communities. There may be some spatial competition

for economic activity and population that is responsible for the unexpected negative effect of co-op membership in neighboring areas on community population growth.

Contrary to our expectations, the level of social capital, proxied by co-op membership per 1,000 people in the community and also in the surrounding communities, was not revealed as a statistically significant positive determinant of community population growth. Based on these results we fail to accept the proposition that *communities with higher levels of co-op activity are more successful in community population growth and retention.* In seeking to understand our results, possible explanation may be found in other recent studies. Potentially, part of these may be explained by the fact that our study period, 1991-2001, coincides with a period where co-operatives, especially agriculture co-ops in Western Canada and Quebec were consolidating their activities. This restructuring came with the subsequent decline in membership. As Ketilson (1990) elaborates, mergers shift decision making from local to central bodies, thereby weakening membership control. Other researchers, e.g. Fulton (1999) elaborate this phenomenon by pointing to the breakdown of membership commitments as co-operatives adapt to evolving market conditions. Yet membership commitment is the yardstick of the strength and vitality of co-operatives. It is also the major factor that differentiates co-ops from investor-owned businesses. Additional explanations may be sought in future research.

Yet another consideration may be the data. The co-operative data was taken from the 1992 annual mail survey of co-operatives in Canada, and this is a voluntary process, which in some cases co-ops are missed. Although there is a 75 per cent response rate, which is a very high response rate and one that should not give rise to any data concerns. Still, we cannot completely rule out the likelihood of understating the importance of co-operatives. In sum, we fail to find statistical evidence at the national level, that co-op activity has a positive impact on population growth in either rural or urban communities.

3.1 Co-op Activity Population Impacts, by Region

Another of the major objectives of this research is to provide an understanding of how the role of co-operatives may vary spatially. We associate physical places and spaces with differences in co-op activity and jurisdiction. There is a possibility that the broader economic regions in the country represent fundamentally different settings for economic growth and thus, perhaps the role of co-ops. In this regard we conduct an analysis of the determinants of population growth by dividing the data into five regions[15] : British Columbia, hereafter referred to as **BC**; Saskatchewan, Manitoba and Alberta(**Prairies),** Newfoundland and Labrador, Prince Edward Island and New Brunswick (**Atlantic Canada),** and Central Canada will be divide into two distinct regions, **Quebec and Ontario.**

[15] The choice of regional groupings or separation was informed by the differences in the provincial groupings, for instance although BC is part of Western Canada we analyzed it as a separate region due to its differences with the rest of the prairie provinces, similarly Quebec and Ontario make Central Canada, but are two distinct regions especially where co-operative activity is concerned. For instance the co-operative sector in Quebec is organized differently than the rest of Canada (Fulton, 1990)

The results for rural and urban communities are shown as columns 1-10 of Appendix Table 3. Generally, the effect of distance to the nearest urban center remains a negative and significant influence for rural communities across regions (columns 1- 5), but the negative influence is bigger for the Prairie region. In Ontario this variable is not significant. In both the Prairie region and in Quebec, nearest Census Metropolitan Area (CMA) population size exerts a positive and significant impact. While own CCS population in 1991 has a positive impact for rural communities in the Prairie region, it has a negative impact in rural CCSs in Quebec. For other regions, agglomeration variables were insignificant, other than distance to the nearest CMA.

The contribution of the share of the population of aboriginal ancestry is strong and positively related to population growth in rural Prairies, Atlantic Canada and Quebec. In Ontario however, this variable is significant and negative. In BC this variable is insignificant. We observed that the level of human capital is a determinant of population growth in rural areas only in Atlantic Canada (column 3). The employment rate is positively related to rural population growth in all regions except in Ontario (column 5). The negative impact of the agricultural sector dependence on rural population is evident in the prairie region, Quebec and Ontario but is insignificant in Atlantic Canada and BC. The share of population employed in manufacturing results are similar to the base model results, expect for the prairies and BC. Dependence on the other primary sectors employment has similar effects for all regions compared with the all Canada results.

Compared with the base model (Table1), all regional regressions explained a greater variation in population growth. The only exception was the rural Ontario sample, with an R-squared value of 0.31. The Quebec rural model, with the bulk of the rural CCS (871 of 1995), explained only 34 percent of the variation in population change between 1991 and 2001. The Prairie Provinces had the second highest sample size (449) after Quebec and explained about 48 percent of the variation in population change. Atlantic Canada reported an R-squared value of 0.56 and had a sample size of 289. British Columbia had the least number of CCSs, and the model reported the highest R-squared value i.e. the model explained about 71 percent of the variation in population change between 1991 and 2001. At large, the all Canada sample results are relatively influenced by the relationship in the Prairie region and Quebec regions given the large number of observations in these regions.

The urban sample results presented in columns 6 -7 of Appendix Table 3 show that most results are different from those of the base model for all Canada. A strong negative influence of distance is evident in Ontario and Atlantic Canada. A positive influence of size of nearest or own urban center is apparent only in Ontario and BC, whilst the impact of the pre-existing (1991) community population size is evident only in BC. However, the aboriginal population share is positively related to population growth only in Quebec and the Prairies. The share of population with a university degree is negative in BC and Quebec, which is unexpected. The positive impact of the employment rate is upheld in all regions except Atlantic Canada. The share of agricultural employment is not a significant factor in urban growth. Amenity variables, natural and physical, are largely insignificant except for January temperatures in the Prairie regions.

3.1.1. Key Co-op Results by Region. With regard to the co-op activity variables, Appendix figures 2 to 5 help readers get an appreciation of the distribution of co-operative membership in Western Canada, Atlantic Canada, Quebec and Ontario respectively.

Our econometric results show that on the Prairies, per capita co-op membership is a positive though not a significant determinant of community population growth for both the rural and urban samples. The same applies to the urban co-op membership in the surrounding areas for the prairies. Surrounding community co-op membership is however negative and significant in the rural prairie communities, as well as in Atlantic Canada.

Quebec shows some evidence of a *positive impact* of co-op activity. In a typical urban Quebec community, higher co-op membership has a positive and significant impact on population growth. The surrounding co-op membership is also a positive influence on population growth for rural BC communities.

The previous discussion has shown the importance of agglomeration and social-economic factors in the growth and vitality of rural and urban communities, but apart from the positive impact of co-op membership in urban communities in Quebec, as well as co-ops in surrounding rural communities in BC, there is little evidence of the importance of co-op social capital in population growth. We further assess if there are any factors that we might not have captured in our national and regional level analyses by differentiating co-operatives by type and by industry

3.2 Co-op Activity Population Impacts, by Co-op Type

Our data on co-ops allowed us to divide the data into co-operatives that were consumer, producer, worker, multi-stakeholder, and federation and wholesale co-operatives. Because the latter three had very low numbers, they were combined into a single category that we will refer to as 'other' co-ops. Table 2 gives a summary of the number of co-operatives and total membership in each category. The rows denote co-op types, while the columns show their industry categories.

Consumer co-ops make up the bulk of the co-operatives in our data sets, 2,863 of the 3,633 total co-ops in the study. Consumer co-ops are basically owned by their customers. They provide services to households such as retail services, health care, and housing among others. Membership in consumer co-ops also constitutes more than half of the total members in all co-ops in Canada (1,961,189 of 2, 34,919). Producer co-ops (615) are owned mostly by farmers who band together to process and/or to market their products. Producer co-ops may also provide supplies or services for their members.

Worker co-ops are owned by employee members as jointly owned enterprises. Worker co-ops may be found in all economic sectors, but at 106 they are less common than other types of co-ops. In Canada, they are most prevalent in the forestry industry. The last category comprised of the combined wholesale (4), federation (42) and multi-stakeholder co-ops (3) are basically co-ops whose membership includes different categories of members who share a common interest in the organization. That is, a variety of stakeholders unite their efforts to provide quality service and to meet a community need. For instance, wholesale co-ops develop to give their local co-ops the benefit of mass buying. A major distinguishing feature of these co-ops in the 'other' category is that the members are composed of other co-ops. In undertaking our analysis we included the consumer, producer, worker and 'other' co-op membership variables in successive analyses.

