Job Market paper

Born Global, Gradual Global, and their Determinants of Exit from Exporting

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December 2009

Abstract

Applying the duration analysis on 1,959 newly established small and medium-sized Canadian exporting manufacturers, this study compares the survivability of Born Global and Gradual Global firms in the export market. The unique longitudinal (1997-2005) data set that used in this study is constructed by linking multiple administrative data sources from Statistics Canada. With all else held constant, the probability of survival of Born Global is 6 percent lower than Gradual Global firms. After correcting for endogeneity, the probability of survival of Born Global is 15 percent higher, albeit statically insignificant, than Gradual Global firms. Further, the results show that Born Global and Gradual Global firms have notably different advantages and disadvantages while competing in the global export market. These findings have important implications for both academic researchers and policy-makers.

1 Introduction

A Born Global company is also referred to as an International New Venture (INV) or an International Entrepreneurship, and has been conceptualized as "a company which, from or near its founding, seeks to derive a substantial proportion of its revenue from the sales of its products in international markets" (Knight, 1997, p1). The phenomenon of Born Global has become a popular academic concern, since it challenges the traditional model of internationalization--the stage model. According to the stage model, the internationalization process of firms is "a process in which the enterprise gradually increases its international involvement" (Johanson and Vahlne 1990, p. 11).

The purpose of this paper is to contribute to this debate by investigating the effect of different internationalization processes on the survivability of firms in the export market. There are two types of internationalization processes that this study compares: Born Global and Gradual Global. Specifically, a firm is classified as a Born Global if it has started to export within two years of its inception and that during its first year of export activity, no less than 25% of its revenue is from exporting; otherwise, a firm is classified as a Gradual Global.

This paper makes three contributions to the literature. First, it contributes compelling evidence to a growing body of literature in the field of international business and international trade and has many important implications for international management, entrepreneurship, and strategic management by seeking to answer the following questions:

(1) What is the impact of the Born Global internationalization process on the survivability of firms in the export market?

According to a review study by Keupp and Gassmann (2009), there have been at least 179 articles on Born Global published in 16 top-tier journals over the past 14 years. The only study that examined the survival of Born Globals is written by Mudambi and Zahra in 2007. While Mudambi and Zahra's study identified the survivability of Born Globals in the domestic market,

the survivability of Born Globals in the global export market were not investigated. By investigating this question, this study contributes to the debate between the stage model and the Born Global phenomenon. For example, the evidence of a negative impact of Born Global on the survivability of firms in the export market may imply that the gradual global internationalization process could increase firms' probability of survival in the global market, and thus, support the idea of the stage model. The evidence of a positive impact of Born Global on the survivability of firms in the export market, on the other hand, may imply that Born Global is a strategic choice for a particular group of young firms. These firms would have a lower probability of survival in the export market if they have chosen the traditional gradual global internationalization process.

(2) What are the factors that determine Born Globals' survival in the export market? What are the factors that determine Gradual Globals' survival in the export market?

Export activity is an important catalyst for the growth of young firms (Oviatt and McDougall, 1994; Zahra, Ireland, and Hitt, 2000) since the uncertainty and risk of exposing young firms to foreign markets will trigger their dynamic capability for exploiting new opportunities and resources (Sapienza *et al.*, 2006). A study by Eaton et al. (2007) on Colombia exporters found that, only a small fraction of new exporters are able to continuous exporting in the following year. However, these successful new exporters account for almost half of total export expansion in less than ten years. Therefore, it is important to identify the factors that determine the success or failure of new exporters in the international market. Furthermore, by identifying factors that determine the survival of Born Globals' in the export market, especially factors that are different from those that determine the survival of Gradual Globals, the results of this paper enrich our understanding of the comparative advantages of Born Globals' in the global export market.

Answering these questions requires quality dynamic firm-level data. After reviewing and assessing fifty-five empirical studies that were published between 1989 and 2002 within the field of Born Global, Coviello and Jones (2004) noted that Born Global research is characterized by

static, readily obtainable, and judgment-based data. Among these fifty-five studies, only five studies are longitudinal and twelve studies used random selection of their sample design. In contrast, my data set is drawn from three large-scale administrative databases from Statistics Canada: the Exporter Register (1993-2005), the Business Register (1997-2005), and the Longitudinal Employment Analysis Program (1997-2004). The Exporter Register, the major database that is used in this study covers the universe of Canadian exporting firms that have at least one shipment to a foreign market from 1993 to 2005. Therefore, the second contribution of this study stems directly from the unique longitudinal firm-level data set I constructed, which includes the export activities of a relatively large sample of Canadian firms between 1997 and 2005.

Third, in recognition of the possibility that a firm's choice on its internationalization process is endogenous, simple comparisons of Born Global and Gradual Global firms are unlikely to have a causal interpretation on the impact of Born Global on the survivability of firms in the export market. Therefore, this study applies a two-stage estimation methodology to correct for the selectivity bias. Furthermore, a reduced-form duration model, the Cox proportional hazard model, is employed to examine the survivability of firms in the export market. Compared to the logit model that has been applied in Mudambi and Zahra (2007)'s study, the hazard model that has been applied in this study has many advantages. Firstly, the logit model can only address the unconditional probabilities, such as a firm's probability to exit from exporting in a moment t. The hazard model, on the other hand, allows me to address the conditional probabilities, such as a firm's probability to exit from exporting in a moment t, given that it has continuously exported until this period t. Secondly, to use the logit model, the researcher needs to select the time when firms' characteristics are observed. This selection bias may cause the estimated probabilities to be biased and inconsistent with the true probabilities. The hazard model, on the contrary, can produce more efficient and consistent results by accounting for the duration dependence and using all the available information at each point in time.

The rest of the paper begins with a brief review of the relevant literature and the hypotheses to be tested in section 2. The data is presented in section 3. Attention is then given to the methodology in section 4. Section 5 presents empirical results with discussions. Finally, concluding remarks are discussed in section 6.

2 Theory and Hypotheses

Despite the increase in Born Global studies, neither name nor definition of such groups of firms has been universally accepted (Keupp and Gassmann, 2009). Such groups of firms have been given different names such as Born Internationals (Ray, 1989), Born Globals (Rennie, 1993), and International New Ventures (Oviatt & McDougall, 1994). Different conceptual definitions have also been offered by researchers to describe Born Globals. Examples are: "a business organization that, from inception, seeks to derive significant competitive advantage from the use of resources and sale of outputs in multiple countries" by Oviatt and McDougall (1994, p. 470); firms that "adopt an international or global approach right from their birth or very shortly thereafter" by Madsen and Servais (1997); "a young entrepreneurial company that initiates international business activity very early in its evolution, moving rapidly into foreign markets" by Cavusgil et al. (2008), and "SMEs with accelerated internationalization potential and global market vision" by Gabrielsson et al. (2008).

Regardless of different definitions, what these firms have in common is their early and fast approach as opposite to the gradual approach of internationalization process that have been described by the traditional internationalization model--the stage model. The stage model, or the Uppsala model, is the earliest internationalization model that was developed by a group of Swedish economists (Johanson & Wiedersheim-Paul, 1975; Forsgren & Johanson, 1975) who worked at the Uppsala University. A considerable number of empirical studies have found evidence that supports this model from different countries. Examples are Johanson and Wiedersheim-Paul (1975) on Swedish firms, Welch and Luostarinen (1988) on Finnish industrial

companies, and Lam and White (1999) on small companies in the UK. According to the stage model, firms are cautious and become involve gradually in foreign business activities because of the risks and uncertainty associated with foreign market entry and survival. Therefore, if the stage theory is relevant, Born Globals would have a lower chance of survival in the foreign markets than the Gradual Globals.

Beginning in the early 1990s, however, a number of empirical studies in the have reported an intriguing phenomenon that contradicted the traditional internationalization theory.[1] Brush (1992) found that 13% of small US manufacturers had started international activities during the first year of operations. Rennie (1993) observed that about 25% of Australian exporters began exporting in substantial quantities right from the birth of the company. In their seminal work, Oviatt and McDougall (1994) argued that the stage model cannot be applied in some cases, especially among newly established firms who belong to industries that are characterized by intense international competition and unique knowledge. Similar conclusions have been made by other empirical studies such as Bell's (1995) study on computer software companies and Shrader's (2001) study on high-technology new ventures.

2.1 The Impact of Born Global on the Survival of New Exporters

Sapienza *et al.* (2006) developed a dynamic capabilities framework to explain the effect of Born Global on firm survival and growth. Based on this theoretical framework, Born Global firms may experience lower survival rate than Gradual Global firms because they need time to develop routine organizational processes and positional advantages in the foreign market. A study by Zahra (2005) made the same prediction, that Born Globals would have a relatively lower probability of survival because of their disadvantage in organizational age, prior

[1] Studies by Zahra (2005) and Meckl and Schramm (2005) are the two recent reviews on the theory and empirical evidence of Born Globals.

managerial experience, and resource constraints.

In the Industrial Organization literature, one of the stylized facts is that age and size are positively related to the probability of a firm's survival (Geroski, 1995). For example, decreasing hazard rates with age has been found among US firms (Audretsch and Mahmood, 1995), Canadian firms (Baldwin and Gorecki, 1991), and Portuguese firms (Mata *et al.*, 1995). New firms need time to develop their new organizational capabilities and face a high probability of exit (Stinchcombe, 1965). The age-effects on survival, or the so-called liability of ''newness''[2], refer to the time firms need to establish themselves, carry out specific investments, develop knowledge and appropriate production routines, and build up with business partners. Based on this argument, by choosing to become international in a slow and incremental manner, Gradual Global firms could have a better chance of survival in the foreign markets by gaining knowledge and experience and building up sufficient capacity for selling their products worldwide over time.

In the field of International Entrepreneurship, Born Global is described as "a combination of innovative, proactive, and risking behavior that crosses national boundaries and is intended to create value in organizations" (McDougall & Oviatt, 2000, p903). Younger firms, as reported by Ursic and Czinkota (1984), often are lacking of cost advantages, sufficient amount and source of resources and financial assistant to help them compete in the local market, hence are more interested in the global market than the older ones. Conditional on "improvements in global telecommunications and transport networks, combined with increasingly liberalized global trading regimes" (Fan and Phan, 2007, p1113), Born Global is a strategic choice for a particular group of firms. For example, the founders of these companies may be familiar with foreign markets because of their prior international business experiences (Knight and Cavusgil, 1996;

[2] The terminology of the liability of newness is original from Freeman *et al.* (1983).

Oviatte and McDougall, 1997). In this case, a firm's decision on its internationalization process is endogenous. Consequently, one has to take into account for the endogeneity of a firm's choice on its internationalization process when assessing the impact of Born Global on the survivability of firms in the export market.

To the best of the author's knowledge, the impact of Born Global on the survival of firms in the export market has not been investigated empirically. The existing empirical evidence on the survival of Born Globals is not entirely conclusive either. A study by Mudambi and Zahra (2007) found that Born Globals are significantly less likely to survive than established firms. However, the lower probability of survival associated with Born Globals disappears when the endogeneity on a firm's choice on its internationalization process is taken into account. The results of their study suggest that early internationalization maybe a value-maximizing organizational form and an endogenous optimal strategy for a particular group of firms. Empirical models that do not account for self-selection of strategy choice, suggested by Shaver (1998), can be misspecified, and lead to incorrect conclusions.

The theoretical considerations described above yield two hypotheses with regard to the effect of the Born Global internationalization process on the survivability of firms in the export market, which I will explore empirically:

Hypothesis 1a: Everything else being equal, Born Globals have a higher probability of exit from exporting than Gradual Globals.

Hypothesis 1b: After endogenizing a firm's choice on its internationalization process, Born Globals have a probability of exit from exporting no greater than Gradual Globals.

