

**Knowledge, Influence, and Firm-Level Change:
A Geographic Analysis of Board Membership Associated with
Canada's Growing and Declining Businesses**

Murray D. Rice^a, Sean Tierney^b, Sean O'Hagan^c, Donald Lyons^d, Milford B. Green^e

^a Corresponding Author. Department of Geography, University of North Texas, 1155 Union Circle, Denton, Texas, USA 76203-5017. Tel: (940) 565-3861. Fax: (940) 369-7550. E-mail: rice@unt.edu.

^b Department of Geography, University of North Texas, 1155 Union Circle, Denton, Texas, USA 76203-5017. E-mail: sean.tierney@unt.edu.

^c Department of Geography, Nipissing University, 100 College Drive, Box 5002, North Bay, ON, Canada, P1B 8L7. E-mail: seano@nipissingu.ca.

^d Department of Geography, University College Cork, Cork, Ireland. E-mail: d.lyons@ucc.ie.

^e Department of Geography, Social Science Centre, The University of Western Ontario, 1151 Richmond Street, London, Ontario, Canada, N6A 5C2. E-mail: mbgreen@uwo.ca.

Abstract

This study analyzes the development of Canadian business by examining the connection between firm-level growth and decline and the elite knowledge and influence connections that Canadian businesses use to link themselves to other corporations and cities nationally and globally. This is important because clarification of the factors that drive business change is among the most significant topics that can be addressed by research in economic geography. The investigation focuses on the inter-firm and inter-city linkages embodied in the boards of directors of Canada's leading corporations. Corporate directorships have an important geographic dimension, as firms invite people from a variety of places and backgrounds to serve on their boards. The study finds that board member selection practices among Canadian firms can be linked directly to business change. Benchmarking board composition against firm expansion and decline in terms of inflation-adjusted annual revenue change over the 1991 to 2006 period, this study shows that growing Canadian firms are associated with directors from a much broader range of national and international cities than firms that experienced decline over the same period. Firm growth in Canada thus appears to be related to boards encompassing diverse members from national and international locations, while firm decline appears to be associated with boards including more local and regional members. The conclusion interprets the implications of board member diversity and suggests that broadly-based boards might play a role in encouraging firm growth through access to elite knowledge and influence networks.

Keywords: corporate directors, business strategy, business growth, business decline, Canada.

1. Introduction

The development of a foundational understanding of the forces that influence business expansion and contraction is one of the most practical and important topics that can be addressed by contemporary research in economic geography and related disciplines. Especially in the midst of economic recession, managers and decision-makers in government and the private sector have a need for information that can help them create and implement policies that can encourage corporate growth. Business research from a geographic perspective in particular can provide a valuable service to society by uncovering strategies that can be associated with regional business expansion.

Knowledge and influence are two key dimensions of corporate activity that are connected with firm success. Businesses engage in a variety of strategies to acquire, manage, and control knowledge that is central to their ongoing ability to survive and thrive, such as specialized expertise related to market needs, or skills and competencies generated internally through a firm's own research and development efforts (Audretsch and Feldman 1996; Reiffenstein 2006; Birch 2007). Expertise related to such business fundamentals is important, but knowledge on its own is not sufficient to achieve the desired goals of business. In addition to the pursuit of knowledge, firms also seek to influence elements of the business environment such as markets and suppliers that are external to their direct control, but important to their ongoing success (Pfeffer and Salancik 1978; Mintz and Schwartz 1985; Carroll and Fennema 2002). The strategic management of corporate initiatives to acquire knowledge and influence is an important factor in the growth and decline of business enterprises.

This study investigates business development in Canada by examining the connection between firm-level change and the key knowledge and influence connections that link Canadian businesses and cities nationally and globally. To do this, the study focuses on the inter-firm and inter-city linkages embodied in the boards of directors of Canada's leading corporations. Boards of directors sit at the top of the corporate hierarchy and comprise the highest level of responsibility for the performance and decisions of the corporation (Lynall et al. 2003; Mizruchi 2004). Board members both assess the results achieved by top management and provide the executives of the corporation with high-level knowledge and advice. As such, study of board membership structures and linkages provide a unique opportunity to examine the inter-personal and inter-organizational linkages among the most powerful and influential individuals in national and global economies (Mizruchi 1994; Domhoff 2002).

Board activity is a multifaceted phenomenon, as firms typically include among their board membership a mix of individuals. In an organizational dimension, boards typically include some members from within the firm (inside members) and some from other firms and organizations (outside members). From a geographic perspective, boards often include some members from the immediate vicinity of their corporate headquarters, along with board members selected from other national and even international locations. Thus board membership and linkage research addresses questions that are inherently complex in multiple dimensions.

Previous corporate board research indicates that board members function to transmit both knowledge and influence, and that the spatial structure of board member networks is indicative of the changing status of metropolitan areas as corporate knowledge and power centers (Rice and Semple 1993; O'Hagan and Green 2004; Rice et al. 2008; O'Hagan and Rice 2011). However, research in this area has focused primarily on analysis of board membership patterns, and has left

largely unexplored the potential impacts of board networks on firms. The present study addresses this gap by investigating the connection between the *geography of board membership* and *firm growth and decline* in Canada. To begin, the study surveys two distinctive approaches to research related to the location and distribution of knowledge: the region-centric perspective and the firm-centric view. The review goes on to further integrate key corporate and director themes into the discussion before proceeding to use this cumulative conceptual framework as the basis for the Canadian firm and director analysis that forms the study focus.

2. Knowledge and Regional Economic Development

Knowledge is a primary factor that drives the global economy. Possession of business insights, practices, and technologies forms a foundation for corporate competitiveness. In a spatial context, economic geographers often analyze knowledge at the regional level, focusing on how firms and regions gain, process, and use knowledge to gain a competitive advantage (Boschma and ter Wal 2007). As Bryson has put it, “Central to the geography of economic activity should be an understanding of the transfer of management ideas and techniques into and between companies” (Bryson 2000: 157-158). There is an obvious need for empirical evidence and theoretical development that relates *inter-firm knowledge transfer* to *competitive outcomes*. However, application of this competitiveness framework at the regional level is more contested: a vigorous debate has emerged as to whether regions can be conceived as competing in the same manner as firms (Boschma 2004; Shearmur 2008; Adams 2008). It is indisputable, however, that a substantial literature has developed around the idea of regional competitiveness and its policy implications (Jacobs 1984; Porter 1990; Buck et al. 2005). Given that the present study incorporates aspects of knowledge analysis linked to both the *firm* and the *region*, it is useful to

briefly survey the conceptual background that relates to debate and development from both perspectives.