Table 2: Number of Co-operatives and Total Membership by Category[16]

	Agriculture Co-ops	Retail Co-ops	Housing Co-ops	Other Service Co-ops	TOTAL
CONSUMER					
Number of Co-ops	49	393	1,633	788	**2,863**
Total Membership	23,650	1,618,880	89,722	228,937	**1,916,189**
PRODUCER					
Number of Co-ops	225	8	-	382	**616**
Total Membership	261,115	12,762	-	70,957	**344,852**
WORKER					
Number of Co-ops	14	6	-	86	**106**
Total Membership	450	518	-	4,897	**5,865**
FEDERATED					
Number of Co-ops	1	3	16	22	**42**
Total Membership	1,514	309	1,615	16,696	**20,134**
MULTI-STAKEHOLDER					
Number of Co-ops	-	1	-	2	**3**
Total Membership	-	1,295	-	1,017	**2,312**
WHOLESALE					
Number of Co-ops	1	3	-	-	**4**
Total Membership	10	557	-	-	**567**
TOTAL					
Number of Co-ops	**290**	**414**	**1,649**	**1,280**	**3,633**
Total Membership	**286,739**	**1,634,321**	**91,337**	**322,522**	**2,334,919**

Source: Co-operative Secretariat 1992 annual mail survey of co-operatives.

Results from the analysis by Co-op type are presented in Appendix Table 4. Generally the influence of economic and amenity factors are similar to those in the base model results. The total explanatory power of the models for both rural and urban communities by co-op type is not however very different from the base model presented above with the R-squared values ranging from 0.316 to 0.476. For instance the rural consumer co-ops model explained about 32 percent of the variation in the 1991-2001 population change whilst the corresponding urban model had an explanatory power of 48 percent.

In neither rural nor urban communities do we find membership in worker or producer co-ops influencing population growth. Also, there are no positive neighborhood effects accruing from worker and producer co-op membership in the surrounding communities. The worker co-ops may be expected to have a different effect than the rest of the co-op types due primarily to the fact that they are concentrated in labor-intensive sectors such the forestry industry, and the major problem they face is lack of financial capital for their businesses (Quarter, 1992). Their expected positive marginal influence on population growth is not supported by these results.

[16] Note that the divisions and the definitions of co-ops into co-op type and industry types and taken from the Co-operatives Secretariat Database, and as such may not mean the commonly used terms in the co-ops world. For instance Multi-stakeholder in the context of this research means co-ops whose membership includes different categories of members

In rural communities, co-op membership in consumer co-ops in surrounding communities has a positive influence on population growth. Unlike consumer, producer and worker co-op types, we observe positive and significant effects for community per capita membership in the 'other' co-ops category on rural community population growth. However, given the heterogeneous nature of this group and the small numbers these results must be treated with caution.

There was some evidence that *different co-op types may have different effects* on community population growth. The relationship between population growth and co-op activity may be sensitive to organizational changes or turbulence in market conditions. Further, some co-op sectors may have different priorities than others. The following section gives a summary of the results by industry category.

3.3 Co-op Activity Population Impacts, by Industry Category

Each co-op type (consumer, producer, worker and 'other') includes a number of different industry categories. For example, consumer co-ops have all the industry categories represented. The distribution of industries varies by co-op type as shown in Table 2. Our data is organized into co-ops by industry category in order to capture various membership structures and their objectives. The first group, agriculture co-ops (290), is a combination of agriculture supply and marketing co-ops, whose mandate is to enable farmers to receive a fair price for their products. Additionally agriculture co-operatives formed so their farmer members had more control over their marketing and input supply. Thus 225 of the 290 agriculture co-ops are producer co-ops. Our second group is retail co-ops, which are almost exclusively Consumer co-ops—393 of the 414 retail co-ops.

The largest industry sector in our sample (1,649) is composed of the housing co-ops. Due to the large numbers and their importance in the Canadian economy, especially in Quebec and Ontario, we separated these from the rest of the Service industry category. Housing co-ops have developed to meet the needs of average income households who could not afford housing on the private market. Dependence on government financing, differentiates housing co-ops from other co-operatives. In the "Other services" category (1,280 co-ops) we encompass all co-ops that respond to the service-type economic and social needs of their members. Service co-ops are operational in various sectors from child care, transportation, and health care to utility provision.

Similar to the analysis by co-op type described above, the analysis included the entire set of rural and urban communities, and successively included as potential explanatory variables membership in agriculture, retail, housing and "Other services". Appendix Table 5 outlines the results for industry categories.

The role of co-op activity in community population growth reveals some variation across industry categories. Higher per capita co-op membership in retail co-ops has a *positive* impact on population growth in urban communities. Co-op membership in "Other service" co-ops in surrounding communities exerts a *positive* influence on urban community population growth. From columns 1, 2, and 4 of Appendix Table 5 membership in agriculture, retail and in the "Other services" category are unrelated to population growth in rural communities. Housing co-

op membership (col. 3) in surrounding communities exerts a *positive* influence on community growth in rural areas only.

With regard to membership in housing co-ops, we expected a positive response in the urban CCS since housing co-ops are more concentrated in large urban centers where the high private housing market prices are a disincentive to average income households. Quarter (1992) indicates the lack of financial independence differentiates housing co-ops from other co-ops. They require mortgage subsidies from the government, to enable average residents to afford the co-op houses. Thus government support is also required. In summary, our results show that with the exception of housing co-operatives in surrounding rural communities and retail and 'Other service' co-ops in urban centers, co-op activity does not contribute to community population growth[17].

4. Summary of Research Findings

4.0 Socio-economic Population Growth Influences

Our research into the determinants of community population change has highlighted the importance of access to agglomeration economies, in the form of proximity to urban centers and the size of these urban centers. This indicates the presence of spillover benefits accruing to rural areas due to being located near an urban center. Strong rural-urban linkages will facilitate rural community access to benefits of agglomeration economies. In this regard, economic development policies may be streamlined to enhance such synergies.

Our results also suggest that the percentage of the population that is of aboriginal origin strongly and positively impacts population growth, with implications speaking to the need for stronger public policies and resources to engage this growing population. The share of population, who attained a university degree, as our proxy for human capital, shows no clear positive results, suggesting that the impact of human capital is already captured in the distance and population size variables. Alternatively, increased levels of education will make a labor force more mobile. In the absence of local opportunities it is possible that higher education leads to out-migration.

As expected the employment rate variable came out strongly positive and significant, whilst a high share of employment in the primary industries resulted in population decline. Thus, in light of the trends facing the agriculture and the primary sectors at large, communities dependent on these sectors would benefit from engaging in diversification of their economic bases. The share of population employed in the manufacturing sector is negative and significant. If the manufacturing in rural communities is predominantly routine manufacturing this sector is also subject to labor saving technologies, declining labor requirements and the off-shore migration of labor intensive manufacturing activities. Lastly the share of population engaged in non-farm self

[17] In addition to the four types of analysis we undertook some sensitivity analysis to test whether various lag structures would be useful in explaining population growth. For instance in one of our runs , we re-estimated the base model in Table 1 by adding 1981-1991 change in population as an explanatory variable to account for persistent population growth effects. The results (not reported in this report) showed that there was no such pattern.

employment, our indication of entrepreneurship, is a very important determinant of population growth. Consistent with our theoretical model, most of our socio-economic and spatial variables show evidences that households "vote with their feet" to communities with favorable economic conditions.

4.1 Co-op Activity Population Growth Influences

In undertaking this analysis our major focus was to investigate if, in addition to the above discussed socio-economic and spatial variables, the presence of co-operative activity has an impact on population growth. Our investigation of co-operative activity is in the context of the expected positive influence of social capital on the attractiveness of a community as a place of residence and a place of business. We take co-operatives as a manifestation, and a generator, of community social capital. Specifically, our hypotheses therefore were:

- *Communities with a higher level of co-op activity (social capital) grow faster than those with lower levels;*
- *Various co-op types may have different effects on communities*

Table 3 summarizes the results of our investigation of the relationship between co-op membership and community population growth for all of the analyses conducted—that is, all co-ops, co-ops by region, and co-ops by type and cop-ops by industry. Where there was a positive (negative) statistically significant relationship, the sign of the relationship is indicated. Where the relationship, regardless of sign, was statistically insignificant, only n.s. (not significant) is indicated. Occurrences of a positive significant relationship are highlighted.

