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The Role of Credit Unions in Rural Communities in Canada¹

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Abstract

Many cooperatives in rural areas of Canada had their beginnings in agriculture and in serving farmers and farming communities. They developed to market products, access inputs, process outputs, and to provide mutual insurance services and cooperative banking services. Over time, other players performing similar functions have left as agricultural communities have experienced population losses, while many cooperatives remain. The cooperatives provide access to services crucial for small businesses, producers, and households in rural areas, as well as representing access to networks within and beyond the community. This paper investigates whether a positive impact of the presence of credit unions in rural communities can be discerned in the community's ability to retain and attract population. Our quantitative results do not support the hypothesis of a positive influence, although limited results of a qualitative case study suggest that credit unions perform a different function in rural communities than commercial banks.

Keywords: rural communities, cooperatives, rural credit unions

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Introduction

In Canada credit unions are the only financial service providers in more than 900 communities (CCA 2007). The first credit union in Canada, the *caisse populaire* in de Levis, Quebec, was founded by Alphonse Desjardins in January 1901 with 80 members and \$26.40 in deposits. Outside Quebec, the first financial cooperative was Ottawa's Civil Service Savings and Loan Society, established in 1908. Credit unions subsequently spread to the Prairie Provinces, where they developed largely as a response to difficulties faced by farmers in obtaining financing during the Great Depression of the 1930s. Primary producers in communities with an agriculture base had found themselves at a disadvantage relative to large grain handling and marketing corporations and many of the Prairie cooperatives were formed to provide these services for farmers. Similarly, the formation of local credit unions to serve the needs of farmers and small business was a response to the perception that large and distant banks did not serve the needs of rural communities (Fairbairn et al. 1997).

Credit unions have been shown to play an increasingly important role in the small business sector and are the second largest lender to small businesses in the Canadian economy (Ketilson and Brown 2009). Canada has the world's largest per capita membership in credit unions with one in three Canadians a member of a credit union. Credit unions operate according to a set of principles that include concern for community, working for the sustainable development of their communities through the policies approved by their membership (ICA 2004). That is, considerations beyond profits position credit unions to be influential in the economic vitality of the community.

The relationship between credit unions and community development is especially important in the context of Canada's rural communities, many of which are in long-term decline. Community population loss is especially prevalent in areas dependent on natural resources, particularly agriculture but also fishing and forestry. These rural communities are the very communities where a variety of cooperatives, including credit unions, were formed to address a range of problems with access to marketing channels and to financial resources. Depopulation has profound implications for social well-being, where a critical mass of population is required to avert a downward spiral (Rothwell et al. 2002; Stabler and Olfert 2002).

Within the general context of decline, rural communities have heterogeneous experiences with varying rates of growth and stability. Proximity to urban centers with the concomitant access to employment and urban services, as well as location in areas rich in natural amenities, have been

shown to exert a positive influence on rural community population growth (Ali et al. 2011; Deller et al. 2001; Partridge et al. 2008). Further, local leadership is a critical factor, indicating that the presence of cooperatives may play a positive role. Improved local access to financial resources would be expected to support local business development.

Credit unions, due to their mandate and structure, are able to network with other organizations seeking to address members' and communities' needs and work to achieve community oriented goals. Credit unions' democratic control and leadership can have spillovers to local and regional issues including rural vitality. Traditionally they have been closely tied to their local economies as they have drawn their membership and assets from the community (CCA 2007). Credit unions' community development activities are linked to their role as financial institutions, receiving deposits, extending loans, and making investments (Fairbairn et al. 1997). Community development objectives may be served through innovative lending to individuals or businesses. In this regard credit unions may be well-positioned to play a critical role in entrepreneurship development and firm growth, the overwhelming source of jobs in the economy globally (OECD 2000). Not only do entrepreneurs create new local jobs, but they also generate new wealth and new growth (Low et al. 2005). Additional benefits flow to the community from having additional employment and the resulting spin-offs (Fulton and Ketilson 1992).

In light of these functions of credit unions and their continuing presence in rural communities, an understanding of the role of credit unions in rural community vitality is of interest. Credit Union Central of Canada (CUCC) maintains that responsibility to communities is core to the roots and daily operations of credit unions (CUCC 2008). The objective of this research is to investigate the impact of the presence of credit unions on Canadian rural communities' vitality as measured by population growth. Our quantitative analysis fails to find a positive influence of credit unions, though qualitative evidence suggests that credit unions do provide services to their communities that are differentiated from those of commercial banks.

This paper is organized as follows. We start with a brief description of the credit union system in Canada, which is followed by a review of selected literature and the conceptual framework for our quantitative analysis. Data and empirical implementation are discussed next, followed by a section presenting the quantitative results. A qualitative case study is presented in a separate section, followed by conclusions.

Context: credit unions in Canada

Credit unions in Canada operate according to a set of worldwide principles that guide them in putting their values into practice (ICA 2004):

- voluntary and open membership;
- democratic member control;
- member economic participation;
- autonomy and independence;
- education, training, and information;
- cooperation among cooperatives;
- concern for community.

A credit union code of ethics and a statement of environmental responsibility have evolved as additional principles that guide credit unions in their operations.