The *institutionalist* approach focuses on the sharing of knowledge that can be related to close geographic proximity (Amin 1999). Proximity facilitates knowledge sharing through the social and cultural ties that are available within regions. Consequentially, this view conceives of regions as primary containers of collective learning systems. A related *embeddedness* concept, linked to personal relations, trust, and formal and informal deal-making, further emphasizes the importance of social linkages as they impact the regional complexes of firms and their ability to exchange knowledge (Granovetter 1985; Grabher 1993; Dicken 2007). Viewed in this way, the relative prosperity and potential for development in each region relates to distinctions in the corporate structures and management practices of the local institutions that comprise each regional business community. For example, Gertler (1997) compared machinery maintenance practices in North America and Germany from an institutionalist perspective. He showed that North American firms managed their maintenance schedules with a focus on short-term results, leading to less regular maintenance and more equipment malfunctions. German firms, in comparison, incorporate more regular maintenance in their operating routines based on a long-term perspective, leading to fewer breakdowns. Gertler's analysis demonstrates that regional business communities have maintained distinctive foci, supporting the assertion that the analysis of regional differences in business cultures and routines is an important component of explanation in economic geography.

The *evolutionary* approach to development within geography and economics focuses on firms, and not regions, as the foundational level of analysis. Evolutionary perspectives focus on the processes and mechanisms by which firms, and groups of firms, transform themselves from

within (Witt 2003, 2006). Such transformation is generated from within the socio-economic system, with enterprise-driven adaptation being the primary process (Ramlogan and Metcalfe 2006). Within this process, knowledge plays a key role. Firm adaptation is driven by knowledge generation, which in turn is motivated by a search for competitive advantage. Metcalfe et al. (2006) conceptualize this search as comprising a circular and cumulative cycle, with every advance in competitive advantage creating the motivation for additional knowledge generation activity. Within the evolutionary framework, firms are continually seeking knowledge to enhance their prospects for success, but any advantage gained through this process is temporary. The degree to which firms and industries survive and thrive is a measure of their ability to acquire and productively employ their strategic business knowledge.

The possession of knowledge, and connections that enable the firm to gain more knowledge, are important factors with a well-developed relationship to firm and regional success. However, other firm and regional characteristics are also reflective of dynamic corporations and business clusters. In particular, geographic research has a longstanding and continuing interest in the location, distribution, and linkage characteristics associated with the possession and development of corporate influence and decision-making power (Goodwin 1965; Borchert 1978; Holloway and Wheeler 1991; Baaij et al. 2004; Bel and Fageda 2008). The following briefly surveys key contributions relating to the geography of corporate influence in general, as well as the specific focus in the present study, corporate boards of directors.

3. Geographic Perspectives on Corporate Influence and Boards of Directors

The study of the location of business influence and decision-making activity, most prominently associated with corporate headquarters activity, has an extensive record within geography.

Although reference to the need for research into corporate decision-making activities dates to the early 20th century, the modern study of the geography of decision-making (or quaternary sector) activities began in earnest with a flurry of activity beginning in the 1970s. Quaternary location research as a field attempts to explain the geography of corporate administration functions, including the location and distribution of high-level corporate decision-making represented by headquarters, regional offices, and high-ranking executives (Rice and Lyons 2010). Hymer (1972) provided an early contribution to the construction of this field by conceptualizing the firm as being composed of different levels of activity within a hierarchy, with the highest of these levels consisting of top management connected geographically with the globe's elite cities. Other quaternary research from this period provided evidence that defined the basic locational and developmental trends relating to the evolution of systems of headquarters cities in the U.S. and other developed countries (Semple 1973; Westaway 1974; Holz 1977; Borchert 1978; Taylor and Thrift 1980).

Quaternary location research from the 1980s and onward expanded and diversified on this early base (Rice and Lyons 2010). One key development was the Semple and Phipps (1982) model of headquarters city evolution that provided a framework for understanding the emergence of a series of strong, regional headquarters cities that has occurred in the U.S. since the 1950s. Numerous studies used the Semple and Phipps model as a basis for investigation of headquarters location trends in the U.S., and later in Canada and elsewhere (Wheeler 1988a, 1990; Holloway and Wheeler 1991; Rice 1996, 2004; Baaij et al. 2004). Along with a continuation of headquarters-focused research, quaternary research grew to include several diverse but related strands, including subsidiary offices (Martz and Semple 1985; Meyer and Green 2003; Rice 2010), high-level information flows (Wheeler and Mitchelson 1989; Mitchelson and Wheeler

1994), and major stockholder and venture capital investment (Wheeler 1988b; Green 1993, 2004).

One key element of this diversification in the quaternary location literature is research into the geography of interurban corporate director networks. This focus area exists as a subset of an extensive, multi-disciplinary literature that links corporate governance and boards of directors. The propensity of firms to share common members among multiple boards, known as interlocking directorates, has been a particular focus for sociologists, geographers, and other business researchers from the early 20th century to the present (Hilferding 1910; Dooley 1969; Mintz and Schwartz 1985; O'Hagan and Green 2004). Geographers have extended this research field by focusing on the spatial dimension of director networks that arises when a corporation based in one city includes members from locations other than its host city. Research in the field has examined director networks from the dual perspectives of *strategic knowledge gathering* (where directors funnel knowledge to the firms on whose boards they serve) and *corporate influence* (where directors play a role in shaping the decisions and behaviors of multiple firms) (Pfeffer and Salancik 1978; Carroll and Carson 2003).

Green (1981, 1983) and Green and Semple (1981) were the first geographers to examine interlocking directorates as an information network. All three studies showed that the US Manufacturing Belt, a region in decline by the late 1970s, was dominated by intraregional interlocking. At some point in the region's development, this configuration of knowledge and influence flows might be conceived as having been advantageous, especially when the industrial firms of the region were leaders in technological and organizational development. However, over time, firms in other regions in the United States and around the world became increasingly competitive relative to the northeastern industrial complex, and manufacturing firms in this

tightly-interlocked region began to lag behind. By not interlocking with firms in other, more dynamic regions, Green (1981, 1983) and Green and Semple (1981) argued that the firms of the Manufacturing Belt were denied critical information.

Rice and Semple (1993) provide an initial example of interlocking directorate analysis from a corporate control perspective. Their temporal analysis demonstrated that the directorate network of Canada paralleled and reinforced trends in the location of major Canadian corporate headquarters. Over the 1971 to 1989 period, corporate power shifted and centralized in Canada, evolving from a system dominated by two major centers (Toronto and Montreal) to a single, primary center of business influence (Toronto) and two centers of regional influence (Calgary and Montreal). Rice and Semple's (1993) analysis indicated that interlocking director linkages provide a complementary means, along with studies of corporate headquarters location patterns, of measuring the changing corporate influence of cities in a national urban system.

Research from the 1990s to the present in geography and related disciplines has extended the director analysis. Kono et al. (1998) showed that geographers are not alone in investigating the spatial implications of interlocking directorate activity. Their analysis, combining insights from sociology and geography, demonstrated that the presence or absence of elite social clubs in a metropolitan area has an influence on whether locally headquartered firms pursue local or non-local board members. O'Hagan and Green (2002a, 2002b, 2004), continuing the analysis from within geography, examined spatial flows of knowledge among the cities of Canada and the U.S. They show that the urban systems of the two countries function in distinctive ways to facilitate the spread of knowledge among their respective corporate networks, with the U.S. system being more complex and regionalized in comparison with the Canadian counterpart. Most recently, work by O'Hagan et al. (2008) and O'Hagan and Rice (2011) has investigated the influence of

the personal backgrounds of board members in shaping the spatial structure of the U.S. director network. These papers indicate that shared social characteristics, such as birth, residential, and educational ties, play an important but regionally-varying role in shaping the composition of corporate boards across the U.S. Although corporate performance was not the central focus in these studies, both of these papers provide some evidence to indicate that board composition may have some relationship with regional economic success.