At the national level, our empirical results do not show clear evidence of a positive link between membership in co-ops and community population growth. A number of measures of co-operative activity were utilized. Per capita membership in the surrounding communities, per capita total co-operative assets, co-op employment and wages as well as the count of co-ops within 100k and 200km of a community were all examined as possible measures of co-operative activity in the community. Per capita co-op membership in the community, as well as per capita co-op membership in surrounding communities (to capture spatial spillover effects) were the two measures of co-op activity utilized in the study.

Contrary to the hypothesis we find neither own community nor surrounding communities' per capita co-op membership positively related to community population growth. In this regard we failed to accept our first hypothesis. However, analyses by region, by co-op type and by industry category have shown that there is some evidence of co-ops having a positive effect on community population growth. For instance per capita co-op membership was *positively and significantly* related to population growth in urban Quebec communities. Further, co-op membership in surrounding communities in rural BC also *positively* impacted community population growth.

Differentiating by co-op type (consumer, producer and worker), membership in consumer co-ops showed a weak *positive* relationship with population growth in rural communities (through co-op membership in surrounding communities).

Table 3. Summary of the Impact of 1992 Per Capita Co-op Memberships in Own and Surrounding Communities, on 1991-2001 Rural and Urban Population Change.

Co-operatives Categories	Rural Population Change	Urban Population Change
All Co-ops		
Membership/1,000 in Community, all co-ops	n.s.	n.s.
Membership/1,000 in Surrounding Community, all co-ops	-ve	n.s.
Co-ops by Region		
Membership/1,000 in Community, Prairies, all co-ops	n.s.	n.s.
Membership/1,000 in Surr. Communities, Prairies, all co-ops	-ve	n.s.
Membership/1,000 in Community, BC, all co-ops	n.s.	n.s.
Membership/1,000 in Surr. Communities, BC, all co-ops	+ve	n.s.
Membership/1,000 in Community, Atlantic prov., all co-ops	-ve	n.s.
Membership/1,000 in Surr., Comm., Atlantic, all co-ops	-ve	n.s.
Membership/1,000 in Community, Que., all co-ops	-ve	+ve
Membership/1,000 in Surr. Communities, Que., all co-ops	n.s.	n.s
Membership/1,000 in Community, Ont., all co-ops	n.s.	-ve
Membership/1,000 in Surr. Communities, Ont., all co-ops	n.s.	n.s.
Co-ops by Co-op Type		
Membership/1,000 in Community, Consumer Co-ops	n.s.	-ve
Membership/1,000 in Surr. Communities, Consumer Co-ops	+ve	n.s.
Membership/1,000 in Community, Producer Co-ops	n.s.	-ve
Membership/1,000 in Surr. Communities, Producer Co-ops	n.s.	n.s.
Membership/1,000 in Community, Worker Co-ops	n.s.	n.s.
Membership/1,000 in Surr. Communities, Worker Co-ops	-ve	n.s.
Co-ops by Industry Category		
Membership/1,000 in Community, Agriculture Co-ops	n.s.	n.s.
Membership/1,000 in Surr. Communities, Agric. Co-ops	n.s.	n.s.
Membership/1,000 in Community, Retail Co-ops	n.s.	+ve
Membership/1,000 in Surr. Communities, Retail Co-ops	n.s.	n.s.
Membership/1,000 in Community, Housing Co-ops	n.s.	n.s.
Membership/1,000 in Surr. Communities, Housing Co-ops	+ve	n.s.
Membership/1,000 in Community, Other Services Co-ops	n.s.	-ve
Membership/1,000 in Surr. Communities, Oth. Serv. Co-ops	n.s	+ve

Source: Authors' computations from Co-operative Secretariat 1992 annual mail survey of co-operatives data.

The division of co-ops into industry categories revealed a *positive* relationship between retail co-op membership and population growth in urban communities, and a weak *positive* relationship between housing co-ops and population growth in rural communities as well as between "Other service" co-op membership in surrounding communities and population growth in urban communities. These findings lend further support to the second hypothesis that we proposed in our study.

Overall, however, no general pattern of a positive relationship between co-op activity and community population growth was found. Additional investigation regarding the way in which co-op activity may be measured may reveal other patterns.

5. Implications for the Co-operatives Sector

The co-operatives sector has gained widespread recognition in Canadian society since their inception in the 19th century, and various researchers have documented their influence in sectors as agriculture (Fowke, 1973), their resilience in small communities (Fulton and Ketilson, 1992) to how they contribute to sustainable development (Quarter, 1992; Gertler, 2001). In most of these studies co-ops are viewed as the key to answering many of the questions facing our society. After controlling for other factors, including demographics, economic and geography, our study conducted an empirical analysis of the influence of co-ops on 1991-2001 population growth in rural and urban communities in Canada.

Although our national level empirical analysis fails to find clear evidence of the impact of co-ops on population growth, there are a number of considerations in the interpretation of these results in the context of our initial hypotheses:

- The presence of some results showing a positive relationship between community population growth and co-op membership by region, by type and by industry category suggests the national-level investigation for all co-ops may be too broad.
- There may be other influences that cannot be captured in the econometric analysis. If there are unknown omitted variables that are strongly correlated with co-ops, this could generate the present results.
- While we have used co-op membership as a manifestation of social capital, the results do not necessarily negate the positive influence of social capital on community attractiveness. There may be other aspects of social capital that are not represented by co-ops and aspects of co-operatives that do not perfectly coincide with social capital characteristics.
- Imperfections in the data representing co-op activity and membership at the community level may account for limited positive findings.
- Co-operatives undoubtedly perform numerous valued functions for their membership that may not translate into community population growth. The limited positive findings here should not be taken as a negative assessment of co-ops in their communities.

Most importantly, the research results reported here provide fertile ground for additional investigations. While a small set of questions may have been answered, many more have been raised:

- What factors could improve the social capital function of co-operatives?
- What are the mechanisms by which co-operatives make communities more attractive places to live and do business?
- How can co-ops more directly impact economic development?
- What incentives would reinvigorate member commitment and the active role of members in their communities?

- How can co-ops keep abreast of the demands and challenges of globalization, economic restructuring and member needs?

Fundamentally, the role of social economy enterprises in community growth and vitality requires further investigation. In addition to case studies and theoretical work, quantitative analyses such as that presented here have an important function. Through rigorous econometric investigation the relevant questions and hypotheses can be articulated and refined. A more complete understanding of the role of social economy enterprises, of social capital and of co-ops in the community will improve both our academic understanding of these relationships as well as contributing to the policy environment. From the perspective of the co-operatives themselves, research results may be useful in increasing their effectiveness and assessing their priorities. Just as co-operatives were able to develop and thrive amidst the turmoil of the 19th century, an improved understanding of their role in the modern economy will enhance their ability to play a positive role in their communities in the 21st century.

