Industry Canada Industrie Canada

Growth Firms

Workshop Synopsis

September 29, 2004

Small Business Policy Branch

Industry Canada

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Canada

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Supporting Documents

1. "Leading Growth Firms: Job Creation and Growth Performance 1997-2000" (Don Rumball for the Government of Ontario, 9 pages)

2. "Characteristics of Firms that Growth from Small to Medium Size" (IRAP, 62 pages)

3. "Growth Firms Project: Key Findings (Phase I)" (SBPB, 19 pages)

4. "Growth Firms Project: Phase II Report" (SBPB, 21 pages)

5. "Factors Relating to SME Growth: A Review of Research Findings (Executive Summary)" (Orser, Riding and Gasse, 1996, 4 pages)

6. "Dimensions of Business Growth (Deck and Bibliography)" (Gasse, 2004, 15 pages)

7. References for "Growth Analysis: New Directions" (Erwin Dreessen, 1 page)

8. "Productivity in Small Business" (Chris Parsley, 2004, 6 pages)

Growth Firms Workshop
Synopsis of Meeting
September 29, 2004

1. Introduction

For the past two years, Industry Canada's Small Business Policy Branch (SBPB) has been working with several partners -- Statistics Canada's Science, Innovation and Electronic Information Division (SIEID), the National Research Council's Industrial Research Assistance Program (IRAP) and the Government of Ontario -- on a multi-phased project to analyze the growth of Canadian firms. This project aims to improve our understanding of the dynamics of economic growth using a firm-level longitudinal database[1] to investigate which types of firms provide growth, their contribution to job creation, the barriers to growth and the areas where governments can make a contribution.

This work on growth firms has important policy implications. Understanding the process of firm growth sheds light on how jobs and wealth are created. Specific potential policy links revolve around start-ups and measures to encourage and support these firms given their significant role in the growth process. Another key policy issue is the extent to which reducing any barriers to growth will have positive returns on the growth process.

This ongoing, multi-year project is conducted under a Memorandum of Understanding (MOU) that was signed by all partners in October 2003. Although the terms are non-binding and

[1]The database used for this project is known as LEAP/SAF; more details are available in Appendix 1.

do not include any financial commitments, it indicates a commitment to share research over the next several years. New partners may be welcomed into the project under the MOU with the agreement of all partners.

By the end of the summer of 2004, each partner had completed at least one component of research and a workshop in Ottawa was held on September 29, 2004 to share and discuss the results as well as consider future directions of the project. All partners attended and presented their work to the group and several observers.

This paper begins by briefly summarizing John Connell's introductory remarks and the work that was presented at the workshop. The second section discusses the main themes raised at the workshop and the paper concludes by outlining some of the future directions for this project that were raised by the participants.

2. Workshop: Work Completed to Date

Introductory comments made by John Connell anticipated discussions that arose throughout the day and provided a policy context for this research. He noted that this research is important because it provides baseline data to policy makers on where growth firms exist and their contribution to employment creation. This project improves the understanding of the nature of obstacles that firms face when they seek growth and what policy responses would be

appropriate to assist them. However, some specific issues need to be addressed further. It is important to examine the impact of innovation on the process of growth in order to understand the significance of new ideas to growing firms. Human resources practices in small growing firms are often very different from those in larger firms and these differences need to be understood to identify best practices that are conducive to growing firms. Additionally, management skills required by growing firms change as they grow and these gaps need to be recognized and addressed. Financing growth is a crucial issue of which more needs to be understood because firms need capital to start, survive and grow. Finally, the most appropriate framework to measure growth needs to be identified because different measures can provide different results.

To enable a comparison of the studies and put the later discussions in context, Table A captures the main elements of each study.

