

Research Papers *and* Reports

2015

SOBEY SCHOOL OF BUSINESS

WORKING PAPERS SERIES

No. 2015-01

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MEASURING AND MAPPING KNOWLEDGE-SEEKING BEHAVIOUR IN AN ENTREPRENEURIAL ECOSYSTEM

Presented at Financing Knowledge Transfer Conference, Rimini, Italy April 16, 17, 2015

This paper is an earlier version of the paper, 2016-03, Quantitative Analysis of the Atlantic Entrepreneurial Ecosystem's Innovation Activities. This paper outlines the knowledge-seeking behaviors by type of organization and type of information sought. The later paper, noted here as 2016-03, demonstrates the remaining knowledge-seeking capacity of the ecosystem when one constituency is withdrawn.

Measuring and Mapping Knowledge-Seeking Behaviour in an Entrepreneurial Ecosystem

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Abstract

Interest in entrepreneurial ecosystems has intensified with the acceleration of the importance of entrepreneurship and with the success attributed to specific locations such as Israel, Silicon Valley, Route 128 in Massachusetts, as examples. The discussion has principally focussed on historical ethnographic account of the interactions of personalities, events, the actions of various companies, the recycling of talent, and the composition of a variety of different types of actors and groups in the ecosystem. The research outlined in this report responds to the need to study the dynamics of differing entrepreneurial ecosystems and the investigation of their context and institutional characteristics (Autio, Kenney et al. 2014). We measure the knowledge-seeking behaviours of participants in an ecosystem and chart them using network theory. Stripping away various elements of the ecosystem shows the relative importance of the remaining actors. The results demonstrate that the ecosystem performs better when all of the components are contributing. Network average degree weightings decline when any of the supportive constituents is missing. The work contributes to understanding the relative relationships in this ecosystem and suggests implications for comparison work with other regions.

*The authors would like to recognize the contribution made by the Province of Nova Scotia for sponsoring the original research into the Atlantic Entrepreneurial Ecosystem. Any of the comments made in this report are the sole responsibility of the authors and do not reflect the view, opinions or policy of the Province of Nova Scotia.

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Introduction

Interest in entrepreneurial ecosystems has intensified with the acceleration of the importance of entrepreneurship and with the success attributed to specific locations such as Israel, Silicon Valley, Route 128 in Massachusetts, as examples. The discussion has principally focussed on historical ethnographic account of the interactions of personalities, events, the actions of various companies, the recycling of talent, and the composition of a variety of different types of actors and groups in the ecosystem. The research outlined in this report responds to the need to study the dynamics of differing entrepreneurial ecosystems and the investigation of their context and institutional characteristics (Autio, Kenney et al. 2014). We measure the knowledge-seeking behaviours of participants in an ecosystem and chart them using network theory. Stripping away various elements of the ecosystem shows the relative importance of the remaining actors. The results demonstrate that the ecosystem performs better when all of the components are contributing. Network average degree weightings decline when any of the supportive constituents is missing. The work contributes to understanding the relative relationships in this ecosystem and suggests implications for comparison work with other regions.

Regional Advantage

Entrepreneurial innovation is thought to be a competitive advantage of a nation (Baumol, 2002). Yet nations can be large, and smaller regions have come to dominate success in entrepreneurial innovation. Concentrated systems of entrepreneurial innovation in specific regions has spawned the terminology of entrepreneurial ecosystems. The term goes back beyond 1995 (Bahrami and Evans 1995) where the most famous entrepreneurial ecosystem in the world, Silicon Valley, was characterized by “fleeting opportunities, shifting customer preferences, cascades of technological innovations, brutally short product life cycles, and furious global competition” (p. 62).

In the 20 intervening years, entrepreneurial ecosystems have evolved to represent “networks of actors contributing to joint value creation” and that had “undertaken some degree of co-innovation or adaptation” (Overholm In press). By now, however, the study of networks based on social constructs are far more prevalent (Pentland 2014) and knowledge-exchange systems that are defined by cooperation need not be spatially proximal or have a local context. This work adopts a general term of entrepreneurial ecosystem to describe a system that has elements of co-location and clustering, but that can also have the far reaching element of networks and innovation systems.

While there is a tendency to place successful ecosystems within their current day context, most of the former, and currently successful, systems have roots well back into the 1940’s and 50’s and for some, beyond that. The success of regionally-based entrepreneurship undertakings focussed attention on locations such as Silicon Valley, Route 128 in Massachusetts, Start-up Nation Israel, Silicon Glen in Scotland and Sophia-Antipolis in France to name a few. Some attention has been paid on less-than-successful locales (Honig and Black 2007) as well. The following section briefly investigates some of these ecosystems.

Silicon Glen

The Scottish example of Silicon Glen is a notable example of an entrepreneurial ecosystem because of the small population of the country, only 5,000,000 persons, and its unusual up then down results (Galbraith, Rodriguez et al. 2008). Unlike Silicon Valley, the region between Glasgow and Edinburgh, Silicon Glen, was created via a very planned approach.

Scotland had a comparative advantage in education and financial services (Dow and Dow 2005), but they had a low incidence of small business start-ups (Dow and Kirk 2000). With a previous background in heavy manufacturing, agriculture and shipbuilding, the policy initiatives by local Scottish governments were intended to attract international technology-based firms to Scotland to expand its local high-technology manufacturing and entrepreneurial base (Galbraith, Rodriguez et al. 2008) using economic development initiatives combined with the provision of grants (McCann 1997). The policy led to an insurgence of US, Japanese and Korean electronics firms that created jobs and the region grew to encompass manufacturing, electronics, life sciences, software, optics and instrumentation.

While there was significant co-location of large international firms, there occurred few technological spin-offs. The policies developed showed some significant successes followed by periods of significant failure (Honig and Black 2007). Decades later and the subsequent terminations of the international technology companies, little indigenous growth had resulted (Dow and Kirk 2000).

Route 128

The 100-year history of Route 128 also has a significant presence in the literature of regional advantage and was the first highly successful ecosystem in the U.S. The success of Route 128 in Massachusetts was born out of early research collaborations between MIT and large firms clustering about the information, defence and communications technologies. MIT pioneered corporate cooperation building relationships by means of business consultancies, research contracts, apprenticeships, spin-offs and venture capital funding with large enterprises. This was bolstered by the highest concentration of hospitals, research institutes, colleges and universities in the world (Hulsink, Manuel et al. 2007).

Within walking distance of Harvard, research centres and industrial laboratories, MIT and Route 128 had exceptional communications capabilities taking advantage of the beneficial consequences of social exposure. Massachusetts grew to be amongst the leading states in patents per capita, invention disclosure, licenses issued and venture capital and the number of initial public offerings (Rosegrant and Lampe 1992).

In the late 20th century, Route 128's relative fame was eclipsed by Silicon Valley. In Saxenian's (1994) cultural review of Route 128, she characterized the New England area as having a more hierarchical and old world social order. The New England area had a

social order where schools and churches and family and social class still maintained importance – a world where hierarchical order was central. This social norm was reflected in business interactions as well. Businesses were more stable and less risk taking; they had fewer connections between companies and fewer spin-offs. Proprietary products and systems were a way of reducing competition, and vertically integrated companies developed and operated under a more closed innovation method.

Silicon Valley

Silicon Valley's rise to regional prominence began to emerge in the 1970s and 80's. They developed many of the university and business relationships as did MIT, but Silicon Valley had a different business culture and social order (Hulsink, Manuel et al. 2007). Resting heavily on the incubation centres, science parks and technology centres established at Stanford. Silicon Valley was able to adapt to rapidly changing paradigms and industrial prominence. The industrial base at Silicon Valley spanned microprocessors, discs and storage, the manufacture of parts and peripherals, Internet-based technologies, and the current day intermediating services delivered over the Internet.

Silicon Valley's ability to try, test, fail, recycle people and reinvent new firms is still considered revolutionary. The ecosystem is resilient in its ability to rejuvenate itself. The Stanford connections and Valley network fostered a business structure of mutually dependent, highly specialised companies where the risks associated with failure were, and are, accepted (Hulsink, Manuel et al. 2007, p 19). "Paradoxically, while high-technology firms experience a high failure rate, Silicon Valley continues to thrive and prosper. In this domain, the demise of one firm invariably leads to the formation of others, directly and indirectly. This process of 'flexible re-cycling' can result in novel reconfigurations of knowledge and human capabilities, allowing new firms to rise from the ashes of failed enterprises" (Bahrami and Evans 1995).

Sophia-Antipolis

Sophia-Antipolis, in France, is an example of a cluster developed largely artificially through planning and regional policy. Described as a "City of Science, Culture and Wisdom" (Ter Wal 2013 p. 653), Sophia-Antipolis was the creation of a private interest who hoped the sunbelt region may be attractive to investment and entrepreneurial candidates. As time passed and costs of the effort mounted, public officials of the Côte d'Azur came on board as an effort to diversify the area's principally tourism economy.

Unlike the other examples of entrepreneurial ecosystems, when the first buildings were erected in 1972, Sophia-Antipolis had no industrial or university tradition at its core (Longhi 1999). It largely attracted non-European firms that wanted to adapt their products to suit a European market. However, the addition of France Télécom and its efficient fibre-optic network was a drawing card. But rather than spawning entrepreneurial ventures, Sophia-Antipolis was initially a home to subsidiaries. Remarkably, in a move from exogenous to endogenous growth, the University of Nice and National Centre of Scientific Research were established in the region. It was not until much later, when some of the large companies decided to move, that a labour force -

- unwilling to move -- began to start their own firms (Quéré, 2007). The innovation networks were lopsided, however, benefitting IT with a stronger culture of spin-offs and high technology growth than the life sciences group that was not so influenced by the co-location (Ter Wal 2013).

Study Purpose

To study the context of entrepreneurial ecosystems entails numerous variables associated with cultivating regional advantage: a combination of community, success, concentrations of university talent, growing pools of venture capital funding, and adept abilities to adopt new paradigms (Saxenian 1994). Other than the ethnographic and historical accounts noted earlier, some of the work highlighted the groups of constituents contributing to the ecosystem to build models illustrating the flow of activities amongst the groups (i.e. Bahrami and Evans 1995; Ferrary and Granovetter 2009). Some others construct economic models using expenditure and investment data, for example (McCann 1997). Autio, Kenney et al. (2014) have built a framework for investigating entrepreneurial ecosystems within the context of the industry, technology, social policy and organizational context, and related policy concerns, but also temporal and global, national and regional innovation systems. Some ecosystem research is based on survey data of measurements such as location decisions (Galbraith, Rodriguez et al. 2008), and interpretive analysis resulting in theoretically constructed propositions (Honig and Black 2007). A longitudinal analysis of the inventor networks highlighted the emergence of clusters and networks in specific industrial classifications (Ter Wal 2013).

The purpose of this study is to investigate the relationships amongst the various groups of actors within an entrepreneurial ecosystem in a more structured manner by using network theory to show the distribution of information-seeking activities as well as quantitative measurements amongst the constituents. This attempts to introduce context by avoiding focus on the firm or the entrepreneur, but introduces a more quantitative approach. We conduct this study using an entrepreneurial ecosystem located on the east coast of Canada where the foci are a number of small provinces that are sparsely populated. This is in sharp contrast to the methodologies currently seeking to study the context of entrepreneurial ecosystems.

The paper proceeds as follows. First we describe the Atlantic Entrepreneurial Ecosystem and its acceleration over the past decade. The methodology for studying the ecosystem follows, this outlines the type of study, the sampling methodology, the survey protocol and type of analysis. The descriptives of the respondents are included there. The next section contains the results, including network charts and tables of measures. The paper concludes with a discussion of the implications, limitations and opportunities for further research.