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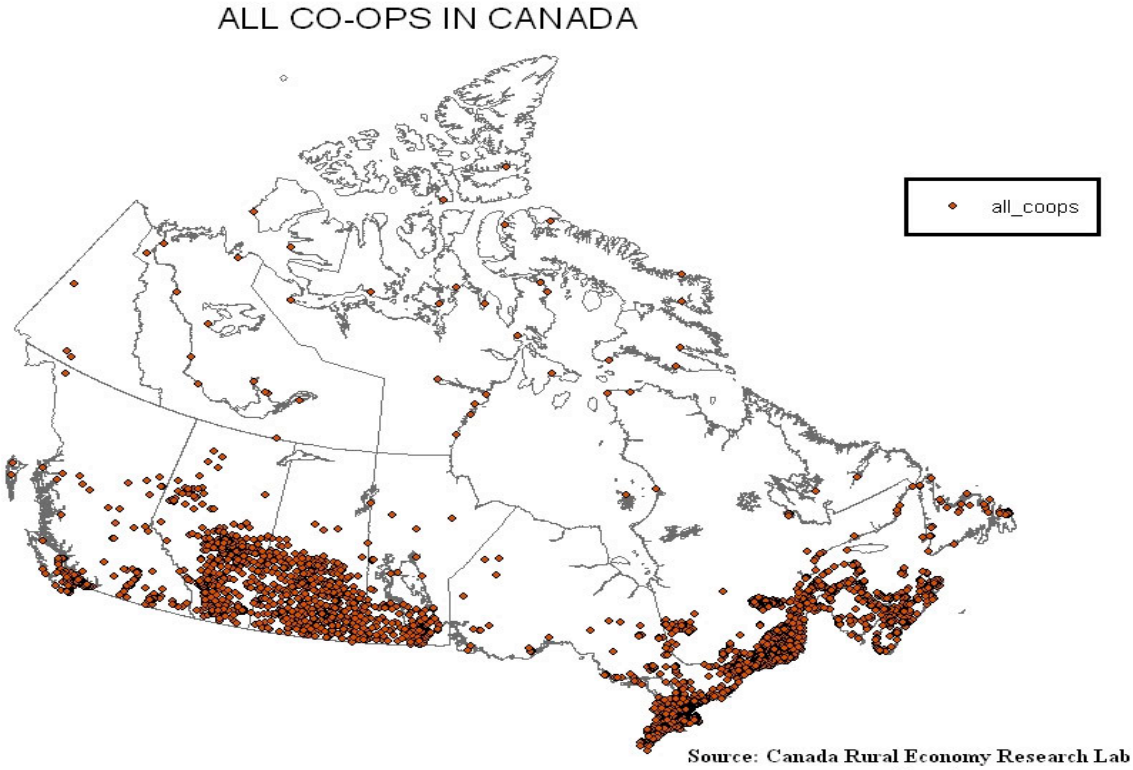
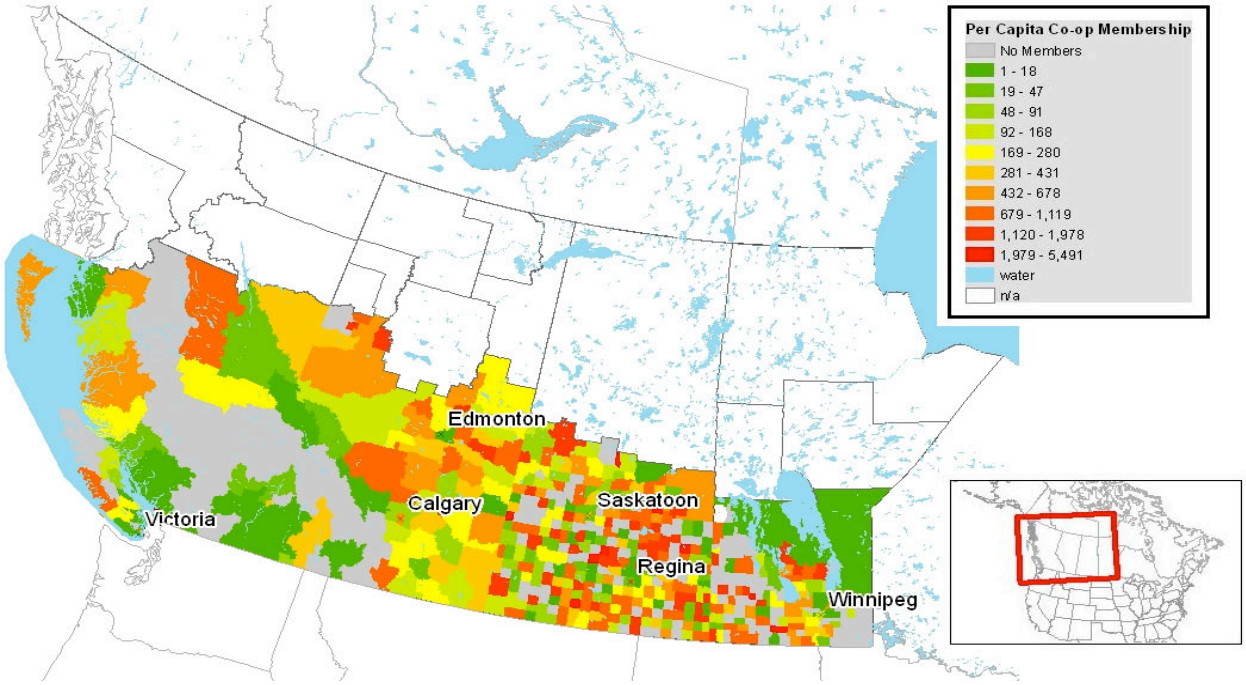
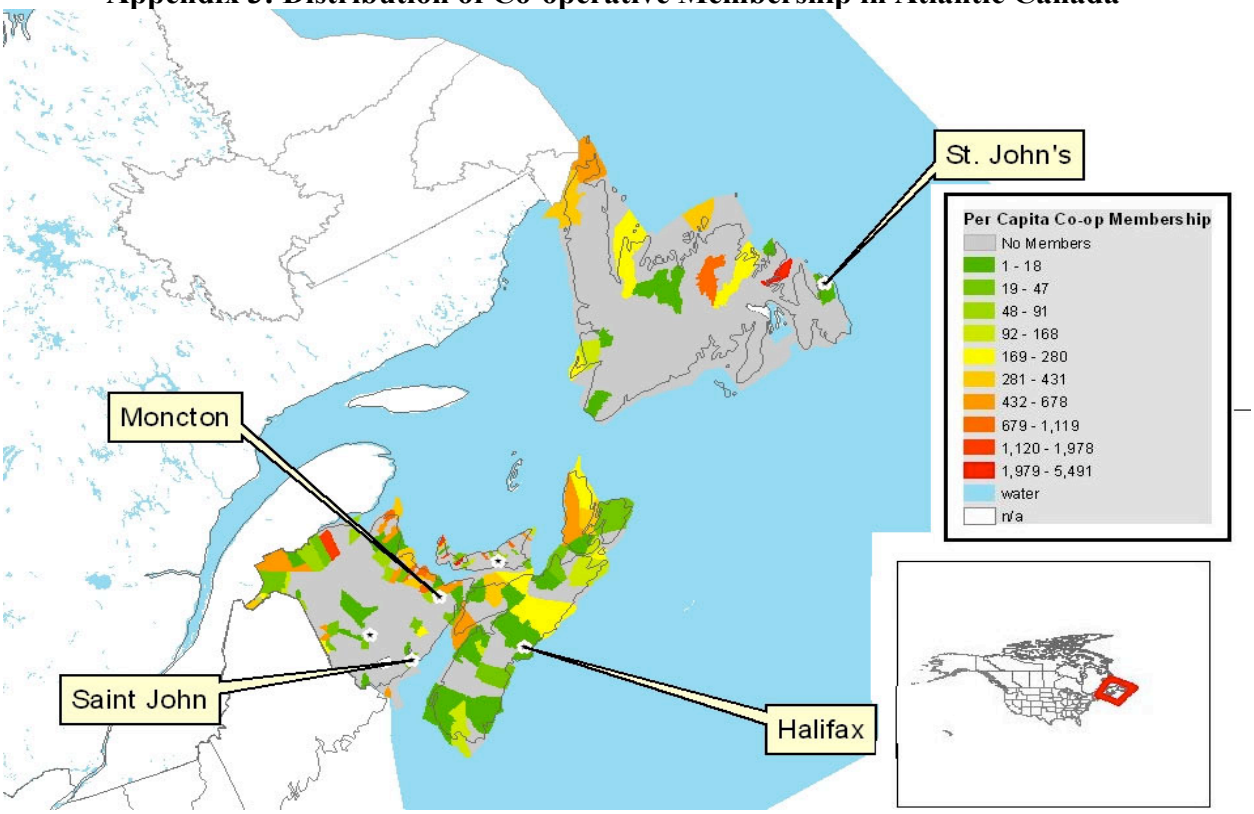
Appendix 1: Distribution of Co-operatives in Canada, 2005