Credit unions in Canada are hierarchically structured in a three-tier system of local, provincial, and national organizations. At the base of the system are the local credit unions, which operate autonomously and are provincially regulated. They are the primary shareholder members of the provincial centrals, the second tier in the system. The provincial centrals are responsible for ensuring liquidity at the provincial level and providing services as a trade association. They also provide wholesale lending and facilitate settlement of checks and electronic payments for local credit unions. Provincial centrals are, in turn, the primary shareholder members of Credit Union Central of Canada (CUCC), which functions as the system's national trade association and service provider. CUCC is responsible for establishing liquidity policy and overseeing liquidity maintenance at the national level. It also works in partnership with the national credit union system to stimulate growth, improve cost-competitiveness and enhance the effectiveness of the democratic process. It gives the credit unions a national voice on financial service issues.

Ownership and corporate governance of credit unions are based on cooperative principles, and the primary commitment of credit unions is to serve their members' financial needs. Membership eligibility may include being part of a "common bond of association," such as an industry, trade union, club or community, religious or ethnic background, or being a resident of a defined geographic area.⁴ Just as members can form a credit union, they can also dissolve their credit union or merge with another.

4 Most credit unions today are open to anyone who wishes to join.

All credit unions are provincially incorporated, and thus almost exclusively regulated at the provincial level.⁵ The federal government does, however, play a regulatory role through some of the centrals. The national central, the CUCC, is chartered and regulated by the federal government, which can provide the CUCC with liquidity support through the Bank of Canada or the Canada Deposit Insurance Corporation (CDIC). In addition, the provincial centrals in six provinces have chosen to register under both federal and provincial legislation.

The legislative and regulatory framework for credit unions generally parallels that of federal financial institutions, such as banks. In addition, the provinces provide deposit insurance for members of credit unions. The provinces of Alberta, Saskatchewan, British Columbia, and Manitoba provide unlimited deposit insurance, while the other provinces provide coverage at least as generous as that provided by CDIC (Canada, Department of Finance 2008; Ketilson and Brown 2009).

Recent developments in the credit union sector reflect developments in Canada's overall financial services sector. For example, credit unions are becoming more active in the sale and distribution of mutual funds and in some provinces in the sale of insurance. Technological changes provide alternatives in the delivery of member services, such as Internet service. Some credit unions are loosening their common bond of association restrictions to allow them to provide services to a wider clientele (Canada, Department of Finance 2008).

Like the rest of Canada's financial services industry there have been numerous amalgamations of credit unions in recent years. The total number of credit unions decreased from 2,700 in 1990 to 953 in 2009. This has led to an increase in the average size of credit unions, particularly in Ontario, British Columbia, and the Prairies (Canada, Department of Finance 2008; CUCC 2008; CUCC 2009). These credit union mergers strengthen the ability of credit unions to compete with large commercial banks by achieving improved operating efficiency and meeting rising technology costs (CUCC 2008). Credit unions in Canada remain small compared to the commercial banks partly due to being limited to operations within each province.

5 Every province has a Credit Union Act, except Newfoundland, where credit unions are incorporated under the Cooperative Societies Act.

Background: rural Canada

Prior to the 20th century, the development of natural resources (fur, fish, minerals, lumber, and agriculture) for export to the European markets offered attractive economic opportunities that shaped subsequent development of the early Canadian economy. Rural areas had the function of providing an export base, attracting foreign capital, and receiving public investments. Developing these rural-based industries was consistent with national objectives of populating the country (Partridge and Olfert 2008; Freshwater 2007; Deavers 1992).

Since the early 20th century, technological changes and falling transport costs gradually led to the replacement of the primary sector as the engine of economic growth. Outmigration from rural areas has been persistent and dramatic, largely due to productivity improvements in primary production that have been successively labor-saving. During the Great Depression of the 1930s exports declined precipitously, farm income fell, and policy shifted to farm incomes rather than being the instrument for a larger rural development policy (Freshwater 2007; Stabler and Olfert 2002). Since World War II farming has been replaced by other sources of income and employment in the majority of rural areas but new economic activity has not been sufficient to stem outmigration to urban centers. Rural areas have continued to decline and depopulate – the share of Canadian population living in the rural and small town areas had declined to 20% by 2006 (Statistics Canada 2009).

Low population densities affect the performance of rural economies by increasing the per capita costs of infrastructure and other public investments (Moser and Wessen 1999; Deavers 1992; Mann 2005). Small scale poses similar competitive challenges for the private sector in rural communities as demand threshold may not be met and benefits of economies of size are not achievable.

The experiences of rural communities, however, have been highly heterogeneous. Those within easy commuting distance of urban centers or offering special natural amenity attractions have flourished, while those dependent on natural resources have fewer options. For these communities, local entrepreneurship to diversify their economic bases is essential for retaining their population and finding new sources of growth (Goetz 2003).

Selected literature

In addition to labor-saving technological changes in agriculture, agglomeration advantages of urban areas contribute to the rural exodus. Agglomeration economies can be defined as the positive externalities that exist outside the firm

but within the industry (localization economies) or within the broader urban area (urbanization economies) (Rosenthal and Strange 2001; Viladecans-Marsal 2004). Localization economies arise from spatial concentration of activity within industries. Marshall (1920) identified three sources of localization economies: access to inputs whose production involves internal increasing returns to scale; labor market pooling, where agglomeration allows a better match between an employer's needs and the worker's skills; and knowledge spillovers. The attraction of agglomeration economies has resulted in the concentration of economic activity in urban areas. Key exceptions to this pattern are the rural areas offering amenity-rich life styles or those with easy commuting access to urban concentrations (Ferguson et al. 2007; McGranahan 2008).