Table A: Summary of Studies Conducted Under the MOU

	Ontario	IRAP/Stats Can	SBPB Phase 1	SBPB Phase 2
File Used:	T2/LEAP and LEAP	LEAP/SAF and various surveys	LEAP/SAF	LEAP/SAF
Coverage:	Firms operating in Ontario with <500 employees in 1997 and >10 employees in 2000	All employer firms with >20 employees in 2000	Private sector employer firms, all firm sizes	Private sector employer firms, all firm sizes
Definition of Growth:	Payroll growth over 4 years: ***Leading Growth*** <50 employees and >50% growth, or >50 employees and >35% growth ***Early Stage Leading Growth***: <20 employees and >50% growth	Employment growth over 5 years, 1995-2000: ***High growth***: >100% and had at least 20 employees in 2000	Employment growth over 4 years, 1985-1989: ***Hyper growth***: >150% ***Strong growth***: 50-150% ***Slow growth***: 0-50% ***Declining***: <0%	Employment growth over 4 years, 1985-1989; also 1996-2000: ***Hyper growth***: >150% ***Strong growth***: 50-150% ***Slow growth***: 0-50% ***Declining***: <0%
Variables of Interest:	Employment Firm Size Payroll Revenue Industry	Employment Firm Size R&D Innovation	Employment Firm Size Wages Industry Region Business Cycle	Employment Firm Size Wages Firm Age Start-ups & exits R&D
Main Result:	2.7% of firms were leading growth firms and these firms created 60% of the new jobs between 1997 and 2000	5.1% of firms with 20-49 employees and 4.7% of those with 50-99 employees met the criteria for high growth firms	7% of all firms were hyper or strong growth firms and they created 56% of the 1.0 million new jobs created between 1985 and 1999	Between 1996 and 2000, 19% of continuing firms were hyper or strong growth and they created 192% of the net jobs created over this period.

a. Ontario: "Leading Growth Firms: Job Creation and Growth Performance 1997-2000"

The goal of this report prepared for the Ontario Government by Don Rumball was to describe the role of leading growth firms in job creation and to profile their growth experience.

This project considered growth in firms' payroll between 1997 and 2000 based on the relationship between revenue growth and payroll growth using the T2/LEAP file[2] between 1994 and 1997. Only firms that had a head office and more than half of their employees in Ontario were examined and those with more than 500 employees in 1997 or fewer than 10 employees in 2000 were excluded. Furthermore, the firms were required to operate continuously over these 3 years; entries and exits were not included. The following criteria were used to define the growth groups:

- **Leading Growth Firms**: Firms with fewer than 50 employees that increased their payroll at least 50 percent during the 1997 to 2000 period; for firms with more than 50 employees, the criterion was 35 percent. In addition, this groups was split into:
  - **Hyper Growth Firms**: Firms with fewer than 50 employees that increased their payroll by more than 100 percent over the period; for firms with more than 50 employees, the criterion was 65 percent.
  - **Strong Growth Firms**: Firms with fewer than 50 employees that

[2]The T2/LEAP file is a linked file containing firm-level employment data from LEAP and revenue data from T2 tax records. Only incorporated firms are included in this file and the most recent year that has been linked is 1997.

increased their payroll by between 50 and 100 percent over the period; for firms with more than 50 employees, the criterion was between 35 and 65 percent.

- **Early Stage Growth Firms**: Firms with fewer than 20 employees in 1997 that increased their payroll at least 100 percent;

This study found that a small percentage of firms were responsible for the bulk of job creation. In Ontario, 2.7 percent of firms met the leading growth firms criteria and these firms created 60 percent of the new jobs between 1997 and 2000. Moreover, about 1.5 percent of firms were hyper growth firms and they accounted for 48 percent of jobs created. Early stage growth firms accounted for 2.9 percent of all firms and were responsible for 17 percent of job creation over these years. Non-leading growth SMEs was the only group of firms to shed jobs over this period (a 6 percent decrease), which was offset by the 7 percent job growth due to the net effect of firm entry and exit.