2.2 Exit from Exporting of Born Global and Gradual Global Firms

Productivity. In the international trade literature, studies from the microeconometrics of

international firm activities have noticed the superior performance of exporters relative to non-exporters (e.g. Bernard and Jensen, 1999; Isgut, 2001, Clerides *et al.*, 1998; Delgado *et al.*, 2002). For example, firm-level evidence from European countries (Mayer and Ottaviano, 2008) revealed that internationalized firms are "superstars", they "are bigger, generate higher value added, pay higher wages, employ more capital per worker and more skilled workers, and have higher productivity".

An important theoretical framework to explain such findings is the Melitz (2003) model with heterogeneous firms. The Melitz model is a theoretical model that incorporates firm heterogeneity into the Krugman's (1979) monopolistic competition framework. In that model, there are fixed costs and variable costs associated with entering the industry and entering the export market. As a result, only a small fraction of productive firms engage and remain in exporting. Furthermore, wage is used as a proxy for human capital intensity by Wagner (2003) to reflect different levels of labor productivity. Based on Wagner's argument, one would expect firms that pay higher wage rates to be more productive, and thus, more likely to survive in the export market. The least productive firms are forced to exit. These arguments lead to the following hypotheses:

Hypothesis 2a: Everything else being equal, firms that produce more revenue per worker have higher probability of survival in the export market.

Hypothesis 2b: Everything else being equal, firms that pay higher wage rates have higher probability of survival in the export market.

Export Market Diversification. Geographic concentration of export destinations leaves exporters vulnerable in case of rapid changes in the political or economic situations of their key trade partners. By exporting to multiple destinations (especially countries with different business cycles, exchange rate regimes, etc.) exporters are less likely to run the risk of depending on one trading partner, and thus, can maintain a certain level of threshold to be profitable. Hence, more

market diversified exporters are more likely to survive in the international market. Similar arguments can be applied to product diversification. In other words, exporting to more destinations and exporting more varieties of products could provide the insurance benefit to exporters because the risks of uncertain demand are less correlated from different types of markets and products. Furthermore, a study by Eaton *et al.* (2005) suggested that more productive firms should be able to export to more destinations. Consequently, more diversified firms are more productive, and are more likely to survive in the export market. These arguments lead to the following hypothesis:

Hypothesis 3a: Everything else being equal, firms that are more market-diversified are more likely to survive in the export market.

Hypothesis 3b: Everything else being equal, firms that are more product-diversified are more likely to survive in the export market.

US first. A study by Sabuhoro *et al.* (2006) suggested that for Canadian firms, choosing the US as the first export destination has a positive impact on their probability of survival in the export market. This result is consistent with the idea of the stage model, that after building strong appearances in the domestic market, firms often export first to a single neighboring market and subsequently enter more distanced foreign markets (Bell, 1995). This finding is also consistent with a study conducted by Eaton *et al.* (2007), who investigated the cross market dynamics of Colombian firms from 1996 to 2005. The authors showed that it appears to be a popular geographical expansion strategy for Colombian exporters to present themselves gradually from a single neighboring foreign market to additional destinations within the regional market, and then reach to larger OECD markets. Eaton *et al.* suggested that the likelihood of the survival of exporters depends on their choice of initial market destination since success in neighboring markets may suggest that the expected payoff could exceed the sunk cost in more distanced markets.

When it comes to Born Global firms, however, physical distance is argued to be less important during their internationalization process (Boter and Holmquist, 1996; Keeble *et al.*, 1998; Madsen *et al.*, 2000). These arguments lead to the following hypotheses:

Hypothesis 4a: Everything else being equal, choosing the US as the first export destination has a positive effect on the survivability of Gradual Global firms.

Hypothesis 4b: Everything else being equal, choosing the US as the first export destination does not affect the survivability of Born Global firms.

3 Data

3.1 Data Sources

The data I constructed to examine my research questions gathers information from the Exporter Register (ER), the Business Register (BR), and the Longitudinal Employment Analysis Program (LEAP). All these databases are produced and maintained by Statistics Canada. The creation of the analysis data set involved the aggregation of establishment-level data to the enterprise level[3], the generation of the variables of interest from administrative records, the aggregation of annual data to panel data, and the merge of different data bases.

I constructed my data set at the enterprise level. Any reference made to "exporter" or "firm" in this study represents a "statistical enterprise". A unique and static identification number (id) is assigned to each firm in each database used in this study. Using this firm id as a time-invariant identifier, I linked the original annual ER database and built a panel that goes from 1993 to 2005. The LEAP panel goes from 1997 to 2004 and the BR panel goes from 1997 to 2005. I linked these three panels and built the final data set used in this study.

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[3] An enterprise may have more than one establishment. For more detailed scandalized classification of both enterprise and establishment, please see Page 8 of "A Profile of Canadian Exporters, 1993-2005".

My main data source, the Exporter Register (ER), is a large-scale administrative database of all merchandise trade transactions by Canadian firms at both the establishment and enterprise level from 1993 to 2005. The data was obtained from two sources: the US Customs documents and the Canada Revenue Agency (CRA) documents. ER is produced and maintained by the International Trade Division at Statistics Canada. Each transaction is recorded separately in ER. I aggregated transactions by a given firm to obtain its total value of exports, its number of export destinations, and the variety of products it exports in each year between 1993 and 2005. A transaction record includes the firm's identification number, a product code that is classified at an 8-digit Harmonized Schedule (HS8), the value of transaction in Canadian dollars, and the country of destination. If the country of destination is the US, information on the destination state is also recorded. If a firm did not export, or its total value of export is $2000 Canadian dollars or less in a given year, this firm is not included in the ER for that year.

The ER database also provides information with regard to the industry to which a firm is classified from a 6-digit North American Industry Classification System (NAICS6) code and the province in which a firm is located. This data set allows me to track the entry and exit of firms in the foreign markets, the number of years a firm exported between 1993 and 2005, its value of exports, the destinations and the products it exports in each year between 1993 and 2005.

The second data source, the Business Register (BR), is a main frame that includes essentially all businesses operating within Canada as well as foreign businesses that have links with Canadian companies from 1987 to 2006. BR is maintained by the Business Register Division (BRD) at Statistics Canada. It contains a complete, up to date and unduplicated list of businesses that have a corporate income tax (T2) account, are an employer, or have a GST account. I used the BR database as supplements for the ER database for information on firms' annual revenue, country of ownership, and first year of business.

The third data source, the Longitudinal Employment Analysis Program (LEAP), contains employment and payroll information for each employer business in Canada and is available at the enterprise level. LEAP is maintained by the Science, Innovation and Electronic Information Division (SIEID) at Statistics Canada and is available between 1997 and 2004. In this data set, each observation corresponds to a unique combination of year-enterprise-province-payroll-individual labor units (ILU). If an enterprise has plants located in different provinces, its corresponding information is available at the provincial level. The variable 'payroll' measures total payroll each enterprise pays in each province in a given year. The variable 'ILU' measures the labor units an enterprise hires in each province in a given year. In most cases, an ILU represents one employee. In cases where one person works for several companies in a year, his or her ILU is distributed proportionally among these enterprises. A part-time worker would still contribute one ILU to the total if he or she did not work for another enterprise.

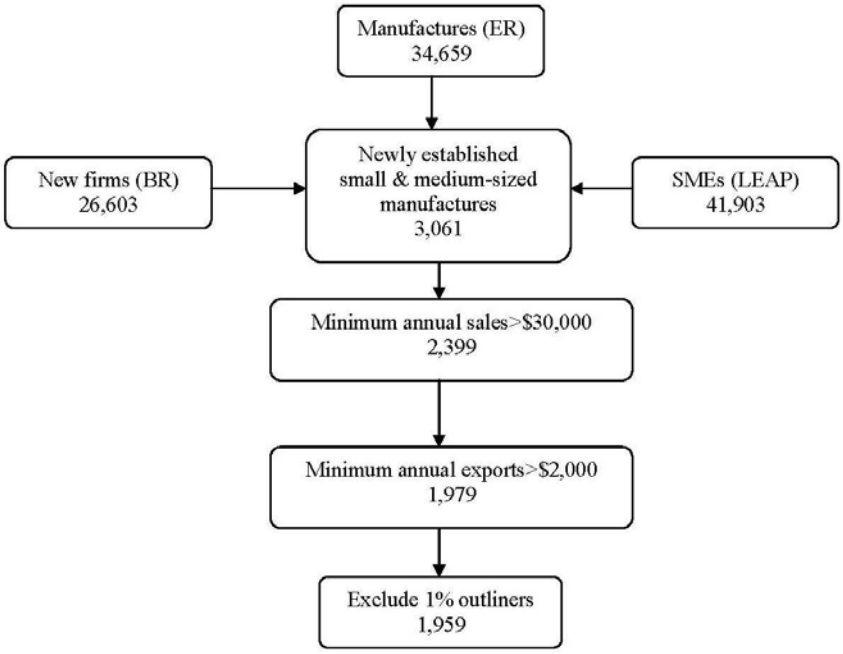
3.2 Sample Selection

I now present the criteria and procedure of selecting observations. A study on the conceptual definition of Born Global by Gabrielsson *et al.* (2008) emphasized that Born Global firms should be "small and medium-sized enterprises (SMEs) with accelerated internationalization potential and global market vision", and when it comes to defining Born Globals, one should take into account "factors such as the type of industry". Following Gabrielsson *et al.*, I selected the suitable observations for this study using the following criteria:

First, I selected firms that belong to the manufacturing industry. I decided to focus my analysis on the manufacturing industry because this study is intended to investigate firms that manufacture their own products. In other words, I want to eliminate Intermediation firms that sell products produced by other companies, such as, firms belonging to the wholesale trade industry. As shown in Figure 1, the initial data set of ER contains 113,113 enterprises across all industries that have at least one shipment to any foreign market between 1993 and 2005. Each enterprise

has a corresponding 6-digit North American Industry Classification System (NAICS6) code. Based on this code, I have information on the industry to which each enterprise belongs. I selected 34,659 out of these 113,113 (30.64%) enterprises that belong to the manufacturing industry for the purposes of this study.

Figure 1. Sample selection



Second, I selected firms that were established between 1997 and 2004. This study uses the founding condition to classify a firm as Born Global or Gradual Global. Because information on firm founding conditions from the LEAP database is only available between 1997 and 2004, firms that were established prior to 1997 were excluded. Among the 113,113 enterprises that appear in the initial ER data set, 62,461 (55.22%) enterprises appear in the BR database. Many of these enterprises that appear in the ER database but not in the BR database are unincorporated businesses, individuals, or institutions whose export behaviors are very irregular. I used the BR database as the main frame of my data set. This implies that enterprises that appear in the ER but

not the BR database are not considered as firms, and thus, were excluded in this study. For each enterprise, BR provides information on the year in which the enterprise entered the BR database. I selected 26,603 out of these 62,461 (42.59%) enterprises that entered the BR database between 1997 and 2004 for the purposes of this study.

Third, I selected firms with less than 500 employees because the aim of this study is to investigate the internationalization process of small and medium-sized enterprises (SMEs). Firms that do not appear in the LEAP database were excluded. Among the 113,113 enterprises that appear in the initial ER data set, 43,691 (38.63%) of them appear in the LEAP database. Among these 43,691 enterprises, 41,903 (95.91%) enterprises with less than 500 employees (measured by individual labor unit) were selected for the purposes of this study.

