

Consistent Business Generators: Urban Leaders in Canada's Next Wave

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Economic development is a concern for all levels of government in Canada. The persistence of regional variation in economic well-being is a primary factor driving political debate and policy-making throughout the country. From federal crown corporations, such as Western Economic Diversification Canada, that are charged with the responsibility for initiating regional economic development projects, to regional and local initiatives such as municipal tax abatements and development incentives targeted at firms willing to locate in a particular community, governments in Canada have been intimately involved in attempts to diversify and strengthen the economic prospects of regions across the country. While the core-periphery model (McCann and Simmons 2000; Ceh 1997) remains a useful starting point for analyzing regional economic development in Canada, one contribution that geographers can make to the modern advancement of economic development policy in Canada and elsewhere is a measurement and assessment of the degree to which the periphery has diverged into different development regions with differential rates of opportunity, growth, and success (Hutton 2002; Halseth et al 2004). Further, geographers can provide important input to the creation of improved government policy by supplying a more subtle picture of how regional economies are actually operating and developing. The purpose of this paper is to provide a solid basis for evaluating current levels and trends in the development of the Canadian economy by region, and to give insight into the ongoing evolution

of the Canadian space-economy.

An emerging research field of relevance to regional economic development relates to the interconnected fields of innovation, the nature of knowledge and its transfer over space, and the clustering of economic activity. Innovative activity is important because it lies at the core of economic growth and development, and is central to analysis of regional economic convergence and divergence (Ó hUallacháin and Leslie 2005; Johnson and Brown 2004). Innovation and knowledge transfer are intimately linked, because knowledge is a key input to innovation, and a source of competitive advantage in the modern economy (O'Hagan and Green 2002). In turn, knowledge networks are one important factor of several that combine to promote the growth of clusters of economic activity, many of which are associated with high levels of innovation (Porter 1998). Studies focusing individually on innovation, knowledge transfer, or clustering might be conceived as examining smaller components of an evolving, larger phenomenon. Taken as a whole, the combined innovation-knowledge-clustering (I-K-C) literature examines issues of great importance to regional development within the emerging information economy in the world's core countries.

The present study addresses directly the innovation and clustering components of the I-K-C framework. This research investigates the current state of evolution of the Canadian economy by focusing on the development of clusters of the innovative firms that find themselves on the leading edge of change in the country – the rapidly-evolving firms that lead the country in absolute growth rate. While important limitations exist related to the conceptualization and analysis of these firms, this paper argues that such “next wave” firms (Rice 2004, 2005) form an important link between the state of the present national economy and the economy of the future. A geographic examination of the nature of next wave businesses within the Canadian urban system is of value in better understanding the evolution of this component of the economy and in building our capability to predict the changes that may occur as a result of the continued development of these firms.

The concept of innovation as examined here is much broader in form than is often investigated in innovation studies within geography. The innovation addressed in this research certainly encompasses technological forms of innovation, including exploratory activity that results in material invention and patent registration (Ó hUallacháin and Leslie 2005; Johnson and Brown 2004; Ceh 1997). However, innovation as examined here also includes advancements such as new business processes, ground-breaking marketing ideas, and fresh retail concepts. The focus in this paper is on the factors that allow next wave firms to expand so rapidly, regardless of source or area of advancement. Whether the innovation comes from a scientific laboratory or the mind of an entrepreneur, or whether the advancement arrives in the form of a new microelectronic technology or an original marketing idea, we argue that any innovation that is greeted by an overwhelming market response and rapid business growth is worthy of study. The innovation examined here might also be termed creativity, rather than being limited to that important subset of innovation connected to technological advancement (Florida 2002).

The following analysis examines the geography of innovation by addressing

the spatial-temporal evolution of the next wave group of firms in Canada. The study does this by implementing a set of indices that collectively provide insight into the evolving spatial form of the next wave in Canada. An initial study context section reviews the literature relating to this analysis, while a case study section outlines the datasets, methods, and research questions that form the focus for the paper. The research findings follow, with the paper concluding in a general discussion of the meaning of the study findings and their implications for continued research in this area.

Study Context

Location Analysis and Quaternary Activities

Previous advancement in the field of business location analysis forms the foundation for the present study. Investigation into the location of economic activities has occupied geographers and regional scientists for decades. Johann Heinrich von Thünen's classic analysis of the spatial distribution of agricultural production (von Thünen 1826) provided a precedent in concept and analysis that established the quantitative, neo-classical location tradition that grew to dominate economic geography through the early and mid-twentieth century. Although von Thünen is most widely cited in terms of his insights into agricultural production and relative location, it is his lesser-known development of concepts relating to the agglomeration of industry that provides the most direct link to the present study. The early recognition by von Thünen of the forces that would shape the industrial landscape, including the attraction of cities in creating industrial clusters, is an important advancement deserving of wider recognition than this aspect of von Thünen's work has received to date (Fujita and Krugman 2004).

Following on von Thünen's advancement, Weber's (1909) theory of the location of industry is widely cited for its identification of location factors of relevance to manufacturing. As with the theory of von Thünen, Weber's writing includes a core that is well-known and has proved to be influential in the development of economic geography through the early- and mid-twentieth century. The identification of transportation, labour, and agglomeration economies as key influences on the location of heavy industry is one of the classic statements of theory in the discipline. However, also as with von Thünen, Weber's work includes elements that are both important and lesser-known. Specifically, Weber's conceptualization of the structure and organization of the economy, including the identification of an element that Weber termed the "central organizing stratum" (Weber 1909: 206), forms a foundation of importance for the modern-day analysis of firm location. This acknowledgement of the role of corporate administration in shaping the evolving economic landscape demonstrates a more nuanced understanding of the business location problem than Weber is often given credit for advancing. It is to this corporate administration and control aspect of the literature of business location analysis that the present study provides a contribution.