Conventional local economic development policies focused primarily on the recruitment of firms to rural communities. However, many argue that the firms receiving assistance would have located in that area without the use of incentives (Bartik 1991; Papke and Papke 1986; Partridge and Olfert 2011; Fisher and Peters 1998). Illustrating a local development orientation, the Community Futures Program was introduced in Canada in the 1980s to address pockets of high unemployment in rural places by stimulating local business growth (Freshwater and Ehrensaft 1994). This local development strategy nurtures local entrepreneurial creativity, often based upon local resources and improving internal linkages (Sharp et al. 2002; Radin et al. 1996). Proponents of this approach argue that net job formation today is largely driven by small businesses and thus creating small businesses is central to economic development (Henderson 2006; Fritsch and Mueller 2004).

Goetz (2003) found that in the U.S. the share of non-farm proprietor jobs in all full and part-time rural jobs increased from less than 14% in 1969, to 18% in 2000, and he argues that if these non-farm proprietorships had not been formed, the population loss from many rural areas over the last few decades would have been even more pronounced. Minniti (1999) argues that entrepreneurs are catalysts for economic growth because they generate a networking externality that promotes the creation of new ideas and new market formations. Local entrepreneurs are also more likely to establish firms that are compatible with the resources and opportunities for the communities than are outsiders.

One constraint to the development of entrepreneurship is lack of access to financial capital. Small businesses generally lack a track record and are often unknown outside their local communities hence they have been historically turned down by major banks for funding (Sharp et al. 2002). Credit unions may offer a local solution to this problem. Credit unions are community owned and

democratically controlled financial institutions that differ from banks in that they serve their membership and are committed to the development of communities, largely because their future is also tied to the future of these communities (CCA 2007). Credit unions have a long history of providing financial services in communities where other mainstream financial institutions have found it unprofitable to do so. They are also increasingly playing an important role in the small business sector and are the second largest lender to small businesses in Canada (CCA 2007; CUCC 2008; Ketilson and Brown 2009).

Credit unions are, by virtue of their structure, involved in local community development initiatives. As community based organizations, credit unions can contribute together with other regional or local organizations to creating a climate favorable for community development. While offering the same services offered by conventional banks, they are also community organizations with the goal of community development, which entails innovative lending (Fairbairn et al. 1997).

For example, in addition to the traditional lending, some credit unions in the western provinces also engage in micro-lending in partnership with the Western Economic Diversification Canada (WD), a department of the Government of Canada. WD works in partnership with the provinces, industry associations, and communities to stimulate and encourage diversification of the western economy, as well as to represent the interests of the West in national decision-making. According to WD (2009), the micro-loan agreements established with credit unions are doing extremely well. Micro-lending offers credit access for small business start-ups that have difficulties in accessing traditional loans mainly because they have no credit history. This program therefore encourages the growth of small and medium enterprises that, in turn, generate multiplier effects in terms of employment, income, and population growth.

According to Central Canada Credit Union (CCCU 2008), the greatest strength of credit unions is their local structure, their sense of community, and their focus on the individual as an integral part of the community. This places credit unions in a position to focus on community development. Studies by McArthur et al. (1993) and Fairburn et al. (1997) highlight that community involvement is a key feature of credit unions and, through their work, they facilitate and promote capacity building, strength, and resilience within the community.

Conceptual model

The conceptual model for our empirical investigation describes the determinants of community population change, including the possibility that credit unions may contribute to community population retention or growth through the support of local entrepreneurship and business development. We use a spatial equilibrium approach following Roback (1982), where location decisions of households and firms are influenced by a range of local economic conditions. Local population change then reflects the evaluations by households and firms of the comparative economic and quality-of-life attributes across communities. In this framework, wages and land rents adjust in response to movements of households and firms until equilibrium is reached (Dumaias et al. 2002; Rappaport 2004b).

Households derive utility from traded goods (X), non-traded goods (H), local household amenities (A^H), and other exogenous factors (G). In maximizing (net present value) utility the household compares the expected utility associated with residing in the current location (i) with what is possible in another location (j). The household faces a budget constraint defined by its income (w), prices of the traded good (p), rent (r), local economic conditions affecting the probability of employment ($econ$), local social conditions (soc) – all observed at the current location i – as well as distance costs in accessing employment and services in other locations j ($dist_{ij}$). If the difference is greater than the moving costs, the household will move to the higher utility location. The indirect utility function may then be expressed as:

$$V(w_i, r_i, p_i, A^H_i, G_i, econ_i, dist_{ij}, soc_i) \quad (1)$$

Firms choose a location to maximize profits from the sale of its products subject to prices and input costs. Output prices, labor and land costs are those already represented in the household indirect utility function, as well as distance costs related to sourcing inputs or selling outputs and general economic conditions. There may be location-specific amenities considered by the firm (A^F) that we will take to include local business conditions or support for entrepreneurship, as well as exogenous factors (G). In maximizing profits firms will relocate from location i if their current (net present value) expected profits, net of moving costs, are lower than in location j . Assuming that firms are not sensitive to social conditions in their location decisions, we express the indirect profit function in location i as:

$$\Pi(w_i, r_i, p_i, A^F_i, G_i, econ_i, dist_{ij}) \quad (2)$$

In the transition to equilibrium, wages and rents adjust to demand and supply shocks as firms and households relocate and reassess. If distance costs become more or less binding while technologies, business conditions, and tastes and preference change over time, adjustments are likely to be ongoing. Equilibrium wages will vary across regions according to the compensating differentials in amenities.

