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Characteristics of Firms that Grow from Small to Medium Size: Growth Factors-Interviews and Measurability

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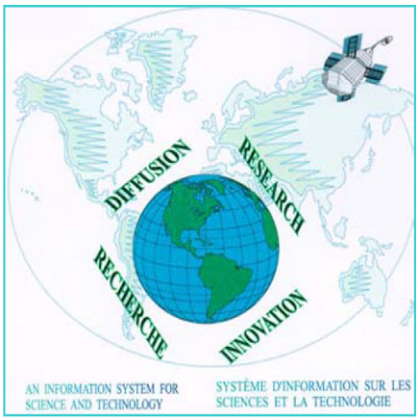

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Characteristics of firms that grow from small to medium size

This series of working papers on ***Characteristics of firms that grow from small to medium size*** results from a joint project of Statistics Canada and the National Research Council's Industrial Research Assistance Program (NRC-IRAP). The project developed out of a need to better understand how and why certain businesses grow.

Existing studies on business growth are largely done on specific industries or with a limited set of factors. While building on this, the current project takes advantage of the specific data strengths of Statistics Canada's Science, Innovation and Electronic Information Division to provide a unique assessment of a broad range of growth factors as they relate to Canadian firms.

The foundation of this study is the analysis of firms that have made the transition from small to medium in our surveys: the Survey of Innovation 1999, the Research and Development in Canadian Industry survey, the Biotechnology Use and Development Survey, the Survey of Advanced Technology in Canadian Manufacturing (1998) as well as the Longitudinal Employment Analysis Program—Small Area File (LEAP-SAF). In addition to the statistical analysis, we have also conducted interviews of firms that have made the transition. Each of the five working papers in the series provides one perspective on the transition from small to medium size.

Background and purpose

There have been numerous approaches to studying the factors contributing to the growth of firms. The theoretical models as well as empirical research (Niosi, 2000) point at many of the same important factors: conducting R&D, engaging in alliances with other businesses, competence in funding, protecting their IP and finding a market niche. None of the preceding work considered exactly the same situation as the one confronted here, that is, the characteristics of Canadian technology-based firms that have made the transition from small to medium size. Furthermore, previous studies have been assessing the contribution of various factors to growth without considering the growth stage of the firm (Hanks, 1993), its industry or the important management practices in which they might be engaging.

Interviews were developed to complement the statistical analysis and to explore additional growth factors. While certain growth factors could be assessed with existing data, open interviews are more appropriate for understanding the context of the firm's growth. With interviews, we were also able to explore factors that were not included in the statistical analysis. In the section on "measurability", we explore additional sources of data and make recommendations for contents of possible future surveys.

Results

For every company that had made the transition from small to medium by adhering to the "traditional" growth factors, there was another that managed to do it by breaking the rules. In general, the respondents largely were aware that to grow they needed to engage in alliances, conduct R&D, develop a competence in obtaining funding, manage their IP and find a market niche (Niosi, 2000). The experiences of the companies interviewed imply that these factors are not important for all companies at all times. Furthermore, many pointed out other growth factors that, for them, were as or more important.

The "traditional" factors

Research and development: Most of the companies interviewed did conduct R&D to develop new products. In a few cases, the R&D was very informal, such as "inventive" founders testing new materials, the software department developing new control programs or *ad hoc* applications of existing goods or services.

Business alliances: Only a few of the firms that made the transition had engaged in broad-based alliances with other businesses. Some of the alliances were specialized and limited. For example, they might engage in an R&D alliance for one specific project, for licensing their technology or for marketing. Those that did not engage in alliances were, for one reason or another, determined to "go it alone". For some the reason was to protect their IP. Others were simply cautious about getting too close to the competition. Some of the business alliances were complex, for example one company was licensing their technology to one part of a multinational and suing another part of the same company for patent infringement.

Competence in funding: Since most of the companies interviewed were still operational, they obviously had some success in obtaining funding. This factor, though, is an overall assessment of the difficulty and success in obtaining funding according to the original plan. While all of the companies that were successful in obtaining their desired funding were also successful in making the transition from small to medium, others that had made the transition did so with various levels of funding success and various approaches to funding. Those that did not obtain all the funding they anticipated (or had difficulty in doing so) stated various reasons for the difficulty such as inexperience or wanting to maintain control.