Using the unique identification number assigned to each enterprise, I linked the ER, BR, and LEAP databases. My sample is reduced to 3,061 enterprises. I cleaned the sample and excluded outliers by using the following criteria: first, in order to make sure that firms in my sample are active, I eliminated 662 enterprises whose annual revenue is never higher than $30,000 Canadian dollars in my research period (remaining sample 2,399). Second, in order to make sure that exporting is an important part of a firm's business activity, I eliminated 420 enterprises whose annual value of exports is never higher than $2,000 in my research period (remaining sample 1,979). I found that some values of the variable 'payroll per worker' in my sample are unreasonably high or low. It is possible that the values of this variable were incorrectly entered. Therefore, I eliminated the highest and the lowest 0.25% outliers to avoid possible misleading results. This gives the analysis sample of 1,959 enterprises.

The method of trend imputation is applied in constructing my data set. For example, the enterprise-level employment and payroll information is available between 1997 and 2004, but is not available in 2005. I imputed an enterprise 2005's employee and payroll from its previous years' information with a year-to-year change ratio where there are indications that the enterprise has activity in 2005.

3.3 Construction of the Variables of Interest

In Appendix A, Table 1 presents definitions, data sources, and descriptive statistics for the variables used in this paper. I constructed the following variables in order to classify the Born Global firm. '**BRBY'** (Business Register birth year) is estimated by the first year a firm appears in the BR database, which is used as a proxy for the first year a firm starts its business. Since the BR database starts in 1987, this information is unknown for those firms that are established before 1987. Accordingly, I generated a set of dummy variables **'Cohort'**, which equal one if a firm starts its business in a particular year. An exporter may register in the ER before it registers in the BR database. Such exporters are usually individuals who have to register the ER database because they need to ship products to a foreign buyer. They do not have to register in the BR database unless they want to form a company. Therefore, such firm is not considered as a firm until it registers in the BR database in this study. **'ERBY'** (Exporter Register birth year) is estimated by the first year a firm registers in the ER database after it registered the BR database, which is used as a proxy for the first year a firm starts to export.

A firm's export start-up age, '**ExAge**', is measured by the difference between a firm's ER birth year and BR birth year plus one. If a firm enters the BR database and the ER database in the same year, its start-up age equals to one. If a firm enters the ER database before it enters the BR database, its export start-up age equals to one as well. Enterprises that do not register in the BR database are not considered as firms, and thus, were excluded in my data set.

The variable **'Exports'** is measured in millions of Canadian dollars from the ER database and is deflated by annual merchandise exports customs-based price indexes, using base year 2000. The Variable **'Exports'** is available annually from 1993 to 2005. '**Revenue'** is a proxy for the size of a firm measured in millions of Canadian dollars from the BR database and is deflated by annual industry price indexes, using base year 2000. The Variable **'Revenue'** is available annually from 1997 to 2005. A firm's export intensity, **'EI'**, is measured as the ratio of export sales to revenue of the firm and is available annually from 1997 to 2005. I found some firms

have higher level of exports than revenue. One possibility is that the moment a firm reports its revenue might be different than the moment it reports its exports, which is referred to as a calendar issue. Another possibility is that either the value of exports or the value of revenue, or both are incorrectly entered. I let the export intensity of such enterprise equal to one.

'**BG**' is a dummy variable that equals to one if a firm starts to export within two years of its inception and has exported no less than 25% of its total revenue during the first year of its export activity. Accordingly, 497 out of 1959 (25.37%) firms are classified as Born Global in this study.

I constructed the following variables that might influence a firm's survivability in the export market. Based on a firm's country of control from the BR database, I generated a dummy variable '**Foreign**', which equals to one if a firm's home country of owner is not Canada. The percentage of foreign-owned firms in my sample is 1.68%. Based on a firm's corresponding 5-digit North American Industry Classification System (NAICS5) code from the ER database, I constructed a dummy variable '**ICT',** which equals to one if a firm belongs to the information and communication technology (ICT) sector. In general, the ICT sector is defined as the combination of manufacturing and service industries that electronically capture, transmit, and display data and information (Statistics Canada, 2001). The percentage of ICT firms in my sample is 7.5%. Table B in Appendix B presents the corresponding NAICS5 codes that are classified as ICT sectors. This classification was developed by Statistics Canada and Industry Canada in 1999.

From the ER database, I know the first year each firm enters each market. I generated a dummy variable **'US first'**, which equals to one if a firm exports to the US before it exports to another country. If a firm only exported to the US market, it is considered as having chosen the US as its first destination and is included in the 'US first' category. The percentage of firms that choose the US as their first export destination in my sample is 81.98%. This result suggests that newly established small and medium-sized Canadian manufactures are highly dependent on the US market.

Based on a firm's corresponding NAICS3 code from the ER database, I generated a set of dummy variables **'Sector'**, which are set at one if a firm belongs to a particular sector. There are eleven sector groups in this study. Based on a firm's corresponding 2-digit province-of-location categorical variable from the ER database, I generated a set of dummy variables **'Province'**, which equal one if a firm is located in a particular province. If a firm has plants in multiple provinces, I used the province in which the firm derives the highest share of it value of exports as its province of location.

'**Employees**' is measured by the individual labor unit (ILU) and is available annually from 1997 to 2005 from the LEAP database. As I described in the earlier section, an ILU represents one employee in most cases. In cases where one person works for several companies in a year, his or her individual labor unit is distributed proportionally among the enterprises. A part-time worker would still contribute one ILU to the total if he or she did not work for another enterprise. The variable **'Labor Productivity'** is calculated by the ratio of revenue to the number of workers and is available annually from 1997 to 2005. It is measured in thousands of Canadian dollars and is deflated by annual industry price indexes, using base year 2000. The variable '**Wage Rates**' is calculated by the ratio of total payroll to the number of workers and is available annually from 1997 to 2005. It is measured in thousands of Canadian dollars and is deflated by annual consumer price indexes, using base year 2000.

The variable '**Products**' refers to the variety of products a firm exported based on the count of its HS8 code from the ER database, which is used as a proxy for a firm's degree of product diversification. The variable **'Products'** is available annually from 1993 to 2005. The variable '**Destinations**' is measured by the number of countries to which a firm exported from the ER database, which is used as a proxy for a firm's degree of destination diversification. The Variable **'Destinations'** is available annually from 1993 to 2005.

I constructed the following variables for the purpose of the duration analysis. The dummy variable **'Censor'** is set at one if a firm is exporting in the year which the period of observation

is terminated. 1395 out of 1959 (71.21%) firms in my sample were still exporting in 2005, and thus, their corresponding value of variable **'Censor'** equals to one.

Most studies on the exit and entry of exporters consider a firm as having stopped from exporting if it stays out of the export market for one year or longer. To account for the seasonality in firms' export behavior, the following estimation convention is adopted in this study: a firm is considered as having stopped from exporting if it stays out of export market for two consecutive years or longer. Based on this methodology, the variable **'Duration'** is defined as the number of years a firm remains active in the export market. There are 81 out of 1959 (4.13%) firms that export over the whole period (1997-2005) in my sample, and thus, their corresponding export duration is nine years. Moreover, to estimate the impact of previous exits on survival time, I generated a dummy variable '**Re-enter**' that is set at one if a firm reenters the export market.

4 Empirical Methodology

4.1 Duration Analysis

This study uses a reduced-form model to identify the determinants of the ability of Born Globals' to remain active in the export market. The statistical software I used for my analysis is STATA 10. My aim is to identify the factors that affect a new exporter's instantaneous probability of exit from exporting.

In the duration analysis, the variable of interest is the length of uninterrupted time that elapsed between a firm's entry and exit in the export market. Let T denote the duration of exports and t denote a particular value of T. The survivor function $S(t)$, the probability that the duration of the spell T equals or exceeds the value t, is defined as follows:

$$S(t) = P(T \geq t) = \int_{t}^{\infty} f(x)dx = 1 - F(t) \qquad (1)$$

where $f(.)$ is the probability density function (pdf) and $F(.)$ is the cumulative distribution function (CDF) for T.

Following Lancaster (1990, chapter 2), the hazard rate of firm i is defined as the instantaneous probability of i exiting the global market in a moment t, given that it has continuously exported until this period t, and conditional on a vector of covariates X_{it}, which includes both time-invariant and time-varying variables,

$$\lambda(t_i; x_{it}) = \lim_{h \to 0} \frac{P(t_i \leq T < t_i + h \mid T \geq t_i, x_i)}{h} \tag{2}$$

where T is specified as a non-negative random variable. I assume that T is a continuous variable, so that for each t, $\lambda(t_i)$ is the instantaneous exit rate for firm i.

This study uses the semi-parametric Cox proportional hazard model (CPHM) specification. CPHM is flexible in the specification of the baseline hazard $\lambda_0(t_i)$, allows for a proportional specification for unobserved heterogeneity, and a function of observables. The proportional hazard model with time-varying covariates was first introduced by Cox in 1972. A particular advantage of the Cox model is that the baseline hazard is left unspecified and is not estimated. The basic proportional hazard model takes the form of:

$$\lambda(t_i; x_i) = \lambda_0(t_i) \cdot \exp(\beta_1 x_1 + ... + \beta_k x_k) \tag{3}$$

where $\lambda_0(t_i)$ is the baseline hazard for firm *i*, which measures the hazard of an individual firm for whom all covariates are zero at a given time t. I introduce a transformation function $g(t_i)$ into above regression as the following:

$$\lambda(t_i; x_{it}) = \lambda_0(t_i) \cdot \exp\{\beta_1 x_1 + ... + \beta_k x_k + g(t_i)(\gamma_1 z_1 + ... + \gamma_m z_m)\} \tag{4}$$

where variables $(z_1,...,z_m)$ are independent of time. However, the transformation function $g(t_i)$ makes $g(t_i)(\gamma_1 z_1 + ... + \gamma_m z_m)$ vary continuously with time.

4.2 Counting Process Approach for Multiple Failure Events

The event of exit from exporting may occur more than once for a given firm during the research period, since a firm may enter, exit, and then re-enter the export market. Such events are called "multiple events", or "recurrent events". To model this type of event, I used the CPHM and converted the multi-failure event data to a replicated-process single-failure event data, by assigning a new identification number to a firm if it re-enters the export market. This approach is called the Counting Process Approach (Andersen et al., 1993). Alternatively, I can restrict the analysis to the first event of the multiple events only. The drawback of such approach is that it cannot estimate the impact of a past event on the occurrences of a new event.

This study focused on the Counting Process Approach, but also assigned a set of dummy variables to each firm to indicate the number of times a firm enters the export market. As I mentioned in the data section, a firm is considered as having stopped exporting if it stays out of the export market for two consecutive years or longer. Based on this estimation method, the maximum number of times a firm could re-enter the export market between 1997 and 2005 is three times. My data set has an observation of 1,959 firms. The numbers of firms that are entered the export market once, twice, and three times are 1,395 (71.21%), 112 (5.72%), and one (0.05%), respectively. In all, my data set includes 2,072 single events.

This length of time is measured in years, which can be either fully observed as a complete spell, or partially observed as an incomplete spell due to the fact that some firms have an export duration that pass the observed period. The second type of spell is defined as a censored spell in the context of duration analysis. More specifically, a spell is left censored if the firm exported in the first sample year. To minimize the left censor problem, this study only focused on new exporters. A spell is right censored if the firm is still exporting in the last sample year. My data set has an observation of 1,959 firms, of which 1,395 are right censored (71.21%).

4.3 Two-Stage Estimation Methodology

The aim of this study is to investigate the impact of Born Global on the survivability of firms in the export market. In general, the indicator for those who choose the Born Global internationalization process is endogenous, because the firms who choose this strategy perceive this strategy beneficial for their long-run profit or export market survivability. In recognition of possible endogeneity of a firm's choice on its internationalization process (Masten, 1993), I used a two-stage estimation methodology that is similar to Mudambi and Zahra's (2007).