Atlantic Entrepreneurial Ecosystem

The Atlantic Entrepreneurial Ecosystem is centered on the east coast of Canada with a hub in Halifax Nova Scotia and another in Fredericton, New Brunswick, two small sparsely populated provinces. The provinces of Prince Edward Island and Newfoundland and Labrador round out what is referred to as Atlantic Canada. With approximately three percent of the nation's population, the region suffers difficulties. The most populous province, Nova Scotia has a population of only 943,000 (Statistics Canada 2014B), and currently suffers from a declining birth rate as well as declining population. The number of births in the Province dropped by 6 percent between 2010-2014. The mean family income in Nova Scotia is \$66,590, with the median income at \$53,606 (NS Dept. of Finance 2014).

Nova Scotia's private sector R&D expenditures are well below the Canadian average, with total expenditure of \$503 million (CAD) in 2012 (Statistics Canada 2014). Canada-wide, private business R&D expenditures contribute 50 percent of the total on average. In Nova Scotia only 16 percent is contributed to R&D expenditures by private business (Statistics Canada 2014). This point is further emphasised when the Province's gross expenditure on research & development is expressed as a percentage of gross domestic product. This percentage is only 1.3% for Nova Scotia as compared to 1.8% for Canada.

Traditionally focussed on fishing, forestry, and some large industrial pulp and paper and tire manufacturing plants, the sources of these higher paid skilled labour positions are diminishing. One large pulp and paper manufacturer is closed and another faces a precarious future with odour levels that are challenging to correct. One of Michelin's major tire plants has announced its closure. The current trend sees many families supported by Nova Scotians working in oil fields in western Canada and commuting between Alberta and Nova Scotia on a three- to six-week schedules. More recently, the declining price of oil raises concern about even this form of employment. In February, 2015 Alberta lost 14,000 jobs (Babad 2015), many of them expected to be migrating workers from Nova Scotia.

Yet the Province is very well suited to see significant growth in its GDP by transitioning towards a knowledge based economy. In recent years the foundation for this has been facilitated by the urbanization of the population, as well as the Province's high levels of post-secondary education. With 10 universities, and 13 community college campuses, Nova Scotia produces more post secondary graduates per capita than any other Canadian province. However, despite these encouraging factors, the shift away from Nova Scotia's traditional foci has been slow and the outpouring of youth to western Canada is likely to continue (Babad 2015).

Due to the combination of a declining growth rate in Nova Scotia's population and traditional industries along with their knowledge-based positioning, all three levels of Canadian government have begun to devote resources to encourage growth in the local innovation ecosystem.

Halifax, Nova Scotia's capital city, is the largest population centre in Atlantic Canada and is home to 43 percent of the Province's residents (Halifax Partnership 2014). The city has been recently experiencing a growth in university enrolments that are twice the national average. This strong academic presence contributes significantly to the R&D expenditures in the region, accounting for 74 percent of the total (Statistics Canada 2014).

With some of Canada's oldest and top rated universities, Halifax is turning its focus towards entrepreneurship, and the knowledge transfer from academia to the private sector. There has long been a foundation of support organizations, from the private sector such as Entrepreneurs Forum (founded 1992), from the federal government such as Atlantic Canada Opportunities Agency (formed 1987), and from the Provincial government with Innovacorp (formed 1994), in the city. By 2000 there were a number of government (Innovacorp, NSBI, Investment New Brunswick) and private venture capital (ACF) options in the region, and more were to come. An online, publication called *Entrevestor* was founded with the help of local governments. This publication followed the developing entrepreneurial ecosystem, with an explicit focus on technology enabled high growth firms.

This foundation, however, saw tremendous growth in the aftermath of a \$350 million exit and \$640 million exit (reputed) of two entrepreneurial firms in nearby New Brunswick. Radian 6 and Q1Labs had similar founders, investors and were both ICT firms. Respectively, they were sold to Salesforce.com and IBM. In 2012, Halifax-based firm, GoInstant, also sold to Salesforce.com. These exits developed a flow of capital into the region, and some of the founders and early investors recycled their new wealth into the founding of incubators (Volta Labs), accelerators (Launch 36), university support systems (Pond Deshpond Centre) and innumerable programs and pitch contests to encourage young entrepreneurship.

The longstanding entrepreneurship program at Saint Mary's University, a major business school in the country, was then supported by Dalhousie University's Starting Lean course and a new Masters in Technology Entrepreneurship and Innovation at the Sobey School of Business.

Methodology

The methodology to effectively measure and map an ecosystem quantitatively is best undertaken with a field study of the knowledge-seeking behaviours of constituents of an entrepreneurial ecosystem. Using a snowball sampling method, a survey investigated the knowledge-seeking behaviours of constituents of the ecosystem as well as the importance and frequency of the ecosystem's participants' knowledge-seeking activities. The data was analysed using network theory. A more detailed description follows.

Measures

Alvarez and Barnery (2007, p 126) noted that the central measure used in the opportunity literature were “actions that entrepreneurs take to form and exploit opportunities,” but not all entrepreneurial actions are innovative (Bosma, 2009). So where performance is driven by entrepreneurial innovation which is a function of entrepreneurial behaviour (Autio, Kenney et al. 2014) knowledge-seeking behaviours were used as the best indicator for entrepreneurial innovation.

In this study, knowledge-seeking behaviours were defined as actions taken by phone, in person or by email/text where a constituent of the ecosystem reached out to another individual in an effort to find information to make a decision related to an entrepreneurial firm. Three dimensions were investigated regarding each knowledge-seeking activity: importance, frequency and type of information sought. The number of times an ecosystem member reached out to someone else was measured, and the importance of the information to the seeker was measured with a seven-point Likert scale. The types of information sought were assessed as either business/market/financial information or product/scientific/technical information.

The survey protocol was executed by means of a “fillable form” survey. Returned surveys implicated other companies which were then sent a survey regardless of their physical proximity to the respondent. This type of survey distribution was adopted to avoid services such as Survey Monkey to ensure that the process of exporting data from the surveys occurred on servers owned, and operated, by Saint Mary’s University, as opposed to an independent third party. By ensuring that this data was only retained by the University we were able to better ensure the confidentiality of all personal information collected.

Sample Selection

The sample began with a list of qualified potential respondents drawn from media sources within the entrepreneurial community of Atlantic Canada. The technique of using snowball samples, or respondent-driven sampling, is appropriate for network analysis (Biernacki, 1981). With respondent-driven sampling, respondents indicate persons from whom they sought advice/information/knowledge about entrepreneurial ventures. The individuals noted by each respondent become the source for enlarging the sample and developing new potential respondents.

There is no list *per se* of all entrepreneurs and all firms and all agencies providing services to entrepreneurs so the boundaries are estimated by the participants of the snowball sample. Using this method, it is possible to access hidden agents participating within the Entrepreneurial Ecosystem. It is also recognized some influencers will not be part of the sample.

To develop a targeted distribution list for the Atlantic Entrepreneurial Ecosystem survey a base list of 75 qualified respondents was compiled. These included individuals in organizations that composed the various constituent groups in the ecosystem. The list of

qualified respondents was generated by carefully evaluating personal contacts of the lead researcher, Entrevestor, AllNovaScotia.com, and the online networking site, LinkedIn.ca. Those identified by these sources were the initial recipients of the survey. This distribution grew from the initial group of recipients, to 450 recipients in the first week, and snowballing to, and concluding with, 886 recipients after the final (fourth) week of distribution. A large proportion of the final group were not in any physical proximity to the Atlantic region.

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Data Collection

All emails were addressed to respondents under the principal author's email to take advantage of her name recognition and to add academic credibility to the requests. Most data was obtained in pdf fillable forms and was exported to a csv file. Therefore, information provided by emailing the fillable form populated the database automatically. Cleaning and coding the data was took place. The data are analysed using the complex network theory program, Gephi (Cherven 2013). Sampling techniques, the data collection, and the survey descriptives which highlight the characteristics of the respondents follow.

Table 1 - Example of Gephi Coding

Source	Target	Weight (1-7)	Frequency (#/Year)	Type of Communication
Agent 1	Agent 2	6	30	Business/Market/Financial
Agent 1	Agent 3	2	10	Both
Agent 1	Agent 4	1	1	Neither
Agent 1	Agent 5	7	100	Product/Service/Technical

Gephi created *arcs* for each line of the dataset, each of which required two *nodes*. Many duplicate nodes are consolidated to produce a network graph which introduces the concept of centrality in network theory. Because the entrepreneurial network data is from various types of agents (venture capitalists, entrepreneurs, universities, accountants), research assistants manually coded organizational types as well as the geographic data.

Survey Descriptives

Table 2 describes the response and network descriptive. The survey instrument was responded to by 95 individuals (some of whom declined to participate for specific reasons). The survey was completed by 79 respondents. The total number of different

firms to which the respondents referred was 781. A total number of 1477 knowledge-seeking transactions were engaged in by the ecosystem.

Table 2 - Network Descriptives

Network Descriptives	Count
Individuals responding to survey request (#)	95
Completed Surveys by Individuals (#)	79
Number of firms reported overall	781
Male/Female (%)	75/25

The nature of the respondents' capacities within the ecosystem follows. Respondents were permitted to self-identify into more than one category. Most of the respondents were entrepreneurs (46.8%) and a class of individuals who reported themselves as consultants (36.7%). As a collection, the next largest group were the venture capitalists (15.2%), the private individual investors (10.1%) and a member of an angel network (1.3%). Professors from the local universities and colleges represented 12.7 percent of the respondents' professions.

Table 3 - Self Identification of Profession (More Than One Category Possible)

Self Identified as	Percent (%)
Entrepreneur	46.8
Venture capitalist	15.2
Private Individual Investor	10.1
Member of Angel Network	1.3
Lawyer	1.3
Government Representative	3.8
Consultant	36.7
Professor	12.7
Employee at a large firm	1.3
Bank Representative	1.3
Mentor	3.8

Professors aside, the level of education amongst the ecosystem is very high. Respondents were highly educated with all but two having had some form of post-secondary education. Combined, more than half of the respondents had a masters' level or a doctorate and 27.1 percent of the group had a bachelors' degree. Fourteen percent of the respondents had a professional designation. Table 4 outlines the educational profiles of the respondents involved.

Table 4 - Level of Education

Level of Education	Percent
High School/Equivalent	2.9
Vocational/Technical School	2.9
Professional Designation	14.3
Bachelor Degree	27.1
Master Degree	42.9
Doctoral Degree	10.0

Results

Three elements of the AEE are dissected in the analysis of the results. The AEE as a whole is assessed along with the functioning of the system when specific groups are removed. That is followed by an analysis of the activities of the entrepreneurs in the ecosystem. The last slice examines the activities of the entrepreneurs, venture capitalists and universities – three qualities that are always recognized in successful entrepreneurial ecosystems.