Venture capital funding was often cited as less desirable than private sources since it required relinquishing some degree of control of the company. Similarly, "going public" was often seen as a double-edged sword. Several small firms managed to fund the transition to medium-sized through private equity funding

(including personal savings of the owners, love money[1], angel funding[2], and personal loans), retained earnings (sales of one product to support the development of another), or sales of the rights to one of their early technologies. One biotechnology company referred to the latter approach as "selling your first-born".

IP protection: Almost all the companies interviewed held patents. Some had augmented patents with confidentiality agreements with staff and with partners. Four firms, two software developers and two small manufacturers, relied entirely on confidentiality rather than patents or copyrights. Rather than simply protecting their IP, many companies were also actively managing it: generating one-time sales or an on-going revenue stream while also maintaining exclusivity.

Market niche: Respondents were assessed as to the degree of competitiveness of their markets. If they were specialized and were in a less competitive market, they were considered to be in a market niche. It has been proposed that firms with a specific market niche would have a greater chance of growing. While most of the firms interviewed that were in a niche did make the transition from small to medium, many of those in moderately or highly competitive markets also made the transition.

Other factors

Business advice: The one factor that emerged consistently was the importance of business advice. Firms that thrived during an otherwise turbulent period largely attributed their success to previous business experience or timely business advice from outside the firm.

Business advice was brought into the firms in many different ways. A few businesses were founded by individuals with business skills (whether learned formally or on-the-job) and had little need for outside advice. Others obtained business advice from people outside the firm: members of the board of directors, advisory committees, business coaches and consultants. In several instances, the respondents remarked that they should have sought business advice sooner.

Formal organization and planning: One of the qualitative differences between small and medium-sized firms is the degree of formalization of their organization and planning. A medium-sized firm is more likely to adopt management specialization (development, marketing, human resources, administration, etc.) as well as more formal business planning. Although a majority of the firms interviewed had formalized their organization and planning, there were several firms that managed to make the transition with varying degrees of informality. The less formally managed firms tended to cite their flexibility as a positive outcome. If all business decisions are made at the weekly meeting of partners (and there is no Board of Directors to satisfy), then the company may be in a better position to take advantage of short-term opportunities. Larger, formally-organized firms also mentioned that they needed to maintain some level of flexibility, for example, in terms of a short-term strategic plan that was distinct from the annual business plan.

Most of the medium-sized companies interviewed, during their transition from small, experienced not only an increase in formality of their organization but also a parallel formalization and specialization of job functions. This occurred both through hiring management specialists (such as in human resources, financing, marketing and IP management) or in the increasing technical specialization of the founders. The founders of small companies tended to be generalists and in many cases became directors of research or of finance, depending on their competencies.

One company, during their transition had already allocated the primary roles (Technology, Finance, Marketing, etc.) to their founders and the first senior manager hired was Director of Everything else. This illustrates the chicken-and-egg situation of many growing companies: do we design the organization and fill the slots with people or do we hire the people and design the organization around them? One common theme among the companies interviewed was that soon after establishing a formal board of directors, organization and planning became more formalized and job functions became more specialized.

Innovation: Almost all the firms were innovative to varying degrees. The firms conducting R&D were clearly doing so to develop technologies that were "new to the world". A few advised caution that it was better to remain on the "leading edge" as the "bleeding edge" was too risky. That is, incremental changes were, for some, a better strategy than breaching the frontiers to develop a technology with an unknown future. This may be interpreted as strategic R&D: developing products "on spec" for waiting clients.

Adaptability: Several respondents, in relating their growth story, mentioned instances in which the future existence of the company was at risk. In one case, a major supplier withdrew the license; in another a major competitor marketed the technology first. A company's adaptability was often cited in terms of either (a) the diversity of its product line or (b) the flexibility of the company to "retool" or reinvent itself on demand. In contrast, many of the firms that had made the transition had done so with a single product and a single approach.

Other factors: Some factors were mentioned by too small a number of respondents to contribute to the analysis but these should be considered for further investigation:

- Aggressive development: be in touch with client needs and develop products to solve their problems;

1. funds from friends and relatives
2. informal investors

- Being first to market: get a product out even if it is not perfect;
- Conduct R&D in collaboration with the client;
- Control the whole process: R&D to production;
- Develop tools for others rather than final products;
- Don't compete with customers;
- Establishing a good relationship with distributors;
- Export orientation: in some industries the domestic market is limited; small firms with international markets have a greater chance of growing to medium size;
- High adjacency: it helps to be geographically close to markets and collaborators; and
- Informal networks: know the right people;
- Manage costs: don't spend frivolously, keep costs in line with income;
- Personality of the founder: persistence, realism, vision, inventiveness;
- Provide a quality product: rather than compete on price.