Leading growth firms were found in all industries, but some industries had a higher proportion of leading growth firms than others. Manufacturing had the highest concentration of leading growth firms, which accounted for 23 percent of the industry, compared to the provincial average of 7 percent. However, looking at the growth rates of leading growth firms gives a different picture than the proportion of leading growth firms that are in a given industry. Leading growth firms operating in Government services had the highest annual growth rates (31 percent), followed by Finance, Insurance and Real Estate at 25 percent. Manufacturing ranked fifth at 18

percent, which was below the average of 20 percent. The study observed that industries with the highest proportion of large firms had the highest average growth rates and suggested that the dominance of large firms in an industry may be best predictor of which industries will have the highest growth rates. This implies that large firms provide the market for small firms.

b. IRAP: "Characteristics of Firms that Grow from Small to Medium Size"

This joint study by Statistics Canada and the National Research Council's Industrial Research Assistance Program (IRAP) examined the internal and external factors affecting firms growing from small to medium size. The study used the LEAP/SAF database and other Statistics Canada databases to analyze the changing characteristics of small firms growing to medium sized firms. This empirical work supplemented a qualitative analysis of literature and growth models, and interviews with 25 firms. (This summary focusses on the empirical work only.)

High growth firms were defined as those with employment growth of at least 100 percent over the 1995 and 2000 period and have at least 20 employees at the end of the period. Using the LEAP/SAF database, 5.1 percent of firms with between 20 and 49 employees met the criterion for high growth as did 4.7 percent of those with 50-99 employees. Only 2.9 percent of large firms, those with more than 500 employees, met the criterion for high growth firms. Firms were also compared between high growth and non-high growth firms.

Examining high growth firms by industry revealed that the proportion of small high growth firms (1-99 employees) varied across industries. The top ten industries with the highest proportion of small high growth firms were all in manufacturing and, over the period examined, between 4.0 percent and 6.9 percent of all firms in each industry were small high growth firms.

Cities and communities were ranked according to the concentration of small high growth firms in each industry and geographical area to test for the presence of industrial clusters.[3] The hypothesis posited that the presence of industrial clusters would be indicated if larger cities had higher concentrations of small high growth firms than smaller communities. This was not found to be true. A list of the top fifteen communities with the highest concentration of small high growth firms included a large number of small communities in addition to large cities.

Using the *Research and Development in Canadian Industry* surveys and the *1999 Survey of Innovation*, high growth firms were compared with growing, stable and declining firms using various R&D and innovation indicators for firms with 20-49 employees and 50-99 employees. The following hypotheses were tested:

- There will be more small high growth firms than large high growth firms;
- High growth small firms will be concentrated in certain industries and certain geographical locations;

[3]An industrial cluster is a set of businesses within an industry that are related through inter-business relationships or by common technologies or labour pools. Industrial clusters are geographically concentrated to best exploit the positive externalities associated with the commonalities between businesses. For more, please refer to Porter (1990), *The Competitive Advantage of Nations*.

- Small firms that have developed R&D/innovation/technology acquisition resources, competencies and capabilities will be more likely to exhibit high growth;
- Small firms that protect their intellectual property; have developed their capability to access external financial resources; have a strategy for growth; and/or collaborate with other firms and organizations will be more likely to exhibit high growth;
- High growth in small firms will be accompanied by significant changes in the firm's human resource capability and/or organizational structure of the small firm;
- High growth will be accompanied by significant changes in the perceptions of the owner-manager or top management team; and,
- The owner-manager or the top management team of small high growth firms will have the capability to identify and exploit technological and market opportunities.

Using data from the *1999 Survey of Innovation*, high growth firms with between 20 and 49 employees were found to be significantly different than other firms in the several areas. Relative to non-high growth firms, high growth firms: were more innovative; applied for more patents; used more confidentiality agreements; made more use of R&D Tax Credit Programs; and, were more involved in collaborative and cooperative arrangements to develop innovative products of processes. Furthermore, additional data show that high growth firms are more likely to provide on-going training and use an export strategy than non-high growth firms.

The same comparison was done in firms with 50 to 99 employees. Based on the Innovation Survey 1999, results show that significant differences between high growth and non-high growth firms only exist in the number of "world first innovators." Once again different sizes of firm reveal different practices and outcomes.

c. Industry Canada (SBPB): "Growth Firms Project: Key Findings (Phase 1)"

Industry Canada's Small Business Policy Branch analyzed growth firms in Canada to investigate which firms grow, which are the engines of growth, and what impact they have made on employment creation.

