

Regional and Sectoral Growth in Canada's Emerging Economy

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Despite years of attention by federal and provincial levels of government, Canada continues to be marked by a concentration of economic activity in a select few urban regions. Although government policies, programs, and agencies over the past decades have focused on many aspects of encouraging economic development in Canada, the distinct geographic character of economic activity has been one of the most enduring issues vexing public policy makers. Regional economic development agencies such as the *Atlantic Canada Opportunities Agency* and *Western Economic Diversification Canada*, and their predecessors, have been established by the federal government specifically to address long-standing issues related to natural resource dependence and the consequent lack of diversification in many of Canada's regional economies. This paper focuses attention on business communities and economic development in Canada's regions.

Regional scientists in Canada have demonstrated a high level of interest in the linked issues of regional growth and diversification (Polèse 2000; Polèse and Shearmur 2002). One aspect of recent work in regional science that relates directly to the level of development, diversification, and control resident in regional economies is research into the location and distribution of advanced administration functions and high-level support services. Numerous studies over the past decades have established the ongoing metropolitan orientation of head offices and information-intensive services in North America (Semple 1973, 1996; Klier and Testa 2002). A large-city bias has endured in head office location over the decades, but this has not been unaccompanied by change in business locations. A variety of researchers (Semple 1973; Lyons 1994; Klier and Testa 2002) have demonstrated an ongoing dispersion of head office activities throughout the United States from the 1950s to the 1990s. Similar observations have been made for Canada, although the Canadian urban system has been much slower than its US counterpart in distributing head office activities throughout its regions. For example, Meyer and Green (2003) show that in 2000 the top four head office centres in

Canada hosted 56.4% of all head offices. In Canada's case in particular, research providing insight into regional business growth is of great importance, as the lack of dispersion of advanced decision-making and service activity presents many challenges for a country that continues to hold economic development and diversification of the country's regions as a national priority.

This study investigates the location of head office activity in the regions of Canada. The analysis focuses on three unique regions: the *Ontario-Quebec* core long identified as the social and economic heartland of the country; the *British Columbia* region, far from the country's economic centre and continuing to have a high reliance on resource industries, but with vast economic potential in its growing international links to the Pacific Rim; and *Saskatchewan*, a peripheral, resource-rich province with a long history of economic struggle and out-migration.

The study chooses the Ontario-Quebec core for analysis as a whole because of the region's collective and long-standing dominance of key industries in the national economy. This dominance has been accompanied by a level of coordination in the operation of the two provincial economies that makes joint analysis of the entire core region appropriate. A prime example of such coordination is in banking, where both Montreal and Toronto have hosted important executive functions for the major banks throughout Canada's history, and have worked together to build a national banking industry (Semple and Rice 1994).

The study includes British Columbia and Saskatchewan as regional and peripheral counter-balances to the national core. British Columbia serves as an example of an economically successful peripheral region that, while characterized by the periphery's traditional reliance on resources such as forestry and mining, has also been able to develop a metropolis hosting a selection of head offices of national importance, as well as Canada's key sea and air link to the Pacific Rim. British Columbia's success has also been characterized in recent years by the development and diversification of its urban system, with a growing provincial population and multiple urban centres of importance, including Kelowna, Prince George, and Kamloops, that have emerged outside of the lower mainland. The growth and development of these interior cities has been reflected, for example, by a corresponding expansion in the province's post-secondary education system, with three new universities being established in the interior over the past decade. Vancouver, while continuing to prosper, is only one centre of growth in an expanding provincial economy. Saskatchewan, by contrast, is illustrative of a peripheral regional economy that has continued to struggle. An ongoing resource reliance and a lack of diversification have hampered the province's growth prospects, with provincial population levels unable to break through the one million mark for several decades running. Much of the economic growth that has occurred in the province has been concentrated in the province's two largest cities, with rural and small town depopulation being a dominant provincial theme over the past forty years (Stabler and Olfert 2002: 20-29).

For each of the three study regions, the analysis examines the characteristics of two distinct groups of businesses: *Establishment Businesses*, the largest firms in the country, many of which have long track records of business success, and *Next Wave Businesses*, the most rapidly-growing businesses in the country, repre-

senting new and developing industries experiencing much expansion in sales. Establishment businesses represent the firms that currently dominate the Canadian economy, in terms of volume of business, employment, and influence both nationally and abroad. Next Wave businesses represent evolutionary forces at work shaping Canada's future economy. Study of these rapidly-growing businesses in no way minimizes the ability of Establishment businesses to grow and expand into new areas of business. Indeed, it is possible for a business to be part of both the Establishment and the Next Wave at the same time.¹ However, contrasting the largely small and nimble businesses of the Next Wave with Establishment firms provides insight into current developments in the ongoing evolution of the national economy. Analysis of the extent to which the geographical and sectoral composition of Next Wave firms differs from Establishment firms provides one early indicator of changes in industries and economic regions that have the potential to re-shape the Canadian economy in the decades to come. This work attempts to build on the literature of business location and economic development by investigating the nature of regional and sectoral growth in Canada's emerging economy.