Iterations towards equilibrium will be observed in net migration among regions. Regions where households can, on average, increase their well-being (comprised of both economic and quality-of-life considerations) will be net recipients of migrants. Assuming natural increase rates are relatively constant across space, population change will reflect the result of household and firm location decisions. In reduced form the change in population in community i over period from t to $t+1$ will be a function of initial-period community conditions and non-time-varying conditions:

$$\Delta \text{Pop}_{i,(t+1)-t} = f(w_{ib}, r_{ib}, p_{ib}, A^H_{ib}, A^F_{ib}, G_{ib}, econ_{ib}, soc_{it}, dist_{ij}). \quad (3)$$

It is assumed that amenities (for households and firms), distances between communities, and other exogenous conditions or fixed effects are time-invariant.

Data and empirical implementation

Data sources

Population, economic, and social data are from the 1996 and 2006 Statistics Canada Census of Population (CoP), specially tabulated to ensure constant geographic boundaries over this period. The 10-year time period is considered long enough to represent long-run population, firm, and capital movements and to avoid contamination by short-term idiosyncratic changes (especially in small rural communities) and to help ensure that the initial explanatory variables are predetermined, avoiding direct endogeneity bias in the estimated coefficients. Distance variables are from the Canada Rural Economy Research Lab (C-RERL); climatic and environmental variables from Environment Canada (EnviroCan) and Natural Resources Canada (NRC). Appendix A provides a complete list of variables and sources.

Acquiring credit union data was a challenge for this study. Ideally credit unions would be represented by measures such as branch location, asset size, loan and deposit size, and membership size in 1996 to enable analysis of the subsequent impact of credit unions on communities. However, this detailed information was available only at the aggregate level by credit

union with no disaggregation to the community or by branch. At the community level, the only information available was the presence or absence of a credit union. Even for this information we faced some problems in data access. For two of the provinces we relied on public web sites to manually record the location of credit unions by postal codes. For these two provinces, data reflect current locations of credit unions, not the desired 1996 locations that was available for the five other provinces. We thus proxy the 1996 indication of presence/absence in these two provinces with the current status, recognizing the latter may not be representative of the initial year measures necessary to avoid direct endogeneity.

Empirical implementation

Following the work of Kangayi et al. (2009), Partridge et al. (2007), and Ferguson et al. (2007), we estimate a cross-sectional reduced form model that includes credit union variables, exogenous variables (natural amenities and distances), and demographic variables while allowing for economic, human capital, and social factors that influence labor demand and supply. Census Consolidated Subdivisions (CCSs) are the units of observation representing local communities.⁶ A total of 696 rural CCSs in seven provinces were used for the analysis.⁷

The dependent variable is the percentage change in population between the initial period (1996) and 2006. The empirical model for CCS_i located in province p is therefore given as:

$$\% \Delta Pop_{ip(06-96)} = \alpha + \beta_1 CUdummy_{ip} + \beta_2 Geo_{ip} + \beta_3 Amenity_{ip,96} + \beta_4 Demog_{ip,96} + \beta_5 Soc_{ip,96} + \beta_6 Econ_{ip,96} + \delta Prov_p + e_{it(06-96)} \quad (4)$$

CUdummy is the credit union dummy to account for the presence (1) or absence (0) of a credit union in a community; ***Geo***, ***Amenity***, ***Demog***, ***Soc***, and ***Econ*** are vectors that represent geographic location, amenities, demographic factors, social factors, and economic factors; ***Prov_p*** is a vector of zero-one provincial dummies to capture fixed effects representing common factors within a province; e is the error term. The possibility of spatial autocorrelation

6 A CCS can be defined as a functional economic area that is used for the provision of services. Consisting of rural towns of villages and their immediately surrounding rural areas, the CCS represents a community.

7 These provinces are Saskatchewan, Nova Scotia, New Brunswick, Alberta, Manitoba, Prince Edward Island, and British Columbia.

was addressed by producing robust standard errors with the use of the cluster command in Stata, clustered within a census division (CD).⁸

Credit unions are assumed to be transaction-cost reducing organizations with respect to access to business loans. These lower costs encourage business retention and growth, as well as small business start-ups. The ***CUdummy*** is expected to capture the influence of credit availability and implied business support. The expected “positive” relationship would translate into lower rates of population decline for declining rural areas, perhaps through reducing out-migration.

The vector ***Geog*** defines the geographical location of a CCS in relation to urban centers. Included in this vector are the distances to the nearest urban center of any size and the incremental distances to the nearest medium-sized urban center and large-sized urban center. Better access to an urban center increases employment commuting options, suburbanization benefits, and the development of local input-output linkages to urban growth. Rural areas near urban centers may be attractive locations to firms seeking lower land rents while maintaining urban access. The incremental distance variables are expected to reflect additional costs that a household or a business encounters to access progressively higher order urban centers (Partridge et al. 2008).⁹ Distance variables are expected to have negative signs as distance imposes increased costs of accessing higher tier services and transport costs to larger markets.

The vector ***Demog*** contains three variables that represent the market potential of a CCS. The first two are own population (community population), which measures the local market potential, and the population of the nearest urban center. Population density may also contribute to knowledge-creating institutions, networks, and venture capitalists (Zoltan and Attila 2005). The third variable is a measure of entrepreneurship—the share of employed who are self-employed.