The study used the LEAP/SAF database from 1985-1999 and examined only continuing firms. Firms that operated from 1985 to 1999 were assigned a growth label over the first four years of this period, 1985 to 1989, and then the different growth groups were tracked from 1985 to 1999. The criteria for assigning growth labels is as follows:

- **Hyper Growth**: Firms with at least 150% growth between 1985 and 1989;
- **Strong Growth**: Firms with between 50% and 150% growth;
- **Slow/No Growth**: Firms with between 0% and 50% growth; and,
- **Declining Firms**: Firms with negative growth.

Only private sector firms were examined – those operating in Government, Health and Education industries were excluded, as was Canada Post. While the study concentrated on continuing

firms, the net effect of "churning" from firm entry and exit was measured and found to be very significant. Churning created 1.3 million jobs over the 14-year period, nearly 75 percent of all jobs created.

Consistent with other studies, a very small number of firms was found to be responsible for the majority of net job creation. Hyper growth and strong growth firms accounted for 7 percent of all firms in 1985 but created 1 million new jobs, 56 percent of all jobs created in the private economy over the period. Small businesses created over 660,000 new jobs over these 14 years, which more than offset the 350,000 jobs lost by large businesses.

Hyper and strong growth firms were important to net job creation in all regions of Canada, as were small businesses. However, there were differences in the amount of leverage that growth firms had in terms of job creation.

Examining the results by industry, it does not appear that any industry was predisposed to growth; hyper and strong growth firms were spread over a large number of industries. In contrast to other studies, this would negate the importance of industrial clusters.

Average annual wage levels were highest in declining firms and lowest in hyper and strong growth firms. However, growth in wages over this period was highest in hyper growth firms (4.6 percent annualized) and lowest in slow growth firms (3.7 percent annually).

Tabulations also examined firm growth through different segments of the business cycle and show that hyper and strong growth firms grew significantly prior to the recession in 1990, declined slightly during the recession, but bounced back with positive growth after the recession. Neither slow growth nor declining firms were able to regain positive growth following the recession.

Special tabulations were obtained to examine firm growth in knowledge-based industries (KBIs) relative to those outside of these industries. Firms in KBIs were somewhat more likely to meet the hyper or strong growth criteria than were continuing firms in general. Also, hyper growth firms in KBIs grew faster than all hyper growth firms. Finally, wages in KBI firms were 40 to 60 percent higher than firms outside of KBIs and they grew faster.

d. Industry Canada (SBPB): "Growth Firms Project: Phase 2 Report"

The second phase of the Industry Canada Growth Firms Project builds on the first by examining employment growth by firm age, the growth of start-ups and the characteristics of firm exits. As in the first phase, the LEAP/SAF file was used and only the private sector was examined. An additional year of data was available so the period covered was 1985 to 2000; however, different tabulations examined different time periods. For example, in the firm age tabulations, the early portion of the file was used to construct the firm age variable and the tabulations only cover 1996 to 2000.

One section of the study examined start-ups by comparing the job creation performance of two cohorts over two expansionary segments of the business cycle and by tracing one cohort of start-ups over the full 15-year period. Start-ups were defined as firms with one full year of operation (e.g. the 1985 cohort of start-ups are those firms that entered in 1984). The 1985 and 1993 cohorts were compared over their first five years of operation to examine the performance of start-ups through two expansionary periods. The two cohorts had virtually identical distributions by firm size and very similar levels of job creation by different firm sizes. This suggests that the LEAP/SAF database can provide reliable indicators of the growth of start-ups, as measured by job creation.

Tracing the cohort of 1985 start-ups over the full 15-year period shows how they fared over the medium term. Only 17 percent of 1985 start-ups survived to 2000[4] and of these, 18 percent were hyper growth firms that were responsible for virtually all of the net job creation. Another 23 percent of surviving start-ups were strong growth firms but jobs created by these firms were offset by jobs shed in declining firms. Comparing 1985 start-ups across regions showed that, similar to the entire population examined in Phase 1, there were very few differences in the job creation performance of start-ups by region.