Barriers

In addition to growth factors, we asked respondents to cite the barriers to their growth that were the most difficult to overcome.

Funding (in general): Obtaining funding was the most commonly cited barrier. Several respondents mentioned difficulties in obtaining venture capital.

Funding for business development: One former CEO remarked that "The government won't fund anyone who owns a tie", implying that funding goes for scientific and technological development not business.

Obtaining appropriate highly-qualified personnel: While most businesses had few problems in attracting scientists or managers, some did cite problems in attracting persons with specific technical skills. There were also a number of firms that indicated they had difficulty locating a marketing person (where marketing was defined as the ability to not only identify and pursue new clients, but also to locate promising firms with whom to partner and integrate their technology). This was true in many non-biotech firms. Biotech firms tended to rely on their board of directors or scientific advisory board members to identify partners and complementary research. The larger firms interviewed sometimes had concerns over the future availability of sufficient engineering and scientific skills.

Taxes: Canadian tax laws whether personal or corporate were sometimes cited as barriers to growth.

Market acceptance of new products: In some cases, products were slow to gain acceptance due to their absolute novelty.

Table 1. Main interview questions

Question 1: Company background and milestones Could you please relate a short story about the beginnings of your company? When did it start? Who was involved? What was the business plan?
Question 2: Specific transition factors We will now go into more detail about specific conditions that contributed to your transition from small to medium: R&D, innovation, ownership, management, human resources, intellectual property, business strategy and external factors.
Question 3: Barriers Now, we would like to discuss some of the barriers that you had to overcome for your business to grow from small to medium. What aspects of growth did you find most difficult (such as, financing, marketing, partnerships, skills, government regulations, competition, taxes, acceptance of new products or technologies, etc.)?
Question 4: Other factors We're certain that we didn't cover all the important factors contributing to your growth. Were there any factors important ones that we didn't discuss? What would you say differentiates your company from similar companies that have either not grown or gone out of business? If you were to do it all over again, what would you do differently?

Complying with government funding programs: Some businesses commented that completing forms required to obtain government grants was sometimes not worth the effort.

Other business support: Some of the smaller firms also commented that they were obliged to hire consultants or purchase expensive software simply to create a business plan or to develop a human resources policy.

The US-Canadian dollar exchange rate: This affects input prices, product prices and relative salaries. There was no preferred exchange rate (a high Canadian dollar benefited those who mainly purchased US goods, a low Canadian dollar benefited those whose main market was the US) but large fluctuations in the rate seemed to impact everyone.

Archetypes

It was not the intention of this analysis to determine archetypical businesses—that is, classes of businesses with similar characteristics. The danger in not doing so is to assume that all

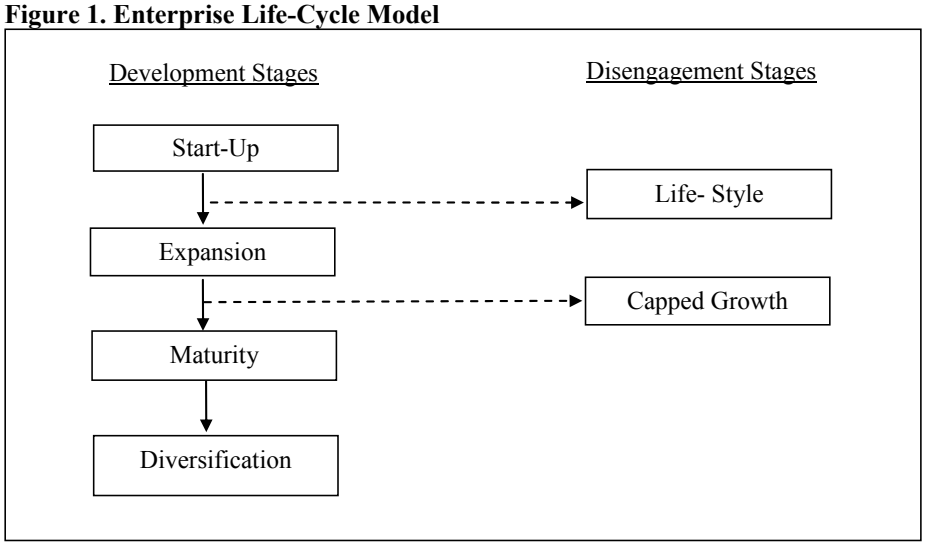
business have the same potential, the same "style" and will react the same way to external stimuli. While we haven't sufficient sample size to conduct a statistical analysis to cluster the businesses interviewed, certain characteristics seem to be important in understanding how businesses grow.