At the first stage, I use a probit model to formulate a firm's internationalization process decision between Born Global and Gradual Global[4]. Because a firm's decision on whether or not to choose the Born Global internationalization process is made at the founding of the company, the setting of this model is cross-sectional.

In general, when a firm's expected value of return in choosing the Born Global is greater than its expected value of return in choosing the Gradual Global internationalization process, the firm will choose the Born Global internationalization process. Otherwise, the firm will choose the Gradual Global internationalization process.

I defined the variable BG_i^* as the difference in the expected value of return between the Born Global and Gradual Global internationalization processes for a new firm i. This value, and hence the chosen internationalization process, is a function of measureable firm attributes and cohort conditions and a disturbance term. I cannot observe BG_i^* but I can observe the chosen internationalization process (BG_i=1 if Born Global, BG_i=0 if Gradual Global) and thus infer

[4] The discussion is drawn from Shaver's (1998)'s empirical model on a firm's foreign direct investment entry decision between acquisition and greenfield.

whether or not BG_i^* is positive or negative. This is the standard formulation of a dichotomous choice model, which can be represented by the following equation:

$$BG_i^* = \alpha_j Y_i + v_i, \qquad BG_i = 1 \text{ if } BG_i^* > 0, \text{ and 0 otherwise.} \qquad (5)$$

where Y_i is a vector of independent variables (which includes a constant term), α_j are the coefficients I estimate. I assumed v_i is normally distributed with zero means and unit variance. Furthermore, v_i represents additional unobserved effects that might affect a firm's choice between the Born Global and Gradual Global internationalization processes.

More specifically, BG is the dependent variable in the binary choice model. In this study, BG equals to one if a firm starts to export within three years of its inception and has exported no less than 25% of its total revenue during the first year of its export activity. The vector of independent variables includes initial firm conditions (number of employees, revenue per worker, and payroll per worker), ICT_i (a dummy variable and which equals to one if a firm belongs to the ICT sector), F_i (a dummy variable which equals to one if a firm is foreign-owned), S_i, P_i, and C_i (sector-, province- and cohort- specific dummy variables respectively).

Accordingly, I estimate $\hat{BG}_i$, a firm's predicted probability of choosing the Born Global internationalization process conditional on Y_i:

$$\hat{BG}_i = \hat{\alpha}_j' Y_i \qquad (6)$$

At the second stage, I used the CPHM to estimate the impact of Born Global on the survival of firms in the export market. I have discussed the CPH model in detail in Section 4.1. In this section, to emphasize the importance of accounting for the endogeneity, I use a simplified specification as the following:

$$Survival_i = \beta' X_i + \eta \hat{BG}_i + \xi_i \quad (7)$$

where $Survival_i$ is the probability of survive of firm i, X_i is a vector of independent variables that may affect the survival of the firm, which includes initial firm conditions (number of employees, revenue per worker, and payroll per worker), current firm conditions (number of employees, revenue per worker, payroll per worker, variety of products exported, and number of export destinations), $USfirst_i$ (a dummy variable which equals to one if a firm chose the US as its first export destination), ICT_i (a dummy variable and which equals to one if a firm belongs to the ICT sector), F_i (a dummy variable which equals to one if a firm is foreign-owned), S_i, P_i, and Y_i (sector-, province- and year- specific dummy variables, respectively). $\hat{BG}_i$ is the estimated probability for firm i to choose the Born Global internationalization process, and ξ_i is an error term that is normally distributed with zero means and unit variance.

Why could the endogeneity of firms' internationalization process choice lead to biased coefficient estimates? Suppose I estimate Equation (7) without accounting for the endogeneity on a firm's choice on its internationalization process with the following equation:

$$Survival_i = \beta' X_i + \delta BG_i + \varepsilon_i \quad (8)$$

where BG_i is a binary variable that indicate whether the internationalization process of firm i is Born Global or not, and ε_i is an error term that is normally distributed with zero means and unit variance. In addition, ε_i represents the unobserved effects that may influence the survival of firm in the export market that are not included in X_i.

If unobserved effects captured in ε_i are the same as in v_i, these two error terms will be correlated. For example, prior international business experience of the founder of the company may increase the likelihood of the firm to choose the Born Global internationalization process, as

well as increase the likelihood for the firm to survive in the export market. Since such effect is not captured in either Y_i or X_i, it is captured in v_i and ε_i. Therefore, v_i and ε_i are correlated. In this case, the estimation of δ will not have desirable statistical properties, and the use of δ to interpret the effect of Born Global on the survival of firms in the export market would likely be misleading (Shaver, 1998).

4.4 Split-Sample Instrumental Variable Estimation

The method of the Split-Sample Instrumental Variable (SSIV) is applied to check for the robustness of the results. According to Angrist and Kruege (1995), unlike conventional IV estimates, SSIV estimates are biased toward zero regardless of the degree of covariance between structural and reduced-form errors or the first-stage R^2. An unbiased estimate of the attenuation bias of SSIV is given by the coefficient from a regression of the endogenous regressor on its predicted value (using data from one half of the sample but using first-stage parameters from the other half).

Accordingly, I randomly split the sample in half and use one half of the sample to estimate parameters of the first-stage (binary choice model) equation. These estimated first-stage parameters are then used to construct fitted values for the endogenous regressor from data in the other half of the sample. After that, the predicted values of the endogenous regressor are used in the second-stage (duration analysis) parameter estimates.

4.5 Separated Hazard Function for Born Globals and Gradual Globals

The second aim of this study is to identify the factors that are related to the long-run survival of Born Globals and Gradual Globals in the export market. Until now, I assumed that the survivability of exporting of Born Global and Gradual Global firms is explained by the same factors, and these factors differ only by a proportional factor. However, such assumptions may

discard the possibility that the survivability of exporting of Born Global and Gradual Global firms is determined by different factors. One approach to overcome such limitations is to estimate the model separately for Born Global and Gradual Global firms. This approach would not enforce a common baseline hazard function across the two groups, nor equal effects of the independent variables.

For above reasons, I ran separate regressions for Born Globals and Gradual Globals. I control for heterogeneity among firms by including variables that are expected to affect the survival of firms in the export market: the initial firm conditions such as are initial firm size, labor productivity, and wage rates; the time-invariant firm characteristics such as ICT, foreign-owned, and US-first; the time-varying firm specific characteristics such as the present firm size, labor productivity, wage rates, number of export destinations, and variety of products exported. The inclusion of sector-specific dummy variables is important to capture the industry variations in unobserved factors in the data. For the same reason, it is important to include province-specific and cohort-specific dummy variables.

5 Results

5.1 Classification of Firms

Although there are many different numerical classifications of Born Globals, the common criteria that have been used to classify Born Globals are start-up age (age of the firm when it started to export) and export intensity (proportion of revenue that are exported). Period of time a firm must internationalize to be considered as a Born Global ranges from two years by McKinsey and Co. (1993) to eight years by McDougall *et al.* (1994). It is not precise in the literature on the proportion of revenue that must be exported for a firm to be considered as a Born Global. The minimum export intensity a firm must achieve to be considered as a Born Global ranges from 5% by Zahra *et al.* (2000) to 80% by Chetty and Campbell-Hunt (2004).

Most studies (Rennie, 1993; Moen and Servais, 2002; Madsen *et al.*, 2000) have used the criteria of 25% that is proposed by Knight and Cavusgil (1996).

Considering the entry cohort of firms (1997-2004) and the research period (1997-2005) of my data set, I decided to specify a firm as a Born Global if it has started to export within two years of its inception and have exported no less than 25% of its revenue during the first year of its export activity. The rest of the firms in my sample are classified as Gradual Globals. Accordingly to this classification, the number of firms is classified as Born Global is 497 (25.37%), and the number of firms is classified as Gradual Global is 1,462.

Table 1. Comparison of the Initial Conditions between Born Global and Gradual Global firms

Variables		**Born Global**		**Gradual Global**		**t-test**
Initial Size	$=\log(revenue_1)$	**-1.25**	(1.17)	**-0.84**	(1.08)	**0.0000**
	$=\log(employees_1)$	**1.87**	(0.05)	**2.41**	(0.03)	**0.0000**
Initial Labor Productivity	$=\log(revenue/worker_1)$	**10.01**	(0.67)	**11.13**	(0.65)	**0.0000**
Initial Wage Rates	$=\log(payroll/worker_1)$	**3.10**	(0.50)	**3.20**	(0.47)	**0.0000**
Initial Export Market Commitment	$=\log(exports_e)$	**-1.72**	(1.33)	**-3.09**	(1.37)	**0.0000**
	$=\log(destinations_e)$	**0.13**	(0.39)	**0.09**	(0.31)	**0.0082**
	$=\log(products_e)$	**0.79**	(0.74)	**0.52**	(0.64)	**0.0000**
ICT (%)		**6.84**	(25.27)	**7.73**	(26.71)	**0.2582**
Foreign-owned (%)		**1.21**	(10.93)	**1.85**	(13.47)	**0.1649**

Note:

a. Value of means is reported in this table, value of standard deviations is reported in parentheses, and value of two-tail t-test, Pr(|T|>|t|), is reported in the last column.

b. Variables ‘employees’, ‘payroll per worker’, and ‘revenue per worker’ are estimated in the first year a firm started its business; variables ‘exports’, ‘products’, and ‘destinations’ are estimated in the first year a firm started to export.

Data Source: the Exporter Register, the Business Register, and the LEAP from Statistics Canada.

In Table 1, the student’s *t*-test is used to compare the mean of the variable of interest for Born Global and Gradual Global firms. The distribution of most variables that are used in this study, such as the variety of exported products and the number of exporting destinations is substantially skewed towards small numbers. For this reason, I use the natural logs rather than the original raw values of the continuous variables in my analyses.

Results from Table 1 suggest that Born Global and Gradual Global firms are associated with very different attributes. Compared to Gradual Global firms, Born Global firms (1) are smaller both in terms of number of employees and revenues, (2) have lower revenue per worker, (3) have lower payroll per worker, (4) are more committed to the export market since they have higher value of exports, number of export destinations, and variety of exported products, and (5) are not significantly different when it comes to the probability of being foreign-owned or belonging to the ICT sector.

Will the attributes of the Born Globals change if I adopted different numerical thresholds? For example, I could specify a firm as a Born Global if it has started to export within two years of its inception and have exported no less than 50% of its revenue. To address above, Appendix B delivers a detailed investigation on the attributes of firms that are grouped by different thresholds of export start-up age and initial export intensity.

In Table B1, firms are grouped by their export start-up age and initial export intensity as in Table 1. However, both of these two measurements are divided into five rather than two sub-groups. Specifically, the measurement ‘export start-up age’ is grouped into zero year old, one year old, two years old, three years old, and four or more than four years old; the measurement ‘initial export intensity’ is grouped into 50%-100%, 25%-50%, 12.5%-25%,

6.25%-12.5%, and 0%-6.25%. Preferably, I would like to group firms' initial export intensity into smaller groups, such as, 90%-100%, 80%-90%, … , 10%-20%, and 0%-10%. Due to confidentiality issues with regard to the use of data by Statistics Canada, I selected the above numerical thresholds so that the minimum number of firms in each group is ten (see Table B1 for the number of firms in each group). The results from Table B2-B10 are qualitatively similar to my previous results in Table 1. Therefore, my conclusion is that the attributes of the Born Global and Gradual Global firms will not be drastically affected by adopting different numerical thresholds.

5.2 The Founding Conditions of Born Global and Gradual Global Firms

Table 2 presents key results for the internationalization process choice model, estimated by a probit model[5]. The details of the estimated results are reported in Table 2b in Appendix C. The coefficients in Table 2 show the effects of the explanatory variables on the marginal utility of the Born Global relative to the Gradual Global internationalization process. The statistical significance of a coefficient indicates the extent to which the corresponding explanatory variable affects the marginal utility of the Born Global relative to the Gradual Global internationalization process.