In recent years, the investigation of evolving spatial distributions and eco-

conomic linkages associated with corporate administration and control have come under the banner of *quaternary location studies* (Semple 1985; Wheeler and Mitchelson 1989). Quaternary activities, such as corporate headquarters, decision-making, and high-level information processing, account for one sector in a four-part conceptualization of the economy, where primary (resource-based), secondary (manufacturing), and tertiary (services) activities comprise the other three. Work related to the location and linkages of quaternary activities has included research on a wide variety of topics, including head office location (Meyer and Green 2003; Klier and Testa 2002; Lyons 1994), head office relocation (DeYoung and Klier 2004), interurban networks of stock ownership (Green 1993), and interlocking corporate directorates (O'Hagan and Green 2002, 2004). However, despite the diversity of subject matter, the literature has maintained a consistent concern with understanding the factors that shape the evolving landscape of elite corporate activities. Studies of diverse elements of the external competitive environment of business are necessary because it is these elements that comprise the complex and changing system of corporate control. The present investigation contributes to the knowledge of one component of this corporate control network, outlined below, as part of a larger effort to improve our understanding of the system as a whole.

Fast-Growing Firms: Geographic Investigation of the Next Wave

One aspect of the evolving system of inter-urban corporate command and control centres that has attracted attention in recent years is the relationship between the fastest-growing companies in Canada and the largest companies in the country. Following Rice (2004, 2005), this study calls these two groups the *next wave* (fastest-growing firms) and the *establishment* (largest firms). Next wave companies are companies that may have little present size or influence, but have potential for future importance due to their shared dynamic nature – these firms collectively account for the fastest growing component of the Canadian economy. Next wave businesses such as FundTrade Financial, Angiotech Pharmaceuticals, and Diversinet have little in public profile or influence over outside firms or markets, but each has experienced a tremendous expansion in their business in recent years. Establishment companies, by contrast, are the most influential and well-known companies in the country. These firms broadly represent much of what characterizes the modern Canadian economy, a mix of the country's automobile manufacturers (General Motors of Canada, Ford of Canada), major financial institutions (Royal Bank of Canada, Bank of Montreal), national retailers (Hudson's Bay Company, Wal-Mart Canada), communications firms (BCE, Quebecor), and resource companies (EnCana, Noranda), along with assorted conglomerates (Onex, Power Corporation) that combine a vast array of business activities under one corporate banner.

Geographic investigation of the next wave group of firms has precedent in the literature of economic geography. Wheeler (1990) studied the spatial distribution of Inc 500 firms, the closest US equivalent to the Profit magazine listing in Canada. Wheeler's 1978-1987 study observed that Inc 500 firms were more likely than

Fortune 500 firms to locate in Sunbelt cities and in suburban locations. Wheeler's research also demonstrated that service firms were more prominent among Inc 500 companies than manufacturing companies. Lyons (1995) updated and extended Wheeler's work with a study of the evolution of the Inc 500 from 1982 to 1992. Lyons found that although southern and western cities were prominent Inc 500 firm generators, such a simple regional characterization was inadequate in capturing the true geographic nature of the distribution. Some Sunbelt cities, such as Miami, were important Inc 500 centres, while others, such as New Orleans, were not. Additionally, Lyons' sectoral analysis demonstrated that Inc 500 firms were concentrated largely, but not exclusively, in industries that were fast-growing themselves. Lyons took this result to be indicative of the role of fast-growing firms in the restructuring of the economy, whether as participants in the emergence of new forms of economic activity (as with the many Inc 500 firms in fast-growing sectors), or as indicators of renewal among traditional manufacturing industries (as with the remaining Inc 500 firms in slower-growing sectors).

In Canada, Ceh's (1997) study of patent and industrial directory information relates closely to the fast-growing component of the economy represented by the next wave. Ceh's research demonstrated the fundamental influence of the core-periphery relationship in shaping the spatial distribution of inventive activity in the country. Rice (2004, 2005) provides the only two analyses to date of the Profit listings of Canadian fast-growing firms. Rice's analysis based on 2002 figures showed that the Profit companies were concentrated in Canada's largest urban areas. Comparison of this Canadian next wave group of companies with the Canadian establishment showed some signs of relative decentralization on the part of the next wave, but the analysis showed that this decentralization was primarily limited to next wave locations in the regions surrounding Toronto and Montreal, versus the establishment's orientation to more central city locations in these two cities. However, other demographic evidence shows that certain metropolitan regions outside the core, almost exclusively in western Canada (e.g., Kelowna, Saskatoon, and Calgary), have recorded considerable population growth over the last 20 years (Halseth et al 2004; Foot 2002).

Building on these previous works, the present study provides a further contribution by extending the single-year analysis of Rice (2004, 2005) to a multiple-year format. Such a temporal analysis provides the opportunity to more conclusively determine the extent of decentralization of Canadian next wave and establishment companies to the periphery. In addition, a temporal analysis enables the study to address the changing sectoral composition of the national economy. Given the potential, argued earlier, of the next wave analysis to yield insight into the economy of the future, combined spatial-sectoral insights have much potential for a contribution to the literature of location analysis and economic geography in general. The following section defines the case study that forms the core of this work.

Case Study

Data

The case study investigated here analyzes data from the establishment and next wave databases. Next wave data come from the annual publication of Profit magazine's listing of the fastest-growing firms in Canada. Although this list was first published in 1991, publication of the current annual listing of the 200 fastest-growing companies in Canada only began in 1999, based on financial data for 1998. For this reason, analysis of this dataset begins with the 1998 financial year data, continuing through to data for 2004 that was published in 2005, the most recent year available at the time of writing. Establishment data come from the annual publication of the Financial Post 500, a compilation of corporate data for the largest companies in Canada. Establishment data in this form has been published for several decades. However, as the analysis involves comparison of this dataset with the next wave database, the study also uses establishment data for 1998-2004 only, and analyzes the top 200 establishment firms in each of the study years to facilitate direct comparison with the 200 firms contained in the next wave database, also for each of the seven study years.

