Access to Government Micro-data for SME Internationalization Research

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

International entrepreneurship (IE) is "a combination of innovative, proactive and risk-seeking behaviour that crosses national borders and is intended to create value in organizations" (McDougall & Oviatt, 2000). The IE literature has been concerned with entrepreneurial behaviour in multiple countries and cross-border studies of entrepreneurship and international activities of small and medium-sized enterprises (SME) (Oviatt & McDougall, 2005). Due to the potential for SMEs to serve as significant sources of export, considerable research has been conducted regarding their internationalization (Barker & Kaynak, 1992). However, according to Cieslik & Kaciak (2009), despite attempts to integrate concrete frameworks of international entrepreneurship, some primary issues have not been adequately addressed and IE researchers are faced with challenges including insufficient micro-data for advancing quality research.

The main objective of this thesis is to study and explore the limitations on researchers to access governmental data regarding small firms operating internationally and use it for scientific purposes. Despite company data being compiled and publicly available in some countries, such as Germany, other countries, including Canada, have not made any such efforts in a coherent way. There is a significant disconnect in the Canadian context between internationalization and firms' data. This shortcoming may stem from various sources, including the legal framework in Canada for accessing data and a lack of sufficient financial support and expertise to gather and integrate such data. Furthermore, the type of data available to the research community through statistical institutions were identified and analyzed, as were access methods.

With the increasing interest of researchers in accessing data gathered by the government, the formation of anonymized records or anonymized micro-datasets has acquired great importance (Nanopoulos & King, 2003). Therefore, the primary approach is to explore the extent to which data regarding firms' characteristics and internationalization activities are currently available to the research community, as well as to ensure the confidentiality of official statistics, most notably in the Canadian context.

The research resulted in the confirmation of data availability in Canada through government and statistical organizations. The latter bodies can provide researchers and research organizations access to some data but limitations arise in providing micro-datasets to researchers due to confidentiality issues; these constraints were identified and further analyzed. Moreover, this research has studied methods to overcome these limitations and assess the shortcomings in micro-data in order to advance quality research. Methods and recommendations were introduced and studied to allow researchers access to essential data and information while maintaining confidentiality.

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First and foremost, I would like to express my deepest gratitude to my supervisor, Dr. Rod McNaughton, for his patience, insights, and guidance throughout this entire research process. His advice and encouragement were instrumental in the completion of this thesis, and he has truly made this a valuable learning experience.

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I am deeply obliged to many of my friends and colleagues for their support and help during and beyond my master's program, with whom I have shared many happy moments of my life. I would also like to thank the faculty, staff, and students of the department of Management Sciences for making this journey a memorable one.

Last but not least, I am deeply indebted to my family and loved ones for their unprecedented care and encouragement during my university experience. My parents' love and support, and their commitment to lifelong learning, growth, and hard work have nurtured and inspired me throughout my life. I am eternally grateful and wonderfully blessed to have them in my life. Thank you.

Dedication

This thesis is dedicated to
my lovely parents, Ali and Farideh
and
my adorable brother and sister, Farnaz and Farzad
for their unconditional love, endless support and encouragement throughout my life.

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Chapter 1

Introduction

1.1 Background

A growing number of studies in the evolving field of international entrepreneurship have identified the limitations to further studying what are known as small and medium-sized enterprises (SME) and their international activities concerning success in exporting. In particular, a lack of access to companies' crucial business micro-data, such as total sales and employment figures (Cieslik & Kaciak, 2009), is seriously hindering progress. The primary focus of this thesis is to examine the availability of such micro-data to the research community within the Canadian context in comparison to other Organization for Economic Co-operation and Development (OECD) countries including Germany, the United States, Sweden, and the United Kingdom.

Many countries, such as Germany, collect micro-data related to export activities; however, researchers in the field of international entrepreneurship are restrained by an insufficient supply of reliable data due to a number of factors such as inaccessibility of data, reluctance of business owners, and a lack of awareness (Cieslik & Kaciak, 2009). Beyond these factors, research community access to data is further constrained by a combination of privacy legislation, costs of access and methods of access. As a result, theories and measures used by researchers are largely based on available data and so the majority of research relies on small-scale surveys, case studies, and interviews (Coviello & Jones, 2004).

The recent international entrepreneurship literature considers knowledge-intensive firms to be one of the most important antecedents of internationalization (Autio, Sapienza, & Almeida, 2000) because there appears to be a positive correlation between knowledge intensity and international growth. If firm-specific data can be obtained, it would significantly enhance the knowledge base concerning internationalization and high-growth

firms, which would then benefit both policy makers and exporters' strategic decision making by helping their advisory staff to formulate more meaningful recommendations.

This thesis proposes a methodological framework using secondary research data that can help to investigate phenomena in greater depth to produce descriptive findings. The proposed framework focuses primarily on the internationalization of SMEs and the analysis is limited to exports as a primary internationalization mode since SMEs are infrequently engaged in advanced forms of internationalization (Cieslik & Kaciak, 2009). The opening section of the introductory chapter presents the background and research issues, followed by a brief introduction to the key topics and concepts in the field of international entrepreneurship, justification of the research, how it fits into the extant literature, and an overview of the research question. Finally, there will be a brief outline of methods used in this study.

1.2 Research Issues

A significant portion of the economic literature describing the international business operations of SMEs makes use of the terms internationalization and globalization. The globalization of the business environment has created many opportunities which are essential not only for the economic development and independence of most countries, but also for the growth, profitability, and survival of most business firms today (Albaum & Peterson, 1984; Leonidou, 1995).

Exports constitute the initial preferred means of internationalization for SMEs (Young, Dimitratos, & Dana, 2003). The main objective of this research is to study and explore the restrictions on researcher access to governmental export data for scientific purposes as a means to acquire information regarding the internationalization of small and medium-sized firms. Despite company data being compiled and publicly available in some countries, such as Germany, such efforts have not yet been made coherently by some other developed countries, including Canada. The Canadian context has a significant disconnect between the collection of data and the ability of researchers to access the micro-data, a

shortcoming which may stem from various causes, such as the legal framework in Canada for accessing data and a lack of sufficient financial support and expertise to gather and integrate such datasets. Therefore, researchers must take into consideration whether the government has merged the information on manufacturing firm characteristics and export activities to obtain the datasets required for international entrepreneurship measurements. Thus, I examine the availability of these data in the Canadian context and evaluate the process through which researchers can access it. This is compared with access to the micro-data and types of available and accessible data gathered by the governments of other countries.

The primary approach of this research is to explore the extent to which data regarding firms' internationalization activities are currently available to researchers, as well as to ensure the confidentiality of official statistics. The OECD is the organization that promotes the collection of comparative data between member states and micro-data on SME trade is an area of its concern. Therefore, the collection and process for accessing micro-data in Canada is compared with other countries within the OECD.

1.3 Objectives

The main objective of this study is associated with researcher access to micro-data and how this could improve research-based knowledge of SME internationalization. This could then lead to research that better informs the formation of public policy. The issue is that government-collected micro-data is not readily available to researchers in many countries, including Canada. However, it is more easily accessed in some other countries, such as Germany. What accounts for this difference in access? What are the potential benefits of increased access? And what are the trade-offs between the right to privacy and the public benefit of improved research access?

Historically, confidentiality protection has been mainly a national issue but with the growing prevalence of data distribution, it is now becoming an international concern. Confidentiality protection is a main issue in policy development for statistical offices and is an essential factor in sustaining the trust of respondents and thus ensuring the quality of data.