To complete the picture of entry and exit, some tabulations were also performed to examine firm exits. In any given year, approximately one-third of firms exits are firms in their

[4]Between 1985 and 2000, some start-ups may have merged, been bought or changed their name or line of business. Statistics Canada has a methodology to identify these false births and deaths, but a small number may remain undetected.

first year of operation but one-third of the jobs lost due to exiting firms were in the oldest firms, those 16 or older. Some regional differences appeared in the exit tabulations. In Atlantic Canada, there was a much higher rate of exit in the first year of operation: approximately 40 percent of firms exited during their first year. At the other extreme, only 25 percent of businesses exited in their first year in Quebec.

The final focus of this phase of work was on firm age. To construct the firm age variable, the first year of operation was subtracted from 1996 and tabulations were performed from 1996 to 2000. To avoid disclosing confidential data, firm age cohorts were combined into pairs. The important conclusion from examining job creation by firm age, is that it is not just the youngest firms that create jobs. When expressed as job creation per firm, it appears that an older firm contributes more to job creation than the typical young firm and this was generally consistent across all industries and regions. However, in primary industries this relationship was much more pronounced than other industries because of the high concentration of large firms in this industry. Growth matrices were also constructed by firm age and there was little difference in the pattern of growth between the youngest and oldest firms. This finding has implications on government policies that focus only on start-ups.

e. "Growth Analysis: New Directions"

Following the presentations and discussion on the four studies, Erwin Dreessen provided

insight on key issues and suggested future directions for this work. He noted that the definition of growth is critical to all studies and the consortium must think about what growth is and how it is defined. Some highlights of Yvon Gasse's presentation on firm growth to the Small Business Research Advisory Group[5] were raised, specifically, that he felt there are four ways to measure firm growth: sales, employment, profit, and capacities. Sales, employment and profit are self-explanatory measures, but capacities is a 'soft' measure that includes knowledge, firm structure and abilities. As discussed below, however, challenges remain in determining a measure of growth acceptable to all.

Central to growth theory, the business owner's intentions of growing their business is highly indicative of whether or not the business grows. This element cannot be captured in the administrative data files and therefore, the work conducted in this project must be careful not to expect more from these data than they can provide. These data do not suffice to construct a model of growth determinants; however, this work is still very useful because certain lessons for policy can be learned from these profiles. It is important to examine not only firms that grow, but also those that do not because it is just as important to understand why some firm do not grow. In addition to learning about obstacles to growth and winning strategies, many myths can be dispelled with these data. For example, the myth that high growth is only found in high technology firms was disproved by these studies.

Productivity was raised as an alternative measure of growth, and is in some ways

[5]This presentation was distributed to workshop attendees (see page 3, item #7).

preferred to growth in employment or revenue because it measures efficiency. Further, productivity is an important theme for policymakers because Canada lags behind the United States in productivity levels and growth, leading to an increasing gap in the standard of living between the two countries. An immediate focus of this project should be on exploiting the T2 data and exploring the possibility of shifting the focus of this work to productivity. The Small Business Policy Branch has proposed a productivity study by firm size that builds on the growth firms work. The LEAP/SAF database could be used for such a project but some key challenges must be overcome. All measures require appropriate deflating and labour units require adjusting for hours worked. A productivity study could also be enhanced using case studies. These elements are explored in the discussion that follows.

3. Workshop: Discussion

Discussion at the workshop covered both technical and conceptual issues. Additionally, some policy implications were discussed and all parties agreed to move forward with future plans. This section is divided into subsections on Defining Growth, Financing Growth, Commercialization and R&D, Management Skills and Exporting. Each of these topics came up in discussions following each presentation.

Definition of Growth:

One of the most important themes that came up in the discussions throughout the day was the definition and metric used to define growth. This began early in the workshop with Don Rumball's presentation where he posed the question "what is growth?" Erwin Dreessen's presentation picked up on this question, and in particular, on how growth is measured. This is an issue that has been much discussed in studies on firm growth, but was not addressed in the 1996 literature review prepared for the Small Business Policy Branch.