The foregoing review establishes a number of important points relating to the director literature. First, director networks have geographically complex structures that function to transmit both *knowledge* and *corporate influence* among a subset of elite cities within an urban system (Rice and Semple 1993; O'Hagan and Green 2004; Rice et al. 2008). Second, these director networks have a complex relationship with other elements of the urban-economic environment, including personal factors such as the residence, upbringing, and education of each individual involved in corporate boards, as well as broader, metropolitan factors such as the presence of social clubs and regional economic trends (O'Hagan et al. 2008; O'Hagan and Rice 2011). Third, director networks have some relation to economic change, for example regarding the link between regional director connections and regional economic performance (Green 1981, 1983; O'Hagan and Rice 2011). This body of evidence suggests that corporate board networks (and their geographies) may well have an important connection to not just regional economic fortunes, but the performance of individual firms. However, the director literature of geography and related disciplines has not investigated this specific connection to date. The following defines the datasets and research questions that provide a foundation for such a targeted case study investigation.

4. Case Study: Canadian Firm-Level Change and Director Geographies

4.1. Data

This study makes use of two distinctive databases to address the dual *firm-level change* and *director-network* focus of this research. In the firm-level change dimension, the study uses business directory data from Canada's *Financial Post* magazine and *Dun and Bradstreet* to assemble a database of the top 1000 businesses in Canada, as ranked by revenues, for the years 1991 and 2006. From this database, and using supplementary *FPinfomart* data to account for mergers, acquisitions, and name changes over time, the study extracts the businesses that existed in both years, yielding a final list of 234 firms for which revenue growth and decline statistics could be computed for the complete 1991-2006 period. These 234 firms include 198 that experienced an inflation-adjusted expansion in annual revenues over the 1991-2006 period, and 36 that experienced inflation-adjusted decline in revenues over the same time frame (Table 1).

Table 1 about here

In the director dimension, the study assembles directorate information for the year 2006 for each of the businesses identified above that are also included in the premier (but not exhaustive) compilation of board membership information in Canada, the annually published *Financial Post Directory of Directors*. This resulted in a database of directors including information for 114 of the 234 firms identified in the initial 1991-2006 firm-level change analysis.¹ Of these 114 firms with director data, 96 experienced an inflation-adjusted *growth* in

¹ The 120 firms not included in the director analysis were businesses not represented in the *Financial Post Directory of Directors*. This does not necessarily mean that director data for these firms have not been published in other places, although this might be true for some privately-held businesses. *Directory of Directors* data is preferable in comparison with other Canadian director-data sources (such as director listings in corporate annual reports) in that the directory includes supplemental information for most directors listed (including business and/or residential address information). Thus, for the purposes of this

revenues over the study period, and 18 experienced an inflation-adjusted *decline*.² It is the directorate information associated with these two groups of growing and declining firms that provides the empirical basis for the remainder of the analysis.

4.2. Research Questions

Given the background and data resources surveyed, this study investigates the following research questions focused on the connection between firm-level change and director-network structure.

1. The Linkage Geography Question Does the geography of directors for growing firms differ from the geography of directors for declining firms? This question divides into two key subcomponents:

a. A region-based analysis: focused on director locations by major Canadian region, do growing firms differ from declining firms in their inclusion of board members from outside of their host region? Following long-held historical precedent in Canada, this analysis defines the regions of Canada (excluding the country's lightly-populated northern territories) as:

- i. British Columbia
- ii. The Prairie Region (including Alberta, Saskatchewan, and Manitoba)
- iii. Ontario
- iv. Quebec

research and to ensure comparable coverage for all firms included in the study, this investigation relies solely on director data provided through the *Directory of Directors*.

² It would, of course, have been desirable if the dataset had included more declining firms. However, the small number of declining firms relative to growing firms is simply an indication of the overall, expanding orientation of the Canadian economy in the 1991-2006 study period.

- v. The Atlantic Region (including Newfoundland and Labrador, New Brunswick, Prince Edward Island, and Nova Scotia)

This regional analysis categorizes all firm-director links in the study as “within-region/within Canada”, “outside-region/within Canada”, “foreign/United States”, and “foreign/all other countries.”

b. A distance-based analysis: focused solely on the distance between the headquarters location for each firm in the analysis and the work location of each of its directors, this analysis investigates whether firm-director distances for growing firms differ significantly from firm-director distances for declining firms.

2. The Metropolitan Centrality Question Research over the past two decades has consistently depicted Toronto as the continuing, dominant corporate center in Canada, and shown that Montreal has become more peripheral since the 1960s in terms of both headquarters and directors (Rice and Semple 1993; Semple 1996; O’Hagan and Green 2002; Rice 2004, 2005). At the same time, Calgary and Vancouver have grown rapidly since the 1990s to join Montreal as close counterparts in a second tier of Canadian corporate centers (O’Hagan and Green 2002; Rice and Lyons 2007; Rice and Pooler 2009). Given this body of evidence, this question investigates whether such broadly observed changes in Canadian metropolitan corporate status are reflected in the director connections for each metropolitan area that are associated with the growing and declining groups of businesses analyzed in this study. Specifically, given the top two cities’ divergent developmental trajectories, a primary aim of this analysis is to explore whether Toronto-based firms have continued to develop linkage-rich director networks that have many interconnections with firms in other important business centers, and whether Montreal-based firms have become more regional in their orientation. Similar comparisons can also be

made between Toronto and Calgary, and Toronto and Vancouver. This investigation is important because of the centrality of Toronto's business community within the Canadian economy. The Greater Toronto Area hosts many of the most strategically-important companies in Canada, including the largest firms in the Canadian financial, conglomerate, communications, advanced services, and manufacturing sectors (Rice 2006). In this way, Toronto's function is similar to that played by dominant centers such as New York, London, Shanghai, and Tokyo within their respective, national urban systems. Thus, Toronto's premier corporate status provides an important reference point from which to assess corporate trends and governance practices within the Canadian economy broadly, and a useful comparison to gauge the changing status of the business communities in second-ranked Montreal and in other cities in the next tier of the Canadian corporate hierarchy.