In the Canadian context, a number of issues limit micro-data access by researchers. One of the issues is privacy legislation and the lengthy process through which researchers must go in order to access data. There are other constraints on access including export and business registry data not being automatically linked, the process for accessing data being time-consuming and not widely communicated to researchers, and the significant cost of accessing data which must be borne by the researchers.

There are a large amount of international activities among members of the research community and researchers are usually not allowed to access other countries' micro-data unless the confidentiality protection can be guaranteed. However, cross-countries comparisons of the availability of business micro-data to the research community, methods for accessing micro-data by users and legislations regarding the confidentiality protection of export micro-data have an important part in this research since there are diverse confidentiality measures for micro-data in different countries. This is not only of interest to academic researchers since international agencies, governments, and policy developers are also interested in using micro-data for research purposes. This raises the question of whether it is possible to agree on some common internationally acceptable policies and principles for distribution of micro-data. It also needs to be discovered whether developed countries such as Canada have attempted to generate micro-data directly related to the internationalization of SMEs. If so, why are quantitative micro-data not available to researchers and how can researchers gain access to essential data while maintaining confidentiality?

This study tries to find answers to the above questions by dealing with confidentiality issues to access micro-data and evaluating risks and benefits associated with micro-data access through case studies of available methods, policies, and legislation in various OECD member countries that have SMEs with the will and ability to expand internationally and are therefore more involved in export activities. The subsequent chapters provide a review of the existing literature on SME internationalization with a view to demonstrating the most frequent methods that are used to generate and access micro-data.

1.4 Overview of Research Methodology

To address the research question, I rely on published sources which describe the processes in Canada and other OECD countries for the collection and dissemination of data which can support the investigation of phenomena in greater depth and produce descriptive findings. The proposed framework focuses primarily on the internationalization of SMEs and the analysis is limited to exports as a primary internationalization mode, since SMEs are infrequently engaged in advanced forms of internationalization (Cieslik & Kaciak, 2009).

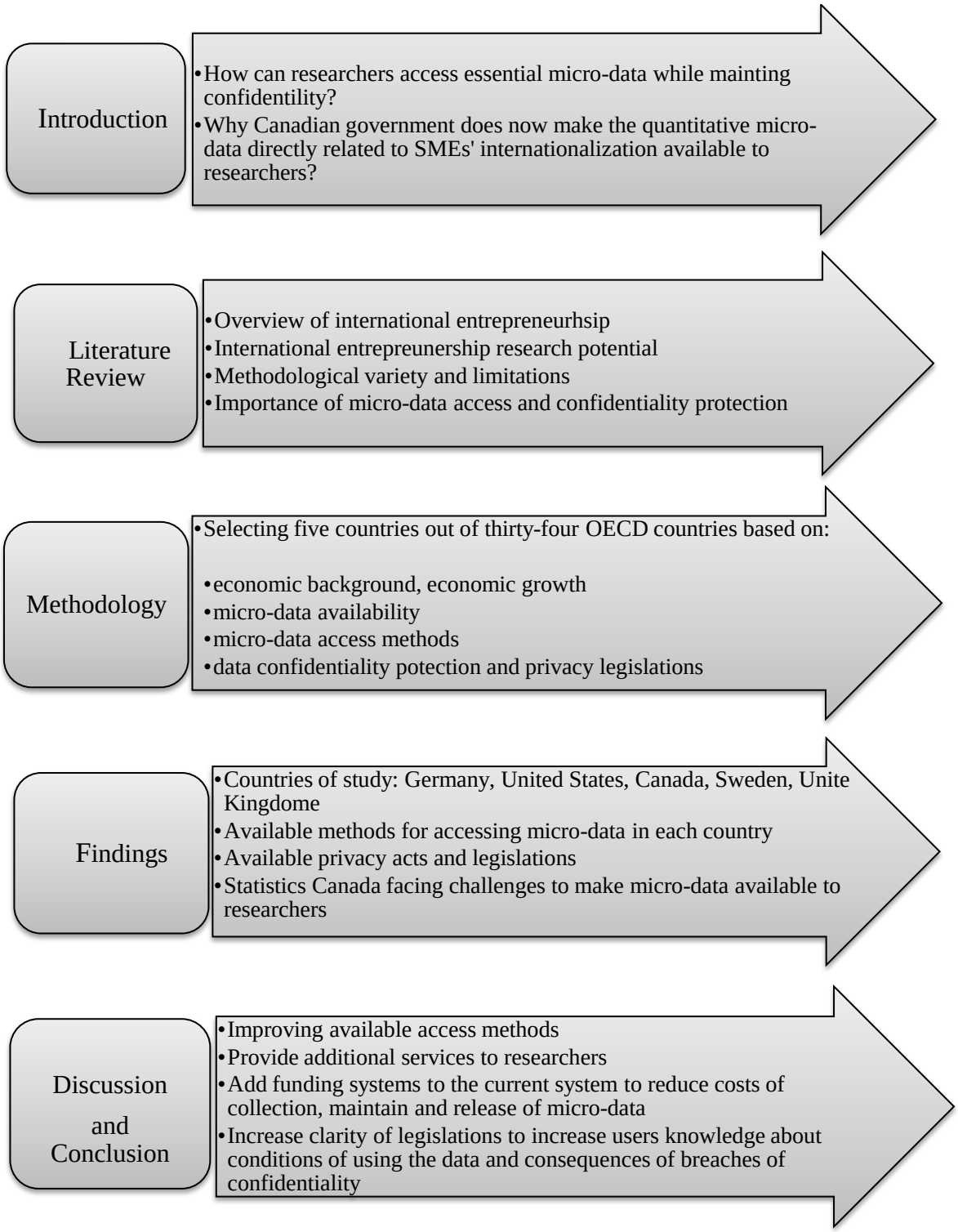
Secondary data and some personal interviews as well as historical and real-time information were used. I started with a study based on data that I have collected through various secondary sources, such as annual reports and statistical portals, especially OECD and Eurostats statistics and factbooks. From these sources, quantitative data about the countries' population, economic growth, incomes, employment, and other factors were collected to discuss countries' economic background. However, the secondary data at some points was not adequate enough to achieve a more in-depth understanding of the matter. Therefore, in addition to desk research, some interviews were conducted with researchers that have experience accessing Canadian government micro-data to better understand the practicalities of the process, such as Jerzy Cieslik, Daniel Trefler and Sui Sui. These researchers have strong background in the collection and use of government micro-data in their own research and are also collaborating closely with statistical offices, for instance Sui Sui was working with Statistics Canada as a deemed employee for four years .

First, it is required to specify the OECD countries used in the study, which is done through the country comparison based on their maturity in export activities and their economic growth. Second, case studies were conducted which contained information regarding countries' economic backgrounds, SME performance in their economies, micro-data availability, and supporting legislation.

1.5 Thesis Organization

This thesis is composed of five chapters (See Figure 1.1). The first chapter provides the foundation for the current thesis by introducing the fundamental concepts, research problem, and its justifications. The second chapter provides a complete literature review on international entrepreneurship, SME internationalization, and the availability and accessibility of SME micro-data to researchers, especially those who are active in the IE field. Chapter three details the methods and country selection procedures used in the research. Chapter four summarizes the findings of the study. Finally, chapter five discusses the conclusions and recommendations for policy makers and implications for future research.