Research Questions and Methodology

The study uses the conceptual framework and datasets outlined on the previous pages to investigate the evolving geographic distribution of establishment and next wave firms in Canada. By analyzing the changing distribution of these firms, the study attempts to relate the patterns observed to the literature of quaternary location and economic geography more generally. Below we outline our key research questions for this analysis.

The following research investigates a primary *decentralization premise* that investigates whether the comparison of next wave and establishment databases indicates any tendency toward decentralization of business in Canada. Previous work has indicated that business activity appears to remain highly concentrated in Canada, largely focused on Toronto and the surrounding region, with little prospect for decentralization (Meyer and Green 2003; Semple 1996). However, such past work dealt almost exclusively with the establishment group of firms.¹ As argued above, and similarly in previous studies by Rice (2004, 2005), next wave firms might be conceptualized as providing insight into possible changes that may characterize the future economy. Differences in spatial pattern and level of geographic concentration among next wave firms as compared to establishment firms

1. As discussed earlier in this article, Rice (2004, 2005) provides some perspective on next wave headquarters and the question of decentralization by finding limited evidence for next wave firms as decentralization mechanisms. However, the two studies examined data for a single year only, so a study involving multiple years would provide more conclusive evidence to indicate whether decentralization has been occurring in Canada, and where it might be seen.

may provide an indication of the geographic patterns that will characterize the Canadian economy of the coming years. The decentralization analysis investigates whether the establishment-next wave comparison provides evidence suggesting that the Canadian economy may be moving toward increased geographic dispersion and a decoupling of the traditional relationship between Canada's core and peripheral regions (Davis 1993; Hutton 1997, cited in Nelson and Mackinnon 2004). A more dispersed next wave in comparison with the establishment, or a next wave characterized by greater decentralizing trends in comparison with the establishment, would indicate that further decentralization within the economy as a whole may be possible for the future.

A second, exploratory *regional centre premise* investigates the geographic focus of possible regional next wave business growth across the country. Previous research (Rice 2004) identified British Columbia in general, and Victoria in particular, as prominent geographic focal points of Next Wave business activity in 2002. The regional centre analysis investigates the potential emergence of regional centres in the Canadian next wave. Does a multi-year analysis demonstrate that Rice's (2004) findings for 2002 are part of an ongoing trend seeing the potential emergence of new and important corporate centres on Canada's west coast, or did 2002 merely represent a one-time surge in activity? In addition, are there any other cities or regions in Canada that can be identified by a multi-year analysis as possible, emerging regional centres of next wave growth?

A third *consistency premise* studies the longitudinal profile of cities hosting next wave firms. This analysis examines the ability of cities to produce and host fast-growing firms throughout the study period. As previous work has continued to provide general support for, an albeit more varied, core-periphery model (Ceh 1997; Rice 2004), a logical expectation is that Toronto, Montreal, and cities located on the suburban fringe of the two major Canadian centres would lead in consistently hosting next wave firms. A lack of access to markets, suppliers, and other key resources should not prohibit cities in the periphery from generating any next wave firms, but such difficulties may create barriers to peripheral cities from creating next wave firms on a consistent basis. On the other hand, the increased diversification of opportunity and growth within the periphery's and the emergence of new regional centres may provide *in situ* new opportunities for next wave firms to emerge. This study examines the question of whether the core-periphery model continues to provide an adequate framework for explanation of next wave firm location, versus whether the evolving spatial distribution of next wave firms supports recent research pointing to the emergence of new geographic patterns of wealth and opportunity in the country.

A fourth and final exploratory *sectoral orientation premise* examines the structure of the Canadian next wave by economic sector and by city. This analysis investigates whether the Canadian next wave is uniform in business specialization from city to city and region to region across the country. Is the next wave of the Toronto and Montreal regions different in any way from the next wave firms present in major regional centres in the periphery like Calgary, Winnipeg, and Vancouver? Could sectoral orientation be linked in any way to the relative performance of each of these regional centres as next wave firm generators?

To investigate each of these research premises, the study makes use of a set of statistics calculated for each city hosting establishment and next wave firms through the 1998-2004 study period. The *trend index* indicates the direction and magnitude of business growth or decline by city over the 1998-2004 period, calculated for both the establishment and the next wave groups of companies. The trend index is the slope derived from a simple linear regression of number of firms on time. The *size index* is the mean number of establishment and next wave firms hosted by a city through the study period. Size index is a basic measure of the level of business activity occurring in each city. The *consistency index* is a measure of how much variation over time there exists in the number of next wave and establishment firms hosted by each city. Calculation of the consistency index is based on the relative entropy statistic employed in numerous studies in economic geography over the past decades (Rice 2004; Sui and Wheeler 1993; Berry and Schwind 1969). Under this calculation, a city that consistently hosts the same number of firms each year would have a consistency index of 100, while a city that hosts firms in one study year and no firms in any other year (the polar opposite of consistency) would have a consistency index of 0. Finally, the *location quotient* provides a comparison between the activity ongoing in a city and the corresponding activity occurring at the national level. For any given city and economic sector, a location quotient greater than 1 indicates that the city has a greater share of its activity in the sector than characterizes the sector within the national economy, while a location quotient less than 1 indicates that the city hosts less activity in the sector than occurs at the national level (Frederiksen and Langer 2004; Beauchesne and Bryant 1999). The study employs the four indices described above in combination to provide a comprehensive profile of the economic structure and dynamics characterizing establishment and next wave firms in Canada, as use of any one of these statistics on its own would provide an incomplete picture of these evolving urban systems.