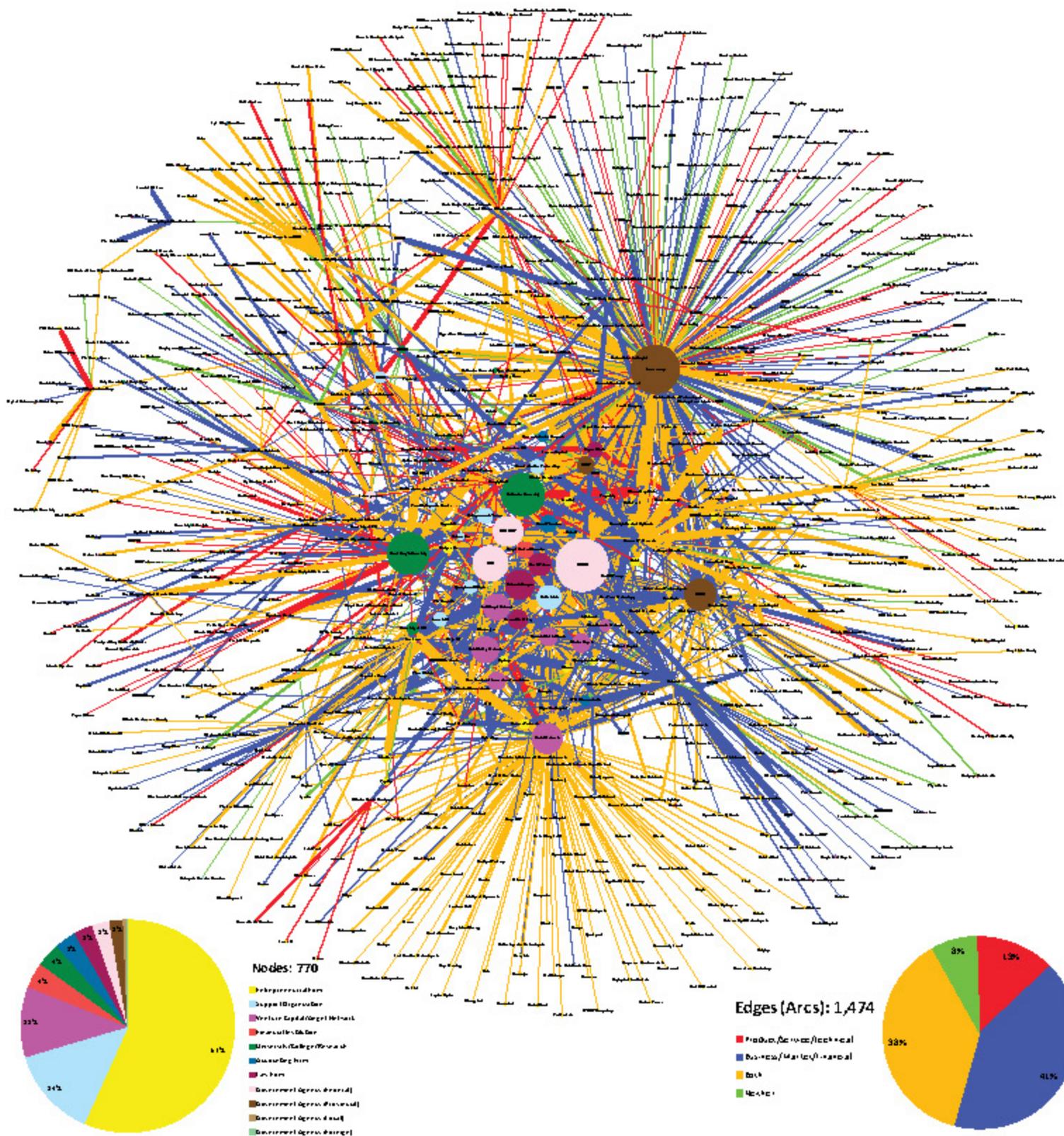
Atlantic Entrepreneurial Ecosystem

The knowledge-seeking activities of the Atlantic entrepreneurial ecosystem (AEE) are very complex. There are 780 different organizations represented in the reported AEE and 1477 separate knowledge-seeking relationships activities by 79 respondents. The image of the AEE is displayed in Figure 1. The various types of organizations identified by their colour and a legend displays the number of nodes. Fifty-seven percent of the nodes are represented by entrepreneurial firms. Support organizations, venture capital firms, universities, Federal and Provincial governments, and professional firms represent the bulk of the named organizations that were sought after for some type of knowledge. The size of the node represents the number and importance of the knowledge-seeking behaviours which others sought of the named node. The centrality of a node is an indication of its interconnectedness amongst may different information seekers.

Two key types of information were suggested as the basis for reporting respondents' behaviours. *Product or Service Technical* information indicates science-related, product, programming, equipment, or technical information. Thirteen percent of information requests were of this nature. The legend in Figure 1 displays the types of information sought. Forty-one percent of the requests were for *Business Market or Financial* information which relates to markets, administrations, funds seeking and business operations. Thirty-eight percent of the respondents were looking for both kinds of information from their knowledge-seeking activities and the remaining eight percent indicated they were looking for information other than these two key categories. Careful examination of the arcs reveals numerous other bits of information such as the direction of the information-seeking activity. The small pointed end, terminating on the periphery of a node means the information was *sought from* that organization. Avive Naturals for example has many arcs emanating from theirs. They sought information

from Perennia, NSBI, Canada Business Reference Library, Halifax Port Authority, NRC-IRAP, Export Canada and Port Mexico to name just a few. They, on the other hand, are a very small node because they have not been sought to provide information to others in the AEE.

Figure 1: Atlantic Entrepreneurial Ecosystem



The major financial institutions, universities, support groups and federal and provincial agencies are very important to the ecosystem. They are more sought-after for information and more connected which drives their nodes it to the centre of the chart. Some entrepreneurial firms that are frequently linked to these organizations are also in the centre of the chart. Many of the firms on the periphery of the chart are those from which information was sought but that have no other knowledge-seeking associations with any other company in the AEE.

A considerable proportion of the knowledge-seeking behaviours of the AEE is not proximal to the Atlantic Canada location. Approximately 75 percent of the nodes are situated in the Atlantic region. Encouragingly, 15 percent of the nodes are from the rest of Canada, nine percent are from the U.S., and one percent are from abroad. This suggests a global group reaching out for information from companies and groups around the world. If these global-facing nodes are connected to entrepreneurs it suggests an inoculation to dis-entrepreneurship as defined by Honig and Black (2007). Dis-entrepreneurship occurs when the community adopts an inward facing orientation rather than an outward orientation in a globalizing world. “Entrepreneurs finding themselves in communities characterized by strong client-patron relations would do well by appealing to broader regional institutions that frequently trump local oligopolies” (Honig and Black 2007. p 286).

One way of measuring the importance of individual groups of constituents is the proportion of relationships between the edges or arcs (the lines running from node to node) and the number of different constituents (number of nodes). This is called the Average Degree statistic. A larger Average Degree statistic (Arcs/Nodes) indicates that more knowledge-seeking behaviours are taking place per member of the ecosystem.

Table 5: Ecosystem Statistics With and Without Various Ecosystem Groups

	Entire Ecosystem (EE)	EE Minus Federal Participation	EE Minus Provincial Participation	EE Minus Support Orgs	EE Minus University Participation	EE Minus Venture Capital
NODES	770	752	571	633	692	584
EDGES	1474	1359	1059	1145	1282	1045
AVERAGE DEGREE	1.914	1.807	1.855	1.809	1.853	1.789
AVG WEIGHTED DEGREE	12.481	11.669	10.737	12.104	12.172	11.844

Table 5 shows the AEE without various groups of constituents as comparators. The average knowledge-seeking activity decreases when any group is removed from the ecosystem. For example, when the Federal Government’s participation is removed from the AEE, the AEE’s average degree declines from that of the average degree of the whole ecosystem; the entire ecosystem’s knowledge-seeking activity level improves when Federal participation is included. Federal Government constituents punch above their

weight in the AEE because the ecosystems' arcs per node declines when the Federal Government is absent. The AEE is most hampered if the Province is withdrawn likely because of the contribution of government-sponsored venture capital in Innovacorp, NSBI and Build Ventures.

A similar situation occurs when considering all of the other major groups noted in Table 5. Removing any one of them causes the average degree of knowledge-seeking behaviours to decline. The AEE is more knowledge-seeking when all the major groups of constituents are in place.

The average weighted degree takes into account the combined importance weights indicated by the respondents to the survey – the *value* of the information sought by the seeker. A higher value indicates more importance. In Table 3, the Weighted Average Degree of the AEE is 12.481 when everyone is participating. However, the AEE's average weighted degree declines the most, to 10.737 when the Provincial governments' contributions are removed (two early-stage venture capital funds).

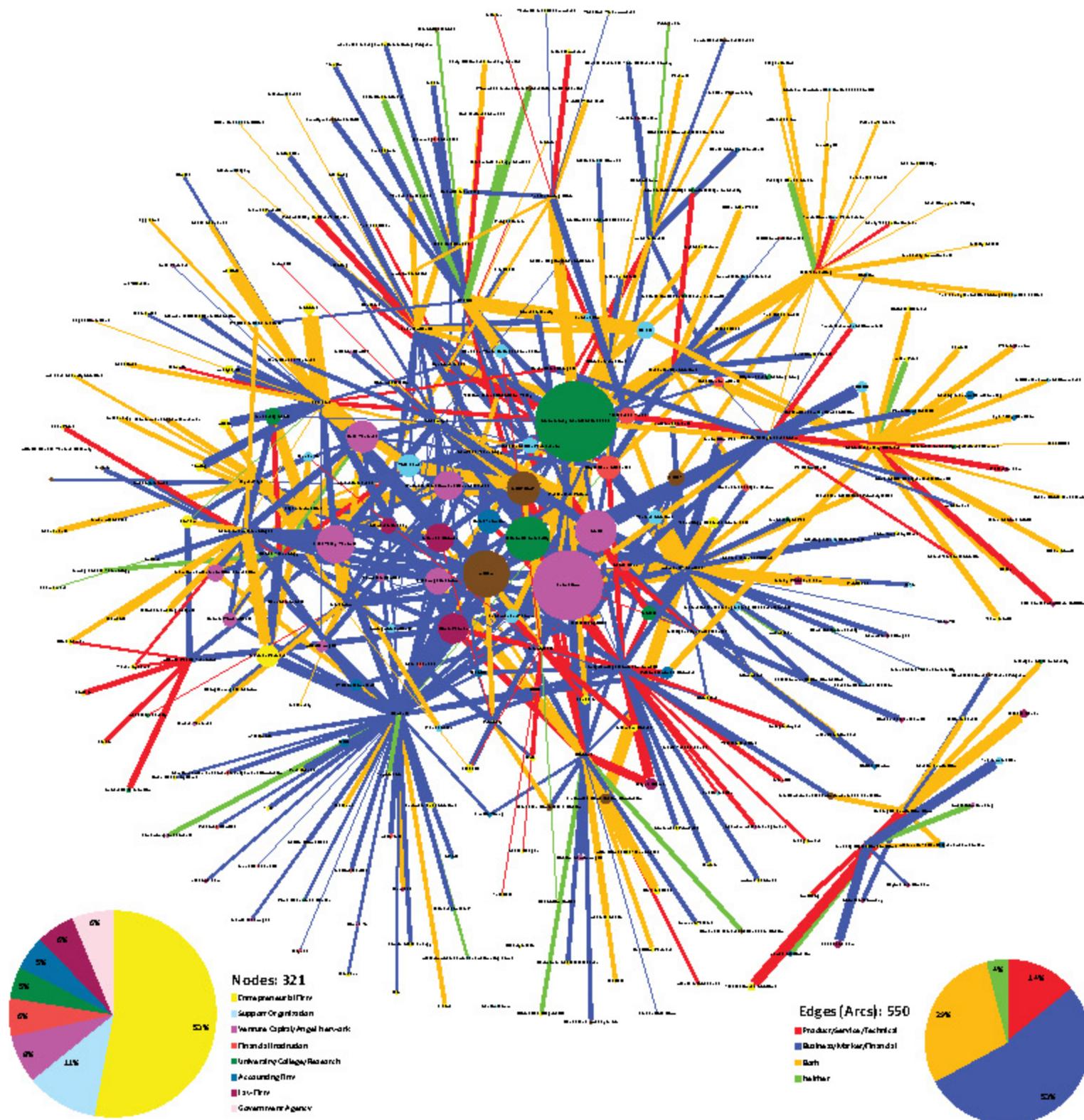
Knowledge-Seeking Activities of the Ecosystem's Entrepreneurs

If one is to assess the overall ecosystem by isolating groups of constituents in order to determine their importance to the ecosystem (above), it is useful to isolate the activities of the entrepreneurs and view their activities in isolation. The complement then is the remainder of the AEE. Table 6 shows the outbound activities of the entrepreneurs, who they reached out to, what organizations their engagements are devoted to, and what type of information they were requesting.