Figure 1.1 - Thesis Framework



Chapter 2

Literature Review

2.1 Overview of International Entrepreneurship

Since the 1980s, social scientists and management scholars have had a growing interest in entrepreneurship (Neergaard & Ulhøi, 2007). The term "international entrepreneurship" first appeared in an article by Morrow (1988) which exposed cultural awareness and technological advances to open previously unexploited foreign markets to new ventures (Zahra & George, 2007). In 1989, McDougall's empirical study compared domestic and international new ventures and opened the door for academic study in international entrepreneurship. In 1994, with increasing popular interest in rapid internationalization, Oviatt and McDougall provided a theoretical base for the study of international new ventures (INVs).Thus, we are dealing with more than two decades of history in international entrepreneurship, which began with an interest in new ventures (Oviatt & McDougall, 2005). Thereafter, further studies were conducted and various articles were published and the field of international entrepreneurship broadened from its early studies of new venture internationalization.

Historically, the focus of international business researchers has been on multinational firms; however, there is a growing interest in smaller entrepreneurial firms which are internationalizing (McDougall & Oviatt, 2000). According to Fillis (2007), "SMEs account for over 95 per cent of businesses, create roughly 50 per cent of total value added worldwide and, depending on the country, generate between 60 per cent and 0 per cent of all new jobs. While they historically have not been associated with international business … SMEs now account for about a quarter of exports in most industrialized nations … internationally-active

SMEs are emerging in notably large numbers throughout the world, and they tend to be more dynamic and grow faster than strictly domestic firms …" (Fillis, 2007, p. 3).

2.2 International New Ventures the main Source of Expansion in SMEs' Internationalization

Exporting is a particularly important internationalization strategy for SMEs (Andersson, Gabrielsson, & Wictor, 2004). There is a long history of SME export research that extends back to the early 1970s. Barabba (1974), Morrow (1988), McDougall (1989), McDougall & Oviatt (1994) and Knight & Cavusgil (1996) were among the first researchers to note small-firm export activities. Although the rapid internationalization of SMEs was identified as early as the 1970s, it was completely overlooked by researchers. Nevertheless, international entrepreneurship has become an increasingly popular field of study with an emergent number of scholars entering the field in the past quarter century (Acs, Morck, Shaver, & Yeung, 2003; McDonald, Gan, & Anderson, 2004).

However, the concept of SME internationalization, that SMEs have a significant role to play in international trade and can internationalize in multiple ways, largely dates from the notion of the INV, which was introduced in the early 1990s (McDougall, Shane, & Oviatt, 1994). Thus, literature on SME export activities and internationalization greatly expanded after the induction of the notion of INVs, which are also important in studying firms' internationalization activities since they challenge the stage theory of internationalization in which firms progress to exporting and gain the economies of scale necessary to enter international trade after starting locally, expanding regionally, and then nationally (Johanson & Vahlne, 2003).

International entrepreneurship (IE) is: "the discovery, enactment, evaluation, and exploitation of opportunities – across national borders – to create future goods and services (Oviatt & McDougall, 2005, p. 540)." As mentioned in Section 2.1, the term *international entrepreneurship* first appeared in a short article by Morrow (1998) which highlighted new ventures and unexploited technological advances. However, McDougall (1998), who had

previously compared domestic and international new ventures, initiated his research direction into the academic study of international entrepreneurship. Subsequently, a number of international entrepreneurship researchers began to focus their research on INVs, which represented a growing phenomenon according to some popular business press, such as *The Economist* in 1992 and 1993 (Oviatt, Shrader, & McDougall, 2004; Jolly, Alahuhta & Jeamnet, 1992; Gupta, 1989). In 1994, with the growing interest in rapid internationalization, McDougall and Oviatt presented a theoretical base for the study of INVs which they classified as a "business organization that, from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries" (Oviatt & McDougall, 1994, p. 49). Thus, international entrepreneurship began with an interest in new ventures.

2.3 International Entrepreneurship Research Potential

In particular, the entrepreneurship literature seems to have significant potential for building further theory in research on exporting. For example, Zahra's definition of international entrepreneurship points to the potential of the interface between exporting and entrepreneurship, "the study of the nature and consequences of a firm's risk-taking behaviors as it ventures into international markets" (Zahra, 1993, p. 21). On the other hand, McDougall (2000) discussed the emerging convergence between entrepreneurship and international business. Additionally, Thorelli's discussion of entrepreneurship highlighted the significance of entrepreneurship to exporting research by illustrating that "small business venturing into international marketing in itself constitutes entrepreneurship" (Thorelli, 1987).

Involvement in international business for many firms consists of being involved in both exporting and importing activities, which has been verified by many researchers such as (Fletcher, 2001; Holmlund, Kock, & Vanyushyn, 2007; Korhonen, Luostarinen, & Welch, 1996). However, although a literature database search reveals that there is large number of published studies on the internationalization of SMEs; very few have focus on SMEs export activities (Pangarkar, 2008; Salomon & Shaver, 2005). A small number of related studies that

can be found on international entrepreneurship are mostly based on qualitative case studies of a single or perhaps a few cases (Nummela & Welch, 2006). Figure 2.1 - a representative sample of available literatures in the IE field - summarizes types of micro-data required by researchers, methods of collecting data, as well as limitations in collecting and accessing the micro-data. Overall, due to the potential of SMEs to serve as significant sources of export, considerable research has been conducted regarding their internationalization and data collection (Barker & Kaynak, 1992).

2.4 Methodological Variety and Limitations in International Entrepreneurship Research

According to Nummela & Welch (2006), IE has its roots in two different research areas, international business and entrepreneurship, which are part of the broader fields of business and management and share common research objectives and methodologies. Quantitative research has been institutionalized and accepted as the standard method and it is accepted as the most common method used in both the international business and entrepreneurship fields (Gartner & Birley, 2002). However, according to the research, 10 percent of empirical studies published in key international entrepreneurship journals between 1991 and 2001 were qualitative; even though qualitative research in entrepreneurship is often rejected by mainstream journals due to a lack of sufficient methodological detail (Anderson & Skaates, 2005). Therefore, a better set of method selection guidelines appears to be necessary.

Most of the empirical research in the fields of international business and entrepreneurship is built on qualitative approaches which are descriptive in nature. The empirical research in the IE field has mainly been based on cross-sectional data and survey methods, such as structured surveys and single or multiple case studies where archival and/or interview data are the primary sources of information (Holmlund, et al., 2007; Neergaard & Ulhøi, 2007). Also, despite certain weaknesses, mail surveys tend to be the most appropriate way of collecting data from SMEs with international activities, especially when the aim is to

study a target population; thus it results in obtaining indecisive findings (McDonald, et al., 2004). For example, Holmlund et al. (2007) conducted their study using a mail questionnaire to examine the role of exporting in the internationalization process, with a concentration on a region of Western Finland with a strong entrepreneurial tradition. The questionnaire sought information on several aspects, particularly in what order the firms internationalized and what factors influenced their exporting activities (Holmlund, et al., 2007). The items in the questionnaire were developed based on literature on the internationalization of SMEs and previous similar studies and examined the role of exporting in the internationalization process (Holmlund, et al., 2007).

However, IE research faces various methodological issues. Many studies provide insights into the various methodological approaches which have been identified as insufficient by IE scholars published to date (Nummela & Welch, 2006). There is also still room for more longitudinal studies and IE research requires more longitudinal data collection and analysis since a very small number of empirical entrepreneurship literature is based on true longitudinal studies. For instance, Coviello & Jones (2004) reviewed 55 empirical studies in the IE field, out of which only five combined qualitative and quantitative research and only five followed the longitudinal approach; surveys were the main research method in IE studies and interviews were the main form of data collection in qualitative studies (Coviello & Jones, 2004). Although surveys and interviews were the two main standard research methods in the field of IE, there were pitfalls involved in moving beyond these two methods which may result in inadequate findings for advancing quality research. Overall, both qualitative and quantitative techniques are used in international entrepreneurship research; however, despite this richness in methodological approaches, entrepreneurship is still considered to be a field lacking methodological diversity (Perren & Ram, 2004).