Result from Table 2 suggests that belonging to the ICT sector has a negative effect on a firm's choice on its internationalization process. This result seems puzzling, since numerous studies (for example, De La Torre & Moxon, 2001; Dunning & Wymbs, 2001) have documented the role of ICT in promoting the emergence of the Born Global phenomenon. However, a study by Baldwin and Gu (2003) indicated that due to slower technological progress within the high-technology sector in Canada compared with that in the US between 1996 and 2003, productivity growth declined among Canadian manufacturers but increased remarkably among

[5] In unreported regressions, I included both of the pobit model and the logit model, and conducted a normality test. The results of the logit model are very similar to those of the probit model.

their US counterparts. Therefore, the negative impact of ICT sector on a Canadian manufacture's choice on the Born Global strategy is consistent with the findings by Baldwin and Gu.

Table 2. Probit Regression Results: What becomes of Born Global?

(Dependent Variables: BG=1 if a firm is classified as a Born Global and BG=0 otherwise.)

Variables	Coefficient	Std. Err.
Initial Size $= \log(employees_1)$	**-0.2812*** **	0.0311
Initial Labor Productivity $= \log(revenue/worker_1)$	**-0.2644*** **	0.0654
Initial Wage Rates $= \log(payroll/worker_1)$	**-0.1318**	0.0900
ICT	**-0.3041***	0.1720
Foreign-owned	**0.2034**	0.2851
Cohort (reference: 1997)		
1998	**0.1051**	0.1117
1999	**0.3186*** **	0.1112
2000	**0.3347*** **	0.1200
2001	**0.4426*** **	0.1168
2002	**0.6911*** **	0.1298
2003	**0.9951*** **	0.1505
2004	**1.0795*** **	0.2078
Sector dummies	yes	
Province dummies	yes	
Observations	1959	
Log likelihood	-990.09171	
LR chi2	231.20	
Pseudo R2	0.1045	

Predicted Probability	**0.2537** (0.4352)
Observed Probability	**0.2557** (0.1506)

Note:

a. N = 1959.
b. The complete results of Table 3 are reported in Table D in Appendix D.
c. Value of standard errors is reported in parentheses.
d. ***, ** and * indicate statistical significant at the 1%, 5% and 10% levels, respectively.

Data Source: the Exporter Register, the Business Register, and the LEAP from Statistics Canada.

Result in Table 3 suggests that, everything else being equal, the smaller (in terms of number of employees) the firm at the founding of the company, the more likely it will choose the Born Global internationalization process. This result is consistent with Cavusgil *et al.* (2008, p15)'s argument that smaller firms are more adaptable and have quicker response times to new ideas and technologies. Consequently, smaller firms are more likely to export intensively at the founding of the company.

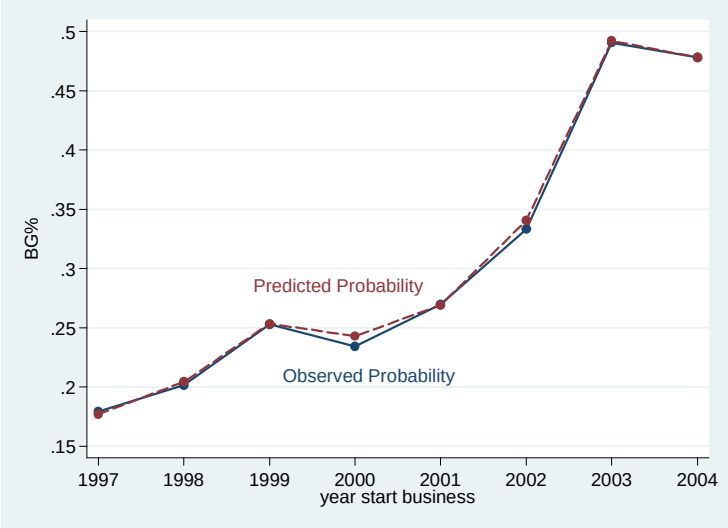
Preferably, I would choose a measure of total factor productivity (TFP) to compare the efficiency of Born Global and Gradual Global firms. Unfortunately, the available data does not permit construction of a TFP index. Hence, I used the apparent labor productivity (APT), revenue per worker, as a proxy for firms' efficiency. Result from Table 3 suggests that everything else being equal, the less productive the firm at the founding of the company, the more likely it will choose the Born Global internationalization process.

Furthermore, the results in Table 3 suggest that, everything else being equal, the later the firm starts its business, the more likely it will choose the Born Global internationalization process. This finding is consistent with previous studies that use macro factors, such as shrinking transportation and communication costs (Holstein, 1992) and "improvements in global telecommunications and transport networks, combined with increasingly liberalized global trading regimes" (Fan and Phan, 2007, p1113) as an explanation of the emergence of the Born

Global phenomenon. This finding may also suggest that Born Global has become a popular internationalization process among small and medium-sized manufactures in Canada.

According to the estimated coefficients of the probit model, the mean value of Canadian newly established small and medium-sized manufactures' predicted probability of adopting the Born Global internationalization process is 25.57% while the mean value of the observed probability is 25.37%. Figure 2 plots the observed and predicted probability for a new firm to choose the Born Global internationalization process in relation to the year it starts its business. An inspection in Figure 2 shows two interesting results. First, the value of predicted probability is very close to the value of observed probability for a firm to adopt the Born Global internationalization process. This may suggest that my model of internationalization process choice fits well and has a high power of prediction. Second, the later a firm starts its business, the more likely it will choose the Born Global internationalization process.

Figure 2. The observed and predicted probability for a new firm to choose the Born Global internationalization process



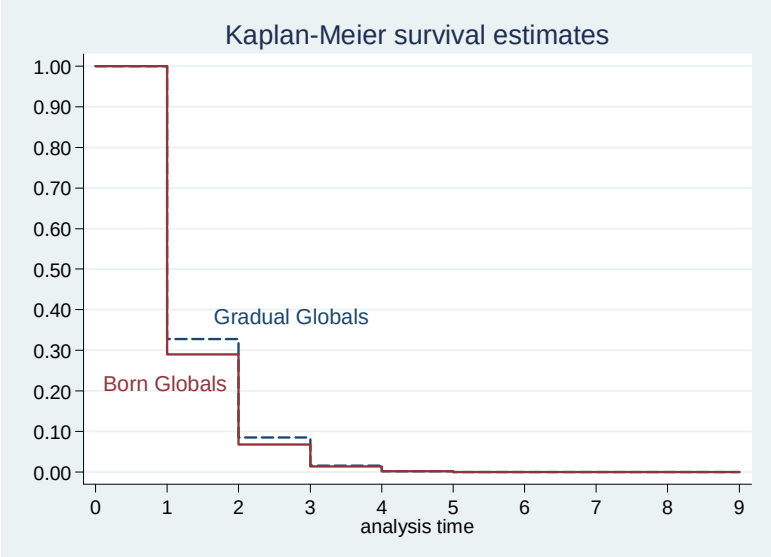
5.3 The Impact of Born Global Strategy on the Exit of New Exporters

Plotted in the figure 3, the survival rate at each moment indicates the probability that a new exporter will keep exporting at any time until that moment. An inspection in Figure 3 shows that

the probability of survival in the export market of Gradual Global firms is slightly higher than that of Born Global firms although the initial difference decreases over time.

The perception that Born Global firms have a lower survivability in the export market, as shown in Table 3, is based on the fact that Born Global firms were smaller and less productive at the founding of the company than Gradual Global firms. As such, the lower survivability in the export market of Born Global firms could be a result of their poor initial conditions. A recent study by Zettinig and Benson-Rea (2008) proposed a co-evolutionary approach to explain the mechanisms that might secure the long-run survival and growth of Born Globals. The authors argued that initial conditions of a firm, such as its ability to explore new knowledge, are essential to its long-run survival and growth. Therefore, it is critically important to control for the founding conditions of firms to assess the *ceteris paribus* effect of the Born Global internationalization process on the survivability of firms.

Figure 3. Exit of New Exporters



The key results of estimating several specifications of the hazard model are reported in Table 4. The details of the estimated results are reported in Table D in Appendix D. The coefficients in Table 4 show the effect of the explanatory variables on the survivability of firms. A positive

coefficient indicates increased risk and a negative coefficient indicates a reduced risk. The statistical significance of a coefficient indicates the extent to which the corresponding explanatory variable affects the survivability of firms.

Table 4.The Impact of Born Global on the Export Market Survivability of New Exporters: Regression Results from the Cox Proportional Hazard Model

	All Firms	**All Firms**	**All Firms (2-stage)**	**All Firms (SSIV)**
	1	**2**	**3**	**4**
BG		**0.0578*** **	**-0.1582**	**-0.0315**
		(0.0222)	(0.1319)	(0.0604
ICT	**-0.0228**	**-0.0202**	**-0.0085**	**-0.0733**
	(0.0476)	(0.0475)	(0.0491)	(0.0721
Foreign-owned	**-0.0165**	**-0.0135**	**-0.0067**	**-0.0273**
	(0.0351)	(0.0350)	(0.0359)	(0.0629
US first	**-0.0113**	**-0.0120*** **	**-0.0113**	**-0.0015**
	(0.0233)	(0.0019)	(0.0233)	(0.0324
Initial Size	**-0.0287** **	**-0.0331*** **	**-0.0418*** **	**-0.0192**
$= \log(employees_1)$	(0.0116)	(0.0118)	(0.0163)	(0.0252)
Initial Labor	**-0.0119*** **	**-0.0144*** **	**-0.0301*** **	**-0.0321*** **
Productivity	(0.0043)	(0.0007)	(0.0036)	(0.0028)
$= \log(revenue / worker_1)$				
Initial Wage Rates	**0.0547***	**0.0551***	**0.0617***	**0.0710**
$= \log(payroll / worker_1)$	(0.0316)	(0.0315)	(0.0324)	(0.0490)
Size	**-0.0026**	**-0.0027*** **	**-0.0024*** **	**-0.0058**
$= \log(employees_t)$	(0.0025)	(0.0007)	(0.0003)	(0.0040)
Labor Productivity	**-0.0125*** **	**-0.0116*** **	**-0.0125*** **	**-0.0046** **
$= \log(revenue / worker_t)$	(0.0044)	(0.0044)	(0.0043)	(0.0021)
Wage Rates	**0.0207*** **	**0.0200** **	**0.0206*** **	**0.0126**
$= \log(payroll / worker_t)$	(0.0072)	(0.0070)	(0.0072)	(0.0098)
Products	**-0.0044** **	**-0.0035*** **	**-0.0041***	**-0.0057***
$= \log(products_t)$	(0.0023)	(0.0006)	(0.0023)	(0.0034)
Destinations	**-0.0039** **	**-0.0036***	**-0.0039***	**-0.0019***
$= \log(destinations_t)$	(0.0020)	(0.0020)	(0.0020)	(0.0009)
Re-enter	**-0.2489*** **	**-0.2471*** **	**-0.2303*** **	**-0.0955**
	(0.066)1	(0.0679)	(0.0685)	(0.0718)
Sector dummies	yes	yes	yes	yes

Province dummies	yes	yes	yes	yes
Cohort dummies	yes	yes	yes	yes
Wald chi2	1170.48	1288.92	1353.92	202.02
Observation	7287	7287	7287	3605
Firms	2072	2072	2072	958
Log pseudo likelihood	-34169.979	-34168.423	-34167.766	-14881.442

Note:

a. The complete results of Table 4 are reported in Table D in Appendix D.
b. Robust standard errors (corrected for clustering at the firm level) are in parentheses.
c. ***, ** and * indicate statistical significant at the 1%, 5% and 10% levels, respectively.