Table 6: Outbound Knowledge-Seeking Behaviours of Entrepreneurs by Type of Organization and Type of Information Sought

Entrepreneurs Reached Out To	Count (#)	Of Total (%)	Product/Service/ Technical (%)	Business/Market/ Financial (%)	Both (%)	Neither (%)
Other Entrepreneurial Firm	165	30.0	16.4	37.6	39.4	6.7
Support Organization	69	12.5	14.5	47.8	37.7	0.0
Venture Capital/Angel Network	96	17.5	6.3	69.8	20.8	3.1
Financial Institution	43	7.8	11.6	65.1	18.6	4.7
University/College/ Research	48	8.7	29.2	45.8	25.0	0.0
Accounting Firm	33	6.0	6.1	69.7	18.2	6.1
Law Firm	42	7.6	19.0	61.9	19.0	0.0
Government Agency	54	9.8	9.3	57.4	25.9	7.4
ALL	550	100	14.0	53.1	28.9	4.0

Figure 2: Outbound Knowledge-Seeking activities of Entrepreneurial Firms



The left panel of Table 6 shows that entrepreneurs' activities represent approximately one-third of the system's knowledge-seeking behaviours (550/1477). The largest proportion of their effort is expended on soliciting knowledge from other entrepreneurs (30.0%). Reading across to the right panel, the information they most frequently seek relates to business/market/financial advice 37.6 percent of the time.

Venture capital/angel networks (17.5%) and supportive organizations (12.5%) are the next most frequently sought-after groups for information by entrepreneurs. The nature of the information sought from both of them is overwhelmingly business/market/financial driven (68.9% and 47.8% respectively). None of the remaining groups takes any more than 10 percent of the information-seeking activities of entrepreneurs in the ecosystem.

In sum, the entrepreneurs are reaching out to an average of 10.7 other organizations over the course of the previous year. This seems light though recall biases might reduce their reporting of who they reached out to. By comparison, the other actors in the AEE, the VCs, the federal and provincial governments, support groups, etc. are reaching out to 14.7 other organizations. So the entrepreneurial group is less active than the other organizations in the system as it relates to knowledge-seeking activities.

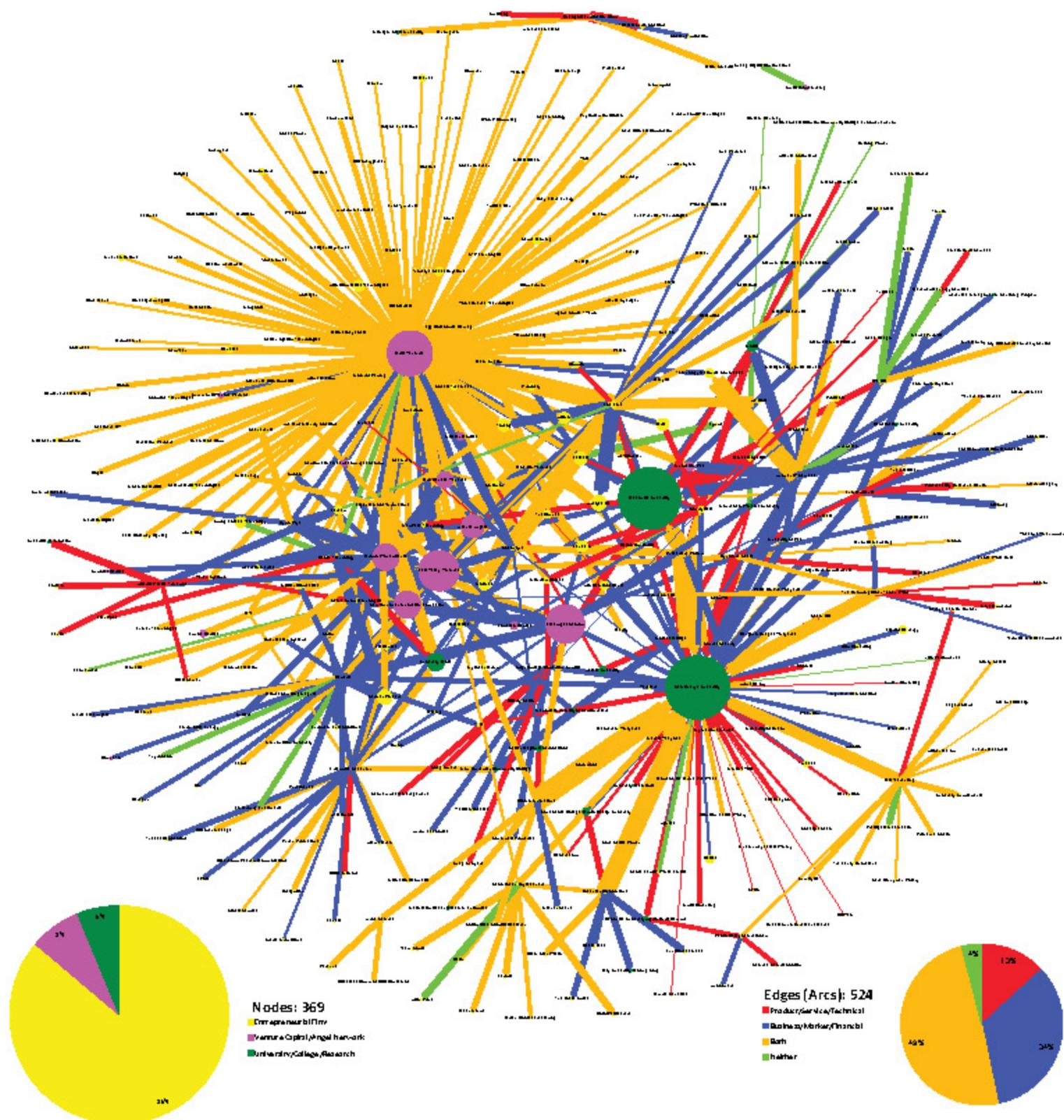
The vast amount of knowledge-seeking is related to business activities, rather than technical, scientific or product execution activities. In each and every category of outreach, the entrepreneurs are overwhelmingly requesting business, market or financial information. This is somewhat surprising.

Knowledge-Seeking Activities of Universities, Venture Capital and Entrepreneurs

The stories of Silicon Valley and Route 128 were both dominated by the active participation of universities and personalities within those institutions (Saxenian 1994) and the contribution of available finance and venture capital were considered very valuable (Ferrary and Granovetter 2009). This analysis considers these three components of the system as a group.

The chart showing the interactions amongst the universities, venture capital firms and the entrepreneurs is composed of 369 firms, the vast majority of them being entrepreneurial firms. There are 1.8 edges per node and the importance of the transactions is high, a weighted average degree of 11.6. This represents about half of the nodes and a third of the edges in the entire AEE. Again, the universities and the venture capital firms are driven to the centre of the chart highlighting their interconnectedness and thereby their importance to the structure of the ecosystem.

Figure 3: Knowledge-Seeking Activities of Entrepreneurs, Universities and Venture Capitalists



An examination of the entrepreneurial firms shows little interaction with other larger firms which has been an approach used in other ecosystems. The mixing and recycling of talent amongst large and smaller firms produces knowledge spinoffs that benefit both parties. Modest encouragement by larger companies in the Province can provide exceptional opportunities developing founders, and very early-stage ventures benefit from close proximity to, and mentorship by, successful high growth firms. Established innovating businesses can mentor aspiring technology oriented entrepreneurs to absorb business models, mentorship, technology, management practices, and the culture of fast-growing businesses.

There is little independent private venture capital in the AEE. Most of the firms are government-sponsored venture capital attempting to fill financing gaps. The larger ones are those which fulfill a government, or quasi-government mandate. For some of them, their mandate has expanded to provide a supportive and mentoring capacity in the ecosystem as well as incubating opportunities.

The universities are sources of both business and technical information for entrepreneurs and founders. This is demonstrated in the different colour arcs emanating from the universities. It is promising to see the role that the universities play in the previous iteration of the ecosystem, but in particular with this iteration, of the entrepreneurial firms. This chart's high average importance rating indicates its value. Clearly, the efforts that are being spent on entrepreneurship education inside the Universities are resulting in considerable involvement. The high levels of education of the AEE's constituents is no doubt related to this observation.

Implications & Future Research

Inviting international firms to jump-start a region is a zero sum game since some other region loses by their choice of location (Acs, Glaeser et al. 2008), or incentives to relocate draw down the benefit of their movement into a region. Silicon Glen failed to see any appreciable entrepreneurial activity from this policy. Others have benefitted from historical clusters of a specific sector which resulted in significant spillovers, and some appear to have succeeded by serendipity and the benefits of geography and maybe a university or two (Acs, Glaeser et al. 2008). These are hard to replicate. Contributing to the mix of attributes, processes, and constituents that most foster entrepreneurial ecosystems, and the context in which they operate, is the aim of this research.

This research calls attention to the multiple parties needed to stimulate entrepreneurial ecosystems (Van de Ven 1993), and addresses a more recent call for investigations into regional and contextual influences on entrepreneurial innovation (Autio, Kenney et al. 2014). This work seeks to expand the knowledge of entrepreneurship by focussing on the context of an entrepreneurial ecosystem's knowledge-seeking behaviours. It does so with a revealing visual and quantitative examination of entrepreneurial ecosystems' knowledge-seeking behaviours. The use of network theory is a unique contribution to the

entrepreneurial literature as well as network theory literature, and its use endeavours to tease out specifics regarding the nature of the ecosystem's functioning.

Knowledge-seeking networks amongst an ecosystem open the founder to complementary competencies and resources to gain access to new knowledge and people. Networking is an active way to create entrepreneurial opportunities for high-tech innovation, and high-tech founders exploit existing opportunities and deploy their networks to form new contacts and relationships that form new opportunities (Moensted 2010).

The interconnectedness of the constituents in the AEE is amply highlighted in the charts presented earlier. Moreover, the metrics associated with the analyses specifically demonstrate the dwindling effectiveness of the AEE's knowledge-seeking behaviours when any one of the major constituents is withdrawn. The incremental value that each group of actors contributes to the ecosystem signifies the synergy present in the combined group of entrepreneurs, governments, support groups, professionals and venture capitalists. Removing any one of the various groups of actors causes the average degree of knowledge-seeking behaviours to decline.

The AEE is more knowledge-seeking -- more seeking of innovation and entrepreneurship -- when all the major groups of constituents are in place. This is corroborated by extant research. It is recognized that governments cannot establish, or mandate, an entrepreneurial ecosystem (Soto-Rodríguez 2014), only the value creation contributions of many actors working in concert through their interconnectedness (Cohen 2006) results in a functioning and sustainable ecosystem.

The AEE has a global orientation. Many of the organizations implicated by the respondents were outside of the Atlantic region. More research is needed to examine whether the founders specifically had a global orientation, or whether it is other constituents who are reaching out to the world. Circumstances that cause dis-entrepreneurship may be obvious if their entrepreneurship activities cause their communities to fail to grow resulting from weak local investment, failure to take advantage of policy opportunities or poor infrastructure (Honig and Black 2007). Similar analyses of other ecosystems may highlight variances when contexts and qualities are contrasted.

Entrepreneurs' overwhelming search for business, market and financial information rather than technical/scientific/product information is a surprising finding. A number of reasons may explain it. If entrepreneurs are competent in their design, science and production of their products, their needs may be largely related to the development of markets, delivery of product, sales techniques and methods of building a firm. That would be reassuring. In an area of challenged resources and financial capabilities, the search for business acumen and finance may be expected. However, if the entrepreneurs are spending most of their time on business-building activities with little or no product innovations or design improvements, difficulties related to immature innovations may prevail.

Further research opportunities abound using this method. Other research may answer questions about the mix of qualities that are necessary for successful ecosystems and provides opportunities for comparison. Is there more or less focus on university, or professional support, or venture capital funding, or incubators or accelerators in the winning regions compared to those less successful ones? Does success have more to do with the social order, or social capital? Is it influence, contacts, and networks that drive successful ecosystems, or is it capability of a number of key players that lubricate them? Is there a critical mass of venture capital required to grease an entrepreneurial ecosystem? Is there a critical mass of people working in a similar area that drives a cluster to become an innovation network? And if so, what is that critical mass? Future research may seek to investigate these areas.