Table 2.1 - Representative sample of available literature in the IE field

Author / Year	Type of Data Collected	Methods of Collecting Data	Results/Limitations
Abdel-Malek (1978)	Sample of 175 firms were selected from a wide range of manufacturing industries, including Agricultural Machinery, Clothing, Electronics, Chemicals, and Heating Equipment.	• Analyzing two sets of data • 1st set related to the attitudes, opinions, and perceptions of senior managers of export oriented firms • 2nd set of data is factual, companies information about the actual export involvement of the firm • Data gathered by means of a personal interview • Structured questionnaire	Examination of data failed to support the hypothesis since responses were not sufficient and differences were found between interviewees' (managers) views of export.
Anderson & Kheam (1998)	• Study population: Norwegian exporting SME firms • All industries were included except agents/wholesalers, financial instructions and service suppliers • Kompass Onlies was used as a sampling frame/ all production firms with more than 5 employees	• Questionnaire • Mail questionnaire • Factor analysis	• The study is inadequate because of the limited number and type of explanatory variables • According to the view that knowledge development is the prime force behind the firm's internationalization process, only intangible resources representing functional and managerial capabilities were included • Hard to predict growth strategies for smaller firms due to the lack of information on individual venture as unit of analysis.
Anderson & Wictor (2003)	• Selected companies based on their size and type of industry • Considered Swedish Standard Industries (SNL 92) • Survey targeted 423 joint stock companies in the high –tech sector with between 0-50 employees (31.9% response)	• Secondary case studies from a specially developed database • 89 primary case studies formed through information obtained from secondary data and semi-structured interviews • Survey	Information Not Available

Table 2.1 – Representative sample of available literature in the IE field (Continued)

Author / Year	Type of Data Collected	Methods of Collecting Data	Results/Limitations
Bell et al. (2003)	• 10 "knowledge-intensive" and traditional firms • Data collected on: firm size, age, export experience, export ratio, etc.) • Series of open ended questions analyzed by using qualitative approach	Series of small firm internationalization studies in several UK regions, Australia, and New Zealand, using following methods: • Exploratory • Qualitative • Case study approach (using 50 in depth semi-structured interviews) • Interviews (CEOs/ export managers of SMEs)	Information Not Available
Cassiman & Golovko (2011)	Information Not Available	• Case studies • Panel of Spanish manufacturing firms	Case studies helped to collect data and conclude that exports constitute the initial preferred way of internationalizing for SMEs
Cieslik & Kaciak (2010)	Information Not Available	• Longitudinal analysis of almost 19000 polish manufacturing firms	Lack of access to crucial company micro-data, such as total sales and employment figures.
Clerq et al (2005)	• Studied the extent to which small to medium sized companies engage in international activities • Used combination of learning theory and the new venture theory of internationalization • Partly relied on the behavioural view of the firms • Used organizational learning theory	• Sample was drawn from a database maintained by Center of Entrepreneurship oat the Vlerick Leuven Gent Management School in Belgium • Considered firms with less than 500 employees, independent and owner-managed firms. • Mailed survey (92 response out of 500 randomly selected firms from the database) • Interviews • Collected sales data used a database maintained by the National Bank of Belgium	• Lack of public data on virtually all of the key variables, therefore authors relied mostly on self-reported data • Survey = existence of outside proxies • Low level of response : obtained information from multiple respondents could have helped to demonstrate the validity of the data

Table 2.1 – Representative sample of available literature in the IE field (Continued)

Author / Year	Type of Data Collected	Methods of Collecting Data	Results/Limitations
Filatotchev et al. (2009)	• Sample of firms located in the high-tech industry • Used unique hand collected data set of 711 SMEs from Zhongguancun Science Park in China	• Survey • Questionnaire • Pilot study; two workshops were organized	Information Not Available
Fillis (2007)	Information Not Available	Triangulation with the more usual methods of survey work and in-depth interview	• Range of methodological limitations relating to the study of international entrepreneurship. • Researchers have largely failed to account for the increasing non-linear behavior of today's business environment when designing their research instruments, and in the data collection & analysis process
Hessels (2007)	• Sample of more than 1800 Dutch SMEs • SME Policy Panel data used for both cross-sectional and longitudinal research • Detailed information on innovativeness and international business activities collected from the participant owners in the SME Policy Panel	Direct interview with owners who participated in the SME Policy Panel in 2004	• Lack of data on firms' export activities. • Lack of empirical studies on the relationship between export/import and innovativeness
Higon (2010)	Data drew from the 2004 Annual Small Business Survey	• Telephone survey of 7505 small businesses in UK • Detailed questionnaire	Lack of access to firms' financial data
Lee & Brasch (1978)	Sample of 35 Nebraska exporting manufacturers	Mail questionnaire	• Lack of collection and personalizing the information ➔ lack of micro-data collection • Lack of qualified sample firms (exporters)

Table 2.1 – Representative sample of available literature in the IE field (Continued)

Author / Year	Type of Data Collected	Methods of Collecting Data	Results/Limitations
Loane (2006)	• Screened over 800 firms in Canada, Ireland, New Zealand, and Australia • Information obtained from 143 firms via an e-mail or telephone • 53 in-depth interviews	• Case studies • Interviews	Specific information gaps, such as financial performance measures and exact employee numbers
Le Roy & Torres (2008)	sample of 59 SMEs from different sectors of activities	• Interview • Survey	• Non-relevant responses to survey questions • Interviewees' particular point of view • Heterogeneity of the sample ; Lack of more targeted sample ➔ scattered data • All results in an insufficient data collection and in adequate data availability
Oviatt & McDougall (1994)	• Conducted 12 primary case studies using cross sectional data of at least 10 countries throughout Europe, North America, South America, Asia, the Middle East, and the South Pacific. • Examined 24secondary case studies: reference and location of ventures' headquarters, its products/services, and the key issue(s) in the study of INVs	• 24 secondary case studies of INVs: reference and location of ventures' headquarters, its products/services, and the key issue(s) in the study of INVs • 12 primary cases were complied as extreme examples. Data collected through interviews; Analysis of official documents, such as business plans and financial statements; firms' products; personal interviews • Examined business press articles and interactive networking process to locate business press articles. • Semi structured business interviews • Personal and Telephone interviews	No directories or publicity available resources were able for identifying international new ventures and SMEs.
Rauch (2001)	Information Not Available	Interviews	Lack of information about international trading opportunities and characteristics of firms (exporters) and their international activities.

2.5 SMEs' Internationalization and Trends

There is considerable interest in SME internationalization because of its potential to contribute to employment and growth. SMEs and new ventures are able to create value, generate growth, and access new knowledge and workforces by exploiting international activities such as exports (Coviello, 2006; Yeoh, 2004). In general, entrepreneurship plays an important role in national economies and is considered to be essential for economic development, such as by initiating employment and innovation (Acs & Audretsch, 2010). Thus, research in this area has the potential to influence entrepreneurs and policy makers. In particular, SMEs are largely recognized to be the main source of innovation and vigor in both developed and emerging economies (Cassiman & Golovko, 2011). SME internationalization is a major contributor to most job-creation initiatives (e.g in OECD countries) and contributes considerably to innovation, production, and economic growth (OECD, 2005).