Most of the work presented at the workshop used employment as a measure of growth, except for the Ontario study which used payroll changes. Other options include revenue, profits, or productivity, but there is no clear answer as to which measure of growth is better because each captures different elements of firm performance. Revenue is currently not available in the LEAP/SAF file so there is no way of knowing the insights that could be gained from revenue growth. However, the Ontario study did observe that there was some correspondence between revenue growth rates and payroll growth rates: 150 percent sales growth over three years was equivalent to 98 percent growth in payrolls for firms with fewer than 50 employees and 63 percent growth in firms with more than 50 employees. Similarly, profits are a measure of firm performance that is not available in the data file. It is similar to revenue but is measured after all deductions are made and is therefore, more indicative of how well the firm is performing financially than revenue. A third metric that could be used is growth in productivity. Discussions around productivity occurred after each presentation and all MOU members

appeared very keen to explore the potential of moving the focus to productivity growth from employment growth.

Furthermore, everyone recognized that the length of time over which growth is measured is very important because of the significance of churning, the net effect of firm entry and exit. The longer the time period examined, the more significant churning becomes and alters the way in which growth is interpreted.

An additional important issue is deciding which firms to examine when considering growth. Principally, studies vary on their treatment of firms with fewer than 20 employees. The Ontario and IRAP studies did not include these firms in their analyses, while the Industry Canada reports did. The relative merits of including or excluding these very small firms were discussed. The main argument for excluding them was that if a firm grows from 1 to 5 employees over 4 or 5 years, it does not really constitute a hyper growth firm because its economic contribution is so small. The counter argument is that often firms with very few employees do grow into firms with more than 20 employees. Additionally, even though these firms may make a small contribution individually, there are thousands of growing firms and their contributions can combine to be very significant. This debate has no clear solution, but one proposed approach was to use a minimum size requirement at the end of the period.

There are policy implications to this debate because these small firms may grow differently than other firm sizes and require special policy attention. Some of the participants

argued that firms with at least 20 employees were organizationally different from those with fewer than 20 employees because once this number of employees is reached, their human resource practices become more formal. This issue was examined during the interviews that were conducted as part of IRAP's study, which investigated the formalization of the organizational structure of the firm through different phases of growth.

Financing Growth:

Financing growth is an important issue that this project has been unable to examine due to data limitations, even though there is keen interest to study how firms finance their growth. It was suggested many times that linking LEAP/SAF to T2 data would facilitate this type of work and should be one of the priorities of the project. In discussion on this issue, IRAP shared some insight on financing issues gained in their interviews. Some firms were not willing to reveal this type of information and other responses were mixed. Most firms, excluding those operating in biotech, were able to fund their growth with their revenue and did not even use banks for financing. At the other extreme, biotech firms often used venture capital, but only as a last resort. Caution must be taken in reaching conclusions from these interviews, given the small sample.

Commercialization and R&D:

Commercialization and R&D were topics that generated interest around the table. The

different approaches that small and large firms have toward R&D presents difficulty in studying small firms because of measurement issues. It is very difficult to fully capture innovative activity with a small number of indicators because innovation is a way of thinking and behaving. Furthermore, measuring innovative behaviour of small businesses is challenging because their approach is often much less formal than in large businesses. For example, large firms usually have R&D divisions and R&D budgets whereas small businesses undertake this activity without a formal structure. However, small businesses are much more adaptable and adopt new technologies and processes more quickly than large firms. Preliminary work undertaken by the Small Business Policy Branch indicated the difficulties associated with working with R&D data. The data are very sensitive to the time period examined and appear to have difficulty capturing R&D performance equally across all firm sizes. Also, the feasibility of identifying outsourcing and subcontracting R&D in the data was discussed. How this could be accomplished was not immediately obvious.

Management Skills:

Another issue that was consistently raised after each presentation was the importance of management skills, likely one of the most significant determinants of firm growth. The work presented did not generally touch on this issue empirically. The IRAP study investigated management skills in the interviews, the results will be reported in a separate study and were not discussed at the workshop. All agreed that management issues are crucial to success in growing firms and need to be considered in planning future work on this project.

Exporting:

Exporting was also raised as an important element in firm growth as many high growth firms rely on export activities. Future work is planned to explore this idea and examine the impact of exporting on firm growth. All parties were very interested in this question.