Study Context

Head Office Location Research

This study draws from two research streams within regional science. One foundational line of inquiry for this study is that of quaternary location, focused specifically on head office activities but highly related to a separate line of research into linked, information-rich business service functions such as marketing, accounting, and legal services. Over the past decades, several researchers have studied the evolving pattern of quaternary and business service activities in North America and around the world. Much of this effort has focused on tracking the spatial distributions of the largest and most nationally- and globally-important businesses (Semple 1973, 1996; Lyons 1994; Wheeler 1988). Study of the head office location patterns of world-leading North American businesses such as General Motors, Royal Bank of Canada, Hewlett-Packard, George Weston, and Boeing has reinforced the

1. The media giant CanWest Global appears in both groups analyzed in the study, along with Establishment counterparts Biovail, Creo, FirstService, SoftChoice, MacDonald Dettwiler and Associates, AltaGas Services, and Patheon. These firms must be acknowledged as the minority, but their concurrent Establishment and Next Wave status demonstrates that the two business lists are not implicitly mutually exclusive. In general, it is difficult for a large firm to achieve the high percentage growth rates that are necessary to appear on the Next Wave list, even though such an industry giant may be achieving remarkable absolute dollar value growth (and percentage growth rates that please their investors). This research does not dispute the national and regional importance of Ford or General Motors making a billion-dollar investment in a new plant, and the business growth and employment creation that would be associated with such an investment. Even though this growth is significant for the Canadian economy, this kind of growth lies outside the true focus of this paper. Instead, it is the growth of the individually-unknown small firms, and the initially-unpublicized discoveries of new technologies and business ideas associated with these businesses, that forms the focus for analysis and comparison with the Establishment outlined here.

importance of the urban hierarchy as a primary force in shaping head office location.

Despite the fundamental influence of the urban hierarchy over head offices, other factors can and do play major roles in quaternary location. As Wal-Mart's Bentonville, Arkansas head office location illustrates, the urban hierarchy is not the only influence on head office location. Outside of the urban hierarchy, previous research has highlighted the importance of foreign linkages (Semple 1996; Meyer and Green 2003), parent-subsidiary linkages (Meyer and Green 2003), information flows (Mitchelson and Wheeler 1994; Walcott and Wheeler 2001), corporate influence networks (Rice and Semple 1993), and legal and regulatory barriers (Semple and Rice 1994) in measuring and influencing the ability of urban areas to host quaternary and elite information-based business functions.

One observation that can be made of the quaternary location literature cited above is that the overwhelming emphasis has been on large firms. This emphasis is understandable given the dominance of large industrial and service empires in our globalizing economy. However, such a focus leaves unexamined the emergence of firms and industries that are small, but fast-growing, with the potential to gain national and international prominence in the decades to come.² The literature on the head office location of these small firms is sparse, but suggestive of the need for further research. Wheeler (1990) studied fast-growing private firms in the United States, finding that they were more likely to be headquartered in non-traditional head office centres, more likely to be found in suburban locations, and more likely to fall in the service sector than their larger, establishment counterparts. Rice (2004) compared rapidly-growing public and private firms in Canada (the "next wave") with the large-company establishment, and also found a bias toward suburban locations among next wave companies. However, in contrast to Wheeler's (1990) study of American firms, Rice (2004) observed little tendency for Canadian next wave firms to locate in urban areas that were not already prominent hosts of large-firm head offices. Rice's research found only one province, British Columbia, where the region's share of the national next wave community was substantially larger than its share of establishment firms (18% of Canada's next wave firms versus 9% of the establishment).

The work of Wheeler (1990) provides a precedent for more investigation into next wave firms, as well as defining some directions for investigation of these businesses in Canada. Rice (2004) provides a partially comparable analysis for Canada in finding limited geographic dispersion of next wave firms outside of the largest traditional head office centres, but Rice's analysis does not address the sectoral orientation of next wave businesses in Canada. What is the sectoral profile of Canada's next wave firms? Does this profile vary from region to region across the country? Is there anything unique about British Columbia's business commu-

2. One good, historical example would be the emergence of the rapidly-growing Ford Motor Company, established June 16, 1903 by Henry Ford and 11 associates with a total of \$28,000 in cash (Ford 2004). Any study following recent large-firm norms of quaternary investigation conducted in Ford Motor Company's earliest years would have missed out on this important development completely.

nity that might account for its next wave success? These questions will be further addressed in the research premise section, but first the study develops the conceptual background for this research in terms of geography's evolving understanding of the location and distribution of economic growth.

Growth Poles, Growth Centres and Clusters of Industry

A second research stream of importance to this work is the study of the spatial and aspatial foci of growth in our modern economy. Perroux's (1955) growth pole conceptualization initiated wide-spread debate and investigation by regional scientists, focused on the idea that an industry or a group of firms within an industry can propel the growth of a wider collection of firms based on external economies of agglomeration and scale. Such external economies are formed and transmitted through the external linkages all firms possess, such as between supplier and customer. Perroux's conceptualization of inter-firm relationships and groupings took place outside of geographic space, however, as Perroux's growth poles were not geographic places or regions. Rather, in Perroux's formulation, firms in a growth pole are bound together in abstract economic space, where groupings are formed by strong inter-firm ties and not geographic proximity.

Others made the step into geographic space that the Perrouxian conceptualization of growth poles avoided. Myrdal (1957) and Hirschman (1958) both contributed a geographic dimension to the literature. In Myrdal's terminology, a growing urban centre could have both positive (spread) and negative (backwash) effects on its surrounding geographic region. Myrdal saw spread and backwash effects operating simultaneously, so that it is the net impact of the two that determines whether the growing centre has a positive or negative impact on growth in the surrounding region.