2.5.1 Innovation and Economic Growth due to SMEs' Internationalization

An assessment of the role of SME export activities in economic growth has obtained special recognition by IE scholars. Creating and maintaining economic growth is one of the essential economic topics for policy makers. Export is the main source of foreign exchange which can also be used to increase innovation, generate job opportunities, and decrease production costs and pressure on the balance of payments.

There is also an increased recognition of SME internationalization since SMEs are increasingly involved in international markets (OECD, 2010c). A number of studies have examined the relationship between innovation and internationalization, while mainly focusing on SME export activities (Cassiman & Golovko, 2011). Empirical studies suggest that there is a direct link between innovation and internationalization; the innovativeness of enterprises is likely to affect the probability of them exporting, for instance through increasing the competitiveness of the enterprise, which helps firms to better exploit and correct their innovative capabilities (e.g Lopez, Peon, & Ordas, 2005; Prajogo, 2006; Adams & Jaffe, 1996).

Internationalization allows firms to spread the cost of their innovations through various markets, which is especially important when the domestic market is small (Knight & Cavusgil, 2007). Higher levels of internationalization may enable firms to customize their products according to the market requirements, which results in the price adjustment which provides the opportunity for price premiums in some markets (Lu & Beamish, 2006). Thus, innovation is recognized as an essential component of the economic growth process.

Overall, entrepreneurship is essential to public policy makers to generate economic growth and foster the creation of new jobs (Audretsch, Grilo & Thurik, 2007). Researchers and policymakers are increasingly recognizing international entrepreneurship as the main source of building and sustaining economic growth (Acs & Stough, 2008). SME internationalization activities, especially export, can offer to firms a range of opportunities which contribute to economic growth in different ways, such as economies of scale and incentives for innovation and technological improvement (Feder, 1982). It also plays an important role in increasing innovation and is mainly focused on the link between innovation and export.

However, researchers now face some major issues regarding IE research and further policy development. They do not have enough access to micro-data on international and export activities since statistical institutions and governments do not usually release those data to researchers because of the risks regarding their secrecy and confidentiality. Therefore, inferences for the broader economic context and the link between individual business micro-data and broader economic performance are usually disregarded (Audretsch, Grilo & Thurik, 2007).

2.6 International SME Micro-data

Researchers need more detailed data to analyze and understand SME internationalization and changes in their export activities. The availability of detailed information facilitates the response to more complex inquiries and the calculation of marginal effects based on tabular data, which therefore allows for more specific analysis

(Ronning, 2006). The results of this IE research are of strong interest to policymakers concerned with entrepreneurship and the broader economy.

The availability of micro-data and developing access to them are required in order to facilitate the work of IE researchers. However, various approaches to micro-data deal with confidentiality issues. Therefore, developing alternative security means which guarantee statistical disclosure control and confidentiality of different micro-data are required, therefore producing a better response to the researchers' growing demand for micro-data. In contrast to confidentiality issues, access to micro-data is costly; however, researchers are allowed to retrieve data through safe centers or remote access facilities (Ritchie, 2008).

In the following sections the available methods for collecting export micro-data and availability of government micro-data related to SME export activities for internationalization research will be examined using recent literature and various government reports.

2.6.1 Government Micro-data related to SMEs' internationalization

In most countries, especially OECD member countries, official statistics are collected not just for government and official purposes but for the use of the public, including researchers. Micro-data is also used to assess the effectiveness of government policies and programs. According to the government of the United Kingdom, "open access to official statistics provides the citizen with more than a picture of society" (Fisher & Reuber, 2010, p. 32); not only can they view the work of the government, but can also measure government activities in every area of public policy (Fisher & Reuber, 2010). They are also allowed to evaluate the social impacts of public policies and actions (Fisher & Reuber, 2010). In particular, the research community plays an important role in instigating policy analysis and assessing the effectiveness of government programs, an activity which requires high-quality data. However, if there is to be no access to quality data, researchers must collect their own, which may involve additional costs (Potok & Gates, 2003).

Generally, accessing micro-data presents high costs and risks of disclosure. These may include the process by which necessary conditions and contracts are set up, keeping the technical tools up-to-date, and monitoring compliance with confidentiality principles (Nanopoulos & King, 2002). Therefore, researcher access to micro-data through statistical offices is often conditional since they are required to provide a benefit to the statistical agency's programs (United Nations Economic Commission, 2007). For instance, researchers in Canada are required to be registered as deemed employees of the Statistics Canada research data center for the duration of their project (Fisher & Reuber, 2010). There are no fees for accessing data at research data centers in Canada and all research projects must pass Social Sciences and Humanities Research Council (SSHRC) screening process.

Confidentiality protection has been one of the greatest obstacles to releasing micro-data to researchers. A guarantee of confidentiality is often a prerequisite for obtaining the data and can constrain what can be done with the data and by whom (Nanopoulos & King, 2002). Therefore, there should be internationally accepted methods for maximizing the use of the data by researchers. In general, supporting research based on micro-data should be the main constituent in any official statistical system. Lack of access to micro-data may result in researchers developing and conducting their own data collection which will be of inferior quality, largely due to the use of smaller samples than those available for official surveys (Nanopoulos & King, 2002).

Sui Sui (2009) conducted a study using a dataset which includes information about the international activities of Canadian firms between 1993 and 2005. Her dataset specifically provides annual information documenting Canadian exporters' value of exports, export destinations, products exported, employment level, revenues, wages, age, country of control, location, and industry (Fisher & Reuber, 2010). According to Sui (2005), "some comparable datasets are also available in American (Bernard and Jensen, 1999), French (Eaton et al., 2006), and British (Harris & Li, 2007), and Colombian (Eaton et al., 2007) firms;" however, this is the first time that such a dataset has been created for research purposes in Canada (Sui, 2009).

2.6.2 The Importance of Confidentiality of Statistical Micro-data

The main challenge to statistical institutions regarding statistical confidentiality and micro-data is to strike a balance between the confidentiality protection and increased use of micro-data. Increased use of data results in the greater possibility of providing better data to meet user needs. Individual data collected by statistical agencies for research and statistical analysis are to be strictly confidential and used exclusively for statistical purposes by authorized users. Therefore, to maintain the balance, researchers are expected to use a combination of various legal, technical, administrative, and methodological measures.

Traditionally, micro-data were collected and published based on their importance by statistical offices, although users had important influence on such decisions (United Nations, 2007). Statistical institutions apply various methods to obtain high-quality data and integrate several micro-data registers to create new databases. Such an integrated database offers rich possibilities to perform different research and analysis. Statistical offices can also link several micro-data registers as an alternative to an integrated database.

However, one major common issue that applies to all use of micro-data which has appeared in most of the documents of the international statistics community is confidentiality. Even when micro-data are anonymized, using them might imply a threat to confidentiality (Statistical Commission, 2007). The need for privacy and integrity regarding the access and use of statistical micro-data is an old concern for statistical institutions. Therefore, it requires a balance between the right to privacy and the increased need for information a micro-data for researchers. According to Barabba (1974, p.34), "…there is an inherent conflict in gathering data from individuals. The conflict is between the individual's right of privacy on the one hand, and on the other, government's use of mandatory processes to obtain the information it needs for valid purposes".

Statisticians should prevent their data from being published unless subjects' identities were inferred and anonymized. Overall, confidentiality protection is the main them of the national code of practice which has been developed by the National Statistical Institutions. Statistical institutions usually estimate the risk of disclosure of micro-data in different areas

and phases of the statistical process concerning the use of the data and try to minimize such risks. There are various methods available for national statistical institutions to improve privacy but there is still a shortage of micro-data regarding firms' international activities (Sundgren, 2001).