5. Results

5.1. The Linkage Geography Question

As already defined, this first analysis consists of two sub-questions that explore related but distinctive perspectives on the geography of directors for growing and declining firms. Tables 2 and 3 address the first part of this analysis, focused on distributions of directors at the regional level of analysis. The two tables collectively indicate that growing firms do indeed include board members from a broader geographic distribution than declining firms. While within-region director links are most prevalent for both groups of firms, on close inspection the tables demonstrate that important differences exist between the groups regarding the presence of extra-regional directors. Among growing firms, 23% of directors come from regions of Canada outside of the firm's headquarters region, versus 13% of directors for declining firms. At the

international level, the contrast is even greater: among growing firms, *directors from the United States* and *directors from the rest of the world* (i.e., outside of Canada and the United States) account for 10% and 5%, respectively, of board membership; for declining firms these same figures are 6% and 0%. Thus, Tables 2 and 3 indicate there is an important difference in the regional orientation of board membership between the growing and declining Canadian company groups, especially relating to foreign director linkages.

Tables 2 and 3 about here

A chi-square analysis of the director database by region substantiates this finding. The null hypothesis for this analysis is that the two regional director distributions are generated by a shared process. To complete the analysis, the study compared the national totals from Tables 2 and 3 and combined the foreign values from the tables to meet the minimum-value requirements of the chi-square test (Ebdon 1985). Doing this, the analysis obtained a calculated chi-square value of 19.87 ($p = 0.00$). Thus, the study finds a statistically significant ($p < 0.05$) difference between the two regional distributions of directors.

One other observation needs to be made regarding these regional distributions: despite the presence of strong, national results, the tables also show that important regional variations exist. In the “growing firm” values of Table 2, Ontario and Quebec have the largest proportions of within-region directors, while British Columbia and the Prairie and Atlantic regions have similar, albeit lower within-region proportions. The high within-region values of Ontario and Quebec can be attributed to the large and diverse business communities present in these two, adjacent provinces (which had, respectively, 45.7% and 17.2% of the top 1000 firms in the Canadian database for this study in 2006). These regions possess within them much of the executive expertise that firms might require for their boards. Likewise, a strong argument can be

made that the other three regions have lower within-region proportions out of necessity, as firms in these areas of the country find they must solicit expertise from external regions. However, with reference to a combined viewing of Tables 2 and 3, it should also be noted that for every region where both growing and declining firms exist, each of these regions has greater extra-regional involvement for its growing firms as compared to its declining firms.

The second sub-question associated with the director network question focuses on firm-director distances for growing and declining firms. Table 4 summarizes the firm-director distances associated with firms in the study based in each of the five Canadian study regions. The table shows that at the national level, the average firm-director distance for growing firms is 1,122 km, while the same figure for declining firms is 380 km. This general relationship also holds true at the regional level, as for each of the three regions that host both growing and declining firms, growing firms have higher average firm-director distances than their declining firm counterparts. The most extreme region in terms of this contrast is the Prairie region, where growing firms have an average firm-director distance of 1,621 km, versus a figure of 209 km for declining companies.

Table 4 about here

Some sample map evidence can help to demonstrate the distinction between growing and declining firm-director distributions. Figure 1 illustrates these two distributions for Toronto, Canada's premier corporate center. The growing firm portion of the figure shows a wide range of director locations across North America, also extending to major cities in other world regions. Declining firms, by contrast, exhibit a director distribution that is for the most part closely clustered around Toronto, with none outside of North America. Such a contrast is broadly

characteristic of the director distributions for the other Canadian cities that host both growing and declining firm headquarters.

Figure 1 about here

A Mann-Whitney U test confirms this overall relationship for the entire database. As with the earlier, region-based analysis, the null hypothesis for this distance-based test is that the two regional director distributions are derived from the same underlying distribution. Implementation of the Mann-Whitney U test (two-tailed) on the growing and declining firm-director linkage datasets reveals a p-value of 0.02, indicating that growing firm directors do indeed travel significantly longer distances to board meetings overall ($p < 0.05$) than their declining firm counterparts.³

5.2. The Metropolitan Centrality Question

This analysis addresses the configuration of the growing and declining firm director linkages associated with Canada's major corporate centers. The study does this by employing the concept of centrality in conjunction with the director networks explored in the previous question. Centrality offers a relatively simple way of measuring the most important and least important

³ Is board member travel important? It is true that the present study does not address the actual meeting and travel practices of boards, and that communication advances provide new options for interaction between an individual director and the boards on which they serve. Indeed, Lublin (2011) indicates that the boards of large U.S. companies have made increasing use of video conferencing technology for at least some of their meetings. However, Lublin also provides some evidence to indicate that video conferencing technology is used in a minority of board meetings, and that boards prefer in-person meetings for especially important or complex discussions. This finding coincides with research indicating the 'stickiness' of certain kinds of knowledge and experience (Markusen 1996) and the dependence of knowledge transfer upon geographic proximity (Morgan 2004). Finally, regardless of technology use, it is the corporation itself that remains the primary nexus of information transferred through its board (Pfeffer and Salancik 1978; O'Hagan and Green 2004; Shropshire 2010). Thus, director locations relative to firm headquarters and board member travel remain important factors in the analysis of board networks.

nodes in any kind of network. Various centrality measures have been previously applied to the geographic analysis of interurban director networks, as well to other spatial and aspatial systems (O'Hagan and Green 2004; Neal 2007; Wang et al. 2011).

Degree of centrality is the most straightforward means of calculating centrality for each node in a network (O'Hagan and Green 2004). As implemented here, degree is the number of director connections associated with the corporate boards in each headquarters city, relative to the total number of director connections in the entire network:

$$Centrality_{Degree}(k) = \frac{\sum_j x_{kj}}{\sum_{ij} x_{ij}} \quad (1)$$

Equation 1 calculates degree of centrality for city k with reference to x_{kj} (representing the flow from director city j to headquarters city k). Thus, the numerator in equation 1 calculates the director connections related to the headquarters located in city k , while the denominator indicates the total director flows in the network. The maximum degree value that any city can attain is 1, occurring when all directors serve on the boards of firms headquartered in a single city. Alternatively, the minimum value of 0 can be attained by a city when no directors serve on corporate boards of firms headquartered in the given city. Thus, the greater the degree value associated with a city, the more connected the city is within the network as a whole (O'Hagan and Green 2004).

The analysis in this section represents the degree values for all cities in the growing and declining firm director networks. Tables 5 and 6 rank each city by their overall degree within the two networks, respectively. It is important to note that, in addition to degree value totals, the tables also break out degree values for each city in two key components of both director

networks: the component associated with *domestic directors* (based in Canada), and the component associated with *foreign directors* (based in the U.S. and elsewhere). The growing-firm director network in Table 5 coincides with the Canadian corporate hierarchy broadly represented by many studies in recent decades (Rice and Semple 1993; Semple 1996; O'Hagan and Green 2002; Rice and Pooler 2009). One key feature in this table that is not reflective of other recent research, however, is the close pairing of Toronto and Montreal at the top of the growing-firm hierarchy. Among these particular businesses, Montreal has maintained a highly competitive status relative to Toronto, even though its overall metropolitan corporate community has fallen behind Toronto's (Semple 1996; Rice and Pooler 2009). One other point of interest from this growing-firm table is the contrast in status between Calgary's Canadian and foreign degree measures. Calgary is notably more important within the foreign component of the overall director network than it is within the domestic equivalent. This makes sense given Calgary's large energy community, including the Canadian headquarters of many multinational oil and gas giants. Vancouver, the other major corporate center in western Canada, is comparable to Calgary in terms of domestic degree but lags well behind Calgary, Montreal, and Toronto in foreign degree.