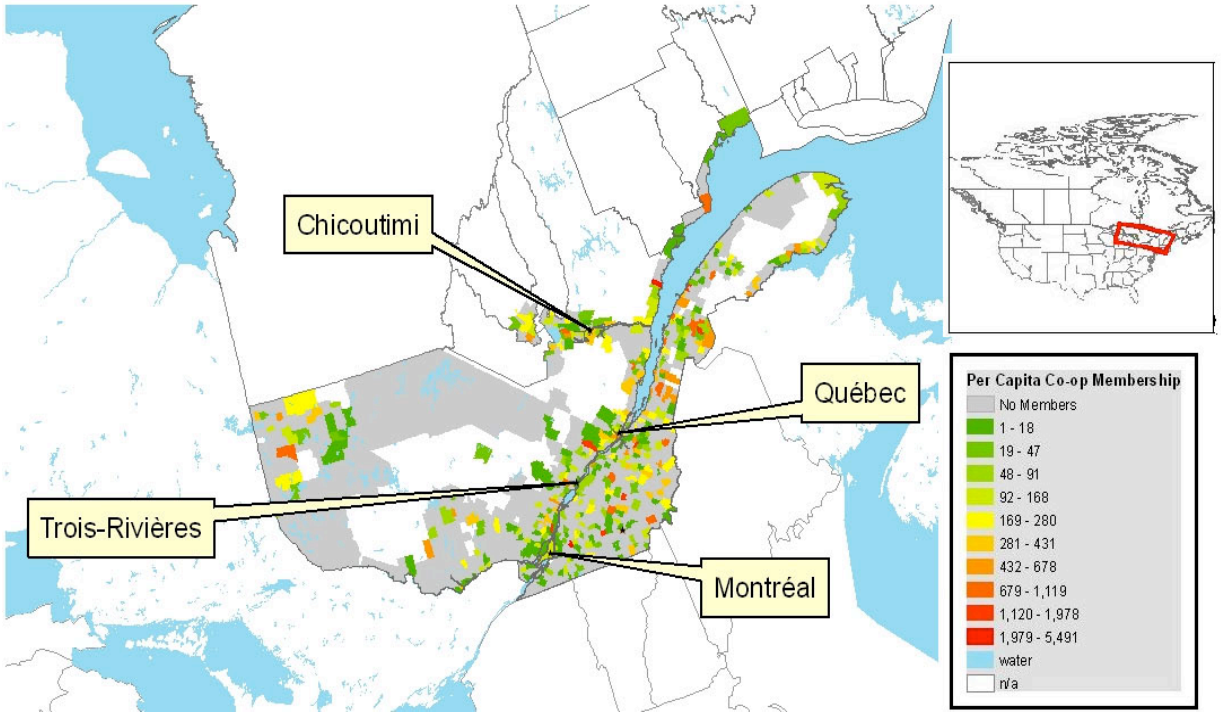
Appendix 2: Distribution of Co-operative Membership in Western Canada[a,b]



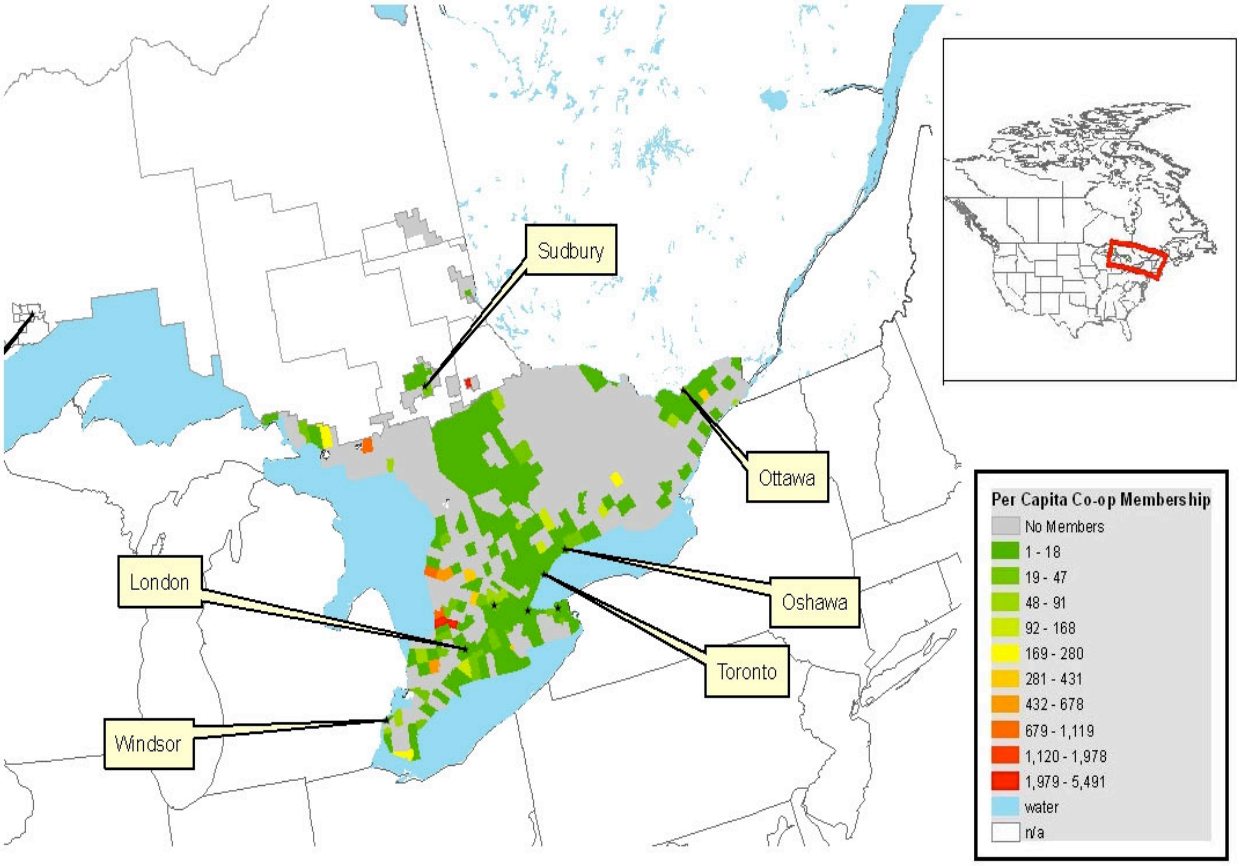
Appendix 3: Distribution of Co-operative Membership in Atlantic Canada[a,b]



Appendix 4: Distribution of Co-operative Membership in Quebec[a,b]



Appendix 5: Distribution of Co-operative Membership in Ontario[a,b]



a. Note that for the sake of clarity, Appendix figures were cropped to show only the populated areas in each province.
b. For more mapping products under this project visit www.crerl.usask.ca under Social Economy Project (New).

Appendix Table 1: Description of Variables used and Data Sources

Dependent Variable	Description	Source
91-01_POP_CHANGE	Percentage Change in the total population between 1991 and 2001	91 and 01 CoP
96-01_POP_CHANGE	Percentage Change in the total population between 1996 and 2001	96 and 01 CoP Author[a]
Agglomeration		
DIST_CMA_100K	Distance from centroid of nearest or own CCS[b] to CMA with a population of 100,000+	CRERL[c], IDLS
INCRE_DIST_250K[e]	Incremental Distance from centroid of CMA with a population of 100,000+ to a CMA with a population of 250,000+. Computed from the difference between INCRE_DIST_250K and DIST_CMA_100K	CRERL, IDLS[d]
INCRE_DIST_500K	Incremental Distance from centroid of CMA with a population of 250,000+ to a CMA with a population of 500,000+	CRERL, IDLS
%Δ_81-91_POP	Percentage Change in the total population between 1981 and 1991	81 and 91 CoP
NEAREST/OWN_CMAPOP	Population of the nearest/own Census Metropolitan area	81 and 91 CoP, Author
POP_SURR_91	Sum of 1991 Population from surrounding CCSs	81 and 91 CoP, CRERL
OWN_CCSPOP_91	Own Census Consolidated Subdivision non-institutional Population	81 and 91 CoP,
Economic		
SHARE_ABORIG_POP	Percentage of total non-institutional population reporting an Aboriginal Identity	81 and 91 CoP, Author
SHARE_UNIDEGREE	Percentage of population over 15 years of age, with a University Degree	81 and 91 CoP, Author
EMPLOY_RATE	Individuals 15+ employed divided by total population 15+	81 and 91 Co P, Author
SHARE_AGRIC_EMPLOY	All individuals 15 years and over employed in the Agriculture Sector divided by total population 15+	81 and 91 CoP, Author
SHARE_PRIM_EMPLOY	All individuals 15years and over employed in the Primary Sector divided by total population 15+	81 and 91 CoP, Author
SHARE_MAN_EMPLOY	All individuals 15years and over employed in the Manufacturing Sector divided by pop 15+	81 and 91 CoP, Author
%NOMFARM_SELF_EMPLOY	Individuals 25-54 whose major job is self employment (non-farm) divided by total population between ages 25 and 54	81 and 91 CoP, Author

Amenities		
JULY_RH	20 year average July Relative Humidity data (%)	Environ Canada, CRERL
JAN_TEMP	20 year average January mid temperatures (degrees Celsius)	Environ Canada,CRERL
PERCAPITA_CINEMA	Density of cinemas in the CCS per 1,000 population	DMTI, CRERL, 91 CoP, Author
PER_OUTPATIENT_CLINIC	Density of out patient clinics in the CCS per 1,000 population	DMTI, CRERL, 91 CoP, Author
Social Capital[f]		
PERCAPITA_MEMBER	Own CCS Co-operative membership divided by own CCs population	Secretariat CRERL, 91 CoP, Author
PERCAPITA_MEM_SURR	Co-operative membership from surrounding CCS divided by total population from surrounding CCS	Co-op Secretariat CRERL,91 CoP, Author

a. Author -denote data that was modified by the authors , CoP-Census f Population
b. CCS stands for Census Consolidated Sub division, which is our unit of observation, see footnote 6 for description
c. CRERL-Canada Rural Economy Research Lab (www.crerl.usask.ca) examines all issues that affect the vitality of Rural Canada from a diversified economy, healthcare, environment, amenities, transportation, to a productive and sustainable agricultural sector.
d. ILDS – Internet Data Library System provided data that was used in the conversion of spatial data.
e. The variable INCRE_DIST was obtained by subtracting the distance to the nearest mega center from the distance to the nearest urban center.
f. Data to proxy for social capital was generated from the 1992 Co-operatives Secretariat yearly co-operative mail survey.