Since the 1950s others have added to the geographic literature of growth based on inter-firm linkages. In North America, study of the growth pole concept has focused on *growth centres*, emphasizing the role of geographic location (Harrison et al 1996). Friedmann's (1973) formulation of *core-periphery theory* is a distinct but related development of geographic thought surrounding economic growth, conceiving of a diversified, dynamic core region and a poor, resource-dependent periphery. The core-periphery concept has been applied to the study of economic activity at multiple geographic scales, from global and national to regional and local (Chamey 2003; McCann and Simmons 2000; Rice 1996). From a regional and local perspective, Porter (1998, 2000) has conceptualized *clusters* as geographic groupings of inter-linked organizations, including businesses, universities, and government agencies. Porter argues that even though advanced transportation and communication technologies might appear to make geographic proximity increasingly meaningless, businesses who are members of such geographic groupings benefit from close relationships and special access to knowledge and resources that those at a distance cannot duplicate. Especially in complex, knowledge-based industries, clusters confer a competitive advantage on their members that propels the growth of the group as a whole (Pinch et al 2003).

Considered collectively, the literature of quaternary location and growth poles/growth centres provides a framework for study of growing head office centres in Canada's regions. The next sections attempt to portray the location of the dynamic next wave group of firms against the backdrop of the wider economy, as represented by the dominant establishment group of companies. Starting from the conceptual development and empirical findings summarized above, the following case study explains the study's data sets and research questions to be investigated.

Case Study

Data

The case study analyzes information from two distinct databases for 2002. The first database includes the largest companies in Canada, a group of businesses known collectively as the *establishment*. Information for this database comes from a variety of sources, including most prominently the annual publications of the *Financial Post*, *Globe and Mail*, and *Dun & Bradstreet*. The *Financial Post* and *Globe and Mail* publish annual listings of the top companies in Canada by annual revenues and profits respectively. *Dun & Bradstreet* publishes an annual *Key Business Directory* listing the top companies in Canada with their sizes measured by annual revenues. The establishment database has also been supplemented in the British Columbia and Saskatchewan regions with information gathered from the business listings produced by *BC Business* magazine, the *Saskatoon Star-Phoenix* and *Regina Leader-Post*, and *Saskatchewan Business* magazine. By region, the establishment database analyzed in this work includes the 300 largest firms in Ontario and Quebec, 100 largest firms in British Columbia, and 50 largest firms in Saskatchewan.

By economic sector, the study standardizes the classification used across all databases in the study. Each data source consulted uses a different means of representing the industry or sector of operation for each business, either by means of an industry classification system or by use of a short, sentence descriptor of each company's operations. The standard sectoral classification used in this study is based on the SIC system, and has been used in several previous studies of head office location in Canada and the United States (Semple 1973, 1996; Rice and Semple 1993; Rice 1996, 2003). This system breaks the economy into resource, service, manufacturing, finance, and utility sectors, which are collectively broken into a total of 33 subsectors. The modification to this established system from past studies has been the addition of new subsectoral classifications within the manufacturing and services sectors to reflect the updated *North American Industry Classification System* for 2002.³

3. The study does not use the 2002 *NAICS* classification, in part to maintain continuity with the previous studies cited in the paper text, and in part because *NAICS* includes industry classifications (such as public administration, health care and social assistance) that fall largely outside of the realm of the Canadian for-profit businesses that are the subject of the study. The study achieves some of the benefit of the updated *NAICS* system by introducing *NAICS* classes such as accommodation and food services into the study's sectoral classification.

TABLE 1 Top Establishment Firms by Region, 2002

Ontario/Quebec					
Rank	Company Name	City	Revenues	Sector	Subsector
1	General Motors of Canada	Oshawa	\$37,000,000	Manu.	Transport. Equip.
2	George Weston Ltd.	Toronto	\$27,446,000	Service	Diversified
3	Bombardier Inc.	Montreal	\$23,664,900	Manu.	Transport. Equip.
4	Ford Motor Co. of Canada	Oakville	\$23,328,700	Manu.	Transport. Equip.
5	Royal Bank of Canada	Montreal	\$23,234,000	Financial	Bank
6	Sun Life Financial Services	Toronto	\$23,101,000	Financial	Insurance
7	Onex Corp.	Toronto	\$22,653,000	Service	Diversified
8	Magna International	Aurora	\$20,364,470	Manu.	Transport. Equip.
9	BCE Inc.	Montreal	\$19,768,000	Service	Communication
10	Alcan Inc.	Montreal	\$19,687,800	Resource	Mining
British Columbia					
Rank	Company Name	City	Revenues	Sector	Subsector
1	Telus	Vancouver	\$7,006,700	Service	Communication
2	BC Hydro & Power	Vancouver	\$6,311,000	Utility	Electrical
3	The Jim Pattison Group	Vancouver	\$5,500,000	Service	Diversified
4	Finning International	Vancouver	\$3,207,486	Service	Retail
5	Westcoast Energy	Vancouver	\$2,871,000	Utility	Gas
6	Insurance Corp. of BC	Vancouver	\$2,738,814	Financial	Insurance
7	H.Y. Louie	Vancouver	\$2,500,000	Service	Wholesale
8	Teck Cominco	Vancouver	\$2,187,000	Manu.	Metals
9	Canfor	Vancouver	\$2,112,000	Manu.	Forestry
10	HSBC Bank Canada	Vancouver	\$1,896,000	Financial	Bank
Saskatchewan					
Rank	Company Name	City	Revenues	Sector	Subsector
1	Federated Co-operatives Ltd.	Saskatoon	\$3,232,000	Service	Wholesale
2	Potash Corp. of Sask. Inc.	Saskatoon	\$3,004,666	Manu.	Chemical
3	Saskatchewan Wheat Pool	Regina	\$2,781,292	Service	Wholesale
4	IPSCO Inc.	Regina	\$1,698,283	Manu.	Metal
5	Canpotex Inc.	Saskatoon	\$1,400,000	Service	Wholesale
6	Saskatchewan Power Corp.	Regina	\$1,124,000	Utility	Electrical
7	SaskTel	Regina	\$893,485	Service	Communication
8	Nexen Canada	Regina	\$856,400	Resource	Oil & Gas
9	Cameco	Saskatoon	\$748,334	Resource	Mining
10	SaskEnergy Incorporated	Regina	\$654,450	Utility	Gas