The vector ***Amenity*** reflects natural location advantages, including topographic and climatic variables. In the United States natural amenities have been shown to exert a major influence on local population growth

8 Statistics Canada defines a Census Division as a group of municipalities joined together for the purposes of regional planning and managing common services. CDs are intermediate geographic areas between the provinces and the municipality (census subdivision). Accessed at <http://www12.statcan.ca/english/census06/reference/dictionary/geo008.cfm> on 08-11-09.

9 Incremental distances are calculated by subtracting the distance of the nearest urban center from the distance to successively larger urban centers.

(Deller et al. 2001; Rappaport 2004a). Standard deviation of the CCS elevation represents the degree of variation in terrain. Mountains and hills are hypothesized to be a desirable topographical feature that enhances recreation and scenery. The share of the total area comprised of water is included to capture the effect on recreation and scenery. Other climatic variables included are annual precipitation (mm), annual snowfall (cm), and mean January temperature (°C). We would expect negative signs for snowfall and precipitation, and a positive effect of January temperature.

The social vector ***Soc*** contains a set of variables that reflect factors that make a community safe and desirable to live in. Variables included in this vector are the share of population living below the low-income cutoff, crime rate, and the share of population living in their own dwellings. Communities with large shares of population living below the income cutoff may be linked with social unrest and lower public services access, resulting in an expected negative influence. The share of population living in own dwellings reflects commitment to the community by investing in property, leading to an expected positive relationship with population growth; crime rates are expected to be inversely related to population growth.

The economic vector ***Econ*** contains those factors that reflect the economic strength of the community: employment rate, income measure, industry structure, and industry diversity as represented by the Herfindahl index. Also included in this vector is a measure of human capital endowment as measured by the share of the population with a university degree.

The employment rate represents the economic opportunities for households in terms of probability of finding a job, while earnings per hour are included to reflect the income attractiveness of the community to households. Positive signs are expected for these variables. Industry structure is represented by the shares employed in agriculture, manufacturing, and other primary industries. A negative sign is expected on the agriculture and other primary sector employment shares. The Herfindahl index represents the degree of specialization (lack of diversification) of the local economy. As a more diversified economy offers more stable and more diverse employment opportunities, we would expect the index to be inversely related with population growth.

The vector of provincial dummies ***Prov_p*** is included to control for differences in the historic, legislative, and institutional characteristics and for policy differences that exist among provinces. When fixed effects are included, the other regression coefficients are interpreted as the average response for within province changes in explanatory variables.

Table 1: Selected descriptive statistics for communities with and without credit unions

Variable	CCSs with credit unions		CCSs without credit unions	
	Mean	St. dev.	Mean	St. dev.
Population change	-3.84	14.59	-4.78	14.39
Distance to nearest urban center	86.28	42.24	72.94	43.49
Incremental distance to nearest medium urban	57.23	62.28	55.87	65.33
Incremental distance to nearest large urban	287.26	184.32	261.82	180.78
Elevation standard deviation	79.13	145.17	44.33	96.17
Share water (%)	1.72	6.59	1.67	8.95
Snow (cm)	142.18	108.35	181.81	86.36
January temperature (°C)	-12.72	4.38	-13.01	4.61
Precipitation (mm)	627.98	438.02	798.13	416.55
Own CCS (community) population	4,891	5,991	2,115	2,519
Nearest urban center population	87,106	152,903	100,107	188,951
Share of population in self employment	9.31	5.08	7.64	5.89
Employment rate	64.29	7.92	61.03	9.71
Earnings per hour	10.78	5.12	8.24	5.84
Share of population employed in agriculture	25.68	18.84	24.56	21.74
Share of population employed in other primary	3.76	5.32	4.39	7.23
Share of population employed in manufacturing	3.68	5.32	6.24	8.09
Herfindahl index	0.21	0.08	0.23	0.11
Share of population with university degree	6.11	2.73	5.49	3.51
Share of population living below income cutoff	13.94	5.63	15.82	8.22
Share of population living in own dwellings	70.29	26.99	60.97	37.62
Crime rate (per 100,000)	9,646	2,236	8,312	2,394
N (Sample Size)	326		370	

Notes: See Appendix A for variable definitions. Territories and urban CCSs are excluded from the sample.

Results

Descriptive statistics

Descriptive statistics (Table 1) show that on average communities with credit unions experienced 0.94 percentage points less population decline than those without credit unions. They are, however, located 13 kilometers farther away from their nearest urban center than those without a credit union, 1 kilometer greater incremental distance from medium sized urban centers and 25 more incremental kilometers from large urban centers, the top of the urban hierarchy. Combined, the average CCS with a credit union is located 431 kilometers from the highest level of the hierarchy with the full complement of goods and services, compared with 391 kilometers for communities without a credit union.

Natural amenities are relatively favorable in the communities with credit unions compared to those without. On average they receive about 40 cm less snow and about 170 mm less precipitation than those without credit unions, though the standard deviations are relatively high.

The share of self-employed population, our measure of entrepreneurship, was higher in the CCSs with credit unions by 1.7 percentage points. Also credit-union communities were more than twice the size of those without (4,891 versus 2,115), suggesting a substantial advantage in terms of market size and potential agglomeration economies. The threshold size population for the presence of a credit union would be near 5,000 (Wensley and Stabler 1998). Population size of the nearest urban center, however, is 13,000 less than that of CCSs without credit unions.