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2015

SOBEY SCHOOL OF BUSINESS

WORKING PAPERS SERIES

No. 2015- 02

Dr. Ellen Farrell

**OPPORTUNITIES FOR SYNDICATION IN A
GOVERNMENT VENTURE CAPITAL DOMINATED
ENTREPRENEURIAL ECOSYSTEM**

Presented at Business and Economics Society International, July 9-12, Portugal, 2015 Accepted
for publication in 2015 Global Business and Economics Anthology

Opportunities for Syndication in a Government Venture Capital Dominated Entrepreneurial Ecosystem

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Abstract

Syndication brings more specialized and domain-specific investors to participate in venture capital investments with local government-sponsored venture capitalists. Local and regional government-sponsored venture capital funds can have difficulty sourcing syndicating investors. This research explores the candid observations of potential syndicating venture capitalists and their likelihood and propensity to invest alongside small regional government-sponsored venture capital funds. Issues relating to the capabilities of local fund managers, valuations, contracting provisions, and the alignment of motives required co-invest together are discussed. The overriding factor that syndicating venture capitalists like to do business with colleagues they have come to trust can limit the local venture capitalists' abilities to leverage the public funding provided by local government-sponsored venture capital funds.

Keywords: syndication, government venture capital, valuation, entrepreneurial ecosystem

Introduction

Syndication is vital for most venture capital-backed firms because of the need for successive waves of increasingly larger finance as the firm rapidly grows. There are three major components in the equation for syndication: the founders, the local VC investors, and outside co-investors invited to participate in financing a deal – the syndicators. The founders sell equity from their newly burgeoning firms to a venture capitalist (VC) and syndicating venture capitalist (SVC) who purchase the equity with capital from the funds that they manage. Syndication is a method to share risk by reducing the amount of investment that must be contributed by each VC, and by allowing the participating funds to include more investments in their portfolio (group of investees financed by a fund), and is a means to validate their decision-making

Most syndicated investments are characterized by two groups: the VC who identified the founder as an attractive opportunity, usually within reasonable

proximity to the founder, and the SVC that the local VC invites to participate in the financing. Isolated locales, or regions bereft of any venture capital often have government interventions to fill financing gaps for founders and their fledgling firms. These government-sponsored venture capitalists (GVC) tend to operate within a specific geography, have no specific domain expertise, nor a specific strategy, and are often saddled with diverse economic objectives such as job creation.

A syndicating VC, however, can originate from anywhere and is invited to participate in the deal by a local GVC. A VC in Chicago that has a specialty in photonics can be invited to participate in a local deal with a GVC because syndicators rely on the local GVC to monitor and provide oversight for any co-investment they might do together. Thus, the geographic range of a syndicator and their money is theoretically limitless.

Syndication fuels the venture capital system. Because one can invite syndicators from around the world, there is essentially an unlimited stock of syndication capital available. Indeed, there are U.S. funds making investments in Asia and European funds making investments in Canada. Someone from the U.K. can invest alongside a local VC to fund a Nova Scotian company (a current situation). With an unlimited number of VCs to work with from around the continent, the stock of syndication funds is vast.

Yet, what is the reality of such deals. The nature of the relationship between local GVC and SVC forms the purpose for this study. The perceptions of SVC as they relate to syndicating with GVC are largely unknown and this explorative study undertakes to identify candid sentiments by SVCs about their interests in participating with local/regional GVC. The research question is relevant because it assesses the impact of the local GVCs relationship building efforts with the potential SVC industry, and it investigates how SVC view local GVC personnel and activities. Their observations could be practically instructive for GVC. Moreover, VCF rationales for their observations give rich context to the quantitative developments in the industry.

The study proceeds with an investigation of the extant research. The methodology for the study follows along with some descriptives of the respondents. The results take the form of the many topics covered by the SVCs forming the results. The paper concludes with a discussion of the findings and limitations of the work.

Extant Research

Regions attempting to develop entrepreneurial economies sometimes create government-sponsored venture capital funds (GVC) to invest in research and development (Cumming 2007) and fill financial gaps (Cohen, Gabbay et al. 2012; Mason and Harrison 2015). Less favoured economic regions embed GVC in order to counteract the tendency for VC to congregate in more metropolitan areas

(Christensen 2007). GVC have different objectives than independent or captive venture capital funds. GVC objectives often limit investments geographically to ensure the funds are invested in the immediate political area (i.e. Myles 2013). GVC investments are then used to leverage other finance (i.e. Humphery-Jenner 2012), referred to as syndication.

Venture capital syndication is financing of a founder that is shared amongst more than one venture capitalist (Bygrave 1987). As a chief method to alleviate adverse selection (selecting poor entrepreneurs), syndication relies principally on the financial need to reduce risk by diversifying their portfolios, as well as to ensure sharing and reciprocity within the industry (Lockett & Wright, 2001). The motives for syndication are more risk sharing in nature than risk reducing. Syndication is a social endorsement practice that reinforces the venture capital network and is a predictor of, and positively associated with, the expectation of risk. Low-innovation projects with lower risks have lower co-investment rates than high innovation projects with higher risks (Bygrave, 1987).

VC prefers to have syndicating partners. In so doing, they can participate in increasingly diverse investment opportunities (Alexy, Block et al. 2012). SVC reduce informational uncertainties by appraising other venture capitalists' willingness to invest (Lerner, 1994). They do this based on the superiority of decisions made when a number of independent observers agree (Sah & Stiglitz, 1986), and by taking advantage of improved information of new syndication partners during follow-on rounds (Admati & Pfleiderer, 1994). Syndication also permits VC to learn improved methods – of say, contracting – that accrue from socialization (Bengtsson and Bernhardt 2014), they benefit from greater added value due to group diversity (Ma, Rhee et al. 2013). Syndication can bring more specialized investors to participate in deals. Some venture capitalists will even reconsider investing in projects that they previously discarded because of the involvement of a particular venture capitalist (Steier & Greenwood, 1995).

VC also exploit informational asymmetries by investing in later rounds of profitable firms to boost their own reputations and returns (Lakonishok, Shleifer, Thaler, & Visney, 1991) so that they do not “*conspicuously under-perform their peers*” (Lerner, 1994, p. 18). Canadian VCF can take advantage of improved exit opportunities if syndicators are cross-border (Espenlaub, Khurshed et al. 2014) originating in the larger US industry.

Early-stage VC or business angel networks (BAN) may even prefer syndication with a larger fund to be preferable to an exit. In these cases, the long run returns from a future exit are expected to be greater than an immediate sale. The original business angel or early-stage VC will stay on as the lead and continue to play a role in advising the investee (Harrison & Mason, 2000; Murray, 1994) while bringing in SVC (Murray, 1994). It is a bit of a double-edged sword, however, because early-stage capitalists have few other options and the larger funds negotiate with that knowledge and the balance of power lays with the new investor even though the

first financier provides the support and specialisation required by the investee (Murray, 1994).

The research question investigates the willingness of private, independent SVC to syndicate with GVCs located in smaller, geographically dis-located regions. This study explores a specific locale, investigating GVC and their relationships with SVC and the perceptions of the latter in engaging with GVC.

Methodology

Investigating the syndicating practices between local GVC firms and SVC took a qualitative exploratory approach. The research question, whether the local GVC had the ability and tools necessary to drive syndicating partners into the local area, was investigated by questioning GVCs' peers outside of the local region. The impact and effectiveness of GVC and its ability to leverage funds from other sources (syndicate) was assessed by broad ranging personal interviews. Fourteen in-depth semi-structured, open-ended interviews were conducted with industry participants from across the continent. These included private and independent venture capitalists, private equity investors, and business angels. The interviews were conducted in a manner supportive of grounded theory. This means that as the interviews are being conducted, the questions evolved, and as new topics and ideas were broached, they became part of the analysis (Fendt and Sachs 2008). The questions advance as new findings about a phenomena unfold.

Fourteen participants were interviewed. All interviews were conducted in the presence of two researchers, and all but two were recorded in full. All respondents were assured of confidentiality and each participant was interviewed for between forty-five minutes to an hour. Their comments were free ranging which were later categorized into three categories: their comments about founders; their comments about GVC specifically and in general; and their comments about syndicators and syndication. This study features the latter two categories, GVC and SVC.

The open ended interviews were complemented by quantitative data analysis. Local data of numerous investments conducted within the region made a quantitative contribution to accompany the comments of the interviewees. The quantitative data were specific term sheet data of 105 GVC investments. This more complicated methodology was used because introducing qualitative material with quantitative data improves the interpretation of observations (Wiersma 1991). Combined, the naturalness of the participants' observations, and stories, along with quantitative data contributes to internal validity of an argument (Smith and Glass 1987).

Participants Selection

The sample for the qualitative interviews was derived from the list of potential syndicating relationships developed by the local GVC. Fifty-two venture capitalists from around the US and Canada were contacted by email to participate in an interview and the scope of research was outlined. Two rounds of the email were distributed. The

respondents whose comments are included in this report were those who volunteered to participate during the short two-week period allotted for these interviews. Concerns by GVC about preserving important relationships were effected by only interviewing respondents who volunteered to participate. No calls were placed to encourage participation.

Respondent Descriptives

There were numerous different types of funds represented by the respondents and not two were identical. Three funds had typical limited partner (LP)–general partner (GP) relationships and they each had different domain specialities. Two business angel organizations and investment clubs from outside the region, and the country, operated on different business models. Two respondents leaned more towards the private equity models, but were in a similar search for growth oriented companies. A corporate (captive) investor and a retail fund investment manager offered to be interviewed. Several investment managers were operating in the U.S. as well as Canada and one former Canadian investor was a serial entrepreneur who had built a very large company.

To present the diversity and breadth of the respondents, their characteristics are presented below in Table 1. These qualities describe the range of characteristics embodied by the investment managers interviewed.

Figure 1 – Respondent Descriptives

- Individuals making investments under the auspices and oversight of a collective
- Syndicators who only lead, and syndicators who never lead
- Typical LP funded and GP organized funds, and business angel network directors
- An investment club that invests up to \$300,000 per investment
- A SVC that characteristically invests \$5,000,000 - \$30,000,000 per investment
- A SVC that offers its incubation and mentoring services on an equity for service basis
- A fund that writes some of the biggest cheques in Canada
- Canadian funds, and American funds
- Controlling interest oriented private equity funds
- Silicon Valley VCs and Ivey League educated VCs
- VCs bred out of the banking industry
- An entrepreneur who built a \$2 billion company turned VC
- VCs who have worked on or advised on IPOs
- Highly successful exit participants
- Early-stage Series A investors, and later-stage Series B and C investors
- VCFs from \$200 million funds
- \$30,000,000 fund managers, and incubators whose money was half of their own.
- Angel investors outside the region, and angel networks outside the country
- Advisory practices for growth stage companies
- A Committee member to the Ontario Securities Commission

- Canadian Venture Capital and Private Equity Association representatives
- Investment managers who have traditionally made Boston financings only
- Investment managers who believe their investments should devolve outside their normal perimeter
- Advisors to capital formation in private markets in mature firms (five to 20 years) and some pre-revenue firms

Results

This section discusses GVC qualities that are related to syndicators' needs. Their opinions were solicited about the nature of valuations in the region and its importance to syndication and their perceptions, if any, of the sense of rivalry or comradery in the industry and its relevance to developing relationships. The skill set of the investing base as part of the value-added that a GVC brings to a syndication were observed.

Regional Awareness

The local area is not widely recognized as a hotbed of VC activity. SVCs varied in their knowledge about the locale; some were well acquainted and had done deals in the region, a few were discerning about it, and others were bereft of much insight into the funds or personalities that ran them. One interviewed fund had U.S. coverage northeast of Washington and was aware of the region as well as some of the local VC funds. Another interviewee has been in the region often, has invested here, and had visited some of the incubator events. He remarked that he does not know everyone in the industry in Nova Scotia, but has a sense of the active funds in the region and his company has someone out here every six months. A third participant said he had looked closely at a technology company in the region at one time, but any other contacts would have been restricted to brief calls with VCs in the area.