Table 1 lists the top ten firms in each of the three study regions for the establishment group of businesses. The listing for each region represents the importance of the largest centres in the urban system as business hosts: in the Ontario/Quebec heartland, the Toronto region and Montreal; in British Columbia, Vancouver; in Saskatchewan, Saskatoon and Regina. Across the three regions, the

lists reflect much sectoral diversity, as a wide range of economic sectors and subsectors are represented. However, in two of the regions certain sector/subsector combinations stand out: *manufacturing/transportation* equipment in Ontario/Quebec, and *service/wholesale* in Saskatchewan. The lists also represent one common tie among all regions: all three lists include the region's dominant telecommunications provider (BCE in Ontario/Quebec, Telus in British Columbia, and SaskTel in Saskatchewan).

The second database used in the study includes the fastest-growing businesses by annual revenues in Canada for 2002. This is the group called the *next wave*, as these firms represent new sources of economic growth. Information for the Ontario, and British Columbia next wave databases comes from *Profit Magazine's* annual listing of Canada's fastest growing companies. However, as no Saskatchewan firms met the criteria for inclusion in *Profit's* 2002 list, the database includes a second, provincial list for Saskatchewan compiled by *Saskatchewan Business* magazine. The criteria for inclusion in the *Saskatchewan Business* list differ slightly from the *Profit* list. In *Profit's* national database, corporate revenue growth is measured in percentage terms over a five year period, so this database reflects growth over the years 1997 to 2002. For the Saskatchewan database, revenue growth is measured over a three year period, reflecting growth from 1999 to 2002.⁴ This research analyzes all Ontario-Quebec and British Columbia businesses appearing in *Profit's* top 200 database (134 firms and 36 firms, respectively), and all 30 businesses appearing in the *Saskatchewan Business* list.

Table 2 lists the top ten firms in each of the three study regions for the next wave group of businesses. Nine of the ten next wave businesses listed in the table for Ontario/Quebec are located in Ontario (Toronto region and Ottawa), while British Columbia's entries are located in metropolitan Vancouver and metropolitan Victoria on Vancouver Island. Saskatchewan's top next wave firms from Table 2 are again located exclusively in Saskatoon and Regina. By sector, the common element among the three regions is the presence of business service firms in all three.

The summary and discussion of businesses in Tables 1 and 2 gives some detail as to specific firms and places involved in the establishment and next wave business communities in the three study regions. However, limited listings of a few top firms do not give an indication of trends characterizing the full business databases catalogued for this research. The research premise and methodology section defines specific questions and methods for investigation of the establishment and next wave in each of the three study regions.

4. As Table 2 (and the following results section) seeks only to compare the business community of Saskatchewan with that of the other two study regions, and not to integrate the databases into a single list, the author made the judgment that including *no* next wave companies for Saskatchewan (and thus excluding the province from the study) would be a greater detriment than to include results from two data sources with slightly different criteria. Businesses appearing in the Saskatchewan database do not appear in the national database because they either (1) did not exist in 1997, or (2) they had low or negative growth in the 1997/1998 period (making their overall 1997-2002 growth too low to place on the national list). However, these businesses do represent the most rapidly-growing component of the provincial economy, and their presence in the study allows for meaningful comparisons with the other two study regions.