4. Conclusions:

The work completed to date by all partners in the MOU has been useful and contributes to our knowledge of growth firms. The evidence based research provides policy makers with good information. Much has been learned about high growth firms through this work; it is clear who high growth firms are, where they operate and their contribution to overall job creation. Additionally, lessons were learned about the data and the significance of the time period examined. It was found that the length of time examined and the period chosen relative to the business cycle very much influenced the results obtained.

Nevertheless, some issues remain unclear after completion of this initial phase of work. Discussions at this workshop raised questions on the definition of growth, how it is measured, whether or not firms with fewer than 20 employees should examined, and how to recognize a firm's growth intentions. It was also noted that it is time to move beyond identifying characteristics of high growth firms to look at determinants and obstacles of growth.

Consequently, the prospect of a link between the LEAP/SAF and T2 files is promising because revenue growth can provide additional insight into the growth process. Case studies may be able to assist in this and they would be very useful to supplement the quantitative work done so far, since they may reveal the importance of strategies and practices pursued by management.

Many ideas about future directions were generated at the workshop. Some of these include more investigation on:

- The influence of growth intention and management skills on firm growth;
- The extent to which exports drive firm growth;
- How firms finance growth;
- The role of innovation in firm growth;
- The impact that R&D and commercialization have on growth; and,
- The relationship between productivity and firm growth.

The results of the workshop and ideas generated will be taken into consideration in the design of future work.

Appendix 1: LEAP/SAF File

This project uses a newly available data source at Statistics Canada, "LEAP/SAF", a longitudinal file that covers all employer firms in Canada. Originally, the Small Area File (SAF), a longitudinal file covering all employer businesses in Canada, was intended to provide firm-level data at a very detailed geographical level. It was linked to LEAP to provide more data from individual T4 tax receipts. The key conceptual units that makes this link possible are employees's Social Insurance Number (SIN) and residential and workplace postal codes. In principle, this database is able to follow an employee through time, identify their employers and track their earnings.

Annual data from 1983 to 2000 were used in the work completed to date and the variables available in LEAP/SAF are: an employee's Social Insurance Number; Payroll Deduction Account Number; Province of T4 earnings; T4 type; UI premiums deducted on T4; Individual Labour Unit (ILU); worker age (T4 year minus birth year); worker gender; worker postal code; business size; and T4 earnings. Other files were linked to this database to obtain additional variables.

Analysis can be completed at approximately the enterprise level. Some of the data are obtained from Revenue Canada tax records which do not accord well with Statistics Canada's establishment unit. Although the establishment unit is more amenable to individual industrial classification because it comprises a more homogeneous set of activities, it has no counterpart in

Revenue Canada tax data. Businesses may span one or more establishments.[6] Carefully tracking employment information at both the business and establishment level allows enterprise data to be reported, identified at the 3-digit SIC industrial level, by province.

This rich database has many strengths. Because it pulls together information from several of Statistics Canada's main files, it offers analytical opportunities unseen before, particularly since it is a longitudinal file. One of the greatest strengths of the database is to join together business-level data with employee-level data, increasing the number of angles that can be used in analysis. It is also conceptually easy to link other files to further enrich the data set by using common identifiers. Geographic detail, although not exploited here, remains a unique feature of this file. Postal code data permit the data to be disaggregated at very fine levels, limited only by Statistics Canada's confidentiality rules.

However, being a file of the universe of employers, there is inevitable "noise" in the data. Furthermore, a limitation of LEAP/SAF is that it includes only employer businesses. In most instances, owner-operators do not issue themselves T4 slips and are therefore under-represented in LEAP/SAF. The degree of this under-representation has not been determined. Another weakness is its inability to distinguish between full- and part-time employment. A final caution is that a validation process through comparison with other data has yet to be developed and formalized.

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[6]An example often used to illustrate this is MacMillan Bloedel. MacMillan Bloedel is an enterprise, but may consist of several companies, or legal entities in the taxation system, and even more establishments.

For more information on the data and on the labour units used in this study, please refer to the individual reports.