2.6.3 Micro-data Protection

Confidentiality protection agreements are mostly arranged based on rules and regulations applied by national statistical institutions (Abowd & Woodcock, 2001). The legislative situation varies across countries and regions; as part of this research there will be a brief overview of each country's legislation to support release of micro-data. One main principle common to these various countries is that data collected for statistical purposes may only be used for the production of statistics regardless whether it has been given voluntarily or collected according to the approved compulsion (Abowd & Woodcock, 2001). The collected data may also be used for research purposes under certain conditions.

Some legislation, such as the Personal Data Act, which aspires to prevent the violation of personal integrity in the processing of personal data, also applies to the creation, release, and protection of micro-data (Ritchie, 2008). There are also regulations on access to confidential data for scientific purposes. According to these, scientific researchers might be able to have an access to the micro-data only if the contract regulating the terms of access and use of data is signed and approved by the statistical institutions and/or if the researchers have been registered as deemed employees with the statistical centers (Statistics Canada, 2011).

Thus far, other than recognizing the broad diversity of IE research and various research methodologies, the research community has a shortage of detailed information about SMEs' international activities. Allowing the research community to access micro-data while also protecting confidentiality is the main national issue preventing IE researchers from carrying out their work effectively. These data are largely required for the study of SME

internationalization, which results in economic growth and greater innovation and job opportunities.

2.7 Summary

This chapter reviewed the theoretical framework of this thesis as well as studies previously conducted research on the past and current standing of the research in the international entrepreneurship field of study. It also reviewed the importance of SMEs' micro-data for internationalization research, while discussing the available micro-data and the importance of confidentiality of statistical business micro-data and methods of protecting them. The overall conclusion of the studies was that allowing research community to have an access to restricted business micro-data while protecting confidentiality is the main issue for statistical institutions and preventing IE researchers from conducting the effective research. The focus of the current study is on the reasons preventing research community obtain access to the confidential SMEs' micro-data and methods increasing confidentiality protection.

Chapter 3

Method

3.1 Introduction

The main objective of this thesis is to discover, investigate, and understand the availability of export micro-data for SMEs and the methods that governments and statistical institutions use to collect it. For the purpose of the inquiry, some OECD countries were defined as having low international barriers, high economic growth, and the ability to expand internationally and engage in high internationalization activities, especially export.

The study focuses on five locations - Germany, the United States, Canada, Sweden, the United Kingdom- which are moderately small open advanced economies and mature strategic exporters. They also have fairly small domestic market size, reasonable domestic competition, SMEs with the willingness and ability to expand internationally, low international barriers, high export value, and high economic and export growth (Holmlund, et al., 2007). The results then obtained through standard methods, such as case studies that focus on various countries' international activities, and data collection methods and availability are then related to general trends derived from various data sources, particularly national statistical offices and international organizations including the OECD.

The first section of this chapter describes the method for selecting countries. The second section illustrates the case studies of selected OECD countries. Chapter four expresses the comparison and the analytical techniques used to justify the hypotheses for identifying the means of data collection and making them available to researchers, as well as the degree of data confidentiality and micro-data protection techniques.

3.2 Country Selection

The data used in this study come from OECD statistics, Economic and Enterprise Factbooks, European Statistics (Eurostat), the Central Intelligence Agency (The World Factbook), and other central statistical institutions. Procedures involved the preliminary examination of thirty-four OECD countries divided into six main geographical groups, from which five countries were selected and cases were conducted from secondary sources of data, such as government and industry reports, OECD statistics, Eurostat statistics, and other related recent literature. Figure 3.1 shows the geographical location of OECD countries on the world map.

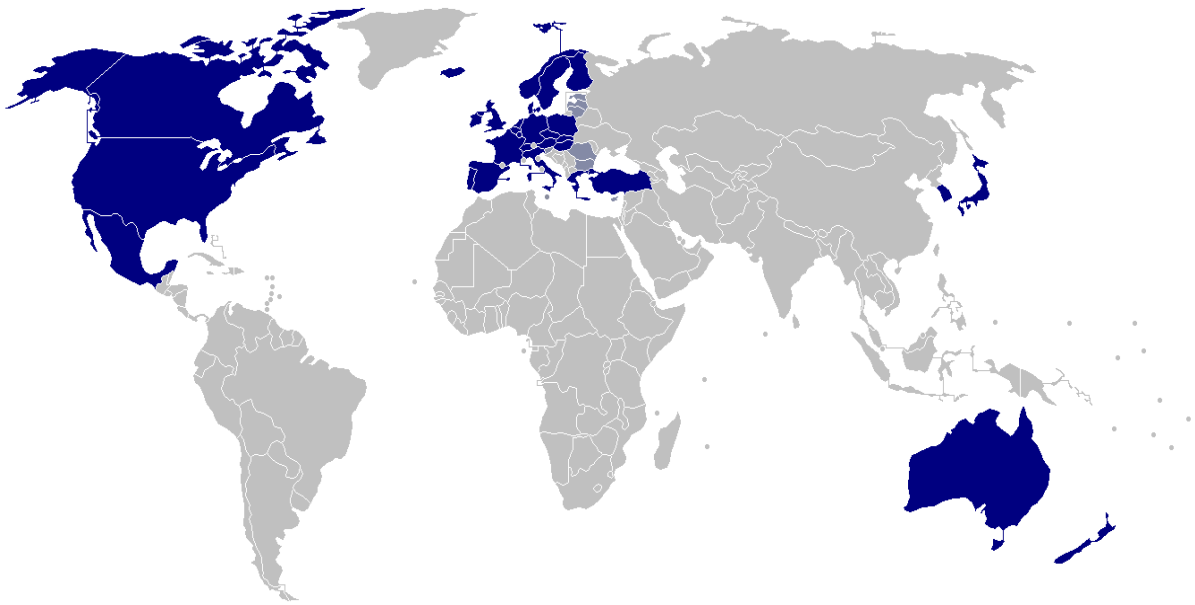


Figure 3.1 - Map of the world with member countries of the OECD highlighted (OECD, 2010a)

Specific information regarding the number of SMEs and the amount of export for each of the OECD countries was obtained through OECD statistics and Eurostat statistics portals. SMEs represent over ninety-five percent of enterprises in most OECD countries and generate over half of the private sector employment (OECD, 2010a). Table 3.2 shows a list of all OECD countries, their population, number of SMEs, economic growth, amount of export, and specifies the mature exporters.

The benchmark countries were chosen from amongst all OECD member countries in six geographical clusters. The clusters include Europe and Central Asia, East Asia and the Pacific, South Asia, the Middle East and North Africa, Sub-Saharan Africa, and America, as shown in Figure 3.2.