Data Source: the Exporter Register, the Business Register, and the LEAP from Statistics Canada.

In order to demonstrate the importance of taking into account the internationalization process on empirical estimates on the survivability of firms in the export market, I reported the results of a regressions with and without BG_i in column 2 and column 1, respectively. To demonstrate the importance of taking into account the endogeneity of empirical estimates, I reported the results of a regression with $\hat{BG}_i$, the estimated probability for firm i to choose the Born Global internationalization process that is estimated from Table 3 in column 3. The regression results with the Split-Sample Instrumental Variable (SSIV) methodology is reported in column 4.

Table 4 shows the pseudo-likelihood ratio test statistics of models with different specifications. Improvement is recorded if a firm's internationalization process is included in the model**,** since the log-pseudo-likelihood statistics increase from -34169.979 to -34168.423 as we move from column 1 to column 2. Meanwhile, the estimated coefficients do not change much. Further improvement is recorded when the selectivity bias is corrected, since the log-pseudo-likelihood statistics increase from -34168.423 to -34167.766 as we moved from column 2 to column 3.

At the top of Table 4, the coefficient 0.0578 of variable BG (column 2) indicates that Born Global firms experience a hazard rate which is about 5.95% (i.e., $e^{0.0578}-1$) higher than that of Gradual Global firms, controlling for a wide range of factors that might affect the survivability of firms in the export market. Such evidence supports Hypothesis 1, that is, everything else being equal, Born Globals have a higher probability of exit from exporting than Gradual Globals.

When the estimates are corrected for the selectivity bias, shown in column 3, the magnitude of this result changes, and the statistical significance of this result vanishes. I examined the robustness of my results by applying the SSIV estimation. This result is consistent as the SSIV is applied, shown in column 4. As such, the Born Global internationalization process no longer has a negative impact on the survivability of firms in the export market. This result supports Hypothesis 2, and suggests that estimations from models that do not account for endogeneity of internationalization strategy choice may lead to incorrect conclusions.

5.4 Exit from Exporting of Born Global and Gradual Global Firms

In order to investigate the determinants on the survivability of Born Global and Gradual Global firms in the export market, I reported the results of separate regressions for Born Global and Gradual Global firms in Table 5 column 5 and column 6, respectively. It appears from Table 5 that Born Global and Gradual Global firms have rather different determinants of exit from exporting. Shown in Table 5 column 5, for Born Globals, a decrease in the initial and current wage rates of the firm, and a decrease in the variety of products exported of the firm, decrease its hazard rate of exit, and thus, increase its survivability in the export market. Shown in Table 5 column 6, for Gradual Globals, a decrease in the initial size and current labor productivity of the firm, an increase in the variety of products exported, an increase in the export destinations, and choosing the US as the firm's first export destination, decrease its hazard rate of exit, and thus, increase its survivability in the export market.

Table 5.The Determinants of Exit from Exporting: Born Globals and Gradual Globals

		Born Global 5	Gradual Global 6
1	**ICT**	**0.0590**	**-0.0609**
		(0.0867)	(0.0551)
2	**Foreign-owned**	**-0.0679**	**-0.0056**
		(0.0646)	(0.0457)
3	**US first**	**-0.0177**	**-0.0021****
		(0.0462)	(0.0010)
4	**Initial Size**	**-0.0210**	**-0.0469*****
	$=\log(employees_1)$	(0.0194)	(0.0150)
5	**Initial Labor Productivity**	**-0.0424**	**-0.0095**
	$=\log(revenue/worker_1)$	(0.0238)	(0.0220)
6	**Initial Wage Rates**	**0.0749*****	**0.0533**
	$=\log(payroll/worker_1)$	(0.0021)	(0.0392)
7	**Size**	**-0.0044**	**-0.0018**
	$=\log(employees_t)$	(0.0257)	(0.0033)
8	**Labor Productivity**	**-0.0087**	**-0.0122****
	$=\log(revenue/worker t)$	(0.0066)	(0.0057)
9	**Wage Rates**	**0.0202****	**0.0128**
	$=\log(payroll/worker_t)$	(0.0094)	(0.0101)
10	**Products**	**0.0071***	**-0.0023*****
	$=\log(products_t)$	(0.0036)	(0.0007)
11	**Destinations**	**-0.0034**	**-0.0074*****
	$=\log(destinations_t)$	(0.0035)	(0.0029)
12	**Re-enter**	**-0.5480****	**-0.1924*****
		(0.2526)	(0.0538)
13	**Sector dummies**	yes	yes
14	**Province dummies**	yes	yes
15	**Cohort dummies**	yes	yes
16	**Wald chi2**	86.88	913.71
17	**Observation**	2125	5162
18	**Firms**	521	1551
19	**Log pseudo likelihood**	-8290.7449	-22829.628

Note:

a. The complete results of Table 5 are reported in Table D in Appendix D.
b. Robust standard errors (corrected for clustering at the firm level) are in parentheses.
c. ***, ** and * indicate statistical significant at the 1%, 5% and 10% levels, respectively.

Data Source: the Exporter Register, the Business Register, and the LEAP from Statistics Canada.

I found that current labor productivity has a negative impact on the hazard rate of exit, and thus, a positive impact on the survivability of Gradual Global firms in the export market. This result is consistent with the predictions from the Melitz (2003) model. However, neither initial nor current labor productivity has a statically significant impact on the survivability of Born Global firms. Therefore, Hypothesis 2a that more productive firms are more likely to survive in the export market is partially supported.

Neither initial nor current wage rates have a statically significant impact on the survivability of Gradual Global firms in the export market. Moreover, counter to expectations, both initial and current wage rates have a positive impact on the hazard rate of exiting for Born Global firms. Therefore, Hypothesis 2b that firms pay higher wage are more likely to survive in the export market is not supported. This result seems puzzling because one would expect that firms that are able to survive in the export market are usually good firms that are able to pay higher wages to their employees. However, these results are consistent with the predictions from Albornoz *et al.* (2009) if we consider wage as a proxy for labor costs instead of labor productivity.

Specifically, building on the original Melitz model, Albornoz *et al.* (2009) developed a mechanism that export profitability is uncertain for a firm before it starts exporting. Everything else being the same, both lower labor costs and higher labor productivity will lead to a higher level of profitability. Firms with lower labor costs may anticipate a higher level of profitability *before* they start exporting. Such firms will export intensively at the founding of the company and become Born Globals. Moreover, such firms are able to continuously exporting if they could maintain their advantage in lower labor costs. On the other hand, firms learn about their productivity only *after* they start exporting. If firms export just to learn about their profit

potential, they will export only the minimum necessary for effective learning and become Graduals Global. Moreover, such firms are able to continuously exporting if they could maintain their advantage in high labor productivity.

For Gradual Global firms, both export product diversification and export market diversification have a negative impact on the hazard rate of exit, and thus, a positive impact on the probability of survival in the export market. These results are consistent with the results from Sabuhoro *et al.* (2006). For Gradual Global firms, however, their export market survivability does not seem to be affected by their export market diversification. Moreover, it appears that export product diversification has a positive impact on the hazard rate of exit for Born Global firms. Therefore, Hypothesis 3a that firms exporting to more destinations are more likely to survive in the export market is partially supported. Similarly, Hypothesis 3b that more product-diversified firms are more likely to survive in the export market is partially supported. Nevertheless, my findings are consistent with a previous study by Chetty and Campbell-Hunt (2004) on New Zealand firms. Chetty and Campbell-Hunt showed that Born Global firms are characterized by having a narrow product range and serving a "specialized product for niche markets"; regional firms, on the other hand, have "diversified product range to broad market segments". Therefore, export product and market diversification may not have as much of a positive impact on the export market survivability for Born Global firms as for Gradual Global firms.

Choosing the "easiest" and "closest" market (the US) as the first export destination has a statically significant negative impact on the hazard of exit of Gradual Globa but no impact on the hazard of exit of Born Global firms. Hence, both Hypothesis 4a and Hypothesis 4b are supported.

The effect of foreign ownership on firms' survivability in the export market will depend mainly on whether the foreign investors seek to establish an exporting platform or to find a new

market (Dunning, 1977). Additionally, previous empirical evidence on the economic performance of foreign and domestically owned Canadian establishments (Globerman et al., 1994) showed that foreign-owned Canadian establishments have significantly higher value added per worker and pay higher wages than domestic-owned Canadian establishments. However, such difference disappeared once the authors controlled for factors such as size and capital intensity of the firms. Therefore, it is not surprising to find that foreign ownership has a negative but insignificant impact on the hazard rate of exit for both Born Global and Gradual Global firms.

Finally, my results show that previous export experience has a statistically significant negative impact on the hazard of exit from exporting, and hence, a positive impact on the survival of exporters, regardless of their internationalization process.

I was concerned with the possibility that these results might have been decisively affected by the alternative numerical definition of Born Global firms. Accordingly, I ran the same regressions as above using Knight and Cavusgil (1996)'s definition (three years and 25% thresholds) on Born Globals. Those results are qualitatively identical to the results reported in Table 4 and Table 5.

6 Conclusions

This study seeks to answer the following questions: What is the impact of Born Global, the accelerated internationalization process, on the survivability of firms in the export market? What are the determinants of survival of Born Global and Gradual Global firms in the export market?

To provide answers to above questions, I analyzed the export market survival patterns of 1,959 newly established small and medium-sized Canadian manufacturers between 1997 and 2005. A firm is classified as a Born Global if it begins to export within two years of its inception and exports no less than 25% of its total revenue during the first year of its export activity; otherwise, a firm is classified as a Gradual Global. The percentage of firms that are classified as Born Global is 25.37%.

After controlling for a wide range of factors that might affect the survivability of firms in the export market, it appears that Born Global has a significant negative impact on the survivability of firms in the export market. After accounting for the self-selection associated with a firm's choice on its internationalization process, however, Born Global no longer affects firm s' survivability in the export market. These results suggest that Born Global is a strategic choice for a particular group of young firms that appear in my data to be relatively small and less productive at the founding of the company. Such firms would have a less chance of survival in the export market if they have chosen the traditional Gradual Global internationalization process.

My findings suggest that Born Global and Gradual Global firms have very different determinants of exit from exporting. The factors that determine the export market survivability of Gradual Globals firms are consistent with previous empirical studies (Harris and Li, 2007; Sabuhoro *et al.*, 2006), that firms are larger, more productive, export more products, export to more markets, and choosing the US as the first export destination have a better chance of survival in the export market.

Unlike Gradual Global firms, Born Global firms will have a higher survivability in the export market with a decrease in both the variety of products they export and the wages they pay. These results could have important implications for the policy-makers in improving the design and targeting of Canada's trade and investment promotion programs. These results also have important implications for researchers in understanding that internationalization is a mixed bag containing different types of firms, who have different advantages and disadvantages in competing in the global export market.

The absence of quality longitudinal data on the international activity of businesses has prevented researchers' ability to understand the underlying mechanisms for real world business phenomena and how firms respond to challenges in the new era of globalization. It has also prevented the government's ability to propose comprehensive and effective policies to promote

trade and foreign direct investment. Guided on the theoretical framework in the literature, my on-going research is focused on empirical investigation on the complex and dynamic nature of the internationalization process of firms. More specifically, I will attempt to investigate the evolution and growth of Born Global and Gradual Global firms before and after their participation in the global market.