A U.S. SVC admitted he had no knowledge of the volume and quality of deal flow, however, he acknowledged the Canadian governments' efforts at bringing companies cross boarder via the Canadian consulate office. A Canadian VC noted, *"Who would they consider their VCs? I only know of two and I couldn't even tell you who they are ... and there was a new fund that started maybe a year ago that I was sort of marginally aware of ... but I don't even really know who they are ... and there were a couple of other groups that do venture stuff but are not funds by trade. So I don't really know who the folks are."*

The key investment manager for an American fund indicated he does half of his financings in Canada representing 40 percent of his capital. He likes to invest in Canada because his reputation provides a competitive advantage. *"In the States, I've only been there for five years. I'm anonymous in the States. But I'm not anonymous in*

Canada; I'm not anonymous in Waterloo particularly. Everybody knows who I am and anybody who wants to do anything, or wants money, has my number." He mentioned Waterloo, Toronto and Montreal connections, and though he has not made any investments in Nova Scotia, but the investor had seen deals from Atlantic Canada.

A domain specialist SVC who knew the province well and the various GVC operating in the region conceded, *"I don't know of any groups in Atlantic Canada that we wouldn't want to deal with. I know the general ecosystem in Atlantic Canada."* On the contrary, even though there is not a fund in Canada that does not know the Radian6 and Q1 Labs deals (New Brunswick), a number of the VCs do not reflect on Atlantic Canada as having a vibrant technology space for deals. One ranked the country in order of importance: Ontario, BC, Quebec, Alberta and the rest of Canada is fifth. *"I spend a day a month in Vancouver, I live in Toronto, Montreal once a month, Calgary twice a year. Teams from here going to the east coast might take place once a year. I have yet to make a trip to Saskatchewan or Manitoba."*

Valuation

In a normal functioning market, the various perturbations of the supply of entrepreneurial equity, and the demand for premium high quality equity by VCs, determines the price. The price, in venture capital vernacular, is referred to as the valuation. If there is an abundance of venture capital demanding to buy the entrepreneurial equity, venture capitalists would jostle cheek by jowl (well maybe not literally) for the opportunity to purchase equity in the founders' firms. This is characterized as a sellers' market (favouring the entrepreneurs) and we would expect the valuation of the firms to be high. This situation benefits the founders.

On the other hand, if there is only a small amount of venture capital demanding to purchase a great supply of entrepreneurial equity, there is more supply than demand and we would expect prices to fall. Entrepreneurs want venture capitalists to purchase their equity, but because there are few VCs, they are able to purchase equity from the best entrepreneurs yet keep the valuations low. This is characterized as a buyers' market and favours the VCs. This is expensive for founders.

Founders in the local region of study think that valuations are lower than major cities. Valuations are often a bone of contention as admitted by almost all participants. Many of the SVCs valuation considerations revolved about the founders, the depth of their capabilities and how they should handle lower valuations. SVCs think founders spend too much time talking about valuation, whereas discussions about strategy are the more important discussions. An investor focussed on Series A investments remarked that the first thing entrepreneurs needed to do was to get *"in front of the best investors and get the best deal."* The best deal could mean selecting the partner with the higher valuation, or securing a better partner with a lower valuation. This investor noted the risk of a down round if the

valuation starts too high. If valuations were too high, the next investors can decrease the valuation and then the founder's company gets the stigma of a *"problem company and the company is then viewed through a negative lens."* This is usually not productive for the company.

One SVC articulated that valuations in Canada are based on a checklist of qualities that a founder accumulates; according to this respondent each quality adds another \$250,000 - \$500,000 to the founder's valuation. Higher margins, recurring revenues, highly profitable revenue streams, multiple products that provide stability, an experienced team with two serial entrepreneurs, and lower fixed costs are all the qualities that contribute to higher valuations. For every one of those boxes that are checked, the investor is paying for a higher valuation.

Another respondent reasoned that if a founder has a prototype, can sell the vision, and articulate the problem that their product is solving, their firm is valued at \$1 million in Atlantic Canada. Whereas, if the same firm were in Silicon Valley, it would likely be valued at \$3 million. He reasoned that when there are so many other firms vying for funding there are more high ability entrepreneurs just due to sheer numbers and that the better ones will be valued higher. Another explained that in Canada, the median valuations are \$2.5 million for angel groups. That includes validated product and validated business model, sales traction and some evidence of sales. If receiving a sufficiently high valuation is a problem for a company they should raise convertible debentures and offer a big discount.

A Series A SVC said the region is less of a focus for the VC industry and there are fewer entrepreneurs and less capital available so valuations are low. *"The stats would probably show there is a discount on valuation in the region."* He quickly noted, *"However, if Jevon MacDonald or Marcel (LeBrun) wanted to raise a company and it was based in Fredericton or Halifax, no one would care. There would be a lineup of people wanting to get into the deal. It wouldn't matter if it was San Francisco valuations or Atlantic Canada valuations."*

A New England angel group's rationale about valuations was similarly rooted in the VC/entrepreneur marketplace dynamics. The respondent noted particularly, *"When you have a huge supply of start-ups and only a little bit of funding to fund them ... If Ross Findlay's group is the only one there to finance it then they're largely determining the economics of the deal, the valuation, the liquidation preference, and things of that nature. In Boston, where there are 100 VC funds and a dozen business angel groups, and you've got a really good company, the competition for that deal is going to put the power in the hands of the CEO of the start-up because he is going to have competing term sheets and he can turn up the valuation till the market will stop bearing it."*

A life sciences SVC said all entrepreneurs think their company is undervalued; there is a general consensus that Canadian companies are valued lower than the U.S. companies that they believe are their equivalents. He succinctly put this notion to rest. He pointed out that the U.S. so-called company *"peer"* will have:

- Likely raised three times as much money already from angels or economic development corporations;
- Done better clinical work because they have had access to more money;
- Tended to have run fuller clinical programs.
- Tended to do more analytical work at a pre-clinical level; and
- Tended to have done much better bench science.
- More deeply protected IP and more clearly thought through, and
- The management team of the U.S. company will be deeper and broader than the Canadian “so-called” peer equivalent.
- Furthermore, it is more likely that the key entrepreneurs in the U.S. firms will have come out of industry and will have deep domain expertise which – it was observed – was less likely for Canadian entrepreneurs in health care and life science spaces.

This SVC says that the U.S. firm has done all the things *“that underpin true value ... If it weren’t true and valuations were so much lower on the east coast, the east coast would have no problem funding every single company that it has in its portfolio. If I could get the same thing for less, I would do that. But I’m not getting the same thing for less, I’m getting something else.”*

A number of SVCs adopted the go-get-it approach whereby founders vigorously pursue the best options for themselves. *“If that means going to the Valley, then go.”* It is of little value for a founder to complain about valuations in Silicon Valley if that money is not available to her. *“It’s about creating category winners and break-out successes. And usually the sort of slicing and dicing of ownership that happens at the early stages of valuations ... if you’re successful in your ultimate mission then everyone’s going to do fine. Sometimes I think in Canada that we’ve had so few big wins, so few inspirational successes, that people focus on what they see around them which are seed rounds and Series A rounds which are really just points in time.”*

Actual GVC Valuations

The previous sub-section considered the comments by SVCs and the methods, means and advice regarding valuations in general. This sub-section considers some GVC’s actual investment valuations. Differences over valuations is the most common reason for potential investment financings to fail.

Table 1 - Mean of Pre-Money Valuation indicates the mean valuation for firms in each of the previous time periods. Since 2003 the mean pre-money valuations have been trending downwards. In 1999 – 2003, pre-money valuations were \$6.6 million, falling to \$5.3 million in 2004 – 2008. The age of the firms is not known which may reflect on the valuation if in earlier years, a greater proportion of more mature firms were available for investment.

Table 1 - Mean of Pre-Money Valuation

Five-Year Span of Activity	N	Minimum	Maximum	Mean
2009 - 2013 Pre-Money Valuation (\$)	22	1,220,588	6,500,000	2,923,853
2004 - 2008 Pre-Money Valuation (\$)	8	456,818	11,919,688	5,260,158
1999 -2003 Pre-Money Valuation (\$)	12	750,000	24,700,000	6,632,278
Pre 1998 Pre-Money Valuation (\$)	4	266667	450000	379,166

For the most recent period, the average pre-money valuation was \$2.923 million. It is not possible to tell whether GVC valuations are significantly lower than other regions in the U.S. or Canada. However, Canadian SVCs' earlier comments about average Canadian valuations seems to be in sync with GVC valuations. GVC valuations do not appear to be significantly lower. Indeed, a number of \$8 million, and \$11 million pre-money valuations took place in the years leading up to the world financial crises in 2008. Not all new investments noted in each period, however, have been assigned a valuation.

Use of Liquidation Preferences

SVCs have found ways to deal successfully with differences in opinion about valuation if it appears that it will be a deal breaker. A logical and fair method to bridge valuation gaps is the liquidation preference. Liquidation preferences are options for a SVC if there are differences of opinion about the company's value. With the introduction of a liquidation preference, the original SVC investment is secured if a liquidation event occurs. It is based on the notion that *"real money in should be real money out - first."* *"It is unfair for the entrepreneur to walk away with millions of dollars and for the investors not to have made a reasonable return, or to have actually lost money"* noted a U.S. VC.

In a liquidation preference example, a VC places a \$500,000 investment in a firm valued at \$5 million taking approximately 9 percent of the company (\$500,000/\$5,500,000). If the firm is later acquired for \$30 million, the liquidation preference returns the VC's \$500,000 first, and then the remaining proceeds are distributed according to the ownership and type of participation. In this example, the VC first receives their \$500,000 (the return of their investment at liquidation) and then nine percent of the remaining \$29,500,000 (if fully participating) for a total

of \$3.155 million (\$2,655,000 + \$500,000) which is 5.3 times the VCs investment (531% return).

In an awkward situation, it is possible for the VC to lose money, but for the entrepreneur to have a very good return. This may happen if the same company in the previous example sold for \$2,500,000 instead of \$30,000,000. In this example, (a real example) the VC placed a \$500,000 investment with a firm valued at a pre-money valuation of \$5 million (without a liquidation preference). Later the company was acquired for only \$2.5 million dollars. In this situation, without a liquidation preference, the VC received \$225,000 (9 percent of \$2.5 million) and lost more than half of their investment (they invested \$500,000 but only received \$225,000). *“The entrepreneur walked away with a \$2.275 million payday.”* The VC lost money, but the entrepreneur was extremely successful. Hence the liquidation preference is used here as a hedge against a valuation for which a VC may feel uncomfortable.

Most recently, the GVC’s activities with respect to liquidation preferences align with the motives outlined by the comments of other seed investors above. In *Table 2 - GVC Liquidation Preference by Pre Money Valuation*, the most recent period’s liquidation preferences can be seen to be applied to investees with much higher mean valuations (2009 – 2013). The liquidation preferences are applied to investees with a mean pre-money valuation of \$4.387 million whereas those without a liquidation preference have a mean pre-money valuation of \$1.911 million. These do not include investments where no valuation was established at the outset.

Table 2 - GVC Liquidation Preference by Pre Money Valuation

Five-Year Span of Activity	Liquidation Preference		Pre Money Valuation (\$)
		n	Mean
2009 - 2013	No	13 ¹	1,910,522
	Yes	9	4,387,555 ²
2004 - 2008	No	3	7,837,633
	Yes	5	3,713,673
1999 -2003	No	10	7,178,734
	Yes	2	3,900,000

¹ An outlier and is removed from the investment data for the 2009 – 2013 sample

² *** Significant p < .01

In a similar vein, the size of the GVC investments is tied to an inclination towards liquidation preferences as well. Table 3 - *GVC Liquidation Preference by Investment Size* demonstrates the larger investments undertaken on behalf of the region are protected from eroding liquidation acquisitions by liquidation preferences. In the most recent history, 2009 – 2013, GVC has included liquidation preferences where larger investment sums were involved. Some liquidation preferences can be used to indicate a return of two or three times the initial investment, but this is not the case with GVC data which issued liquidation preferences at one times the investment only.