Appendix Table 2: Alternative Social Capital Variables

Variable	Description	Direction of Influence in Regression	Reason not used
CO-OP_100KM	Count of number of co-ops within 100km	n.s.	-no clear indication of overlapping co-op presence -use of counts is a little misleading, for instance , due to the heterogeneity of CCSs in Canada (Western Canada has bigger CCSs compared to Central Canada), larger CCSs may portray more activity, and hence attribute an impact where it is not due
CO-OP_200KM	Count of Co-operative with 200km of a given CCS	+ve	-Although the count of co-ops within 200km of the CCS (**CO-OP_200KM)** yielded a positive response, it is far fetched i.e. it is hard to predict the actual effects, moreover some researchers (e.g. Glaeser et al, 1995; Glaeser and Sacerdote, 2000) find that social connection fall sharply with physical distance.
PER_ASSETS	Per capita co-op assets per 1,000 people	n.s.	**-** no clear relationship with population growth
PER_COOP_EMPL	Density of people employed fulltime by a co-operative per 1,000 people	n.s.	- no clear relationship with population growth
PER_CONS_SALES	Density of co-operatives consumer sales per 1,000	n.s.	-no clear relationship with population growth -we take sales as part of the financial assets, therefore are highly related to the assets variables. Including both of them in the model cause unnecessary multicolinearity
PER_WAGES	Wages of co-operative members per 1,000 people	n.s.	-no clear relationship with population growth -related to the employment variable

Source: Data was obtained from the Co-operatives Secretariat 1992 Annual Mail Survey of Co-operatives

Appendix Table 3: Rural and Urban 91-01 % Δ in Population Region Results by Regions[a,b]

	RURAL					URBAN				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variables[c]	PRAIRIES	BC	ATLANTIC	QUEBEC	ONTARIO	PRAIRIES	BC	ATLANTIC	QUEBEC	ONTARIO
Constant	-0.2109	-0.1867	-0.1988	-0.0177	0.3170	0.4963	-0.2401	0.6538	-0.3007	-0.2556
	(-2.52)**	(-0.81)	(-1.47)	(-0.29)	(1.84)*	(0.62)	(-0.91)	(1.87)*	(-2.19)**	(-3.95)***
Dist_cma_100k	-0.0003	-0.0005	-0.0000	-0.0002	-0.00012	0.00011	-0.0001	-0.0012	-0.0002	-0.0005
	(-5.02)***	(-3.10)***	(-0.11)	(-4.06)***	(-0.39)	(0.39)	(-1.21)	(2-.87)**	(-1.07)	(-3.02)***
Incre_dist_250k	-0.0001	-0.0001	0.0001	0.0002	-0.0004	0.0003	0.0002	-0.0003	0.0001	-0.0001
	(-1.35)	(-0.36)	(1.11)	(1.73)*	(-1.52)	(1.30)	(0.80)	(-1.42)	(0.54)	(-2.13)**
Incre_dist_500k	n/a[d]	-0.0007	-0.0001	-0.0003	-0.0005	n/a	-0.0005	-0.0005	n/a	0.0002
		(-0.43)	(-0.57)	(-1.30)	(-1.16)		(-1.68)	(-3.24)***		(0.84)
Nearest/own_cmapop_91	1.10E-07	-1.41E-08	2.282E-08	2.18E-08	1.49E-08	-1.53E-06	3.49E-08	2.22E-07	3.35-09	2.23E-08
	(2.73)**	(-0.26)	(0.83)	(2.44)**	(1.30)	(-1.78)*	(1.94)*	(-1.48)	(-0.41)	(3.47)***
Pop_surr	3.95E-07	1.76E-07	9.14E-08	4.53E-07	1.73E-07	-9.9E-09	-3.00E-08	1.32E-07	-4.02-09	-2.51E-08
	(6.82)***	(1.41)	(0.55)	(1.51)	(0.76)	(-0.14)	(-1.22)	(-0.31)	(-0.31)	(-0.94)
Own_ccspop_1991	4.22E-07	3.96E-06	1.04E-06	-5.36E.06	-2.10E-06	-6.43-08	3.23E-07	-7.36E-07	-9.52E-07	-6.87E-08
	(2.50)**	(1.23)	(0.76)	(-2.18)**	(-0.93)	(-0.35)	(3.21)***	(-1.64)	(-0.26)	(-0.93)
Share_aborig	0.3124	0.3633	0.2794	0.3565	-0.7846	0.2377	0.0447	-0.3829	0.9199	0.2881
	(6.19)***	(-1.35)	(3.07)***	(6.81)***	(-1.84)*	(1.76)*	(-0.23)	(-0.47)	(7.15)***	(-1.12)
Share_unidegree	-0.4699	-0.2350	0.3897	0.3556	-0.3064	0.3981	-1.3355	0.0997	-0.4996	0.0263
	(-1.08)	(-0.31)	(2.06)*	(1.23)	(-0.94)	(0.69)	(-3.00)***	(0.26)	(-3.39)***	(0.19)
Employ_rate	0.2409	0.6310	0.2025	0.3062	0.0615	0.6730	0.5167	0.1059	0.5873	0.3307
	(2.39)**	(2.25)**	(2.69)**	(6.85)***	(0.52)	(4.55)***	(4.83)***	(1.04)	(10.47)***	(5.87)***
Share_agric_employ	-0.2853	-0.0734	-0.2128	-0.5061	-0.4578	-0.0350	-0.8130	-0.4124	-0.1609	-0.2942
	(-3.39)***	(-0.12)	(-1.43)	(-5.39)***	(-2.95)***	(-0.11)	(-1.31)	(-0.94)	(-0.62)	(-1.38)
Share_prim_employ	-0.4488	-1.3602	-0.3495	-0.4219	-1.0709	-0.2165	-0.6593	0.0932	0.3272	-0.0977
	(-1.91)*	(-2.65)**	(-4.13)***	(-1.89)*	(-1.58)	(-0.71)	(-0.97)	(0.19)	(0.49)	(-0.36)
Share_manu_employ	0.3515	-0.7218	-0.3482	-0.1687	-0.8137	0.7223	-0.3872	-1.1822	0.0669	0.0956
	(1.08)	(-0.83)	(-4.04)***	(-1.89)*	(-1.80)*	(0.62)	(-1.62)	(-2.22)**	(0.27)	(0.32)
%nonfarm_self_employ	0.1288	-0.0115	0.1228	0.0425	-0.3239	0.1795	2.5711	0.7405	0.4745	0.4767