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Appendix A: Variables of Interest

Table A1. Variable definitions, Descriptive statistics, and Sources

Name	Definition	Mean	S.D.	Max	Min	Source
BEBY	the first year a firm appears in the BR database	1999.43	1.95	1997	2004	BR
ERBY	the first year a firm appears in the ER database	2000.75	2.00	1997	2004	ER
ERDY	the last year a firm appears in the BR database	2004.35	1.28	1997	2005	ER
Duration	Spell duration in years	3.38	2.01	1	9	ER
Censor	=1 if the firm exports in 2005	0.71	0.21	0	1	ER
Re-enter	=1 if the firm re-enters the export market	0.3	0.16	0	1	ER
ExAge	=ERBY-BRBY+1, the firm's export start-up age	1.32	1.59	0	7	ER, BR
Exports	Annual value of exports, in millions of Canadian dollars	0.70	2.17	0.002	72	ER
Revenue	Annual value of revenue, in millions of Canadian dollars	1.99	3.95	0.03	75	BR
EI	Exports/Revenue, export intensity	0.36	0.34	0	1	ER, BR
BG	=1 if the firm is classified as a Born Global and 0 otherwise	0.25	0.44	0	1	ER, BR
ICT	=1 if the firm belongs to the information and communication sector and 0 otherwise	0.30	0.46	0	1	BR
Foreign	=1 if the firm is owned by a foreign country	0.02	0.13	0	1	BR
US first	=1 if the US is the firm's first export destination	0.82	0.32	0	1	ER
Employees	number of employees the firm hired	21.34	32.69	1	591	LEAP
Wage Rates	Payroll/Employees, in thousands of Canadian	29.02	15.81	0.9	247	LEAP

	dollars					
Labor Productivity	Revenue/Worker, in thousands of Canadian dollars	98.76	94.42	0	3976	BR, LEAP
Destinations	number of export destinations	1.65	2.43	1	54	ER
Products	number of exported products	3.44	4.09	1	80	ER
Sector	=1 if the firm belongs to that sector and 0 otherwise	.	.	0	1	ER
Province	=1 if the firm is located in that province and 0 otherwise	.	.	0	1	ER
Cohort	=1 if the firm starts its business in that year and 0 otherwise	.	.	0	1	BR
Year	=1 if the firm starts to export in that year and 0 otherwise	.	.	0	1	ER

Data Source: the Exporter Register, the Business Register, and the LEAP from Statistics Canada.

Appendix B: Characteristics of firms that are grouped by export start-up age and initial export intensity

In this study, I use export start-up age and initial export intensity to classify Born Global. Before adopting any numerical definition of Born Global that has been used by previous studies, this section explores the characteristics of firms that are grouped by different thresholds of these two variables grouped in a 5*5 matrix.

Table B Matrix of firms that are decomposed by export start-up age and initial export intensity

B1 Number of Firms		**Initial export intensity (%)**					
		50-100	25-50	12.5-25	6.25-12.5	0-6.25	total
Export start-up age	0	197	169	132	118	200	816
	1	58	73	94	74	173	472
	2	37	36	52	50	116	291
	3	14	20	21	25	73	153
	4+	18	32	37	30	110	227
	total	324	330	336	297	672	1,959

B2 log($revenue_1$)		**Initial export intensity (%)**					
		50-100	**25-50**	**12.5-25**	**6.25-12.5**	**0-6.25**	**total**
Export start-up age	**0**	0.54	0.96	1.00	1.52	1.86	1.17
	1	0.45	0.75	0.57	0.63	1.84	1.06
	2	0.59	0.51	1.44	0.43	1.19	0.95
	3	0.15	0.43	0.61	0.28	1.56	0.94
	4+	0.42	1.19	0.33	0.71	1.72	1.18
	total	0.50	0.86	0.85	0.93	1.68	1.09

B3 log($employees_1$)		**Initial export intensity (%)**					
		50-100	**25-50**	**12.5-25**	**6.25-12.5**	**0-6.25**	**total**
Export start-up age	**0**	1.76	1.98	2.17	2.26	2.59	2.15
	1	1.69	2.06	1.99	2.38	2.71	2.29
	2	1.73	2.25	1.86	2.21	2.69	2.28
	3	1.59	2.03	2.14	2.34	2.72	2.38
	4+	1.60	2.53	1.98	2.29	3.02	2.57
	total	1.73	2.08	2.05	2.29	2.72	2.27

B4 log(*payroll*/*worker*$_1$)		**Initial export intensity (%)**					
		50-100	**25-50**	**12.5-25**	**6.25-12.5**	**0-6.25**	**total**
Export start-up age	**0**	3.02	3.15	3.08	3.15	3.21	3.12
	1	3.11	3.14	3.18	3.19	3.31	3.21
	2	3.11	3.11	3.11	3.17	3.21	3.16
	3	2.93	3.33	3.26	3.19	3.38	3.28
	4+	3.17	3.08	2.99	3.18	3.34	3.21
	total	3.05	3.14	3.11	3.17	3.27	3.17

B5 log(*revenue*/*worker*$_1$)		**Initial export intensity (%)**					
		50-100	**25-50**	**12.5-25**	**6.25-12.5**	**0-6.25**	**total**
Export start-up age	**0**	10.95	11.06	11.00	11.19	11.32	11.11
	1	11.03	11.04	11.13	11.11	11.24	11.14
	2	11.01	10.89	10.92	10.98	11.06	10.99
	3	10.81	10.95	11.17	10.89	11.25	11.10
	4+	11.06	11.03	10.95	11.08	11.25	11.13
	total	10.97	11.03	11.03	11.10	11.24	11.10

B6 log(*exports*$_1$)		**Initial export intensity (%)**					
		50-100	**25-50**	**12.5-25**	**6.25-12.5**	**0-6.25**	**total**
Export start-up age	**0**	-1.46	-2.01	-2.58	-3.10	-4.02	-2.62
	1	-1.53	-1.89	-2.50	-2.85	-3.88	-2.85
	2	-1.36	-1.62	-2.67	-3.03	-3.92	-2.93
	3	-2.00	-1.58	-2.32	-2.80	-3.44	-2.80
	4+	-1.73	-1.32	-2.63	-2.64	-3.25	-2.68
	total	-1.50	-1.85	-2.56	-2.95	-3.78	-2.74

B7 log(*destinations*$_1$)		**Initial export intensity (%)**					
		50-100	**25-50**	**12.5-25**	**6.25-12.5**	**0-6.25**	**total**
Export start-up age	**0**	0.16	0.10	0.10	0.04	0.03	0.09
	1	0.14	0.10	0.09	0.08	0.07	0.09
	2	0.22	0.08	0.13	0.19	0.09	0.13
	3	0.10	0.18	0.12	0.00	0.05	0.07
	4+	0.19	0.10	0.21	0.12	0.10	0.13
	total	0.16	0.10	0.12	0.08	0.06	0.10

B8 log($products_1$)		**Initial export intensity (%)**					
		50-100	**25-50**	**12.5-25**	**6.25-12.5**	**0-6.25**	**total**
Export start-up age	**0**	0.89	0.72	0.61	0.53	0.31	0.61
	1	0.77	0.70	0.68	0.53	0.50	0.61
	2	0.80	0.79	0.56	0.50	0.42	0.55
	3	0.83	0.71	0.88	0.43	0.41	0.55
	4+	0.79	0.92	0.49	0.62	0.43	0.56
	total	0.85	0.74	0.62	0.52	0.41	0.59

B9 ICT		**Initial export intensity (%)**					
		50-100	25-50	12.5-25	6.25-12.5	0-6.25	total
Export start-up age	0	8.12%	8.28%	7.58%	10.17%	5.50%	7.72%
	1	3.45%	2.74%	7.45%	10.81%	6.36%	6.36%
	2	13.51%	5.56%	15.38%	4.00%	7.76%	8.93%
	3	7.14%	10.00%	4.76%	0.00%	13.70%	9.15%
	4+	11.11%	3.13%	2.70%	6.67%	7.27%	6.17%
	total	8.02%	6.36%	8.04%	8.08%	7.29%	7.50%

B10 Foreign		**Initial export intensity (%)**					
		50-100	25-50	12.5-25	6.25-12.5	0-6.25	total
Export start-up age	0	1.02%	1.78%	1.52%	0.00%	4.00%	1.84%
	1	0.00%	1.37%	0.00%	1.35%	1.16%	0.85%
	2	0.00%	0.00%	1.92%	0.00%	2.59%	1.37%
	3	0.00%	5.00%	4.76%	0.00%	2.74%	2.61%
	4+	0.00%	3.13%	0.00%	0.00%	4.55%	2.64%
	total	0.62%	1.82%	1.19%	0.34%	2.98%	1.68%

Note:

a. Variables ‘employees’, ‘payroll per worker’, and ‘revenue per worker’ are estimated in the first year a firm started its business; variables ‘exports’, ‘products’, and ‘destinations’ are estimated in the first year a firm started to export.

Data Source: the Exporter Register, the Business Register, and the LEAP from Statistics Canada.

Appendix C: Probit Regression Results

Table 2b: Estimating Born Global strategy choice

Dependent Variables: BG=1 if a firm is classified as a Born-Global and BG=0 otherwise.

Variables	Coef.	Std. Err.
Constant	3.2497***	0.6457
ICT	-0.3041*	0.1720
Foreign-owned	0.2034	0.2851
Initial Size $= \log(employees_1)$	-0.2812***	0.0311
Initial Labor Productivity $= \log(revenue / worker_1)$	-0.2644***	0.0654
Initial Wage Rates $= \log(payroll / worker_1)$	-0.1318	0.0900
Sector(reference: Computer)		
Food	-0.3507	0.2192
Beverage	-0.2059	0.4251
Textile	-0.4200	0.3398
Textile Product	-0.6418*	0.3680
Clothing	0.0920	0.2164
Leather	0.2069	0.4980
Wood	-0.3071	0.2013
Paper	-0.3874	0.3737
Printing	-0.6195**	0.2478
Petroleum	0.0416	0.7763
Chemical	-0.2262	0.2211
Plastic & Rubber	-0.1628	0.2049
Non-Metallic Mineral	-0.4621*	0.2604
Metal	0.4820	0.3135
Fabricated Metal	-0.3940*	0.1911
Machinery	-0.2331	0.1758
Electronics	-0.3046	0.2251
Transportation Equipments	0.0358	0.2203
Furniture	-0.3737*	0.1998
Miscellaneous	-0.3069	0.1929
Province (reference: Ontario)		
Newfoundland	0.3701	0.2541
Nova Scotia	-0.0432	0.2349

New Brunswick	-0.0643	0.0861
Quebec	-0.5769**	0.2493
Manitoba	-0.0168	0.3369
Saskatchewan	0.0708	0.1311
Alberta	-0.1158	0.0969
British Columbia	-0.010	0.092
Cohort (reference: 1997)		
1998	0.1051	0.1117
1999	0.3186***	0.1112
2000	0.3347***	0.1200
2001	0.4426***	0.1168
2002	0.6911***	0.1298
2003	0.9951***	0.1505
2004	1.0795***	0.2078
Observations	1959	
Log likelihood	-990.09171	
LR chi2	231.20	
Pseudo R2	0.1045	
Observed Probability	0.2537 (0.4352)	
Predicted Probability	0.2557 (0.1506)	

Note:

a. The key results of Table 2b are reported in Table 2a.
b. ***, ** and * indicate statistical significant at the 1%, 5% and 10% levels, respectively.

Data Source: the Exporter Register, the Business Register, and the LEAP from Statistics Canada.