Economic conditions appear relatively conducive for population growth in CCSs with credit unions compared to those without credit unions (in terms of population growth literature), with the exception of the share of population employed in agriculture that is higher in CCSs with credit unions. The employment rate is more than 3 percentage points higher in communities with credit unions than in those without, while earnings per hour are about \$2.50 greater. All three social variables also appear favorable to communities with credit unions – about 1.9 percentage point fewer living below the low income cutoff and about 9.3 percentage points more living in their own dwellings.

While several of the descriptive statistics suggest positive average attributes for communities with credit unions in terms of retaining and attracting population, there are two very important exceptions. These communities are considerably more remote from urban centers, and their nearest urban center is relatively small. Of course, the particular roles and importance of these factors cannot be discerned from the descriptive statistics alone. A multi-variable regression will reveal the individual influence of each of these factors on population growth, holding all others constant.

Table 2: Models estimating the role of credit unions on 1996-2006 population change

Explanatory variable	Model 1 Parsimonious	Model 2 Add Demog	Model 3 Add Social	Model 4 Full model
Credit union dummy	5.195594 (3.36)***	2.88574 (2.01)**	2.31413 (1.86)*	0.55384 (0.48)
<i>Geog</i>				
Distance to nearest urban center	-0.080128 (-4.24)***	-0.06700 (-3.87)***	-0.06535 (-3.86)***	-0.05188 (-3.29)***
Incremental distance to nearest medium urban center	-0.043636 (-3.88)***	-0.02108 (-1.95)*	-0.02230 (-1.99)**	-0.02388 (-2.12)**
Incremental distance to nearest large urban center	-0.021464 (-3.71)***	-0.01192 (-2.34)**	-0.01267 (-2.4)**	-0.01574 (-2.98)***
<i>Amenity</i>				
Elevation standard deviation	0.022504 (2.15)**	0.02353 (2.63)***	0.02488 (2.55)***	0.01684 (1.93)*
Share of water (%)	0.044704 (1.15)	-0.02330 (-0.50)	-0.02804 (-0.52)	-0.06980 (-1.3)
Snow (cm)	-0.007176 (-0.97)	-0.00834 (-1.51)	-0.01003 (-1.71)	-0.01062 (-1.93)*
January temperature (°C)	0.630175 (1.76)*	0.61961 (1.85)*	0.68114 (1.97)**	0.20161 (0.69)
Precipitation (mm)	-0.000754 (-0.27)	-0.00092 (-0.36)	-0.00029 (-0.11)	-0.00188 (-0.78)
<i>Demog</i>				
Own CCS population		0.00069 (4.67)***	0.00066 (4.39)***	0.00045 (3.31)***
Nearest urban population		0.00001 (3.04)***	0.00001 (2.92)***	0.00001 (2.60)***
Share of self-employed population		0.30809 (2.74)***	0.22830 (2.32)**	0.09152 (1.06)
Share of self-employed population		0.30809 (2.74)***	0.22830 (2.32)**	0.09152 (1.06)

(continued on next page)

Table 2 (continued)

Explanatory variable	Model 1 Parsimonious	Model 2 Add Demog	Model 3 Add Social	Model 4 Full model
Share living below income cutoff		-0.25336 (-3.45)***		-0.25156 (-4.12)***
Share living in own dwellings		-0.00304 (-0.21)		0.04153 (2.18)**
Crime rate		0.00011 (0.41)		0.00001 (0.02)
<i>Econ</i>				
Employment rate				0.37255 (4.54)***
Earnings per hour				0.29097 (2.05)**
Share employed in agriculture				-0.21147 (-3.68)***
Share employed in other primary				-0.33074 (-4.08)***
Share employed in manufacturing				-0.09222 (-0.92)
Herfindahl index coefficient				-15.05685 (-1.90)*
Share with university degree				0.19954 (1.17)
Provincial dummies	yes	yes	yes	yes

Note: Robust t-statistics are reported in parentheses. The t-statistics are adjusted for spatial autocorrelation of the error term within the census division by STATA cluster command; *, **, and *** denote statistical significance at 10%, 5%, and 1% respectively.

Econometric results

Econometric estimation was done in stages (to assess potential multicollinearity and endogeneity) beginning with the most parsimonious specification including only the dummy for presence or absence of credit union and the variables that are clearly exogenous.¹⁰

The second model adds the demographic variables to assess the influence of the market potential variables; subsequent models include social and economic variables. A consistent pattern across these four stages of estimation would be strong evidence that the findings are not artifact of a particular specification. Table 2 presents the results of the estimations.

Model 1: Parsimonious model. Model 1 results indicate that the presence of credit unions on average results in about 5.2 percentage points higher population growth (or lower decline) at the 1% level of significance. When measured at the mean population of 4,891, this translates into an average of about 254 more people over a 10-year period. Also indicated is a strong inverse relationship between population growth and distances to urban centers of all sizes. This is consistent with the literature that points to the growing influence of agglomeration economies and market potential in driving the spatial population distribution.

Of the natural amenities variables, only January temperature and the elevation standard deviation were statistically significant at the 10% and 5% level respectively. The other three natural amenities variables (share of water, snow, and precipitation) had the expected signs but were not statistically significant in explaining population growth. The lack of significance of the amenities as a group (as indicated by the F-statistic) may be attributable to the fact that in Canada, population is concentrated along an east-west “line” following the U.S. border, where climatic variability is limited. These amenity results counter many of the U.S. findings that show natural amenities to have significant impact on population growth (Rappaport 2004a; Deller et al. 2001).