	(0.80)	(-0.02)	(0.95)	(0.45)	(-0.82)	(0.41)	(1.58)	(0.60)	(0.99)	(1.39)
July_rh	0.0011	0.0001	-0.0005	-0.0012	-0.0010	0.0051	-0.0004	-0.0028	-0.0007	0.0007
	(2.66)**	(0.04)	(-0.69)	(-1.72)*	(-1.11)	(4.48)***	(-0.22)	(-0.94)	(-0.42)	(1.21)
Jan_temp	0.0020	0.0023	0.0019	0.0025	0.0044	-0.0001	0.0023	-0.0054	-0.0006	-0.0033
	(1.37)	(0.51)	(0.29)	(1.19)	(1.34)	(-0.07)	(1.31)	(-0.44)	(-0.21)	(-1.35)
Percapita_cinema	351.8	571.4	-505.6	n/a	258.6	-10.4	-530.1	-359.7	95.6	572.8
	(1.98)*	(1.58)	(-1.71)		(0.35)	(-0.11)	(-0.87)	(-0.82)	(0.12)	(1.75)*
Percapita_outpatient	15.5	829.2	-7.3	25.6	252.3	182.3	946.8	-64.3	-828.9	603.8
	(0.88)	(1.17)	(-0.22)	(1.32)	(1.82)*	(0.79)	(0.68)	(-0.27)	(-2.84)***	(1.13)
Percapita_member	0.0071	0.0988	-0.0186	-0.0530	0.0380	0.0281	-0.1938	-0.0834	0.0945	-0.3203
	(0.75)	(0.75)	(-2.45)**	(-2.40)**	(1.20)	(0.43)	(-1.58)	(-0.44)	(1.96)*	(-2.39)**
Percapita_mem_surr	-0.0520	0.8578	-0.0483	-0.0013	0.1749	0.0302	-0.3785	0.1632	0.0214	-0.4518
	(-1.81)*	(1.91)*	(-1.96)*	(-0.04)	(1.29)	(0.24)	(-1.32)	(0.72)	(0.42)	(-0.89)
Prov_dummy	X		X			X		X		
Observations	449	43	289	871	343	49	39	63	190	169
R-squared	0.4807	0.7067	0.5641	0.3349	0.1746	0.7986	0.8017	0.666	0.5069	0.6545

[a]Northern Territories are excluded from the sample; [b]Robust t statistics in parentheses. They are adjusted for regional clustering of the error terms by Census Divisions (correction for heteroskedasticity) *, ** and *** denote significance at 10%, 5% and 1% respectively. X denotes that provincial dummies are included in the model. [c]See Appendix Table 1 for variable definitions.[d] n/a denotes that variable does not apply in the given model for instance rural CCSs in Quebec do not have cinemas.

Appendix Table 4: Rural and Urban 91-01 % Δ in Population Regression Results by Co-op Type[a,b]

	RURAL				URBAN			
Variables[c]	CONSUMER (1)	PRODUCER (2)	WORKER (3)	OTHERS (4)	CONSUMER (5)	PRODUCER (6)	WORKER (7)	OTHER (8)
Constant	-0.022	-0.022	-0.024	-0.021	-0.192	-0.203	-0.198	-0.202
	(-0.36)	(-0.37)	(-0.4)	(-0.35)	(-2.49)**	(-2.62)**	(-2.53)**	(-2.57)**
Dist_cma_100k	-0.0002	-0.0002	-0.0002	-0.00021	-0.00025	-0.00029	-0.00028	-0.00028
	(-4.04)***	(-4.12)***	(-4.00)***	(-4.26)***	(-3.68)***	(-4.32)***	(-4.37)***	(-4.37)***
Incre_dist_250k	-0.00007	-0.00008	-0.00008	-0.00008	-0.00011	-0.0001	-0.00011	-0.0001
	(-1.69)*	(-1.75)*	(-1.66)	(-1.74)*	(-2.57)**	(-2.21)**	(-2.23)**	(-2.23)**
Incre_dist_500k	-0.00024	-0.00023	-0.00022	-0.00024	0.0001	0.00009	0.00008	0.00009
	(-2.78)***	(-2.72)***	(-2.62)**	(-2.75)***	(0.6)	(0.56)	(0.46)	(0.57)
Nearest/own_cmapop_91	5.50E-07	5.21E-07	5.10E-07	4.93-07	1.53E-08	1.51E-08	1.48E-08	1.49E-08
	(2.19)**	(2.17)**	(2.16)**	(2.22)**	(2.34)**	(2.29)**	(2.30)**	(2.30)**
Pop_surr	2.28E-07	2.80E-07	2.79E-07	2.73-07	-9.22E-09	-8.13E-09	-7.94E-09	-8.04E-09
	(3.97)***	(3.90)***	(3.88)***	(3.72)***	(-0.76)	(-0.74)	(-0.76)	(-0.75)
Own_ccspop_1991	5.50E-07	5.21E-07	5.10E-07	4.93E-07	-7.96E-08	-7.03E-08	-7.94E-09	-8.04E-09
	(0.51)	(0.48)	(0.47)	(0.46)	(-1.46)	(-1.52)	(-1.53)	(-1.52)
Share_aborig	0.15896	0.16306	0.16293	0.15442	0.29532	0.32172	0.32199	0.32309
	(1.70)*	(1.74)*	(1.75)*	(1.65)	(1.83)*	(2.03)**	(2.03)**	(2.04)**
Share_unidegree	0.09669	0.1063	0.10652	0.11331	-0.06925	-0.08084	-0.06912	-0.0671
	(0.51)	(0.56)	(0.56)	(0.6)	(-0.45)	(-0.52)	(-0.44)	(-0.42)
Employ_rate	0.25516	0.25416	0.25312	0.25238	0.34133	0.34626	0.34145	0.34218
	(5.73)***	(5.79)***	(5.73)***	(5.68)***	(3.96)***	(3.99)***	(3.87)***	(3.82)***
Share_agric_employ	-0.41493	-0.41323	-0.41603	-0.4156	-0.46018	-0.4462	-0.43519	-0.43127
	(-7.29)***	(-7.59)***	(-7.48)***	(-7.35)***	(-2.29)**	(-2.18)**	(-2.16)**	(-2.15)**
Share_prim_employ	-0.52613	-0.52891	-0.52726	-0.51641	0.19423	0.20121	0.19619	0.2097
	(-4.85)***	(-4.92)***	(-4.94)***	(-4.76)***	(0.75)	(0.77)	(0.76)	(0.81)
Share_manu_employ	-0.26937	-0.26778	-0.27016	-0.27593	0.06488	0.10473	0.12038	0.11051
	(-3.53)***	(-3.53)***	(-3.55)***	(-3.59)***	(0.28)	(0.46)	(0.53)	(0.48)
%nonfarm_self_employ	0.06592	0.06384	0.06162	0.06193	0.5188	0.52273	0.50475	0.51854

	(0.71)	(0.69)	(0.67)	(0.67)	(2.11)**	(2.14)**	(2.07)**	(2.14)**
July_rh	-0.00003	-0.00004	-0.00003	0.00001	0.00094	0.00095	0.0009	0.00093
	(-0.08)	(-0.13)	(-0.07)	(0.04)	(2.00)**	(2.04)**	(1.92)*	(2.01)**
Jan_temp	0.00262	0.00262	0.00258	0.0025	-0.00182	-0.0022	-0.00214	-0.0021
	(2.60)**	(2.52)**	(2.49)**	(2.45)**	(-1.64)	(-2.09)**	(-2.00)**	(-1.98)*
Percapita_cinema	334	331	333	213	30	28	43	41
	(1.98)*	(1.96)*	(1.98)*	(1.37)	(0.77)	(0.79)	(1.08)	(1.05)
Percapita_outpatient	10	9	9	9	-167	-138	-150	-149
	(0.63)	(0.53)	(0.52)	(0.53)	(-0.98)	(-0.78)	(-0.87)	(-0.87)
Percapita_cons_member	-0.0107	n/a[d]	n/a	n/a	-0.09677	n/a	n/a	n/a
	(-1.04)	n/a	n/a	n/a	(-2.95)***			
Percapita_cons_mem_surr	0.03908				-0.46498	n/a	n/a	n/a
	(1.75)*	n/a	n/a	n/a	(-0.68)			
Percapita_prod_member	n/a	-0.01099	n/a	n/a	n/a	-0.22469	n/a	n/a
		(-0.73)				(-3.90)***		
Percapita_prod_mem_surr	n/a	-0.00376	n/a	n/a	n/a	0.13598	n/a	n/a
		(-0.05)				(0.82)		
Percapita_worker_mem	n/a	n/a	0.02953	n/a	n/a	n/a	-5.08822	n/a
			(0.47)				(-1.27)	
Percapita_worker_mem_su	n/a	n/a	-0.84543	n/a	n/a	n/a	-0.20686	n/a
			(-2.54)**				(-0.12)	
Percapita_other_member	n/a	n/a	n/a	4.95775	n/a	n/a	n/a	0.0204
				(3.44)***				(0.19)
Percapita_other_mem_sur	n/a	n/a	n/a	1.48998	n/a	n/a	n/a	-0.01287
				(4.19)***				(-0.25)
Prov_dummy	X	X	X	X	X	X	X	X
Observations	1994	1994	1994	1994	510	510	510	510
R-squared	0.3159	0.3148	0.3157	0.3185	0.4834	0.4813	0.4787	0.4777

[a]Northern Territories are excluded from the sample; [b]Robust t statistics in parentheses. They are adjusted for regional clustering of the error terms by Census Divisions (correction for heteroskedasticity) *, ** and *** denote significance at 10%, 5% and 1% respectively. X denotes that provincial dummies are included in the model. [c]See Appendix Table 1 for variable definitions. [d] n/a denote that variable does not apply for the given model, for instance rural CCSs in Quebec do not have cinemas.