Tables 5 and 6 about here

By contrast, the declining-firm director network represents a different and simpler situation in comparison with its growing-firm counterpart. While the study's 96 growing firm headquarters are hosted within 17 different cities, the 18 declining firms in the study are located in only 8 cities. Table 6 reflects the fact that declining firms have combined to create a distinctive hierarchy in comparison with the growing firm hierarchy of Table 5. While the urban geography of growing-firm directors corresponds broadly with Canada's established corporate

hierarchy, a different set of cities are important within the declining-firm director network. Most prominently, Regina, Hamilton and Ottawa all rank above Montreal in terms of degree within the declining network. While Toronto maintains a premier position in both Table 5 and 6, it is clear that declining firms participate in a very different knowledge and influence network relative to their growing business counterparts.

6. Discussion and Conclusion

This study demonstrates that growing and declining firms in Canada have distinctive regional orientations and network characteristics. Growing firms are more inclined than declining firms to invite board member participation from outside of their immediate headquarters regions; such growing firm board members come from a much wider national and international geography than members of declining firm boards. At the metropolitan level of analysis, the geography of growing firm directors broadly coincides with the overall and well-established corporate hierarchy in Canada, dominated by Toronto, Montreal, Calgary, and Vancouver. This study's findings differ from previous findings in identifying one important business element where Montreal ranks alongside Toronto, at the top of the Canadian corporate hierarchy. Calgary also emerges in the growing firm network as a particularly strong player among international directors, but less so in the domestic director network. Vancouver has a moderate level of director connection both nationally and internationally, well behind Toronto and Montreal but markedly ahead of all other Canadian cities other than Calgary. By contrast, within the declining firm director network it is a selection of Canada's secondary cities (with the exception of Toronto) that gain prominence. In summary, the study results demonstrate that firm-level change in Canada has a clear connection to the structure of the Canadian director network, with growing

and declining firms having different and distinctive practices with regard to the geographies of their respective director networks.

These findings suggest a number of observations. First, the closeness of the ranking at the top of the growing-firm director hierarchy demonstrates that successful firms in both Toronto and Montreal are following similar strategies with regard to their board member selections. Growing firms in the broad business communities in both cities have demonstrated that they are willing to recruit board members from outside of their local area, including extensive involvement of directors from the United States and elsewhere. This is of interest because corporate research over the past two decades has indicated an increasing difference between the two cities, with Toronto maintaining its national dominance and Montreal being on the decline (Rice and Semple 1993; Semple 1996; Rice and Lyons 2007; Rice and Pooler 2009). In this context, such a finding is important because it indicates that business success in Canada's two largest cities transcends local economic conditions and might be linked to shared geographic strategies. Related to this, it is also important to note that firms based in Calgary join in this orientation toward geographically broad boards of directors. As mentioned earlier, this Calgary finding is not surprising because of the city's multinational energy community. However, this parallel in practice between the dynamic business center of Calgary and Canada's two dominant eastern centers does suggest that geographically broad director involvement could be viewed as one factor related to regional business success.

A second observation focused on the Canadian context is that despite the above-cited downturn in Montreal's corporate community that has extended over several decades, there may be reason for optimism in the city's regional business outlook. Montreal's expanding firms are every bit as active as Toronto's in bringing in corporate expertise at the highest levels from a

wide range of business centers located across the country and around the world. If anything, Montreal-based firms could be argued as engaging in this proactive strategy to a greater extent than their Toronto counterparts, taking into account Montreal's smaller corporate size in comparison with Toronto. Although this study provides no evidence that such board strategies actually determine corporate success, the existence of growth-oriented strategies that are shared between dynamic firms in the two cities could indicate the possibility of economic rebound for Montreal. Certainly, it can be viewed as positive for the local economy that Montreal's most dynamic firms have been demonstrated to link at the highest levels with business people in a broad selection of key corporate centers from across the continent, and around the world. Perhaps further economic growth could be encouraged in Montreal and other centers if other businesses were to consider initiating similar, targeted director practices. Ongoing research is needed to track Montreal's economic status and determine the continuing impact of the director practices uncovered here.

A third, more general observation links to the dual knowledge and influence context for this study. The board-member selection practices associated here with growing firms can be interpreted as securing for these firms knowledge and insights from top business people based in a wide range of world cities. However, in obtaining this high-level knowledge, businesses might also be viewed as giving up some level of control to business people in other places (Rice et al. 2008). Any benefit that the growing businesses in this study gain from diverse director connections ought to be placed in context alongside the oversight capabilities that are ceded to such a diverse board. Corporations in such circumstances could be conceptualized as trading influence over their internal operations for access to specialized competitive knowledge. Research targeted on the nature of this exchange is needed to enumerate its implications. Are

firms with diverse boards more susceptible than others to merger or acquisition? Do firms in this situation engage in a higher-than-average level of joint venture activity? What meaning does this conceptualized transaction have for regional and national economies such as Canada's? Further investigation would clarify the issues associated with board member selection.

A fourth and final observation is to acknowledge a primary limitation of the study results and call for more research in this general field. Although this research indicates a clear relationship between firm-level change and director geographies, the study has not addressed the issue of causality. Thus, an important question remains to be answered: is firm growth actually aided by broad board membership geographies, or is it simply that growing firms have more resources and connections that make it possible for them to select board members from farther afield? At another level, it is also important to continue to investigate the related question of how firm performance is connected to regional performance. Do firms decline because of a poor regional environment, or do regions decline because their major firms decline? Further investigation is needed to specifically address the nature of the key director and regional relationships to firm change that this investigation has begun to explore.

In conclusion, the purpose of this article has been to provide a new empirical perspective on corporate director research in geography. By focusing on the link between director geographies and an (admittedly simple) measure of firm performance, this research has sought to provide new evidence to address the question of whether the location and distribution of directors truly matters. Previous studies have developed a direct link between regional business change and director geographies (Green 1981; Green and Semple 1981; Green 1983; Rice and Semple 1993; O'Hagan and Rice 2011). This established body of results has made it possible to argue that regional business clusters are placed at a disadvantage because of heightened intra-

regional director connections and a lack of involvement of key businesspeople from outside of the region; these factors, as discussed earlier, have implications for interurban knowledge and influence transfers. However, because the emphasis of this previous research has been on directors and *regional* development trajectories, the legitimate criticism could always be made that no evidence has existed to link director geographies with individual *firm* outcomes. This scale of analysis issue has now been addressed. The results presented here provide a solid foundation to support the hypothesis that the geography of board membership is related to business growth and decline at the firm level. While further research is necessary to follow up on still-unanswered questions, it is reasonable to assert that a compelling basis is emerging for businesses to consider board member location as one factor of importance as they review their corporate positioning regarding strategic knowledge gathering and influence management.