Industry and technology: While it is important to know the industry sector of a business to assess which growth factors come into play, even within sectors there will be differences in the stage of technology and processes used. This is especially evident in biotechnology[3] where, at the greatest level of industry sector detail, there remains a great deal of heterogeneity.

Degree of control: Almost half the senior managers we interviewed preferred to maintain control of their business (or technology) over maximizing the benefits. For example, many CEOs avoided selling shares on the stock market or soliciting venture capital because of the loss of control implied. Some firms were started as family businesses and growth was seen as a secondary priority. This is not to say that control and growth are incompatible goals. In fact, many of the firms interviewed managed to grow while maintaining a high degree of personal control. It may be though, that many of the firms that refused to relinquish control were limiting opportunities for further growth.

Enterprise lifecycle: Besides the nature of the industry or the control orientation of the leaders, not all managers want a company to grow to medium size. Whether this was to avoid formalization, "playing in the big leagues" or shunning a more competitive environment, some companies did not seek opportunities for further growth. We have adapted a framework (Figure 1) based on Hanks et al. (1993) and reported by McMahon (1998) that outlines four development stages of an enterprise (start-up, expansion, maturity and diversification) as well as two "disengagement stages", that is, firms that have stopped wanting to grow. The two disengagement stages are lifestyle (very small firms that remain small to accommodate the lifestyle of the owners) and capped growth (larger small firms that do not grow to where formal organization, financing and management practices are required).

Figure 1. Enterprise Life-Cycle Model



Source: Adapted by authors from McMahon *(1998)*

Measurability

This section assesses data sources, present and potential for obtaining indicators of the growth factors and classification criteria. There are three objectives to measuring these phenomena: (1) to better understand it, (2) to estimate its prevalence or importance in the economy or within certain industries and (3) to determine a value for a specific firm. Each of these would require data at increasing levels of detail and coverage: (1) case studies and pilot surveys, (2) ongoing large-sample surveys and (3) censuses or administrative data.

Growth factors

Research and development: The Research and Development in Canadian Industry (RDCI) survey is a census of all R&D performers in Canada. This measures R&D performed in Canada that adheres to the Frascati Manual (OECD, 2002) definition. This is generally consistent with the definition used for the SR&ED tax credits. The surveys of innovation (one was conducted for manufacturing industries in 1999 and for selected service industries in 2003) ask for more general data on R&D performed.

Business alliances: The surveys of innovation (Statistics Canada, 1999 and 2003) do ask about various types of alliances with respect to innovation. They also ask the nature of the collaborator (other industry, public institution, university, etc.) and the distance of the collaborator from the respondent. What is not captured is other forms of alliances, such as marketing partnerships and distribution channels.

Approaches to funding: Data on corporate finances and tax records exist but have not yet been exploited for this purpose. The Biotechnology Use and Development Surveys do obtain

3. Many biotech firms are classified in NAICS code 325410 ***Pharmaceutical and Medicine Manufacturing*** "This Canadian industry comprises establishments primarily engaged in manufacturing drugs, medicines and related products for human or animal use. Establishments in this industry may undertake one or more of several processes, including basic processes, such as chemical synthesis, fermentation, distillation and solvent extraction; grading, grinding and milling; and packaging in forms suitable for internal and external use, such as tablets, vials, ampoules and ointments." (Statistics Canada, 1997)

substantial detail on sources of funding for biotechnology companies.

IP protection: The surveys of innovation ask about the number of patents and the use of other IP instruments (industrial design registrations, trade-marks, copyrights and confidentiality agreements). Although administrative patent data are available outside of Statistics Canada (from CIPO in Canada and the USPTO in the US), they have not yet been exploited for this purpose.

Market niche: We know of no comprehensive data on level of competition faced by a particular business. Some surveys ask the respondent to assess this (e.g., Survey of Innovation 1999 asks about the competitive environment). It may be possible to derive indicators based on the number of businesses within a certain industry classification.

Business advice: Business advice could be internal (that is, the founders have business experience or training or there is a board of directors or advisors with business experience), external but informal or purchased. There is no single source of data for all of these aspects but questions on the sources of business advice could be asked on special surveys.

Formal organization and planning: There may be some information on the formal organization of a business (such as intercorporate ownership), there is no source of statistical data on the formalization of management or planning.