Model 2: Adding demographic variables. In Model 2, with demographic variables added to the most parsimonious specification, the credit union dummy remains statistically significant, though only at 5% level. The presence of a credit union on average results in 2.9 percentage point greater population growth. Distance variables continue to have an inverse relationship with population growth.

10 The clearly exogenous variables included are the geographic vector (distance variables), the amenity vector (natural amenity variables), and the provincial fixed effects.

All the demographic variables are significant at the 1% level and have the expected positive signs. Community population shows the greatest impact on population growth of the three, with an expected 0.6% increase in population for every 1,000 increase in community population. These results, and the positive impact of the size of the nearest urban center, indicate that local market size plays an important role in population growth and retention, possibly facilitating firm entry, expansions, and start-up businesses. Self-employment exhibits the expected influence—a 1% increase in the share of the self-employed population leads to a 0.3% increase in population. This is consistent with entrepreneurship emerging as an important driver of the economy through employment opportunities created as well as the resulting economic spillovers (Minniti 1999; Pages and Poole 2003).

Model 3: Adding social variables. Social variables were added to Model 2 to obtain Model 3. The results for Model 3 with social variables are shown in column 3 of Table 2. The credit union dummy is still statistically significant in Model 3, but now only at the 10% level. When holding all other variables in the model constant, the presence of credit union results, on average, in about 2.3 percentage points greater population growth. At the mean population of 4,891 this translates into an average of about 112 more people over a 10-year period. Distance variables remain statistically significant at least at the 5% significance level. Of the three social variables, only one, the share of population living below the income cutoff, was statistically significant at the 1% level.

Full Model: Adding economic variables. The estimation results for the Full Model that includes all four groups of variables are shown in column 4 of Table 2. Though the explanatory power of the model (measured by the adjusted R^2) increases to 47.22%, which is relatively high for cross-sectional data, the credit union dummy variable loses its statistical significance. Most other variables have the expected influence. The direct inference from these results is that once all the other variables affecting rural community population growth have been controlled for, there is no statistically significant influence of the presence of a credit union.

Sensitivity tests

Two post-estimation tests, the Ramsey Ovttest and the variance inflation factor (VIF) indicator, were conducted on the Full Model to analyze if multicollinearity or model misspecification might have affected the results (Greene 2008). The Ramsey Ovttest was used to test for specification error of

the model in two ways: a) using the powers of the fitted values (to indicate whether the residuals will have stronger dependency between themselves); and b) using the powers of independent variables (to indicate whether the residuals have stronger dependency with the explanatory variables). In both cases the null hypothesis is that the model has no omitted variables. The results were as follows:

- a) Ramsey Ovttest using the powers of fitted values of population changes: Prob > F = 0.2611.
- b) Ramsey Ovttest using the powers of independent variables; Prob > F = 0.3219.

Both tests indicate that we may reject the presence of misspecification as the probabilities lie beyond the statistical threshold ($p > 0.05$).

The VIF test shows by how much the variance of a single β goes up due to the correlation across explanatory variables. As a rule of thumb, VIF values greater than 10 may imply collinearity. Tolerance, defined as $1/\text{VIF}$, is also used to check on the degree of collinearity. A tolerance value lower than 0.1 indicates that the variable could be a linear combination of other independent variables. Table 3 shows the VIF and tolerance scores for variables that were likely suspects; no collinearity is indicated.

Four other sensitivity estimations were considered to check the robustness of the results: 1) inclusion of interaction dummies; 2) regional regressions; 3) subsample regressions; and 4) excluding nonsignificant variables.

Interaction dummies were included because the individual regressors may not be correlated but *jointly* they may affect the dependent variable (Fox 1997). With this type of regression multicollinearity is more likely to be a problem because the interaction term is a product of a regressor and the dummy variable. To avoid the potential problem of multicollinearity the specifications with the interaction terms were estimated with each of the economic variables and the credit union dummy one at a time. In all these specifications the interaction term was not statistically significant at the 10% level, indicating the Full Model results are robust.

Regional regressions were conducted to analyze if different economic regions in Canada might provide different population growth results and possibly different impact of credit unions on communities. Regional models were estimated for three groups of provinces: British Columbia; the Prairies (Saskatchewan, Alberta, and Manitoba); and Atlantic Canada (Prince Edward Island, Nova Scotia, and New Brunswick). The results for each region were the same as for the Full Model—the credit union dummy became nonsignificant once the economic variables were added.

Table 3: VIF and tolerance for selected variables

Variable	VIF	1/VIF
Share of self employed population	1.64	0.6089
Employment rate	2.39	0.4181
Earnings per hour	3.77	0.2650
Share population employed in agriculture	8.88	0.1126
Share population employed in other primary	1.90	0.5270
Share population employed in manufacturing	2.03	0.4916
Share population with university degree	1.38	0.7263
Credit union dummy	2.05	0.4932

Models were also estimated for two subsamples: provinces with higher levels of credit union presence (Nova Scotia, Saskatchewan, Alberta, and British Columbia) and provinces with lesser credit union presence (Prince Edward Island, Manitoba, and New Brunswick). For both subsamples the overall results were consistent with the Full Model.