References

- Adams, J. S. 2008. Editorial—Understanding competition among metropolitan economies: Response to Richard Shearmur. *Urban Geography* 29, 741–44.
- Amin, A. 1999. An institutionalist perspective on regional economic development. *International Journal of Urban and Regional Research* 23, 365-378.
- Audretsch, D., Feldman, M. 1996. R&D spillovers and the geography of innovation and production. *American Economic Review* 86, 630-640.

Baaij, M., van den Bosch, F., Volberda, H. 2004. The international relocation of corporate centres: are corporate centres sticky? *European Management Journal* 22(2), pp. 141–149.

Bel, G., Fageda, X. (2008). Getting there fast: globalization, intercontinental flights and location of headquarters. *Journal of Economic Geography* 8, 471–495.

Birch, K. 2007. Knowledge, space and biotechnology. *Geography Compass* 1(5), 1097-1117.

Borchert, J.R. 1978. Major control points in American economic geography. *Annals of the Association of American Geographers* 68(2), 214-232.

Boschma, R.A. 2004. Competitiveness of regions from an evolutionary perspective. *Regional Studies* 38 (9), 1001–14.

Boschma, R.A., ter Wal, A.L.J. 2007. Knowledge networks and innovative performance in an industrial district: The case of a footwear district in the south of Italy. *Industry and Innovation* 14(2), 177–99.

Bryson, J.R. 2000. Spreading the message: management consultants and the shaping of economic geographies in time and space. In: Bryson, J.R., Daniels, P.W., Henry, N., and Pollard, J. (Eds.), *Knowledge, Space, Economy*, Routledge, London, pp. 157-175,

Buck, N., Gordon, I., Harding, A., Turok, I. 2005. *Changing Cities: Rethinking Urban Competitiveness, Cohesion and Governance*. Palgrave Macmillan, London.

Carroll, W.K., Fennema, M. 2002. Is there a transnational business community? *International Sociology* 17, 393-419.

Dicken, P. 2007. *Global Shift: Mapping the Changing Contours of the Global Economy*. 5th edition. The Guilford Press, New York.

Domhoff, G.W. 2002. *Who Rules America: Power and Politics*, 5th Edition. McGraw-Hill, New York.

Ebdon, D. 1985. *Statistics in Geography*, 2nd Edition. Blackwell, Cambridge, MA.

Gertler, M. 1997. The invention of regional culture. In: Lee, R. and Willis, J., (Eds.) *Geographies of Economies*. Edward Arnold, London, pp. 47–58.

Goodwin, W. 1965. The management center in the United States. *Geographical Review* 55(1), 1–16.

Grabher, G. 1993. Rediscovering the social in the economics of interfirm relations. In: Grabher, G. (Ed.) *The Embedded Firm: On the Socioeconomics of Interfirm Relations*, Routledge, New York, pp. 1–33.

Granovetter, M. 1985. Economic action and social structure: the problem of embeddedness. *American Journal of Sociology* 91(3), 481–510.

Green, M.B. 1983. The interurban corporate interlocking directorate network of Canada and the United States: a spatial perspective. *Urban Geography* 4, 338-354.

Green, M.B. 1981, Regional preferences for interlocking directorates among the largest American corporations. *Environment and Planning A* 13, 829-839.

Green, M. B. 1993. A geography of institutional stock ownership in the United States. *Annals of the Association of American Geographers* 83, 66-89.

Green, M. B. 2004. Venture capital investment in the United States 1995–2002. *The Industrial Geographer* 2, 2-30.

Green, M.B., Semple, R.K. 1981. The corporate interlocking directorate as an urban spatial information network. *Urban Geography* 2, 148-160

Holloway, S.R., Wheeler, J.O. 1991. Corporate headquarters relocation and changes in metropolitan corporate dominance, 1980–1987. *Economic Geography* 67(1), 54–74.

Holz, J. M. 1977. The distribution of business headquarters and command powers in towns in the Federal German Republic. *Mosella* 7, 229-258.

Hymer, S. H. 1972. The multinational corporation and the law of uneven development. In: Bhagwati, J.W. (Ed.) *Economics and the World Order*. Macmillan, New York, pp. 113–140.

Jacobs, J. 1984. *Cities and the Wealth of Nations*. Random House, New York.

Kono, C., Palmer, D., Friedland, R., Zafonte, M. 1998. Lost in space: The geography of corporate interlocking directorates. *American Journal of Sociology* 103, 863–911.

Lublin, J. 2011. Video comes to board meetings. *Wall Street Journal* (Online), April 24.

Lynall, M.D., Golden, B.R., Hillman, A. 2003. Board composition from adolescence to maturity: a multitheoretical view. *Academy of Management Review* 28 (3), 416-431.

Markusen, A. 1996. Sticky places in slippery space: a typology of industrial districts. *Economic Geography* 72, 293-313.

Metcalfe, J.S., Foster, J., Ramlogan, R. (2006) Adaptive economic growth, *Cambridge Journal of Economics* 30: 7–32.

Mizruchi, M.S. 2004. Berle and Means revisited: the governance and power of large U.S. corporations. *Theory and Society* 33, 579-617.

Mizruchi, M.S. 1994. Social network analysis: Recent achievements and current controversies. *Acta Sociologica* 37, 329-343.

Mintz, B., Schwartz, M. 1985. *The Power Structure of American Business*. University of Chicago Press, Chicago.

Morgan, K. 2004. The exaggerated death of geography: learning, proximity and territorial innovation systems. *Journal of Economic Geography* 4, 3-21.

Neal, Z.P. 2007. The duality of world cities and firms: Comparing networks, hierarchies, and inequalities in the global economy. *Global Networks* 8, 94-115.

O'Hagan, S.B., Green, M.B. 2002a. Interlocking directorates: An example of tacit knowledge transfer. *Urban Geography* 23, 154-179.

O'Hagan, S.B., Green, M.B. 2002b. Tacit knowledge via interlocking directorates: A Canadian and U.S. Comparison. *Geografiska Annaler B* 84, 49-63.

O'Hagan, S.B., Green, M.B. 2004. Corporate knowledge transfer via interlocking directorates: a network analysis approach. *Geoforum* 35, 127-139.

O'Hagan, S.B., Rice, M.D. Green, M.B. 2008. North American corporate directors and educational affiliations: a geographical analysis. *Geography Research Forum* 28, 59-81.

O'Hagan, S.B., Rice, M.D. 2011. The geography of corporate directors: personal backgrounds, firm and regional success. *The Professional Geographer* DOI: 10.1080/00330124.2011.614567.

Pfeffer, J., Salancik, G. 1978. *The External Control of Organizations*. Harper & Row, New York.

Porter, M. 1990. *The Competitive Advantage of Nations*. New York, NY: Free Press.