Results

Decentralization Analysis

Beginning with investigation of the decentralization premise, Table 1 provides an overview of the top ten cities hosting next wave firms in Canada through the 1998-2004 study period. Table 1 summarizes the number of next wave firms present in each of the top cities by year, ranking the cities by size index. The table demonstrates the attraction of next wave firms to large cities and their suburbs. Considering size index alone, the table provides little evidence to indicate any tendency toward decentralization. Toronto dominates the table, with a size index (37.1) more than double that of second-ranked Calgary (16.7). Central Canadian locations dominate the top ten, accounting for five of the cities in the table. However, examination of the other indices indicates that more may be happening than a size-only analysis would indicate. Specifically, additional consideration of the trend index provides direct evidence of change within the city-system, as the top cities

TABLE 1 Next Wave Top Ten Cities by Size Index, 1998-2004

City	Prov.	Number of Next Wave Firms by Year							Size Index	Trend Index	Consistency Index
		1998	1999	2000	2001	2002	2003	2004			
Toronto	ON	41	54	36	37	31	30	31	37.1	-2.96	98.9
Calgary	AB	12	16	23	19	13	18	16	16.7	+0.21	98.9
Montreal	QC	19	14	17	13	19	15	14	15.9	-0.39	99.5
Mississauga	ON	16	12	11	12	14	13	13	13.0	-0.14	99.7
Markham	ON	13	13	13	10	9	7	6	10.1	-1.32	98.0
Ottawa	ON	8	10	9	11	10	7	9	9.1	-0.07	99.5
Vancouver	BC	5	5	7	9	11	11	15	9.0	+1.64	96.4
Winnipeg	MB	7	3	5	4	3	8	3	4.7	-0.14	96.0
Edmonton	AB	4	2	3	3	6	9	4	4.4	+0.61	94.3
Victoria	BC	2	2	3	4	7	6	7	4.4	+0.96	94.2

TABLE 2 Establishment Top Ten Cities by Size Index, 1998-2004

City	Prov.	Number of Establishment Firms by Year							Size Index	Trend Index	Consistency Index
		1998	1999	2000	2001	2002	2003	2004			
Toronto	ON	52	55	60	55	54	51	50	53.9	-0.71	99.9
Montreal	QC	33	37	36	35	34	36	34	35.0	-0.04	99.9
Calgary	AB	27	24	21	22	23	23	25	23.6	-0.21	99.8
Vancouver	BC	16	15	16	18	16	16	18	16.4	+0.29	99.9
Mississauga	ON	12	10	10	10	12	11	9	10.6	-0.18	99.7
Winnipeg	MB	7	6	6	6	7	8	8	6.9	+0.29	99.6
Ottawa	ON	2	3	6	6	6	5	5	4.7	+0.46	97.1
Saskatoon	SK	3	3	2	3	3	3	3	2.9	+0.04	99.6
Markham	ON	4	3	2	2	3	3	3	2.9	-0.07	98.7
Edmonton	AB	3	2	3	3	3	3	3	2.9	+0.07	99.6

vary in trend index from +1.64 (Vancouver) to -2.96 (Toronto). Indeed, all five of the central Canadian cities in the table possess a negative trend index, while of the five remaining cities (each in western Canada), all but Winnipeg have a positive trend index. However, the consistency index places the other figures in context by indicating that the magnitude of any 1998-2004 shift was not large, as each of the city values are in excess of 90 on the 0 to 100 consistency scale. All ten cities produced next wave firms with a fair degree of regularity through the study period.

Table 2 provides a counterpart to the next wave findings of Table 1 by listing the corresponding figures for the top ten urban hosts of establishment firms through the study period. The establishment ranking in many respects compares

TABLE 3 Next Wave vs. Establishment Top Ten City Comparison, 1998-2004

	Number of Firms by Year							Size Index	Trend Index	Consistency Index
	1998	1999	2000	2001	2002	2003	2004			
Next Wave Top Ten Total	127	131	127	122	123	124	118	124.6	-1.61	99.9
Estab. Top Ten Total	159	158	162	160	161	159	158	159.6	-0.07	100.0

quite closely with the next wave list. Comparing the two tables, nine of ten cities appear in both rankings, with Victoria appearing only in the next wave table and Saskatoon appearing only in the establishment table. As in Table 1, Toronto dominates the establishment table in terms of size, with a 53.9 size index. The establishment's second-place Montreal achieves a size index of 35.0. Compared with first place Toronto and second place Calgary in the next wave ranking (size indices of 37.1 and 16.7, respectively), it appears that the establishment group of firms is more concentrated by city than the corresponding next wave grouping.

Table 3 provides key figures to substantiate this inter-group comparison. Collectively, the top ten cities of the Canadian next wave account for a size index of 124.6, versus 159.6 for the establishment top ten. The table also shows that the top ten cities for both groups of firms are highly consistent in their hosting of next wave and establishment headquarters (consistency indices of 99.9 and 100.0, respectively), but that the next wave's top ten cities have a much more pronounced trend toward losing top 200 firms to the rest of the country (-1.61) than the establishment's top ten cities (-0.07). The figures show that the Canadian next wave tends to more dispersion than the Canadian establishment, both through the current location of firms (less next wave concentration in Toronto specifically, and in the top ten cities) and through current trends (greater transfer of next wave activity from the top ten cities to the other cities in the country). These results indicate that change is occurring in the spatial distributions of the location of business in Canada, and that the next wave group of companies may well be an agent of change in the Canadian space-economy. However, the results also indicate that this change appears to be occurring slowly and incrementally, not rapidly and radically.