Innovation: Innovation surveys contribute greatly to our understanding of the challenges of bringing new products to market and the processes required to do so. These sample surveys have limitations as to the level of detail obtainable in terms of industry sector, size and location of the firm. Larger-sample surveys (such as Statistics Canada's Survey of Electronic Commerce and Technology-SECT) have been used to provide more detail on a limited number of criteria (Earl, 2004).

Adaptability: The diversity of the product line could possibly be calculated from existing statistical data (for example, business surveys often ask for an accounting of commodities produced). The strategic nature of the diversity could only be obtained through specific questions on new surveys. Similarly, finding a means to assess the ability of a company to "reinvent" itself would require further research. Interviews or surveys could detect whether adaptation had occurred in the past.

Classification criteria

Industry and stage of technology: We have found firms in the same NAICS sector (at the 6-digit level) with widely different strategies, processes and roles in the production process. In this respect, knowing the industry classification is necessary but not sufficient to understand the context of the firm. Knowing its outputs would help to provide further detail. Rather than relying on a standard industry classification by itself, surveys of management practices should also enquire about the nature of the product and the process by which it is being produced.

Table 2. Summary of firms interviewed

Industrial activity - Biotechnology-related (12) - Electronics, information and communications (8) - Other manufacturing and services (5)
Growth strategy (during growth period): - Maintain control (10) - Growth more important than control (12) - Others—includes "sell-off" and "just survive" (3)
Growth type during growth period discussed (may have declined or stabilized since): - High growth—doubled in employment to over 20 (20) - Other—started as medium-sized spinoff, stable, remained small (5)
Source of funds for growth: - Private only (4) - Private and sales (4) - Sales only (4) - VC and other source (8) - Others—Public investors, government, parent corporation (5)
Leadership (during growth period): - Board of directors—may also include Scientific Advisory Board, may include original founders on board (9) - Family-owned and operated (3) - Founders/partners with no board (10) - Others—include leadership from abroad and founders with Scientific Advisory Board (3)

Control orientation: While it may be reasonably simple to infer a firm's control orientation by interviewing a senior manager, obtaining similar information through administrative data or a questionnaire is more of a challenge. The concept is linked to several other characteristics of the firm such as how it is organized and the type of funding it has pursued in the past. It should be possible to develop a survey instrument that covers these characteristics.

Enterprise lifecycle: The age of a firm is insufficient to determine its stage of development. Some of the history of a company's development could be tracked using administrative data but the intent of the owners to grow or not (thereby defining the "disengaged" firms) would require questions on a special survey.

Conclusions

While the generally-accepted growth factors did play an important role in many of the firms that made the transition from small to medium, for many firms, other factors were as important or more important to their transition.

Statistics are available for many of the other factors cited but it would be preferable to conduct a specific survey of management

practices that would (a) collect the data more systematically and (b) develop means of asking new questions about the firm's history and management "style".

Concepts, definitions and approach

Frame

Candidate interviewees were selected from the respondents of the survey of Research and Development in Canadian Industry (RDCI), the Survey of Innovation 1999, the Biotechnology Use and Development Survey and the Longitudinal Employment Analysis Program Small Area File (LEAP-SAF). This provided a frame that covered most technology-based industries. From this frame, businesses were selected that had recently grown from small to medium size.

Definitions

Small and medium size: For the purpose of sample selection, a small firm had between 1 and 19 employees. Firms interviewed, therefore were generally in the range of 20 to 499 employees.

Transition from small to medium: The selection of companies for the interviews was less systematic than for the analysis of the databases. Companies were accepted that had grown from small to medium up to about 15 years ago. Most companies interviewed had undergone at least a doubling in employment within that period.

Approach

Candidate firms were pre-screened by telephone. They were initially asked if they fit the criteria (that is, they had recently grown from small to medium size, that they were technology-based) and whether they would volunteer for a one-hour interview.

The interviews were designed to obtain the firm's own story of (a) how it began and (b) how it made the transition from small to medium. Each interviewee was asked the same five main questions (Table 1) but the optional "probing" questions varied with the nature of the firm and the responses already given. In total, 25 firms were interviewed. Geographic locations were Vancouver, Toronto, Ottawa, Brockville (Ontario) and Montreal. Table 2 summarizes some of the characteristics of these firms. Note that three of the companies interviewed were spun off from larger companies. Their situation at the beginning would have been considerably different from companies starting up with two partners and a few good ideas. This has been taken into account in the analysis.

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