Appendix Table 5: Rural and Urban 91-01 % Δ in Population Regression Results by Industry Type[a,b]

	RURAL				URBAN			
Variables[c]	Agriculture (1)	Retail (2)	Housing (3)	Other Services (4)	Agriculture (5)	Retail (6)	Housing (7)	Other Services (8)
Constant	-0.019	-0.02245	-0.02221	-0.02326	-0.20418	-0.19368	-0.18788	-0.20186
	(-0.31)	(-0.37)	(-0.37)	(-0.38)	(-2.63)**	(-2.53)**	(-2.34)**	(-2.63)**
Dist_cma_100k	-0.0002	-0.0002	-0.0002	-0.0002	-0.00029	-0.00025	-0.0003	-0.00029
	(-4.07)***	(-4.07)***	(-4.07)***	(-4.14)***	(-4.14)***	(-3.83)***	(-4.66)***	(-4.48)***
Incre_dist_250k	-0.00008	-0.00008	-0.00008	-0.00008	-0.0001	-0.00012	-0.00011	-0.00011
	(-1.72)*	(-1.73)*	(-1.77)*	(-1.76)*	(-2.25)**	(-2.82)***	(-2.29)**	(-2.44)**
Incre_dist_500k	-0.00023	-0.00023	-0.00022	-0.00024	0.00009	0.00009	0.0001	0.00009
	(-2.70)***	(-2.73)***	(-2.63)**	(-2.81)***	(0.57)	(0.58)	(0.59)	(0.54)
Nearest/own_cmapop_91	1.64E-08	1.65E-08	1.69E-08	1.64E-08	1.49E-08	1.51E-08	1.45E-08	1.55E-08
	(2.16)**	(2.18)**	(2.25)**	(2.17)**	(2.31)**	(2.38)**	(2.24)**	(2.39)**
Pop_surr	2.74E-07	2.85E-07	3.36E-07	2.79E-07	-8.19E-09	-7.38E-09	-3.00E-09	-8.75E-09
	(3.79)***	(3.99)***	(4.90)***	(3.91)***	(-0.750	(-0.72)	(-0.23)	(-0.79)
Own_ccspop_1991	5.31E-07	5.10E-07	3.77E-07	5.46E-07	-7.38E-08	-7.14E-08	-7.61E-08	-7.58E-08
	(0.49)	(0.47)	(0.35)	(0.5)	(-1.51)	(-1.48)	(-1.49)	(-1.53)
Share_aborig	0.16083	0.16163	0.16086	0.1634	0.32412	0.28889	0.33112	0.34538
	(1.72)*	(1.73)*	(1.73)*	(1.75)*	(2.03)**	(1.88)*	(2.15)**	(2.17)**
Share_unidegree	0.10107	0.10209	0.10482	0.1049	-0.08098	-0.0738	-0.07018	-0.06993
	(0.53)	(0.54)	(0.55)	(0.55)	(-0.53)	(-0.48)	(-0.44)	(-0.44)
Employ_rate	0.25289	0.25442	0.25431	0.2552	0.3464	0.34224	0.34617	0.33869
	(5.73)***	(5.75)***	(5.81)***	(5.81)***	(3.98)***	(3.99)***	(3.85)***	(3.87)***
Share_agric_employ	-0.40688	-0.41209	-0.41156	-0.41608	-0.45078	-0.46061	-0.44349	-0.43769
	(-7.43)***	(-7.27)***	(-7.42)***	(-7.50)***	(-2.20)**	(-2.28)**	(-2.23)**	(-2.18)**
Share_prim_employ	-0.53482	-0.52819	-0.53652	-0.52101	0.20774	0.18259	0.20429	0.15481
	(-4.98)***	(-4.91)***	(-5.03)***	(-4.83)***	(0.8)	(0.72)	(0.8)	(0.61)
Share_manu_employ	-0.26486	-0.26866	-0.26447	-0.26682	0.09923	0.08479	0.09173	0.1184
	(-3.47)***	(-3.51)***	(-3.55)***	(-3.54)***	(0.44)	(0.38)	(0.39)	(0.52)

%nonfarm_self_employ	0.06525	0.06288	0.05837	0.06441	0.53163	0.53427	0.49614	0.55522
	(0.71)	(0.68)	(0.63)	(0.7)	(2.17)**	(2.23)**	(2.00)**	(2.27)**
July_rh	-0.00006	-0.00003	-0.00005	-0.00004	0.00094	0.00095	0.00086	0.00093
	(-0.16)	(-0.09)	(-0.15)	(-0.12)	(2.00)**	(2.08)**	(1.75)*	(2.00)**
Jan_temp	0.00261	0.00263	0.00266	0.00259	-0.00219	-0.00171	-0.0021	-0.00211
	(2.51)**	(2.55)**	(2.50)**	(2.48)**	(-2.03)**	(-1.52)	(-1.96)*	(-2.00)**
Percapita_cinema	324.48	333.15	321.41	323.93	22.83	29.07	39.14	42.19
	(1.89)*	(1.99)**	(1.92)*	(1.94)*	(0.62)	(0.75)	(1.03)	(1.05)
Percapita_outpatient	9.10372	9.85937	9.63863	8.73594	-141.27	-168.67	-140.05	-152.26
	(0.54)	(0.58)	(0.57)	(0.52)	(-0.81)	(-1.01)	-0.81	-0.87
Percapita_agric_member	-0.02257	n/a[d]	n/a	n/a	-0.12851	n/a	n/a	n/a
	(-1.44)				(-1.14)			
Percapita_agric_memsurr	-0.08438	n/a	n/a	n/a	0.19626	n/a	n/a	n/a
	(-1.15)				(1.09)			
Percapita_retail_mem	n/a	-0.00058	n/a	n/a	n/a	0.11691	n/a	n/a
		(-0.06)				(2.93)***		
Percapita_retail_mem_surr	n/a	-0.0239	n/a	n/a	n/a	-0.07502	n/a	n/a
		(-0.98)				(-1.15)		
Percapita_hous_member	n/a	n/a	0.56084	n/a	n/a	n/a	0.15542	n/a
			(0.99)				(0.18)	
Percapita_mem_surr	n/a	n/a	5.13087	n/a	n/a	n/a	2.75418	n/a
			(2.54)**		n/a	n/a	(1.1)	
Percapita__member	n/a	n/a	n/a	-0.03578				-0.12506
				(-1.3)	n/a	n/a		(-1. 87)*
Percapita_Other_mem_surr	n/a	n/a	n/a	-0.05437			n/a	0.13745
				(-1.47)	n/a	n/a		(2.01)**
Prov_dummy	X	X	X	X	X	X	X	X
Observations	**1994**	**1994**	**1994**	**1994**	**510**	**510**	**510**	**510**
R-squared	**0.3156**	**0.3151**	**0.3175**	**0.3153**	**0.4796**	**0.4857**	**0.4792**	**0.4814**

[a]Northern Territories are excluded from the sample; [b]Robust t statistics in parentheses. They are adjusted for regional clustering of the error terms by Census Divisions (correction for heteroskedasticity) *, ** and *** denote significance at 10%, 5% and 1% respectively. X denotes that provincial dummies are included in the model. [c]See Appendix Table 1 for variable definitions. [d] n/a denote that variable does not apply for the given model, for instance rural CCSs in Quebec do not have cinemas.

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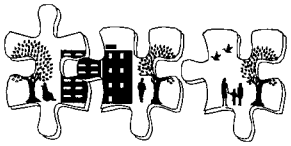

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