Table 3 - GVC Liquidation Preference by Investment Size

Five-Year Span of Activity	Liquidation Preference	N	Investment Mean (\$)
2009 - 2013 ³	No	14	264,285
	Yes	18	483,844 ⁴
2004 - 2008	No	3	186,166
	Yes	21	281,919
1999 -2003	No	14	135,773
	Yes	15	248,656
Pre 1998	No	5	240,000
	Yes	11	231,636

GVC Industry Skill Set

The remarks made about the skills sets of the GVC and the professional community are the subject of this sub-section. Rivalry is discussed amongst the larger and smaller firms across national borders, and a rivalry amongst early stage funds which is contrary to later stage funds, is noted as anti-productive. There were challenges by some SVCs with respect to board composition conducted by GVC whereby boards were seen to be too parochial. Lastly, the contracts for early stage companies were seen to be excessively burdensome and costly.

Cross Border Deals: SVCs indicate that there is more sharing of information amongst later stages funds. The necessity to build relationships and syndicate amongst one another is fundamental and essential, particularly where domain specialization is

³ LightSail is an outlier and is removed from the investment data for the 2009 – 2013 sample

⁴ ** Significant $p < .05$

predominant. The wider SVC community is considered very “clubby” with substantial industry knowledge shared amongst fellow insiders. *“Everyone knows everyone more or less, and everyone talks to one another” “VCs working together, rather than against one another, enhances exits. It improve terms and everyone gets a piece of a variety of deals.”*

SVC indicate that the Canadian industry’s dwindling number of funds presents less competition. This less competitive environment is manifest in deals taking longer to conclude which is not a favourable condition for the industry. In the U.S., *“there is less of a fear of an opportunity getting scooped away from you by other competing investors is lower ... For the Canadian scene to move forward there has to be more intense competition amongst investors to find great deals. More players in the market would help for the chase to the deal.”* There is slack in the Canadian venture capital industry and the brimming U.S. presence is beginning to make itself felt. Increasingly, said a larger fund investor, numerous American firms are prepared to cross the border for the right deal. *“If a Tier 1 firm out of the U.S. wants to do a deal in Canada, even the larger Canadian firms probably do not stand a chance.”*

The somewhat relaxed competitive rivalry does not exist for seed and early stage funds. GVC operating geographically-focussed seed and early stage funds indicate that there is not a great deal of discussion amongst local fund managers. One investor reported that the local GVCs stay in their niche. They have to because they cannot cross borders. Said one local non-GVC investor, *“We talk to them because we have to, but they do not have to talk to us. The territorial interprovincial bantering about VCs and accelerators stealing one another’s entrepreneurs is just starting to stop.”* Recently, a cooperative effort to develop syndication relationship-building took place amongst non-government and GVC funds, and the shared event was well received by SVCs though not well-attended.

SVC investors report that there is a sense of intense competition and a natural rivalry amongst early stage investors unless an entrepreneur forces two funds together. Said a SVC from a larger fund, *“In Canada, I’ve been sitting at the same table at a conference with people I know and they’re super guarded about what they looking at and what they’re interested in, and it’s sort of fascinating to me.”*

Creating Boards of Directors: Helping the founder create a board is an important role for the venture capital industry. SVCs complain that boards are not as sophisticated as they ought to be in the Canadian GVC industry (as well as within the junior public equity space). Building good boards is challenging because the people who are recruited assume high workloads. Domain-focused SVCs (rather than generalists GVCs) have an advantage in selecting boards because they need to travel further afield to find their deals and the partners necessary to bring the right team and syndicate together. The effort produces knowledge of experts for boards. In order to develop relationships to identify the best syndicating partners, domain experts constantly manage networks cultivated from a very diverse group of

Americans and Canadians which helps them create expert specialist board members.

Domain experience is an asset on a board and is provided by someone with experience in selling into the firms' key markets. These domain specialists understand the key people in the market, the sales process (not technical), how the technology can be applied, and how to most effectively speak to potential sales partners and customers. An effective domain director will ideally have the proverbial Rolodex (numerous well-connected contacts) as well. A properly functioning board member need to give time to the firm, not just their names and biography. Unfortunately such members are difficult to find.

SVCs noted that board composition practices of some of the GVCs are parochial. *"From an early stage perspective, the two problems that you would have are: founders that want to be protective and so they try to have board members who are friends to them as opposed to being completely objective; or, venture capital firms that don't have a whole lot of experience and may not think about trying to attract the best. Take ... or ..., my sense is they don't go out of their way to try to attract the best people wherever they are – I just haven't seen that with them. I think those are the two issues that exist in the region."*

Concerns are expressed that boards are not sufficiently broad-based, geographically or industry-wise, and that persons with intelligent insight into the key markets are missing. The company, hampered by poor board selection, suffers under bad governance. Boards can micro manage firms and meddle in situations causing later down rounds. *"Governance issues arise when populating a board if I have one of these angel guys, one of these government guys, one of these private investors who does not have a lot of knowledge, now I have two thirds of the board who are not productive towards the long term goals of the company."* Having dealt with such a situation, an SVC remarked that these circumstances did not cloud his interest in the region; it simply caused him to search for these potential problems in advance.

Other SVCs focussed on contracting details that were too complex, lengthy and expensive. One example was the documentation prepared by professionals which was excessive based on the size and stage of the company, and more suitable for a large publicly traded firm. The respondent indicated that this over-papering of a deal was likely the result of a professional advisor trying to use standardized documentation; they *"pulled all the terms and conditions and applied them to an early stage firm."* The SVC estimated the documentation would have been indefensible regardless because the entrepreneurial firm did not have enough money to even have the documents read should any action have taken place. The local professional community and GVCs were further indicted for other problems such as the length of the documentation (90 pages), length of time to acquire documentation (twice as long as it should have taken), the lengths to which professional support were sought (legal firms that are thousands of miles away), and the amount it ultimately cost (twice as much).

Generalists (GVC) and Domain Specialists (SVC)

This section investigates the candid SVC comments regarding movement of financing from generalists (GVC) to domain specialists (SVC) and the types of syndication partners that are preferred. Founders' firms move from generalist venture capital funds to domain specialist funds as their financing needs grow. As a founder firm matures, and its capital and mentorship needs expand, the requirement for more specialized financial talent takes the search for venture capital out of the investee's region. Larger venture capital industry funds, more sophisticated domain specialists, or companies that are in the investees' market or industry, understand what the investee is doing better than a generalist.

Responding participants indicated that GVC fund managers were principally generalists because they are geographically focussed and cannot move outside their geography. *"Categorically, if you have local investors who have never invested outside of a geography, they are heads down and myopic to the rest of the world. And so their network is what it is. They understand their small pond very well."* They have to, it is their role. Hence, it is difficult for these generalists to know the specifics of some technologies. A generalist, because they do not fully know the capacity of every innovation, necessarily prices entrepreneurial offerings lower than specialists. Deal terms can become very specific to a region.

As the venture capital industry moves upmarket, so does its sophistication. Various SVC funds gather domain specialties usually based on the backgrounds of their GPs and staff. One fund has five PhDs, a MD, and two others who have been in this industry for two decades. Furthermore, all of these individuals have backgrounds in operating companies and none came out of *"a finance degree into the VC industry."* This trend out of the U.S. is changing the Canadian industry as well; the make-up of the fund managers is much more mimicking the U.S. model.

When an investee finds an investment fund that understands what the technology can do and understands the founder's vision and the specifics of the market, the investee and its local VCs have found what the industry refers to as *smart money*. A SVC quipped: *"...in these instances, the founder does not have to tell the investor what the product will do – the investor will tell the founder what the product can do."* One SVC noted that eventually founders need specialists who can: help the CEO get close to a potential customer; have someone to help them if they need to talk to someone in California; have a tie to someone who can make that connection; help tease out human resource issues; find talent; and spend time with the CEO. These can be all separate individuals requiring the syndicate's fund partners to have myriad resources to draw upon.

Alignment of Motives and Stages for Syndicating Partners

SVC have a variety of operational knowledge and strategic qualities that make them sought after by GVC. These qualities typically involve similar motivations and fund values, the network of relationships that they bring to the syndicate for potential

exit partners and to add value with the entrepreneur, capabilities with hiring talent if necessary, and their ability to provide follow-on financing as the firm matures.

Syndicates gather around a specific investment mentality - never go into an investment alone. The simple rule is that the more deal syndication involved the more validation it provides for the SVC. One VC noted, *"I never go alone, I don't believe in it. It's a sobriety test for me. If no one else is interested chances are I've missed something."* Some funds syndicate on every deal, and are the lead architects of every syndicate they participate in. Amongst these, there are a variety of "sweet spots," with most of them varying around the revenue status of the firm (i.e. just pre-revenue, post-revenue, etc.). Alternatively, a few smaller and seed funds that were interviewed, including an American fund, operate differently; they always syndicate but never lead. Sometimes they are aligned more closely with the founders rather than the future syndicating partners. As seed funds, one investor indicated they often opt out at the Series A level where syndicators need to be harnessed.

One of the largest funds that participated in the interviews indicated that they are sought after for syndication about half of the time, and the other half of the time they are soliciting syndications. In particular, the interviewee noted, large funds writing large cheques and participating in large deals definitely seek participation from *"far more sophisticated investors from south of the border."* He noted as an example, large infrastructure deals where a partner is sought that knows big processes, or plant-type businesses, or has expertise related to infrastructure investments for further fund raising; they look for parties who have other partners, relationships, good optics for a particular deal, or specific contracting experience. Having conversations outside Canada was critical to achieving these partnerships. If the relationships are not built on several previous trials or attempts, they may not be there for you when you need them on a later deal. More capital is always better than less, and strong relationships with capital providers is critical to securing funds when necessary.

SVC stress the similar values that must be shared amongst syndicating partners. The selection of a syndicating partner needs to ensure the alignment of motivations and values such as whether or not they are management friendly or will they hold managements' feet to the fire? A \$200-million fund investor is interested in smart partners who have domain expertise. He said:

"What I'm really looking for is who the partner on the deal is going to be. Is that partner smart, and is he accretive to our totally syndicate strategy. Does that partner have a skill set, an aptitude, an experience base, a set of contact numbers or relationships that are incremental to those that we feel already exist in the syndicate that has been architected. We will very rarely bring a partner to a syndicate that's just dumb money. We might if it was a small amount. But that's not what we're looking for. We're looking for partners who are smart, they know what they're doing, who have domain expertise and they have capital to follow-on so that they can ride the continuum of the company with us, and not force us to make decisions that

are not aligned with how we see value creation. And they share our vision of what value creation looks like. We have to be very careful when we syndicate that we invest with people who have the same end points and objectives as us.

Most of All, It Is the Person

The alignment of motives, stages, and series of investment are all objectives being sought by VCs for syndication. More than that, however, VCs like doing deals with the same person whenever they can. This predilection was repeated over and over in a variety of different anecdotes about their syndication preferences. Three vignettes describe these interests pursued by SVCs.

An SVC from a fund with numerous recent exits prefers to syndicate with repeat partners from previous deals. His fund knows the partner well, they know what they are strong at, they know what they are weak at, they know their style, and they know how the other VC (GVC or SVC) interacts with management. Knowing these elements in advance, by working with repeat partners, reduces the risk in the syndicating partner selection decision process because of the timelines which need to be adhered to for typical funds.

A domain specialist SVC who happened to know the locale and the GVC industry well said, *"I would syndicate with people we have worked with before. And I can say to guys, 'You are going to love these guys, they bring real value to the table.' ... we're different because we've been doing it long enough. We like to cut with our own friends."*

An American SVC recognized that his domain specialty came from his considerable expertise as a founder. He took a derisive attitude about SVC fund managers who, as professional intermediaries, invest other peoples' money and who want to raise larger and larger funds for greater prestige. As a job, their role is to make a good return for their LPs, but in sum it is a job for them. His thrill of the hunt is to make money from his own money and to provide *smart money* in the process. He has syndicated with OMERS and Sequoia, but the entrepreneur is usually the architect who wants him on the deal. His value to the founders and the large well-known funds is his background in business. Having started a business from zero and growing it to \$ 2 billion has given him experience and troubleshooting capability that *"professional VCs"* alone cannot provide.