TABLE 2 Top Next Wave Firms by Region, 2002

Ontario/Quebec					
Rank	Company Name	City	Growth (%)	Sector	Subsector
1	Hydrogenics Corp.	Mississauga	16298	Manu.	Chemical
2	DWL Inc.	Toronto	12619	Service	Business Service
3	Gram Precision Inc.	Mississauga	8755	Manu.	Electrical/Electron.
4	Protus IP Solutions Inc.	Ottawa	7577	Service	Business Service
5	Phonetime International Inc.	Mississauga	7490	Service	Communication
6	Strategy First Inc.	Montreal	2970	Service	Business
7	IMC International	Toronto	2579	Manu/	Electrical/Electron.
8	Physical Planning Tech.	Richmond	2551	Service	Business
9	Pink Elephant	Burlington	2485	Service	Business
10	DreamCatcher Interactive	Toronto	2279	Service	Business
British Columbia					
Rank	Company Name	City	Growth (%)	Sector	Subsector
1	Extreme CCTV Inc.	Burnaby	12735	Manu.	Electrical/Electron.
2	Pearlite Display Products	Burnaby	4679	Manu.	Metal
3	Discovery Computers Cdn	Richmond	4349	Service	Retail
4	Carmanah Technologies	Victoria	3669	Manu.	Electrical/Electron.
5	ACD Systems International	Saanichton	3442	Service	Business Service
6	Coast Spas Manufacturing	Langley	3300	Manu.	Machinery
7	DTI Dental Technologies	Vancouver	2570	Service	Business
8	Medicard Finance Inc.	Vancouver	2431	Financial	Miscellaneous
9	Robeez Footwear Ltd.	Burnaby	2309	Manu.	Clothing
10	NetNation Communications	Vancouver	1908	Service	Business
Saskatchewan					
Rank	Company Name	City	Growth (%)	Sector	Subsector
1	The Edge Productions Corp.	Saskatoon	5636	Service	Communications
2	BlackSun Inc.	Saskatoon	4900	Service	Business Service
3	Hospitality Network Canada	Regina	1257	Service	Communications
4	Loose Foot Computing Ltd.	Regina	1103	Service	Business Service
5	Itracks	Saskatoon	380	Service	Business Service
6	Pillar to Post Home Inspect.	Saskatoon	250	Service	Miscellaneous
7	Hinz Automation	Saskatoon	148	Service	Business Service
8	Supreme Office Products	Regina	148	Service	Retail
9	Allan Construction Co.	Saskatoon	109	Service	Construction
10	Brandt Group of Companies	Regina	97	Manu.	Machinery

Research Premises and Methodology

Based on the foregoing literature review and the general summary data presented above, the study shifts to investigate the geographic distribution and sectoral orientation of next wave companies in each of the three study regions. The study

also includes an analysis of the dominant establishment business community as a means of providing context for comparison with the next wave results. Through these two parallel analyses, the study attempts to identify characteristics that provide insight into the level of success experienced by each of the three study regions in attracting their share of businesses and growth in Canada's emerging economy. Are there characteristics of the next wave and establishment business communities in each region that can help us to understand the region's economic fortunes? The guidance of previous quaternary research and application of growth centre ideas provides the basis for this research.

Following Wheeler's (1990) findings for the United States, the study examines the spatial and sectoral orientation of the Canada's next wave business community by study region. The sectoral analysis examines the composition of the next wave by economic sector, as well as the level of sectoral diversification within the next wave business community. Based on core-periphery theory, the sectoral analysis examines the premise that both the advanced Ontario-Quebec core region and the dynamic British Columbia region possess a diverse set of next wave businesses, indicating growth in many industries, while the small and peripheral Saskatchewan economy has less diversity and more resource orientation among its next wave firms. For all three regions, the sectoral analysis examines the premise that the service sector is prominently represented among next wave firms, in accordance with Wheeler's (1990) results for the United States.

The spatial analysis examines the geographic distribution of next wave firms within the three study regions. The spatial analysis examines two research premises, one investigating *within-region* dispersion, the other comparing dispersion levels *between regions*. Within each study region, the analysis investigates the premise that next wave companies exhibit a higher degree of spatial dispersion than their establishment counterparts. The flexible and varied location requirements of next wave firms give these rapidly-growing businesses the ability to locate more widely than establishment firms (Rice 2004). However, in comparing between regions the analysis investigates a second premise, that the high degree of success in generating next wave growth by British Columbia is accompanied by more spatial clustering of rapidly-growing firms than is found in the other regions, especially the much less dynamic Saskatchewan. Such spatial behaviour is consistent with the core insights of the growth centre literature, where close geographic associations promote inter-firm linkages that encourage growth. By contrast, Saskatchewan's weak next wave performance (i.e. no firms in *Profit* magazine's national database) could be attributed at least in part to the lack of a critical mass of dynamic firms in close geographic proximity.

To investigate the spatial and sectoral premises defined above, the study makes use of the relative entropy statistic H . Relative entropy is a measure of the dispersion in a system as a percentage of the total dispersion possible. The study uses relative entropy for this work because of its established application in economic geography in general, as well as in headquarters location research in partic-

ular (Sui and Wheeler 1993; Wheeler 1990; Berry and Schwind 1969).⁵ Applications for the relative entropy statistic fall in both spatial and aspatial realms. This study uses relative entropy to represent both the level of *diversification in an economy* (total concentration in one sector versus equal division of activity among all sectors) and *geographic dispersion of business locations* (total concentration of all businesses in one region, versus total dispersion of businesses among all regions).

Results

Using the datasets and analytical method described, the study develops a profile of the spatial and sectoral structure of the economy in each of the three study regions. Beginning with the sectoral analysis, Table 3 provides an overview of the composition of the economies of the study regions by sector. Table 3 allows a direct comparison between the establishment and next wave by region. The most notable result from this table is that, as expected, the service sector is much more strongly represented in the next wave group of businesses than in the establishment for both the Ontario-Quebec core and for Saskatchewan. However, this does not hold true for British Columbia. The dominance of the service sector in Saskatchewan's next wave (83% of next wave firms versus 46% of establishment firms) and a relative lack of service representation in British Columbia's next wave (44% of the next wave versus 49% of the establishment) are key findings.