Regional Centre Analysis

Proceeding to the regional centre investigation, Table 4 shifts the focus to a ranking of next wave cities by trend index. The table lists the top ten cities in the Canada by next wave growth from 1998-2004. This ranking reveals some geographic clustering of next wave growth, but the patterns depicted appear to defy a simple core-periphery characterization. British Columbia is prominent among these growing, next wave cities, as four of the ten cities listed come from the province. An additional western Canadian entry comes from Alberta (Edmonton), while the remainder of the cities is found in the Canadian heartland of Ontario and Quebec. Each of these heartland cities lies in the heavily-urbanized Quebec-

TABLE 4 Next Wave Top Ten Cities by Trend Index, 1998-2004

City	Province	Size Index	Trend Index	Consistency Index
Vancouver	BC	9.0	1.64	96.4
Burnaby	BC	4.0	1.25	88.3
Victoria	BC	4.4	0.96	94.2
Laval	QC	1.9	0.64	78.4
Edmonton	AB	4.4	0.61	94.3
Quebec City	QC	1.1	0.32	80.1
Kitchener	ON	0.7	0.32	68.5
Oakville	ON	3.1	0.29	98.1
North Vancouver	BC	0.9	0.29	80.2
Niagara-on-the-Lake	ON	0.4	0.29	32.7

TABLE 5 Next Wave Bottom Ten Cities by Trend Index, 1998-2004

City	Province	Size Index	Trend Index	Consistency Index
Montreal	QC	15.9	-0.39	99.5
Richmond Hill	ON	2.7	-0.39	96.0
Woodbridge	ON	1.4	-0.39	80.0
Halifax	NS	1.3	-0.43	78.3
Surrey	BC	2.0	-0.50	91.1
Waterloo	ON	2.6	-0.61	87.7
Kelowna	BC	2.0	-0.64	82.8
Markham	ON	10.1	-1.32	98.0
Concord	ON	2.3	-1.50	91.0
Toronto	ON	37.1	-2.96	98.9

Windsor corridor, but neither Toronto nor Montreal is included. Rather, the table reflects the emergence of Laval and Oakville, on the fringes of the two major metropolitan areas, and Niagara-on-the-Lake, Kitchener, and Quebec City, centres of regional importance in southern Ontario and Quebec falling outside the immediate metropolitan areas of Toronto and Montreal.

Table 5 provides additional detail representing the complexity of next wave growth centres. This table includes the bottom ten cities in Canadian next wave growth, or the cities that saw the largest decline in the number of next wave firms hosted from 1998-2004. Seven of the ten cities in the table come from Ontario and Quebec. However, since Table 4 identified five cities from the same two provinces as next wave leaders, the heartland region cannot be classified in its entirety as either a source of next wave growth or decline. Similarly, British Columbia is a

TABLE 6 Next Wave Cities by Consistency Index, 1998-2004

Consistency Index	Total Cities in Country	Cities in Toronto Region ¹	Cities in Montreal Region ¹	Cities in Vancouver Region ¹	Other Large Cities ²
100.0 (Perfectly Consistent)	1	1	0	0	0
90.0 to 99.9	17	7	1	3	4
80.0 to 89.9	11	2	1	2	1
50.0 to 79.9	24	1	4	2	0
0.1 to 49.9	37	3	2	1	0
0.0 (Perfectly Inconsistent)	54	6	6	0	0
Total	144	20	14	8	5

Note: 1. Number of cities hosting next wave firms and located within 50 km of the metropolitan area downtown.

2. Calgary, Edmonton, Winnipeg, Ottawa, Quebec City.

major contributor to the Table 4 ranking of next wave growth centres, but it also contributes two cities to the Table 5 ranking of next wave declining centres. Taken together, Tables 4 and 5 depict an emerging situation that requires a higher level of conceptual complexity than a straightforward application of core-periphery theory would provide.

Consistency Analysis

Table 6 continues the study by examining Canadian cities by consistency index. This analysis examines the expectation that cities from the country's core regions should dominate as consistent hosts of next wave firms throughout the 1998-2004 study period. Rather than ranking the top cities, Table 6 focuses on the consistency of cities within the country's major metropolitan areas. This table represents various levels of consistency, from perfectly consistent (100.0, hosting the same number of next wave firms each year) through to perfectly inconsistent (0.0, hosting next wave firms in only one year out of the seven year study period). The table supplies details on three metropolitan regions: Toronto and Montreal (the primary focal points of this analysis), and Vancouver, the largest metropolitan region located outside of Ontario and Quebec. For each of these metropolitan regions, the table provides a breakdown of the consistency indices for the central city in each region, as well as all other cities within 50 km of the central city that also host next wave firms. Lastly, the table examines the consistency of the next five largest cities, Ottawa, Calgary, Edmonton, Winnipeg, and Quebec City.

The figures represented in Table 6 lend evidence both for and against the consistency premise. Results for Toronto demonstrate that the region includes many highly consistent next wave hosts, including the only perfectly consistent next wave city in the country (Norval), a highly consistent core (Toronto's consistency index is 98.9), and some large and consistent suburban centres (such as

TABLE 7 Establishment Cities by Consistency Index, 1998-2004

Consistency Index	Total Cities in Country	Cities in Toronto Region ¹	Cities in Montreal Region ¹	Cities in Vancouver Region ¹	Other Large Cities ²
100.0 (Perfectly Consistent)	13	5	3	0	0
90.0 to 99.9	19	4	1	2	4
80.0 to 89.9	3	1	0	0	1
50.0 to 79.9	8	1	0	0	0
0.1 to 49.9	7	2	0	1	0
0.0 (Perfectly Inconsistent)	6	0	2	0	0
Total	56	13	6	3	5

Note: 1. Number of cities hosting establishment firms and located within 50 km of the metropolitan area downtown.
2. Calgary, Edmonton, Winnipeg, Ottawa, Quebec City.