Appendix D: Cox proportional Hazard Regression Results

Table D: The Determinants of New Exporter Exit from Exporting

	All Firms	All Firms	All Firms (FE)	All Firms (2-stage)	All Firms (SSIV)	Born Global	Gradual Global
	1	2	3	4	5	6	7
BG		0.0578***	0.0615*	-0.1582	-0.0315		
		(0.0222)	(0.0326)	(0.1319)	(0.0604)		
ICT	-0.0228	-0.0202	0.0222	-0.0085	-0.0733	0.0590	-0.0609
	(0.0476)	(0.0475)	(0.0546)	(0.0491)	(0.0721)	(0.0867)	(0.0551)
Foreign-owned	-0.0165	-0.0135	0.0245	-0.0067	-0.0273	-0.0679	-0.0056
	(0.0351)	(0.0350)	(0.1025)	(0.0359)	(0.0629)	(0.0646)	(0.0457)
US first	-0.0113	-0.0120***	-0.0284	-0.0113	-0.0015	-0.0177	-0.0021**
	(0.0233)	(0.0019)	(0.0417)	(0.0233)	(0.0324)	(0.0462)	(0.0010)
Initial Size $=\log(employees_1)$	-0.0287**	-0.0331***	-0.0335*	-0.0418***	-0.0192	-0.0210	-0.0469***
	(0.0116)	(0.0118)	(0.0192)	(0.0163)	(0.0252)	(0.0194)	(0.0150)
Initial Labor Productivity $=\log(revenue/worker_1)$	-0.0119***	-0.0144***	-0.0177	-0.0301***	-0.0321***	-0.0424	-0.0095
	(0.0043)	(0.0007)	(0.0286)	(0.0036)	(0.0028)	(0.0238)	(0.0220)
Initial Wage Rates $=\log(payroll/worker_1)$	0.0547*	0.0551*	0.0582	0.0617*	0.0710	0.0749***	0.0533
	(0.0316)	(0.0315)	(0.0463)	(0.0324)	(0.0490)	(0.0021)	(0.0392)
Size $=\log(employees_t)$	-0.0026	-0.0027***	0.0020	-0.0024***	-0.0058	-0.0044	-0.0018
	(0.0025)	(0.0007)	(0.0056)	(0.0003)	(0.0040)	(0.0257)	(0.0033)

Labor Productivity $=\log(revenue/worker_t)$	-0.0125***	-0.0116***	-0.0099	-0.0125***	-0.0046**	-0.0087	-0.0122**
	(0.0044)	(0.0044)	(0.0108)	(0.0043)	(0.0021)	(0.0066)	(0.0057)
Wage Rates	0.0207***	0.0200**	0.0188	0.0206***	0.0126	0.0202**	0.0128
$=\log(payroll/worker_t)$	(0.0072)	(0.0070)	(0.0151)	(0.0072)	(0.0098)	(0.0094)	(0.0101)
Products	-0.0044**	-0.0035***	0.0026	-0.0041*	-0.0057*	0.0071*	-0.0023***
$=\log(products_t)$	(0.0023)	(0.0006)	(0.0054)	(0.0023)	(0.0034)	(0.0036)	(0.0007)
Destinations	-0.0039**	-0.0036*	0.0058	-0.0039*	-0.0019*	-0.0034	-0.0074***
$=\log(destinations_t)$	(0.0020)	(0.0020)	(0.0070)	(0.0020)	(0.0009)	(0.0035)	(0.0029)
Re-enter	-0.2489***	-0.2471***	-0.2311*	-0.2303***	-0.0955	-0.5480**	-0.1924***
	(0.066)1	(0.0679)	(0.1184)	(0.0685)	(0.0718)	(0.2526)	(0.0538)
Sector(reference: Computer)							
Food	-0.0201	-0.0185		-0.0025	-0.0560	-0.0760	-0.0098
	(0.0594)	(0.0579)		(0.0605)	(0.0864)	(0.1316)	(0.0650)
Beverage	0.0571	0.0574		0.0653	0.0529	0.0851	0.0452
	(0.0557)	(0.0560)		(0.0560)	(0.1459)	(0.1017)	(0.0675)
Textile	-0.3005**	-0.2925**		-0.2788**	-0.4643*	-1.1544**	-0.1261
	(0.1389)	(0.1413)		(0.1403)	(0.2666)	(0.6859)	(0.1143)
Textile Product	-0.0409	-0.0329		-0.0133	-0.0516	0.0613	-0.0856
	(0.0957)	(0.0951)		(0.0995)	(0.1226)	(0.1078)	(0.1199)
Clothing	-0.1274*	-0.1281*		-0.1305	-0.1514	-0.0024	-0.2401**
	(0.0759)	(0.0756)		(0.0759)	(0.1034)	(0.1080)	(0.1084)
Leather	0.0799	0.0816		0.0694	0.0591	0.0585	0.1315
	(0.0875)	(0.0889)		(0.0872)	(0.1189)	(0.1901)	(0.1140)

Wood	-0.0718	-0.0708		-0.0572	-0.1881**	0.0020	-0.1002
	(0.0578)	(0.0579)		(0.0590)	(0.0918)	(0.1009)	(0.0690)
Paper	0.0077	0.0171		0.0282	-0.0554	0.0345	0.0242
	(0.0793)	(0.0800)		(0.0809)	(0.1183)	(0.1734)	(0.0940)
Printing	-0.1506**	-0.1410*		-0.1247	-0.2723**	-0.0203	-0.1594
	(0.0762)	(0.0763)		(0.0793)	(0.1328)	(0.1391)	(0.0882)
Petroleum	0.0828	0.0875		0.0834	0.0308	0.0474	0.0768
	(0.0538)	(0.0574)		(0.0544)	(0.0784)	(0.1024)	(0.0644)
Chemical	0.0110	0.0150		0.0222	-0.0020	-0.0846	0.0556
	(0.0539)	(0.0547)		(0.0546)	(0.0763)	(0.1247)	(0.0579)
Plastic & Rubber	-0.0504	-0.0497		-0.0412	-0.0566	-0.0020	-0.0739
	(0.0602)	(0.0603)		(0.0608)	(0.0861)	(0.1035)	(0.0737)
Non-Metallic Mineral	0.0139	0.0188		0.0381	-0.0494	0.1367	-0.0207
	(0.0597)	(0.0596)		(0.0623)	(0.0797)	(0.1007)	(0.0706)
Metal	-0.0519	-0.0638		-0.0818	-0.1400	-0.2612	0.0858
	(0.0959)	(0.0975)		(0.0995)	(0.1456)	(0.2033)	(0.0659)
Fabricated Metal	-0.0693	-0.0645		-0.0495	-0.0585	-0.0471	-0.0704
	(0.0534)	(0.0537)		(0.0560)	(0.0748)	(0.1067)	(0.0610)
Machinery	-0.0470	-0.0443		-0.0351	-0.1340*	-0.0258	-0.0438
	(0.0486)	(0.0488)		(0.0492)	(0.0725)	(0.0899)	(0.0568)
Electronics	-0.0221	-0.0200		-0.0062	-0.1148	-0.0256	-0.0125
	(0.0568)	(0.0565)		(0.0581)	(0.0964)	(0.1029)	(0.0644)
Transportation Equipments	-0.1016	-0.1062		-0.1050	-0.1881*	-0.0377	-0.1336
	(0.0676)	(0.0678)		0.0676	(0.1048)	(0.1214)	(0.0843)
Furniture	-0.1409**	-0.1364**		-0.1223	-0.2187**	-0.1561	-0.1326*
	(0.0656)	(0.0658)		(0.0678)	(0.0992)	(0.1321)	(0.0743)

Miscellaneous	-0.0182	-0.0158		-0.0029	-0.0523	0.0485	-0.0486
	(0.0537)	(0.0539)		(0.0542)	(0.0762)	(0.0929)	(0.0658)
Province (reference: Ontario)							
Newfoundland	-0.1058	-0.0874	-0.0663	-0.0536	0.0506	.	-0.0623
	(0.1626)	(0.1634)	(0.2690)	(0.1670)	(0.1149)	.	(0.1623)
Nova Scotia	-0.0991	-0.1064	-0.0953	-0.1166	-0.1433	-0.0997	-0.0646
	(0.1018)	(0.1018)	(0.1286)	(0.1027	(0.1677)	(0.1612)	(0.1432)
New Brunswick	0.0461	0.0469	0.0433	0.0461	0.0044	0.0848	0.0066
	(0.0576)	(0.0569)	(0.0900)	(0.0576	(0.1210)	(0.0875)	(0.0727)
Quebec	-0.0359	-0.0342	-0.0392	-0.0327	0.0109	-0.0345	-0.0194
	(0.0285)	(0.0286)	(0.0384)	(0.0287	(0.0424)	(0.0511)	(0.0337)
Manitoba	0.0878**	0.0964**	0.1076	0.1098**	0.1011	0.2822***	0.0844
	(0.0427)	(0.0431)	(0.0957)	(0.0466	(0.0813)	(0.1070)	(0.0552)
Saskatchewan	0.0143	0.0244	0.0384	0.0180	0.0129	-0.1820	0.0461
	(0.0872)	(0.0884)	(0.1496)	(0.0869)	(0.1123)	(0.3017)	(0.0878)
Alberta	-0.0138	-0.0154	-0.0025	-0.0177	0.0794	-0.0227	-0.0254
	(0.0396)	(0.0392)	(0.0583)	(0.0396)	(0.0455)	(0.0589)	(0.0499)
British Columbia	-0.0095	-0.0039	-0.0009	-0.0036	0.0075	-0.0246	0.0164
	(0.0289)	(0.0290)	(0.0428)	(0.0294)	(0.0472)	(0.0571)	(0.0338)
Cohort (reference: 1997)							
1998	0.0762	0.0803	0.0818	0.0726	0.0675	0.0239	0.1397
	(0.0570)	(0.0566)	(0.0612)	(0.0573)	(0.0908)	(0.0628)	(0.0914)
1999	0.0826	0.0874	0.0892	0.0724	0.1797**	-0.0527	0.2009**
	(0.0566)	(0.0566)	(0.0614)	(0.0581)	(0.0868)	(0.0737)	(0.0878)
2000	0.1010*	0.1100*	0.1149*	0.0892	0.1557*	-0.0250	0.2043**
	(0.0573)	(0.0575)	(0.0639)	(0.0587)	(0.0901)	(0.0801)	(0.0882)

2001	0.1519***	0.1595***	0.1559**	0.1365**	0.1515	0.1034	0.2219**
	(0.0571)	(0.0571)	(0.0653)	(0.0592)	(0.0932)	(0.0742)	(0.0884)
2002	0.2592***	0.2715***	0.2695***	0.2388***	0.3219***	0.1485**	0.3562***
	(0.0549)	(0.0552)	(0.0668)	(0.0583)	(0.0884)	(0.0680)	(0.0863)
2003	0.3150***	0.3261***	0.3241***	0.2863***	0.3555***	0.1555**	0.4221***
	(0.0551)	(0.0407)	(0.0777)	(0.0607)	(0.0909)	(0.0706)	(0.0866)
2004	0.4532***	0.4573***	0.3907***	0.4190***	0.5323***	0.3844***	0.5416***
	(0.0545)	(0.0544)	(0.1027)	(0.0625)	(0.0955)	(0.0740)	(0.0869)
theta			3.51e-18				
			(2.07e-14)				
Wald chi2	1170.48	1288.92	49.11	1353.92	202.02	86.88	913.71
Observation	7287	7287	7287	7287	3605	2125	5162
Firms	2072	2072	2072	2072	958	521	1551
Log likelihood	-34169.979	-34168.423	-34183.107	-34167.766	-14881.442	-8290.744	-22829.628

Note:

a. The key results of Table E are reported in Table 4.
b. Variable BG* is predicted probability of adopting the Born Global internationalization process that is estimated from Table 3.
c. Robust standard errors (corrected for clustering at the firm level) are in parentheses.
d. ***, ** and * indicate statistical significant at the 1%, 5% and 10% levels, respectively.

Data Source: the Exporter Register, the Business Register, and the LEAP from Statistics Canada.