Table 4 continues the sectoral analysis using the relative entropy statistic H to represent the level of diversification in each regional economy. The table shows that the next wave is more specialized by sector and subsector than the establishment group of businesses in each region. The table also shows that, with an H -value of 62.2%, British Columbia's next wave group is the most diverse of the three regions, while Saskatchewan's is the most specialized with an H -value of 46.2%. Table 3 has already demonstrated that Saskatchewan's specialization is heavily oriented to the service sector. "Retail services" and "business services" explain most of Saskatchewan's sectoral concentration. These two service subsectors alone account for 53% of the companies in Saskatchewan's next wave

5. The relative entropy statistic H is calculated according to equations 1 and 2.

$$H = \sum_{i=1}^n p_i \ln \left(\frac{1}{p_i} \right) \quad (1)$$

$$\hat{H} = \left(\frac{H}{\ln n} \right) 100 \quad (2)$$

Equation 1 calculates H , the absolute entropy of the study system. In equation 1, p_i is the proportion of all members of a particular database that fall within class i , and n is the total number of classes. Equation 1 does not account for system's size. Equation 2 makes the result of equation 1 meaningful by calculating the unadjusted H value as a fraction of the maximum possible entropy in the system, $\ln n$ (Sui and Wheeler 1993; Wheeler 1990).

TABLE 3 Sectoral Composition by Study Region, 2002

Ontario/Quebec		
Economic Sector	Establishment (% of all Firms)	Next Wave (% of all Firms)
Finance	18%	3%
Manufacturing	36%	28%
Resource	3%	0%
Service	40%	70%
Utility	3%	0%
<i>Number of Firms</i>	300	134
British Columbia		
Economic Sector	Establishment (% of all Firms)	Next Wave (% of all Firms)
Finance	13%	6%
Manufacturing	31%	42%
Resource	4%	0%
Service	49%	44%
Utility	3%	0%
<i>Number of Firms</i>	100	36
Saskatchewan		
Economic Sector	Establishment (% of all Firms)	Next Wave (% of all Firms)
Finance	26%	0%
Manufacturing	18%	13%
Resource	6%	3%
Service	46%	83%
Utility	4%	0%
<i>Number of Firms</i>	50	30

TABLE 4 Sectoral Diversification by Region and Business Community, 2002

Region	Relative Entropy H in the Establishment Database by Sector and Subsector *	Relative Entropy H in the Next Wave Database by Sector and Subsector *
Ontario/Quebec	89.2%	56.2%
British Columbia	79.2%	62.2%
Saskatchewan	78.9%	46.2%

Note: * An *H*-value of 0% would indicate total concentration in one sector/subsector combination (such as resource/mining), while an *H*-value of 100% would indicate total diversification among all 5 sectors and 33 subsectors of the economy. This analysis is based on a full decomposition of business activity into sectors and subsectors, while the summary provided in table 3 only summarizes activity at the relatively broad sector level.

database, compared with a total of 13% for all subsectors in manufacturing. By contrast, British Columbia's next wave has 44% of its members in all service subsectors, and 42% in manufacturing.

In the spatial analysis, Figures 1 and 2 illustrates the concentrations of Establishment and Next Wave firms for each of the three study regions. The figures map