Mississauga and Markham, at 99.7 and 98.0 respectively). However, the region's 20 next wave cities also include 9 cities with consistency index scores less than 50, indicating a substantial degree of inconsistency in next wave hosting (including cities such as Milton, Aurora, and Whitby). The results for Montreal run even further against the consistency premise, with only 1 regional city (Montreal itself) exceeding 90.0 in consistency index (versus 8 cities in the Toronto region), while 8 of the Montreal-area's 14 cities fall below 50.0 in consistency. Vancouver, on the other hand, has 3 of its 8 area cities exceeding 90.0 in consistency, with only 1 falling below 50.0. Of the other five other large cities, 4 exceed 90.0 in consistency value.

Table 7 supplies a parallel, establishment analysis for comparison purposes. The table shows that many more cities are perfectly consistent establishment firm hosts (13 in total across the country, including 8 in the Toronto and Montreal regions, versus 1 country-wide among next wave host cities). An additional 5 Toronto and Montreal-region cities exceed 90.0 in consistency index, out of a total of 19 such cities in the country. Only 6 cities are perfectly inconsistent establishment firm hosts country-wide, with 2 of these cities being found in the Montreal region and none in the Toronto region.

Sectoral Orientation Analysis

Tables 8 and 9 complete the findings with a joint analysis of the sectoral orientation of the next wave and establishment. Rather than attempting an analysis using the full NAICS (North American Industry Classification System), for manageability the analysis categorizes each study firm into one of nine broad sectors:²

2. Specifically, the three-digit NAICS codes we combine to form the nine sectors used in this analysis are as follows: Sector 1, basic manufacturing: 311, 315, 316, 322, 331, 332, 333, 336, 337; Sector 2, high technology manufacturing: 325, 326, 334, 335, 339; Sector 3, communications: 323, 511, 512, 515, 516, 517, 518, 519; Sector 4, FIRE: 522, 523, 524, 525, 531, 541, 561, 611, 621, 811; Sector 5,

TABLE 8 Total Numbers of Firms by Sector, 1998-2004

	Basic Manu.	High Tech.	Com. & Software	FIRE	Divers.	Transport, Utilities	Resource- Based	Retail/ Wholesale
Establishment	304 (21.7%) ¹	180 (12.8%)	90 (6.4%)	179 (12.8%)	68 (4.9%)	123 (8.8%)	156 (11.1%)	249 (17.8%)
Next Wave	183 (13.1%) ²	239 (17.1%)	316 (22.6%)	357 (25.5%)	28 (2.0%)	38 (2.7%)	24 (1.7%)	152 (10.8%)
Total	487 (17.4%) ³	419 (15.0%)	406 (14.5%)	536 (19.1%)	96 (3.4%)	161 (5.8%)	180 (6.4%)	401 (14.3%)

Note:
 1. Percent of all establishment firms.
 2. Percent of all next wave firms.
 3. Percent of all establishment and next wave firms combined.

1. Basic manufacturing
2. High technology manufacturing, including electronics, pharmaceuticals, and chemicals
3. Communications, including telecommunications and all forms of paper and electronic publishing, and software development and publishing
4. Finance, insurance, and real estate (FIRE)
5. Diversified conglomerates
6. Transportation and utilities
7. Resource-based firms, including related services
8. Retailers and wholesalers
9. Miscellaneous other firms not categorized above (a small and very diverse assortment of firms, not analyzed)

Table 8 provides an indication of the activity level in each sector in terms of the total numbers of next wave and establishment firms present in each sector throughout the study period.³ While both new wave and establishment firms are found in all sectors of the economy, the establishment group is more heavily concentrated in basic manufacturing, primary extraction, and wholesale & retail. In contrast, next wave firms are more heavily concentrated in the newer growth sectors, including, high-tech manufacturing, software and communications, and producer services (included in FIRE).

Table 9 includes the location quotients of the top corporate centres in Canada (all cities included in Tables 1 and 2) by sector and by establishment/next wave classification. The table highlights the city-sector combinations that represent

diversified conglomerates: 551; Sector 6, transportation and utilities: 221, 481, 482, 483, 484, 491, 492, 493, 562; Sector 7, resource-based: 211, 111, 212, 213; Sector 8, retailers and wholesalers: 423, 424, 425, 441, 441, 442, 443, 444, 445, 447, 448, 451, 452, 453, 454; Sector 9, miscellaneous: all others.

3. Location quotients are calculated here based on the totals from all years of the 1998-2004 study period (seven years of 200 next wave firms and 200 establishment firms, yielding 1400 of each for the calculation).