Figure 3.2 - OECD Countries Categorization - Geographic Regions (OECD, 2011)

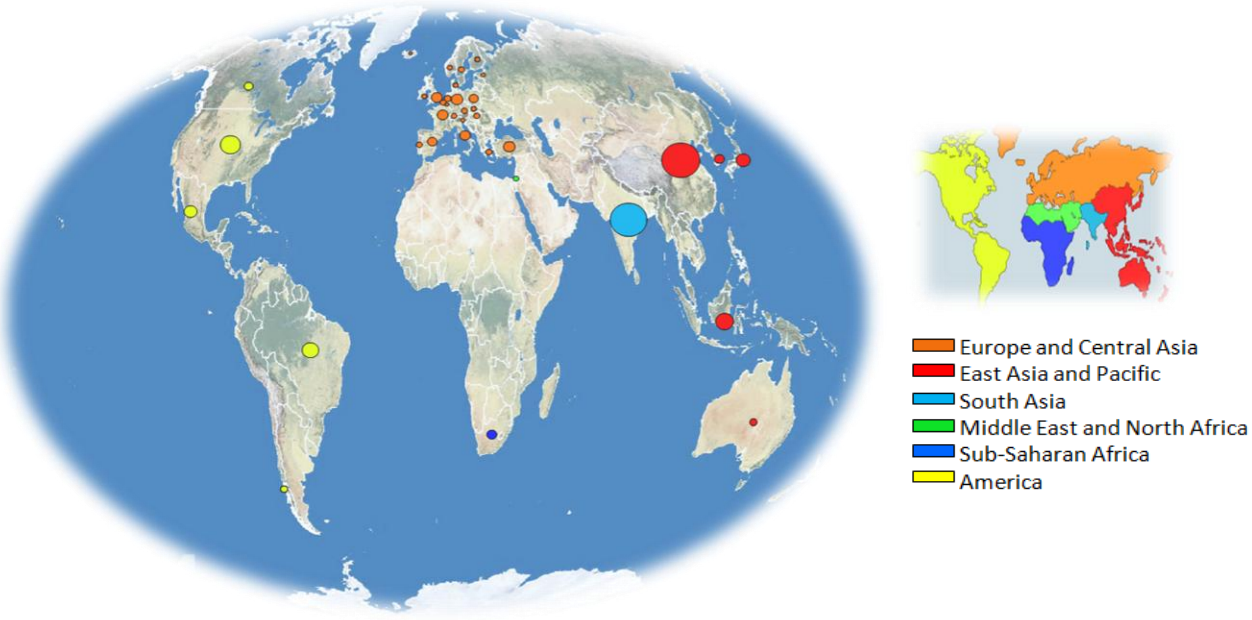


Table 3.1 - OECD Countries Categorization - Geographic Regions

Clusters	Countries
Europe and Central Asia	United Kingdom, Germany, Poland, France, Italy, Spain, Turkey, Greece, Portugal, Switzerland, Austria, Hungary, Slovak Republic, Slovenia, Luxemburg, Belgium, Netherlands, Ireland, Denmark, Norway, Sweden, Estonia, Finland, Iceland, Czech Republic
East Asia and Pacific	Korea, Japan, Australia, New Zealand
South Asia	India
Middle East and North Africa	Israel
Sub-Saharan Africa	South Africa
America	Canada, United States, Mexico, Chile, Brazil

Table 3.2 - List of OECD countries – Ranked based on their economic growth and export value (Dutta, 2009; OECD, 2005, 2010a, 2010b)

OECD Countries	Population	Number of SMES	Exports Value	Export Growth (% of GDP)	Economic Growth % (2010 Data)
Australia	22,546,300	1,200,000	210,900,000,000	19.8	2.7
Austria	8,416,982	300,374	157,400,000,000	50.5	2.0
Belgium	10,839,905	432,390	284,200,000,000	73	2.2
Canada	34,501,798	1,136,053	392,700,000,000	28.7	3.1
Chile	17,248,450	-	64,280,000,000	38.1	5.2
Czech Republic	10,542,080	920,419	116,500,000,000	69.5	2.3
Denmark	5,566,856	202,467	99,370,000,000	47.8	2.1
Estonia	1,340,194	46,108	11,500,000,000	70.6	1.8
Finland	5,391,699	217,129	73,530,000,000	37.4	3.1
France	63,396,000	2,561,292	517,300,000,000	23	1.5
Germany	81,724,000	1,862,476	1,303,000,000,000	40.8	3.6
Greece	10,787,690	745,677	21,140,000,000	18.6	-4.5
Hungary	9,985,722	546,894	93,740,000,000	81.4	1.2
Iceland	318,452	35,585	4,619,000,000	53	-3.5
Ireland	4,581,269	86,764	115,700,000,000	88.5	-1.0
Israel	7,785,400	202,453	54,310,000,000	34.7	4.7
Italy	60,705,991	3,762,921	448,400,000,000	24	1.3
Japan	127,720,000	-	765,200,000,000	12.5	5.1
Korea	48,219,000	-	464,300,000,000	49.9	6.2
Luxembourg	511,840	26,729	17,820,000,000	169.4	3.5
Mexico	112,336,538	-	298,500,000,000	27.8	5.5
Netherlands	16,721,200	577,575	485,900,000,000	69.4	1.8
New Zealand	4,417,500	-	33,240,000,000	28.2	2.5
Norway	4,974,100	266,894	137,000,000,000	42	0.4
Poland	38,092,000	1,552,965	160,800,000,000	38.9	3.8
Portugal	10,555,853	1,008,322	46,270,000,000	28	1.3
Slovak Republic	5,435,273	65,849	64,180,000,000	99.5	0.5
Slovenia	2,055,090	106,720	24,970,000,000	58.9	1.2
Spain	46,162,024	2,408,662	253,000,000,000	23.4	-0.1
Sweden	9,464,486	585,621	162,600,000,000	48.5	5.5
Switzerland	7,856,600	-	232,600,000,000	51.7	2.6
Turkey	73,722,988	2,406,218	135,400,000,000	23.2	8.9
United Kingdom	62,300,000	1,659,946	410,300,000,000	27.7	1.3
United States	312,527,000	-	1,289,000,000,000	11.2	2.9

Figure 3.2 and table 3.1 illustrate that OECD countries can be grouped into six clusters, though most of the countries are located within Europe, Central Asia, and America. Other the other hand, Figures 3.3 and 3.4 respectively locate the countries based on their export income and their competitiveness and export performance (See Appendix A).

Figure 3.3 - OECD Countries Categorization - Export Income (OECD, 2011)

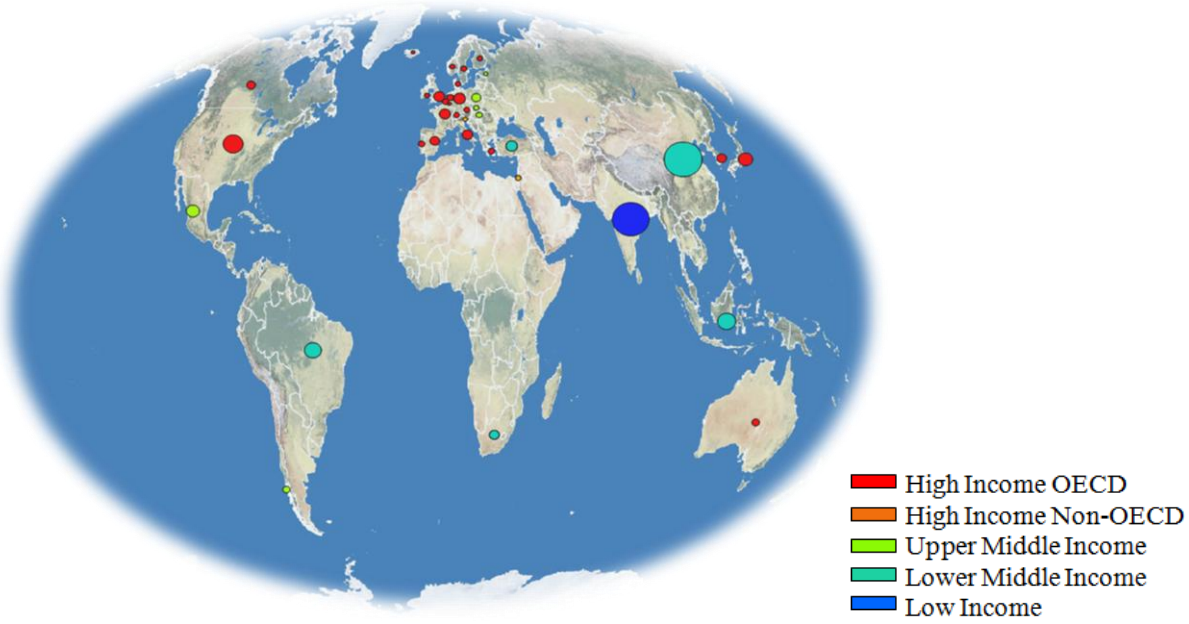


Table 3.3 - OECD Countries Categorization - Export Income

Category	Countries
High Income OECD	United States, Canada, Portugal, Spain, Italy, Greece, France, Switzerland, Austria, Germany, Netherland, Luxemburg, Belgium, United Kingdom, Ireland, Denmark, Norway, Sweden, Finland, Iceland, Japan, Korea, Australia, New Zealand
High Income Non-OECD	Israel, Slovenia
Upper Middle Income	Poland, Hungary, Slovak Republic, Mexico, Chile, Estonia
Lower Middle Income	China, Indonesia, Turkey, South Africa, Brazil
Low Income	India