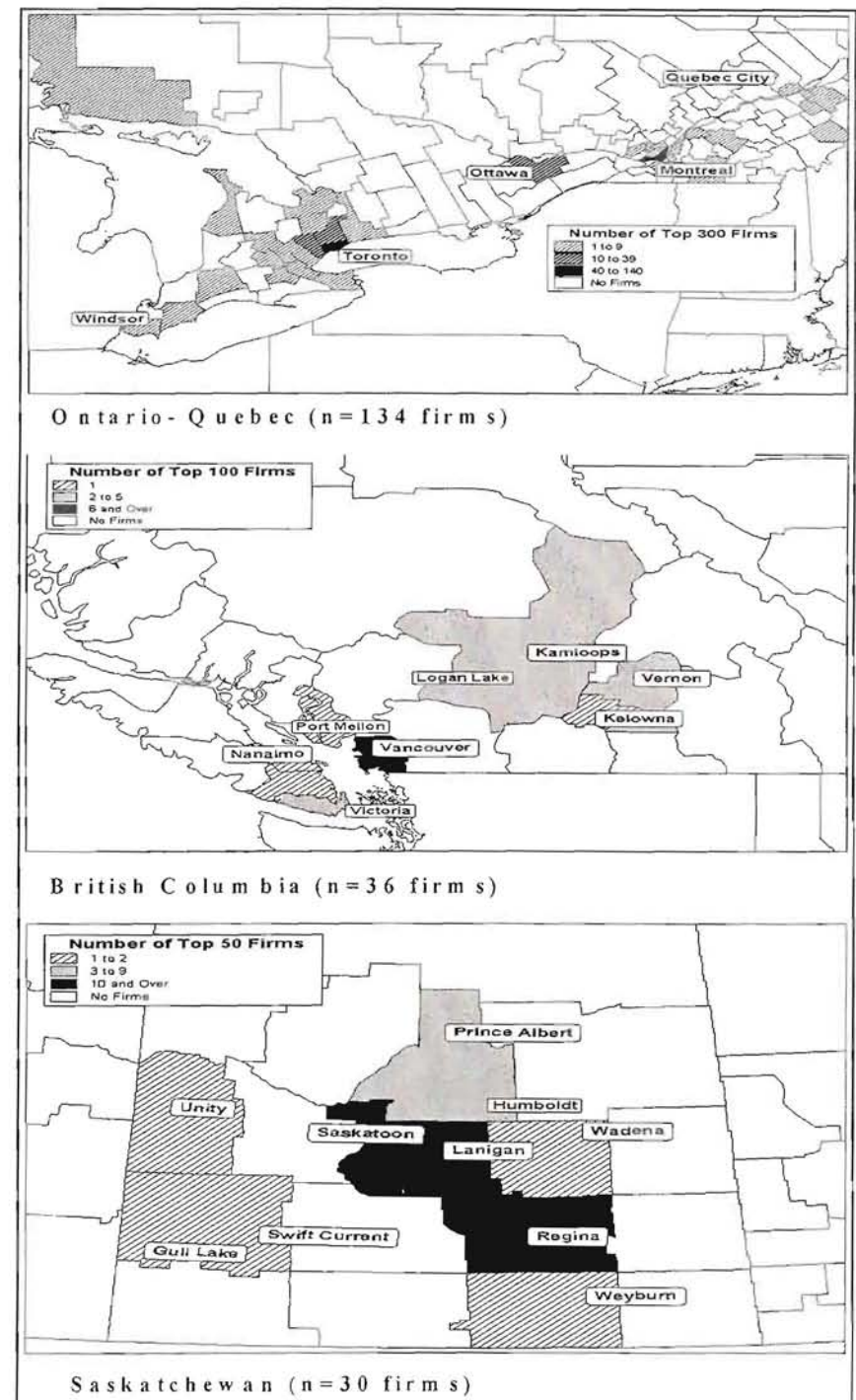


FIGURE 1 Top Establishment Businesses by Census Division for Three Study Regions, 2002

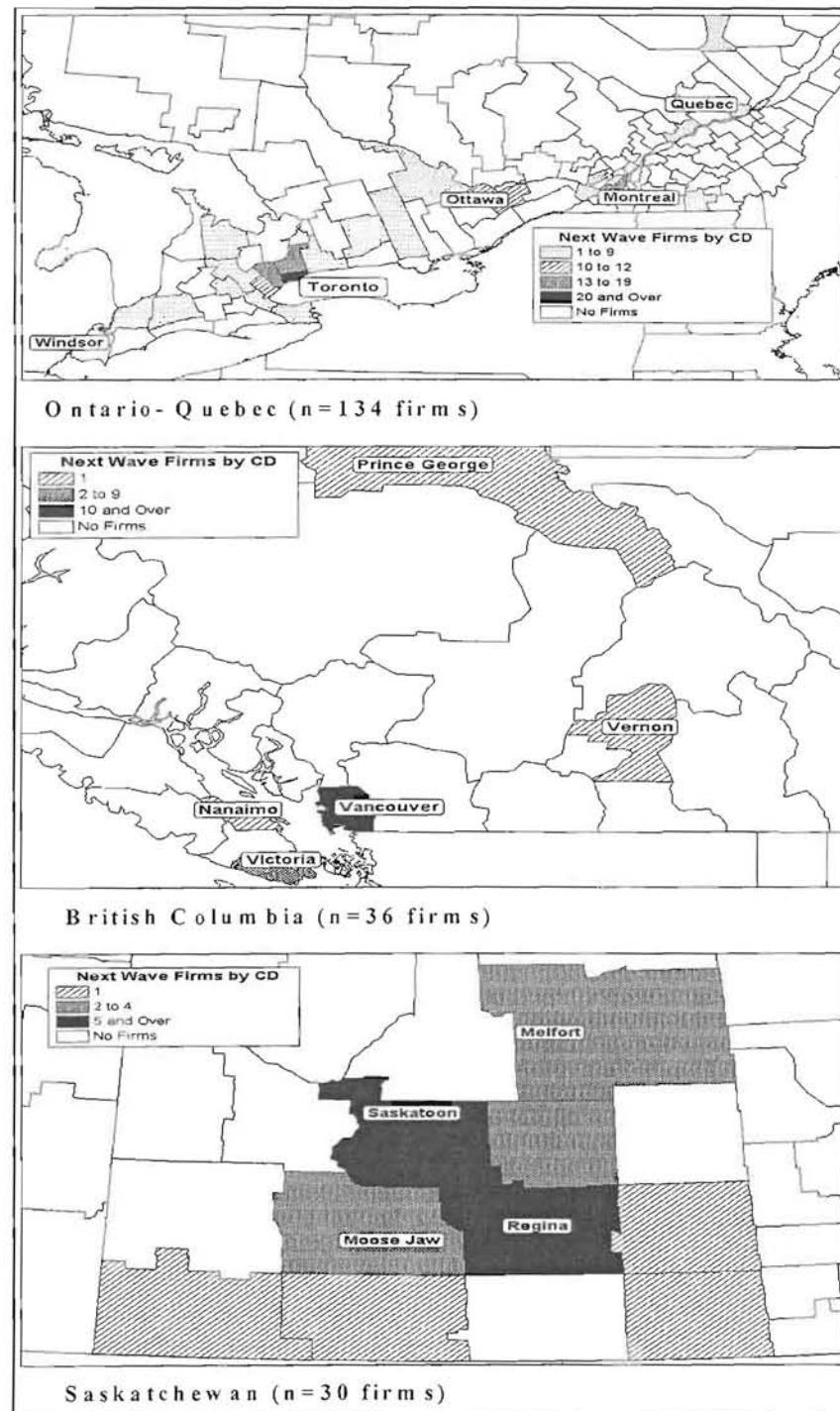


FIGURE 2 Top Next Wave Businesses by Census Division for Three Study Regions, 2002