Ramlogan, R., Metcalfe, J.S. 2006. Restless capitalism: a complexity perspective on modern capitalist economies. In: Garnsey, E. and McGlade, J. (Eds.) *Complexity and Co-Evolution: Continuity and Change in Socio-Economic Systems*. Edward Elgar, Cheltenham, pp. 115–146.

Reiffenstein, T. 2006. Codification, patents and the geography of knowledge transfer in the electronic musical instrument industry. *The Canadian Geographer* 50(3), 298-318.

Rice, M.D. 1996. Functional dynamics and a peripheral quaternary place: the case of Calgary. *Canadian Journal of Regional Science* 19(1), 65–82.

Rice, M.D. 2004. Regional and sectoral growth in Canada's emerging economy. *Canadian Journal of Regional Science* 27(2), 237–254.

Rice, M.D. 2006. Dominant national centers: a comparative analysis of the headquarters communities of New York and Toronto. *The Industrial Geographer* 4 (1), 28-50.

Rice, M.D., Lyons, D.I. 2010. Geographies of corporate decision-making and control: development, applications, and future directions in headquarters location research. *Geography Compass* 4 (4), 320-334.

Rice, M.D., Semple, R.K. 1993. Spatial interlocking directorates in the Canadian urban system, 1971-1989. *Urban Geography* 14, 375-396.

Rice, M.D., Seman, M., Green, M.B. 2008. Regional information and influence networks: the geography of corporate board membership in Texas. *The Industrial Geographer* 5 (1), 1-20.

Semple, R.K. 1973. Recent trends the concentration of corporate headquarters. *Economic Geography* 49, 309-318.

Semple, R.K. 1996. Quaternary places in Canada. In: Britton, J.N.H. (Ed.), *Canada and the Global Economy: The Geography of Global and Structural Change*. McGill-Queen's Press, Montreal, pp. 352-373.

Semple, R.K., Phipps, A. 1982. The spatial evolution of corporate headquarters within an urban system. *Urban Geography* 3 (3), 258–279.

Shearmur, R. 2008. Editorial—Of urban competitiveness and business homelessness. *Urban Geography* 29, 613–15.

Shropshire, C. 2010. The role of the interlocking director and board receptivity in the diffusion of practices. *Academy of Management Review* 35 (2), 246-264.

Taylor, M., Thrift, N. 1980. Large corporations and concentrations of capital in Australia: a geographical analysis. *Economic Geography* 56 (4), 261–280.

Wang, J., Mo, H., Wang, F., Jin, F. 2011. Exploring the network structure and nodal centrality of China's air transport network: a complex network approach. *Journal of Transport Geography* 19, 712-721.

Westaway, J. 1974. The spatial hierarchy of business organizations and its implications for the British urban system. *Regional Studies* 8, 145-155.

Wheeler, J.O. 1988a. The corporate role of large metropolitan areas in the United States. *Growth and Change* 19 (2), 75–86.

Wheeler, J.O. 1988b. Spatial ownership links of major corporations: the Dallas and Pittsburgh examples. *Economic Geography* 64 (1), 1–16.

Witt, U. 2003. The Evolving Economy. Essays on the Evolutionary Approach to Economics.
Edward Elgar, Cheltenham.

Witt, U. 2006. Evolutionary Economics. Papers on Economics and Evolution, No. 0605, Max
Planck Institute of Economics, Evolutionary Economics Group, Jena.

Table 1: Top Ten Growing and Declining Firms from the Canadian Top 1000 Firm Database, Based on Inflation-Adjusted Revenue Change, 1991-2006

Firm Name	Headquarters City	Sector	Subsector	Three-Digit NAICS	Inflation Adjusted Revenue Change, 1991-2006 (%)
Power Corp. of Canada	Montreal, QC	Service	Diversified	551	+13,191.8
CGI Group Inc.	Montreal, QC	Service	Information Tech.	541	+3,888.5
ThyssenKrupp Canada Inc.	Calgary, AB	Manufacturing	Machinery	331	+2,709.3
Precision Drilling Corp.	Calgary, AB	Service	Oilfield Service	213	+2,621.9
Cott Corp.	Toronto, ON	Manufacturing	Food & Drink	312	+2,194.0
Intrawest Corp.	Vancouver, BC	Financial	Real Estate	531	+1,771.1
Motorola Canada Ltd.	Markham, ON	Service	Communication	517	+1,352.1
Husky Energy Inc.	Calgary, AB	Resource	Oil & Gas	211	+1,261.7
Teck Cominco Ltd.	Vancouver, BC	Resource	Mining	212	+1,171.9
Graham Group Ltd.	Calgary, AB	Service	Construction	237	+1,065.3
Marubeni Canada Ltd.	Vancouver, BC	Service	Wholesale	421	-49.7
Hydro One Inc.	Toronto, ON	Utility	Electrical	221	-51.7
High Liner Foods Inc.	Halifax, NS	Manufacturing	Food & Drink	311	-54.7
Société Générale (Canada)	Montreal, QC	Financial	Investment	523	-56.5
Chrysler Credit Canada Ltd.	Hamilton, ON	Financial	Consumer Lending	523	-62.4
Four Seasons Hotels Inc.	Toronto, ON	Service	Accommodation	721	-65.4
Cdn. Broadcasting Corp.	Ottawa, ON	Service	Communication	513	-69.8
ITT Canada Company	Toronto, ON	Manufacturing	Transport Equip.	336	-71.6
John Deere Ltd.	Hamilton, ON	Service	Wholesale	421	-82.6
Falconbridge Inc.	Toronto, ON	Resource	Mining	212	-90.7

Table 2: Firm/Director Links by Headquarters Region and Director Region for Growing Canadian Firms, 2006 (n=96 firms)

HQ Region	Director Region				Total (%)
	Within-Region Total (% of Regional Total)	Outside-Region/ Inside Canada Total (%)	Foreign/US Total (%)	Foreign/All Other Total (%)	
British Columbia	43 (52%)	28 (34%)	7 (8%)	5 (6%)	83 (100%)
Prairie Region	86 (54%)	45 (28%)	18 (11%)	10 (6%)	159 (100%)
Ontario	210 (67%)	48 (15%)	40 (13%)	14(5%)	312 (100%)
Quebec	164 (63%)	63 (24%)	21 (8%)	13 (5%)	261 (100%)
Atlantic Region	14(54%)	11 (42%)	0 (0%)	1 (4%)	26 (100%)
National Total	517 (62%)	195 (23%)	86 (10%)	43 (5%)	841 (100%)

Table 3: Firm/Director Links by Headquarters Region and Director Region for Declining Canadian Firms, 2006 (n=18 firms)

HQ Region	Director Region				Total (%)
	Within-Region Total (% of Regional Total)	Outside-Region/ Inside Canada Total (%)	Foreign/US Total (%)	Foreign/All Other Total (%)	
British Columbia*	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)
Prairie Region	36 (95%)	1 (3%)	1 (3%)	0 (0%)	38 (100%)
Ontario	74 (83%)	8 (9%)	7 (8%)	0 (0%)	89 (100%)
Quebec	6 (35%)	10 (59%)	1 (6%)	0 (0%)	17 (100%)
Atlantic Region*	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)
National Total	116 (81%)	19 (13%)	9 (6%)	0 (0%)	144 (100%)