TABLE 9 Location Quotients by City and Sector, 1998-2004

City		Basic Manu.	High Tech.	Commun. & Software	FIRE	Divers.	Transport, Utilities	Resource- Based	Retail/ Wholesale
Toronto	Establishment	0.83	0.86	1.61*	1.64	1.37	0.42	0.89	0.98
	Next Wave	0.62	0.54	1.40	1.26	0.58	0.28	0.00	1.03
Montreal	Establishment	1.03	0.89	1.84	0.83	0.92	1.67	0.55	0.69
	Next Wave	1.03	0.58	1.32	1.13	3.60	0.00	0.00	0.75
Calgary	Establishment	0.55	0.85	0.47	0.00	1.24	1.93	4.79	0.37
	Next Wave	1.05	1.10	0.76	0.54	1.28	2.20	10.46	0.63
Vancouver	Establishment	1.12	0.41	0.00	1.16	1.25	1.68	1.40	1.08
	Next Wave	0.24	1.30	1.69	0.68	0.79	1.17	0.00	0.73
Mississauga	Establishment	1.18	3.40	1.05	0.42	1.94	0.00	0.00	0.46
	Next Wave	0.59	1.09	0.58	1.38	1.10	4.45	0.00	0.71
Winnipeg	Establishment	0.67	0.00	1.62	0.65	3.00	1.20	0.00	2.34
	Next Wave	1.16	0.89	0.94	0.95	0.00	1.12	0.00	1.67
Ottawa	Establishment	0.00	1.88	0.00	3.56	0.00	2.07	0.00	0.68
	Next Wave	0.59	0.54	1.16	1.99	2.31	0.00	0.00	0.00
Edmonton	Establishment	0.00	0.00	0.78	0.00	0.00	2.28	0.00	1.97
	Next Wave	0.74	0.76	1.43	1.01	0.00	1.19	0.00	0.89
Markham	Establishment	0.92	3.11	0.00	0.00	1.03	0.00	0.00	1.97
	Next Wave	0.75	1.40	1.18	0.61	0.70	0.00	0.82	1.94
Saskatoon	Establishment	0.00	2.72	0.00	0.00	0.00	0.00	0.00	3.65
	Next Wave	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00
Victoria	Establishment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Next Wave	0.00	0.91	1.66	0.98	1.56	0.00	0.00	1.73

Note: 1. Numbers in bold are location quotient values that exceed 1.0.

above-national-average performances. The analysis shows that, among establishment firms, Toronto has particular strength in the communications, FIRE, and diversified conglomerate sectors, while among next wave firms Toronto performs strongly in communications and FIRE. While these sectors are not among the largest in terms of numbers of firms, each of these is central to the functioning of the national economy. Other top suburban cities in the Toronto region, including Mississauga and Markham, supplement the strength of the central city with high location quotient values in high technology manufacturing and diversified conglomerates (among establishment firms) and transportation/utilities and retail/wholesale (among next wave firms). High technology manufacturing represents a key area of activity in the rapidly-growing next wave. The other important core city, Montreal, has strong location quotient values in communications and transportation/utilities (establishment), and in diversified conglomerates (next wave).

In the periphery, the analysis shows that Calgary has particular strength in resource-based firms as well as transportation/utilities (in both the establishment

and the next wave) – but not the higher performing software and FIRE sectors. Winnipeg has high location quotient values in communications, diversified conglomerates, and retail/wholesale (establishment), and retail/wholesale (next wave). Vancouver has a strong performance in the transportation/utilities and resource-based sectors (establishment) and in communications and software (next wave). Victoria has no establishment firms, but places well in the next wave's communications and software, diversified conglomerate, and retail/wholesale sectors.

Discussion and Conclusion

This investigation has examined the urban hosts of next wave and establishment firms by use of a set of indices that jointly provide a multi-faceted perspective on the evolving Canadian space-economy. The study has suggested that next wave-establishment analyses ought to be of value in examining change in the location of economic activity, providing an indication of trends of importance to governments, businesses, and other organizations participating in the promotion of regional economic development in Canada. To this end, the study investigated a primary premise to determine whether there is any evidence of economic activity being decentralized from Toronto, Montreal, and the central Canadian economic heartland. These *decentralization* analysis results show that the Canadian economy remains highly concentrated in Ontario and Quebec. However, the analysis shows that the next wave, by its very nature the most fluid portion of the national economy, is more decentralized than the establishment. The next wave is experiencing a greater trend toward decentralization than currently characterizes the establishment group of companies. These results support the contention that decentralizing forces are active in reshaping the Canadian economy and that the efficacy of the traditional core-periphery model is weakening as the periphery becomes more heterogeneous.

The question that must be asked in follow-up to this decentralization result is simply, what is likely to be the long-term impact of such an evolution? While it is important to see that next wave firms are less centralized and are bringing additional economic opportunities to smaller Canadian centres, what happens to such firms as they continue to develop? A best-case scenario for regional development would be that a variety of small, innovative firms could continue to emerge in several cities across the country, grow rapidly, gain prominence and market share, and become large companies providing the basis for consistent prosperity in their regions. To what degree is this happening in the Canadian next wave? Have the next wave firms tabulated in this study continued to grow and become stable components of their originating region's economy, or are other factors diverting these firms and regions from this ideal development track?

Diversion of next wave activity away from originating regional economies could come in a number of forms. Such a diversion could be manifested in the form of a corporate relocation, where an emerging firm gets to a certain point in its development and decides that it needs to migrate to a different city in order to achieve its growth potential. For example, in the United States, Gateway Com-

puters was a regional member of that country's next wave located in South Dakota, far from major metropolitan markets and other clusters of industry. In the course of the firm's development, it relocated to San Diego, in part because it could not attract the volume of labour needed in its previous peripheral location. How typical is such behaviour among next wave firms in small Canadian centres? Another factor that could disrupt regional growth would be acquisition or merger of the next wave firm by a larger firm with the ability to "buy growth". Large firms like Microsoft sometimes use their resources and market position to buy an emerging firm with a high-potential concept, rather than investing the time and resources to engage in such development internally. Such an acquisition changes the locus of decision making for the acquired firm, and may result in physical relocation to suit the locational strategy of the larger corporation. Again, how much of a factor is such behaviour in the development of Canadian next wave firms?

The study also examined a second premise related to the regional orientation of next wave growth. The *regional centre* analysis sought to use the trend index to identify regional clusters of next wave growth that would mark the potential emergence of new regional economic cores in the country. These trend index findings confirmed that regional next wave clusters in Victoria and the Vancouver region, previously observed by Rice (2004, 2005), exist as part of a consistent growth trend throughout the 1998-2004 study period, and are not a single-year phenomenon. Table 4 shows that Vancouver is joined locally by Burnaby and North Vancouver in creating a regional complex of next wave production activity through the study period. Beyond British Columbia, the analysis also identified Edmonton as a top-ranking regional centre for next wave growth. The existence of dynamic biotechnology and engineering firms in Edmonton, along with local linkages to the University of Alberta, make the emergence of Edmonton as a nation-leading next wave firm producer a realistic possibility.