TABLE 5 Geographic Dispersion by Region and Business Community, 2002

Region	Relative Entropy H in the Establishment Database by Census Division*	Relative Entropy H in the Next Wave Database by Census Division *
Ontario/Quebec	42.9%	49.1%
British Columbia	17.5%	26.6%
Saskatchewan	43.5%	61.3%

Note: * An H -value of 0% would indicate total geographic concentration in one census division in the region, while an H -value of 100% would indicate total dispersion among all census divisions in the region.

the clustering of businesses in the major urban areas of each study region. The regional maps allow for a graphical comparison of the spatial characteristics of the business community in each region, highlighting the extreme concentration of both Establishment and Next Wave businesses in British Columbia compared to the other two regions. Table 5 quantifies the map trends of Figures 1 and 2 by summarizing the relative entropy statistical results, in this case representing the spatial dispersion of the two groups of firms by region. The table shows that the next wave group of companies is more spatially dispersed than the establishment group in all study regions. However, the table also reinforces the concentration evident in British Columbia's next wave ($H=26.6\%$) in comparison with the other two regions. The calculations show that Saskatchewan falls at the other end of the scale from British Columbia (Saskatchewan $H=61.3\%$), while the Ontario-Quebec core falls between the other two regions (Ontario-Quebec $H=49.1\%$).

Discussion and Conclusion

This investigation has highlighted differences in spatial and sectoral behaviour among the next wave and establishment business communities of the Ontario-Quebec core region and the British Columbia and Saskatchewan peripheral regions. The analysis has illustrated the geographic concentration and sectoral diversity that characterizes the next wave in British Columbia, a region that has a substantial share of Canada's next wave compared to the province's establishment business base. This finding contrasts with the geographic spread and sectoral specialization of next wave firms in Saskatchewan, a province with a weak next wave performance in a national context. Ontario-Quebec, the country's long-dominant economic core, maintains its traditional national supremacy through the unparalleled diversity of its establishment business community and numerical control of the country's next wave (134 of the top 200 next wave firms).

With respect to the specific research premises defined earlier in this paper, the study findings support the sectoral premise, that Saskatchewan's next wave community is less diverse than its other two regional counterparts, and that the service sector is a key component of the next wave in all three study regions. However, the study did not find a resource orientation in Saskatchewan's next wave, as suggested in the sectoral premise. Rather, Saskatchewan's next wave is more heavily

oriented to services than for the other two study regions. This finding may be reconciled with the original resource expectation by noting that at least 11 of the 29 non-resource firms in Saskatchewan's next wave database have ties to the resource sector as major suppliers to resource and agriculture-focused businesses (retail services, transportation services, metal fabrication). The study results also support the two spatial premises, that the next wave is more spatially dispersed than the establishment in all three study regions, and that British Columbia's next wave is highly concentrated while Saskatchewan's is spatially dispersed.

The findings of this research reinforce the application of core-periphery theory to Canada, but also raise more questions. With respect to the regional development context introduced at the beginning of this paper, the most important of these questions relate to the investigation's two peripheral study regions. British Columbia's next wave strength is evident from this research, but observations of sectoral diversity and spatial clustering are only an initial step in understanding the success of this region. More study of the firms and regions associated with the province's next wave are needed to identify the factors driving this growth. Why has the growth of key provincial centres in the interior of the province, like Kelowna, Kamloops, and Prince George, not been accompanied by an increased stature for these cities in terms of the hosting of businesses? These cities collectively host a total of 2 of the province's top 100 Establishment firms. Is the extreme spatial clustering of the province's next wave firms a condition necessary for the development of next wave firms in the province, or is this clustering a mere coincidence that is not linked to business performance? Is the province's current standing a harbinger of continued growth to come, or a temporary peak with future business possibilities being brighter east of the continental divide? Experience indicates that the convergence of favourable business indicators and clustering makes mere coincidence unlikely, but further research into the role of inter-firm linkages, clusters, and other elements of the external business environment in driving next wave growth is needed to explain the growth prospects for British Columbia's economy.

The findings for Saskatchewan are also indicative of a need for further research. Given the province's long-standing economic and population struggles, what are the province's future prospects? This research demonstrates that province's economy stands in marked spatial and sectoral contrast to the more dynamic and dominant economies of British Columbia and Ontario-Quebec. What are the business and organizational strategies that the province's business community has followed that have led the province to this point? For example, geographic spread in employment and opportunity in Saskatchewan has been a part of the province's character since its establishment in 1905, when the provincial capital was awarded to Regina and the provincial university to Saskatoon. Over the decades since, the province has developed extensive involvement in its economy from Crown corporations and businesses organized as cooperatives. Do these strategies provide some hope for future growth based on the geographic literature and the experience of other communities and regions in Canada and abroad, or is some change in these or other strategies necessary to improve future growth prospects? Further research is necessary to investigate Saskatchewan's business community and possibilities

for growth, as well as build on the more general quaternary location and growth centre literature.

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