** British Columbia and the Atlantic Region hosted no declining firms for which the study had director data*

Table 4: Firm/Director Distances by Headquarters Region and Firm Type, 2006

Headquarters Region	Growing Firms (n=96)			Declining Firms (n=18)		
	Number of Directors	Total Director-HQ Distance (km)	Average Distance (km/Director)	Number of Directors	Total Director-HQ Distance (km)	Average Distance (km/Director)
British Columbia	83	168,856	2,034	0	-	-
Prairie Region	159	257,786	1,621	38	7,956	209
Ontario	312	242,454	777	89	33,844	380
Quebec	261	236,410	906	17	12,924	760
Atlantic Region	26	38,529	1,482	0	-	-
Total	841	944,035	1,122	144	54,724	380

Figure 1: Director Locations for Toronto's Growing and Declining Firms, 2006

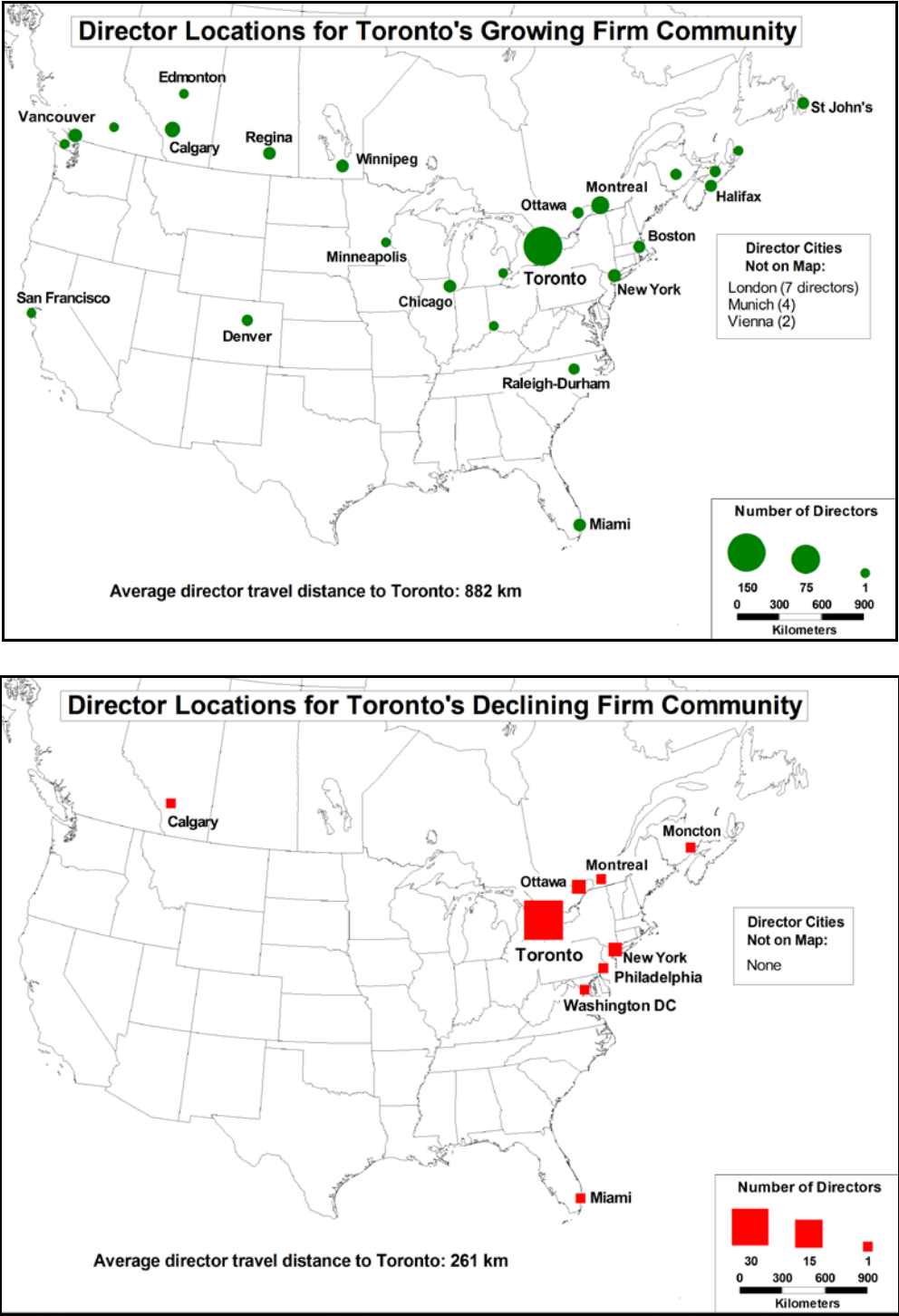


Table 5: Centrality in Director Links by Canadian City for Growing Firms and their Directors, 2006*

Headquarters City	Canadian Centrality**	Foreign Centrality[†]	Centrality to the Entire Network
Toronto, ON	0.2841	0.3089	0.2878
Montreal, QC	0.2897	0.2764	0.2878
Calgary, AB	0.0905	0.2114	0.1082
Vancouver, BC	0.0975	0.1057	0.0987
Winnipeg, MB	0.0669	0.0000	0.0571
Ottawa, ON	0.0432	0.0163	0.0392
Edmonton, AB	0.0251	0.0163	0.0238
Hamilton, ON	0.0153	0.0163	0.0155
Sault Ste Marie, ON	0.0084	0.0325	0.0119
Kingsey Falls, QC	0.0139	0.0000	0.0119
Oshawa, ON	0.0111	0.0081	0.0107
Quebec City, QC	0.0125	0.0000	0.0107
Florenceville, NB	0.0097	0.0081	0.0095
Stellarton, NS	0.0097	0.0000	0.0083
St. John's, NL	0.0084	0.0000	0.0071
Fredericton, NB	0.0070	0.0000	0.0059
Guelph, ON	0.0070	0.0000	0.0059

* Ranked by headquarters city centrality to the entire network

** Centrality within the Canadian component of the growing firm director network

[†] Centrality within the foreign component of the growing firm director network

Table 6: Centrality in Director Links by Canadian City for Declining Firms and their Directors, 2006*

	Canadian Centrality	Foreign Centrality	Centrality to the Entire Network
Toronto, ON	0.2889	0.5556	0.3056
Regina, SK	0.1704	0.1111	0.1667
Hamilton, ON	0.1259	0.2222	0.1319
Ottawa, ON	0.1259	0.0000	0.1181
Montreal, QC	0.1185	0.1111	0.1181
Edmonton, AB	0.0889	0.0000	0.0833
North Bay, ON	0.0667	0.0000	0.0625
Calgary, AB	0.0148	0.0000	0.0139

* Ranked by headquarters city centrality to the entire network