In addition to the identification of regional next wave leaders in Alberta and British Columbia, the analysis uncovers two additional findings that emphasize the true geographic complexity of the emerging next wave. First, the national economic heartland also hosts dynamic next wave centres. Laval and Kitchener are only two of the core's cities identified among the next wave trend leaders. Second, the bottom ten cities listed in Table 5 indicate that no one region has a monopoly on declining next wave production. Montreal and Toronto are joined on this list by Surrey and Kelowna in British Columbia. The findings of Tables 4 and 5 demonstrate that the geography of next wave growth and decline transcends the traditional core-periphery characterization of Canada, as clusters of growth exist in select places within the periphery, and growing and declining centres are closely intermixed in the heart of the country. This is an important result that provides insight into possible directions for further work. Future research needs to investigate the elements of the competitive environment that account for such a spatial complexity.

A third analysis of *consistency* demonstrates a difference in hosting behaviour on the part of next wave and establishment cities. Table 6 shows that the next wave system of cities is highly dynamic, as only one city in the country (Norval,

Ontario) was able to maintain a perfectly consistent record of hosting next wave firms throughout the entire 1998-2004 period. Also, contrary to expectation, the dominant cities of the national core were not necessarily any more consistent at hosting next wave firms than other major cities in the country. Indeed, the record of Montreal-region cities indicates a high degree of fluctuation in next wave firm hosting, as 8 of the 14 cities in the Montreal area come in at less than 50.0 on the 0-100 consistency scale. Meanwhile, several Vancouver-region cities placed among the national leaders in consistency, despite the area's distance from national and continental markets and industrial clusters.

By contrast, Table 7 provides findings more in line with initial expectations. Both Toronto and Montreal perform well as consistent establishment hosts, with 8 perfectly consistent cities between the two regions. The table demonstrates the relative consistency implicit in the entire establishment group of firms, compared to the next wave, as 13 of the country's 56 establishment cities achieve a perfectly consistent establishment hosting record through the study period. At the same time, no Vancouver-region city achieved a perfectly consistent hosting score for establishment firms. In part, this is a reflection of the previous, and more homogeneous, core-periphery structure of the Canadian economy. Establishment firms are characterized by considerable locational inertia and reflect both their past successes as well as current performance. In contrast, however, the consistency analysis also provides evidence, particularly relating to the next wave, of a high degree of geographic complexity among evolving business centres in Canada.

A final analysis, relating to *sectoral orientation*, explores some of the differences existing between cities in the types of firms each city hosts. This analysis investigates whether Toronto and Montreal, as Canada's two largest corporate centres and the dominant cities in the country's economic heartland, host an array of establishment and next wave companies distinct from that hosted by regional centres like Vancouver or Calgary. The sectoral orientation results depict the centrality of Toronto and Montreal in the functioning of the national economy, as seen through the strategically important sectors that these cities host in above-average numbers. The two core cities possess location quotients well in excess of 1.0 for establishment finance, insurance, real estate firms (FIRE), transportation companies, and communications and software firms – businesses that collectively tie the country together and provide many of the basic services that allow the country to function. These core cities also see substantial next wave activity in communications and software, finance, and diversified conglomerates.

At the same time, other cities specialize in hosting other sectors and in specific next wave activities, such as Calgary and the resource and transportation/utilities sectors (establishment and next wave), Mississauga and transportation/utilities (next wave) and high technology manufacturing (establishment), and Winnipeg and diversified conglomerates (establishment). One particularly interesting result comes from a joint viewing of the business numbers of Table 8 with the location indices of Table 9. These tables show that the key sectors in which Calgary experiences its greatest next wave success are sectors that play a minor role in next wave growth nationally. Calgary's top 3 next wave location indices are in resources, transportation/utilities, and diversified conglomerates; at a national

level, these three sectors account for 90 firms out of the 1400 next wave firms in the location quotient analysis.

The study results identify a number of clear findings that require further research. A strong national core continues to exist in southern Ontario and Quebec, with Toronto being its dominant centre. The Vancouver region also appears to be emerging, along with Victoria, Calgary, and possibly Edmonton, to create what could be a competing Western Canadian core within what was formerly the periphery. This, in itself, is a departure from a traditional mono-centric view of the Canadian economy, with the historic Toronto-Montreal heartland being the national focus. However, the situation is even more involved than this. An additional level of complexity exists within each of these two cores, with growing and declining cities located in close proximity within each. In the case of the historic core, we see next wave decline in the major eastern centres, along with concentrations of next wave expansion in a few suburban cities. In the western core, next wave growth exists in the major urban central cities as well as a number of suburban centres in metropolitan Vancouver. The western core is also characterized by selective nodes of decline, both in the suburbs of Vancouver (Surrey) and in smaller regional centres (Kelowna).

The significance of the next wave decentralization observed here is dependent on the future development of these innovative firms. As suggested earlier, future work should further explore the complex spatial relationships between next wave and establishment firm location as investigated here. Answers as to the paths taken by next wave firms as they evolve and ultimately fail (on the one extreme), succeed in becoming establishment firms (on the other extreme), or fall somewhere in between (merger, acquisition, or otherwise), have the potential to offer insight into the processes that play a role in shaping the shifting fortunes of the many urban and regional economies that comprise the national business community. On this final point, further research is needed to clarify the relationship between geography and the evolution of the firm.

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