The importance of repeated relationships with specific people is evident in various successful start-ups, investments, syndications and exits by a collection of individuals in the region. The co-mingling – over more than a decade -- of the personalities associated amongst a corporate entity, a high performing growing firms, several smaller entrepreneurial firms, several successful exits, an IPO, an investment club, and a small number of VCs could challenge a good anthropologist.

Over a decade many of the same names have reappeared on boards, in syndicates and in the ventures themselves.

Trends Affecting Syndicating Partners

The track record for raising new funds in Canada is dismal. Fundraisings are down for private independent funds by 51 percent year over year, and down 24 percent for the industry as a whole (2014). Even the *successful* independent funds are having trouble raising new money. This is particularly troublesome for the east because the fewer funds there are in Canada as a whole, the fewer SVC there are for future financings for GVC. A specific number of funds which were particularly favourable to the local area are having fundraising difficulties. Even a small \$500,000,000 fund could not be raised by a very successful group of VCs. *“These were highly successful people with small shops of only three to five persons.”* The inability of SVC that were once friendly to the region to raise new funds is a loss to the region. *“Previously, there had been some success with mid- to small-size funds where the individuals have a good track record of supporting their investments. But there are very not that many of them left. It’s a very sad day,”* noted one investor.

A few super angels in the region have established funds but they are not ICT, life sciences, clean tech, or ocean tech focused. These newer funds are more private equity-based and are investing in up-market firms (more mature with earnings) in traditional industries because that is what their LPs know. There was some excitement when a very large SVC established a new fund and had articulated an objective to invest down-market into more seed and pre-revenue companies. *“They made one investment and then went up-market again to more private equity deals because the returns were looking much better.”*

Look to the U.S.

Though fundraising opportunities are declining in Canada, they are increasing in the U.S. (Veghte and Herman 2014) where the rate of fund raising is experiencing heated activity. These trends indicate we must increasingly look to the U.S. for future syndicating opportunities⁵. Fortunately, U.S. funds suggest the Canadian market is ripe for syndication consideration.

The leadership of one of the 23 different business angel groups in New England said their group had raised five funds to date and though they have never been approached to invest in the regions’ by the GVC, they appear to be willing to consider Canadian possibilities. The New England BAN noted their sweet spot was just pre-revenue. They had two approaches when seeking their own syndicators. If a deal was seeking to raise \$1,000,000 - \$1,500,000 they had several “pre-existing relationships with SVC regular angel groups that they approach who like to work with to fill out a round. When founders need \$2,500,000 - \$3,000,000, the angel

⁵ Fundraisings are down for private independent funds by 51 percent year over year, and down 24 percent for the industry as a whole. Even the *successful* independent funds are having trouble raising new money.

group goes to the broader set of SVC in New England that are beyond their regular familiar syndicating partners. They have a regular presentation, screening and selection process that takes place twice annually for these larger deals. The many BAN in New England have developed a Due Diligence Treaty to enhance their trust and cooperation.

The U.S. National Capital Association has two initiatives to create broad syndication participation in clean tech and life sciences. Founders who cannot raise enough funds for more expensive deals can access national participation by BAN syndicating from across the U.S. This most recent development of a national business angel syndication structure might encourage them to look at Canadian investments because:

- The real lack of capital for Canadian firms suggests their angel network will find better opportunities;
- They expect that there are more reasonable valuations than in the current red hot Massachusetts market; and
- The Canadian governments' support for entrepreneurship is better than in Massachusetts where there is no governmental support for entrepreneurship.

GVC Syndication

The need for the GVC is crucial precisely because trends in the industry are tending to move up-market, post-revenue, and toward more central and urban areas. *"... Federal funds don't like pre-revenue. It is very hard to get any SVC from out of the region to invest in a company pre-revenue." "It (GVC) adds a lot of ingredients into the ecosystem and I view these funds are absolutely critical ... are far less critical in Boston, or New York, or San Francisco."*

The ability of the GVC to syndicate with partners outside of their own kind indicates the enthusiasm that SVC share in the investment climate in the east coast. *Table 4 – Number of Syndicating Investors* examines the objective data of the GVC's syndication partners over the pre-defined periods. Over the three dominant five-year periods of GVC history in the data, 41.2 to 45.8 percent of the total number of investments were syndicated (barring the pre-1998 group). Looking specifically at the most recent of the five-year periods, the proportion of investments with syndicating partners is approximately 41.2 percent. A couple of investments included two and three other co-investors and one had four syndicating investors in the financing. The slowdown in syndication activity between 2004-2008 and 2009-2014 may have been a result of the rapid increase in investment activity over the two periods (from 24 investments to 34 investments).

Sixteen different SVCs were a part of the 39 deals syndicated since 1998. Troublingly, three of the 16 different syndicators are no longer in existence. A review of the various SVCs concluded that GVC organizations co-invested only on

five of the 39 syndicated investments. In each of these occasions, there were other SVCs in the financing. At least four of the financings had corporate partners as part of the syndicate.

Table 4 – Number of Syndicating Investors

Five-Year Span of Activity		Frequency	Valid Percent
2009 - 2013	GVC	20	58.8
	One Syndicating Investor	10	29.4
	Two Syndicating Investors	1	2.9
	Three Syndicating Investors	3	8.8
	Total	34	100.0
2004 - 2008	GVC	13	54.2
	One Syndicating Investor	7	29.2
	Two Syndicating Investors	2	8.3
	Three Syndicating Investors	2	8.3
	Total	24	100.0
1999 -2003	GVC	16	55.2
	One Syndicating Investor	7	24.1
	Two Syndicating Investors	4	13.8
	Three Syndicating Investors	2	6.9
	Total	29	100.0
Pre 1998	GVC	16	94.1
	Two Syndicating Investors	1	5.9
	Total	17	100.0

The sum of GVC funds invested over the four periods, \$31,897,005, is part of total investments of \$92,086,924. The GVC investments have been leveraged by additional syndication of \$60,189,919.

Table 5 - Amount and Rate of GVC Syndication outlines the additional syndication participation with GVC investments. In the most recent period, every dollar invested by GVC raised an additional \$1.77 for a total of \$2.77 invested in local founders. In 2004 – 2008, 2.88 times investment was raised, and the previous period raised 4.43 times the GVC investments. In total, the additional \$60.189 million invested in local founders was raised from SVC outside the region.

Table 5 - Amount and Rate of GVC Syndication

Five-Year Span of Activity		N	Sum
2009 - 2014	GVC Investment (\$)	34	14,526,749
	Total Raise (\$)		40,424,912
	Times Investment Raised		2.77 X
2004 - 2008	GVC Investment (\$)	24	6,478,804
	Total Raise (\$)		18,454,239
	Times Investment Raised		2.85 X
1999 -2003	GVC Investment (\$)	29	5,630,672
	Total Raise (\$)		24,946,994
	Times Investment Raised		4.43 X
Pre 1998	GVC Investment (\$)	17	3,760,779
	Total Raise (\$)		4,260,779
	Times Investment Raised		1.13 X

Discussion

This research sought to explore the perceptions of local and regional GVCs from the vantage point of potential syndicating venture capitalists. The in-depth interviews with national and international SVCs were combined with data from local GVCs from the Canadian east coast. The rich narrative from the SVCs themselves represents a candid and forthright contribution that adds to the received research to date. Their voice and their brusqueness is vivid.

The discussion draws attention to the need for GVC because of the lack of other available potential syndicating relationships with VCs from outside the region and increasingly outside the country. The nature of the VC asset class is such that without highly qualified local VCs to identify, introduce and monitor founding firms, the potential for syndication is severely curtailed. Syndicators are most likely more specialized domain expertise and are further afield. They will only be introduced to the area if they have local and GVC and VC to provide oversight.

If they wish to be funded in their own locales, founders and their initial investors, friends and family need to work with locally-backed seed and early-stage funds because more formal venture capital funds (larger traditional structures with LPs and institutional funding) have little appetite to syndicate with pre-revenue founders.

Information economics (Akerlof 1970) would suggest that because SVC are industry specific or have domain experience, they have the knowledge and talent to understand the specifics of a technology, can make accurate valuation assessment and can value deals higher. Domain experience is knowledge, experience, and competence in a specific market or industry. A generalist GVC may not fully appreciate how capable is an industry-specific founder's product because the GVC does not have specific domain experience. Therefore, generalist GVCs have less ability to make an accurate assessment and tend to keep valuations low.

Unintentionally, keeping valuations low has the perverse effect of driving away the best founders, those who can go elsewhere for finance, or who can redirect their efforts, or who can postpone their activities until other finance becomes available. Deliberately or inadvertently driving down valuations often leaves the weakest and the least competent founders as the remaining candidate pool. Less capable founders have fewer other options and are willing to accept poorer terms (i.e. lower valuations).

Comments by SVC are aligned with this hypothesis. Moreover, some local founders have balked at the valuations suggested by local funds and have bootstrapped their way to successful exit, or gone to major cities in the U.S. and Canada for finance. In these cases, GVC have lost out on potentially profitable investments and exits. This, of course, happens to every VC. It was noted that *"every good VC does a retrospective analysis every year to investigate the ones that got away. What was on their A list and where are they now? In reality, we see 500 deals a year and we only do five."* Valuations as presented by SVCs seemed in concert with the valuations indicated by the 105-case GVC database.

The proclivity of GVCs to pursue strategies adopted by other seed stage and growth investors infer the professionalization of the GVC investment managers and their protection of the publics' funds similar to strategies used by SVC. The inclinations indicated by liquidation preferences indicate GVC practices that protect the investment when valuations are uncertain.

The qualities sought of syndicating partners include alignment of motivations, increasing domain expertise, and SVC capable of pursuing follow-on financing as founders' firms mature. Most of all, SVCs are concerned about conducting transactions with individuals they like to work with and who bring value to the syndicate. Often SVC have a small number of other SVC they go to with syndicating opportunities. Relationship-building is paramount and individual personalities, capabilities and methods are important.

As the preference for specific partners is carried throughout a SVC career and subsequent funds they raise, it suggests that the number of different persons with whom they will do business will (proportionate to the number of deals they do) shrink over time. Therefore, local GVCs will want to source good deals to bring in good syndicators to ensure a repeated series of successful syndications over time.

To do so the VCs must be high value-added contributors themselves. More skilful venture capitalists will have superior sources for deals (Amit et al., 1998) which exposes them to opportunities to produce superior returns. Improving one's investing skill promotes reputation capital and subsequent potential for future syndication (Lockett & Wright, 2001).

The local GVC funds' database demonstrate indicate a good proportion of syndicating relationships in the investments made over the past two decades. In the most recent periods, they have been able to almost triple the amount of investments they have placed, bringing in funds at a rate of and additional \$1.77 for every dollar they invest. Sadly, the Canadian industry is flagging and three of the SVCs that GVC formerly participated are no longer in the industry. More vigilance by GVC will be required to sustain the entrepreneurial ecosystem that the region has begun to rely upon for innovation.

In a perfect world, a local VC finds high performing entrepreneurs from whom to purchase equity and the local VCs then invite others to share in the deal. The syndicating partners do not have to be within geographic proximity to the entrepreneur because they rely on the local GVC to assume the responsibility of providing oversight. GVCs invite potential syndicators into deals because they want to distribute risk and the domain expertise of the SVC will add value. But they also invite SVC to participate in hopes that they will return the favour - that the SVC will invite a GVC to syndicate on one of their transactions in the future. Reciprocity is highly implicated in syndication and trusting (Wright and Lockett, 2003) that a SVC will not act on another's information gathering continues the good standing of an SVC in the industry (Anand & Galetovic, 2000).

AGVC who is soliciting other syndicating VCs (the architect of the deal), can invite any other VC in the world to syndicate with them. Given a highly valuable entrepreneur, a generalist GVC, can select one or two, or three, of the most highly specialized VCs in the world to participate in a deal. With a valuable founder, the potential for syndication is almost limitless.

This is not a perfect world, however. The ability to access, assess, and mentor high performing entrepreneurs can be elusive. Moreover, if SVC like to do business with people with whom they have done business with before, then in reality, the potential billions of dollars in the rest of Canada, the US, Europe and beyond, are largely beyond the grasp of a regional locale.

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