The last robustness check dropped all the variables in the model that were not significant at 10% level to test the tradeoff between multicollinearity and omitted variables. The credit union dummy remained not significant, indicating robustness of the Full Model results.

Case study investigation

In addition to the quantitative investigation, an interview-based case study was undertaken in the province of Saskatchewan, comparing the operations of a credit union with those of a major commercial bank. While the head offices of both organizations were located in the province's largest city (population 240,000), both had significant rural activity.

Very few differences were revealed between the credit union and the bank in terms of the type of rural client base they serve, the lending process and default rates, the relationships between deposits, lending and investments, or other forms of community support. Both are involved in the full array of activities related to their core function. However, the credit union is distinguished in that it also offers non-traditional lending in the form of micro-lending and community economic development lending. These features suggest that the credit unions (if the case study credit union were representative) can play a role in supporting rural communities beyond what the banks may

do. Of course, not all credit unions participate in non-traditional lending and it may be that the urban setting of the interviewed credit union sets it apart from rural credit unions, where market size would be smaller. A differentiated role for credit unions is thus possible, though whether it is utilized broadly or whether it is effective in terms of local economic development cannot be inferred from the case study.

Conclusions

Credit unions developed in Canada early in the 20th century to serve local small businesses, consumers, and especially farmers. They were formed when the banks were perceived to inadequately serve local populations, especially rural and agricultural. In that sense their historical role implies a positive economic development impact. In addition, both the community development focus declared in their global guiding principles and their local ownership structure suggest that credit unions may offer support beyond conventional lending practices, and lend to local and small businesses that may not otherwise be able to access financial resources. These characteristics may be especially important in parts of rural Canada where small communities are generally in decline. Indeed the local credit union is the only financial services provider in more than 900 rural communities in Canada.

Our empirical analysis, conducted in a spatial equilibrium context, did not find support for a positive role of credit unions in community population growth and retention. Other explanatory variables performed as expected. Especially important were the distances from the full size range of urban centers, stressing the influence of access to markets and to the full array of consumer and producer goods and services. The size of the rural community itself and the size of the nearest urban center also had a consistently strong positive influence, underlining the importance of market size. In contrast to research findings in the U.S., natural amenities had limited influence. After controlling for the full set of demographic, economic, and social variables our results failed to find a significant impact of the presence of a local credit union.

Further research may focus on better representation of the credit union through size measures, as compared with only a presence/absence dummy. The evidence of non-traditional lending revealed through our case study suggests that a closer investigation of specific instances where these alternatives are practiced may yield different findings. Augmenting small business and entrepreneurship support in rural agriculture-based communities could make a difference in their general trajectory of population decline.

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Appendix A: Variable definitions and data sources

Variable	Variable definition	Data sources
POP_CHANGE	Dependent variable: percentage change in population between 1996 and 2006	1996 and 2006 CoP ¹
CU DUMMY	Credit union dummy: 1 if CCS has a credit union branch, otherwise 0	Provincial Credit Union Centrals web sites, CRERL ²
<i>Geog</i>		
DNUC	Distance between CCS centroid and centroid of closest nearest urban center of any size.	CRERL
IDNMUC	Incremental distance between nearest city and nearest medium-size city	CRERL
IDNLUC	Incremental distance between nearest medium city and nearest large city	CRERL
<i>Amenity</i>		
STD_DEV_ELEV	Standard deviation of CCS elevation as a proxy for hills and mountains	NRC ³ , CRERL
SHARE_WATER	Percentage of land covered by water	NRC, CRERL
SNOW	Average annual snowfall (cm)	EnviroCan ⁴ , CRERL
JAN_TEMP	Average January temperature (degrees Celsius)	EnviroCan, CRERL
PRECIP	Average annual precipitation	EnviroCan, CRERL
<i>Demog</i>		
OWN_POP	Own CCS non-institutional population in 1996	1996 CoP
NUCP	Nearest urban center population in 1996	CRERL
SHARE_SELF_EMP	Percent of population 25-54 years with some non-farm self-employment.	1996 CoP (calculations by author)

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Appendix A (continued)

Variable	Variable definition	Data sources
<i>Econ</i>		
EMPLOY_RATE	1996 employment rate for individuals aged 15+.	1996 CoP
EAR_HR	Average 1996 earnings per hour for population 25-54 years (in 1995 constant \$)	1996 CoP
SHARE_AGRIC	Percent of 1996 workforce employed in agriculture	1996 CoP(calculations by author)
SHARE_OTHER_PRI	Percent of 1996 workforce employed in other primary industries	1996 CoP(calculations by author)
SHARE_MANU	Percent of 1996 workforce that is employed in manufacturing sector	1996 CoP(calculations by author)
HERFINDEX	1996 Herfindahl index, calculated as $\sum s_i^2$ where s_i is the share of employment in industry i	CoP
SHARE_UNI_DEG	Percentage of 1996 population aged 15+ with a university degree	1996 CoP(calculations by author)
<i>Soc</i>		
SHARE_LICO	Percent of 1996 population with income below the low-income cutoff	1996 CoP (calculations by author)
SHARE_OWN_DW	1996 percentage of population in own dwellings.	1996 CoP
TOT_CRIME	Total crime rate (crimes/100,000 pop.)	CRERL

1 Census of Population

2 Canada Rural Economy Research Lab, University of Saskatchewan.

3 National Research Council of Canada

4 Environment Canada