Figure 3.4 - OECD Countries Categorization - Export Value (OECD, 2011)

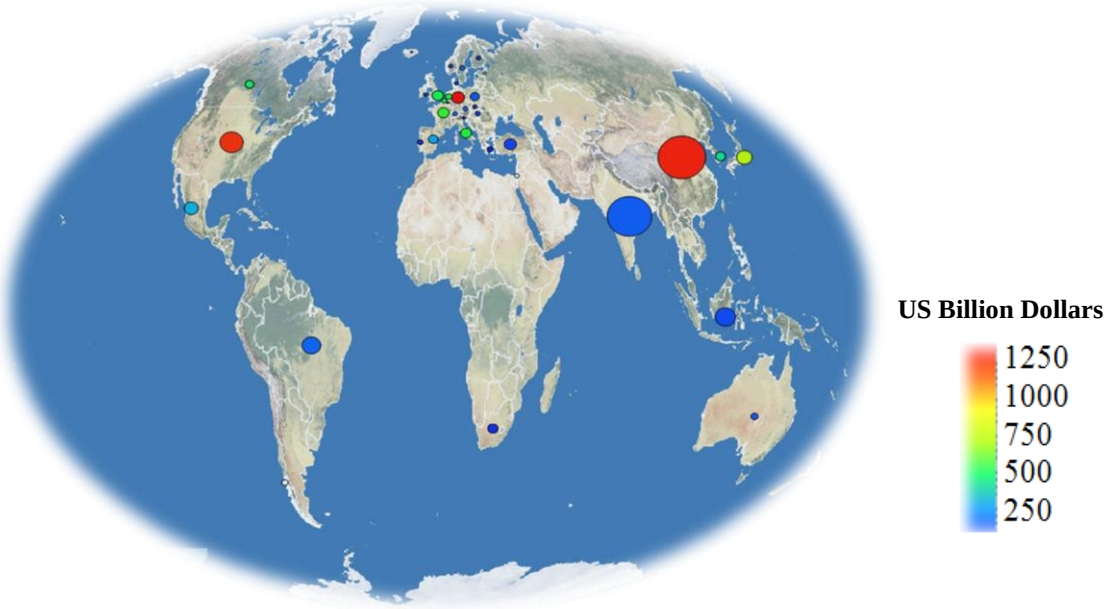


Table 3.4 - OECD Countries Categorization - Export Value

Export Value (USD Billion)	Countries
0-249	Australia (141), Austria (157), Brazil (161), Denmark (102),Finland (90), France (539), Greece (24), Hungary (95), Iceland (4.8), India (146), Indonesia (114), Ireland (121), Luxemburg (16), New Zealand (27), Norway (136), Poland (139), Portugal (51), Slovak Republic (58), Slovenia (27), South Africa (64), Sweden (169), Switzerland (172), Turkey (107)
250-499	Belgium (431), Canada (420), Italy (492), Korea (371), Mexico (272), Netherlands (477), Spain (254), United Kingdom (440)
500-749	Japan (714),
750-999	-
1000-1250 >	China (1218), Germany (1329), United States (1162)

Once again, higher-income OECD countries are mostly located within the European, Central Asian, and North American groups. Therefore, benchmark countries will be selected from the list of countries that resulted from the comparison of Tables 3.3 and 3.4. Table 3.5 shows the selected countries based on their high export income and export value.

Table 3.5 - Elected OECD countries with high export income and export value

Region	Elected OECD countries (top 15 countries with highest export income)		
Europe and Central Asia	Australia Belgium France Germany	Italy Japan Korea Mexico	Netherlands Spain Sweden Switzerland
America	United States Canada		

As a result, the benchmark countries were chosen from a list of countries in two categories which is shown in Table 3.6.

Table 3.6 - Categories for Selecting Benchmark Countries

Category	Description	Countries	
Young Exporters	• These countries have small population (usually less than 25 million) • Emerging economies concern with economic growth and economies of scale issues • They also have smaller number of SMEs with export activities; but are achieving great exporting growth	Netherlands Austria Belgium Norway	
Mature Exporters with High Economic Growth	• They are fully developed countries • Have larger number of SMEs with stronger export activities and higher economic growth • They are mature exports which know how to perform in the world market	Canada Germany France Italy Japan Korea	Mexico Poland Spain Sweden United Kingdom United States

According to Table 3.7, the final country selection will be completed using mature exporters which have a larger number of SMEs, higher economic growth, and higher export value growth in comparison with the first group, young exporters. Countries in the mature exporter category were then ranked according to three criteria to determine which countries are the most relevant targets for research. Canada is the main focus of this study, so benchmark countries are compared with Canada based on their export activities, micro-data availability, security, policies, and legislation. Thus, the criteria used were designed to gauge

countries' similarity to Canada; comparison was made taking into account countries' population, number of SMEs, amount of export income, and economic and export growth. Table 3.8 shows the criteria used to select countries.

Table 3.7 - Criteria Used for Selecting Benchmark Countries

Criteria	Young Exporters	Mature Exporters
Similarity to Canada	• Significant amount of internationalization • Low international barriers (low barriers to entry and exit) • Similar export industry mix (i.e. large proportion of export in the ICT sector)	Successful , well established export sector amongst broad range of exporters
Export Success	• High export and GDP growth rate • Growing number of SMEs, employment, and value of export	• High export income and GDP growth • Highly cited by scholars and various literatures
Data Availability	• Data are available/accessible through: • National Statistic Offices/Institutions • Eurostat statistics and Fact-books • OECD statistics and Fact-books • Research data centers	

Table 3.8 - Mature Exporter Benchmark Country Selection

Criteria / Mature Exporters	Compatibility in Export Activities	Export Success	Data Availability	Overall Ranking	Key Decision Factors
Canada	◕	◕	◑	◕	-Large number of SMEs -High economic growth -High amount of export activities -Mature exporter with stabilitiy in the world market -Data are available through governmental and statistical portal -Not enough data is available to researchers

Table 3.8 - Mature Exporter Benchmark Country Selection (Continued)

Criteria / Mature Exporters	Compatibility in Export Activities	Export Success	Data Availability	Overall Ranking	Key Decision Factors
France					-Relatively large number of SMEs but economic growth -Data difficulties/not enough data are available through statistical organizations
Germany					-large number of SME with high export activities -Mature strategic exporter / experience in internationalization -highly recommended and cited through various literatures -Data are available through various statistical organization and high security is applied for increasing data confidentiality
Italy					-Smaller population -Smaller number of SMEs that have the potential to export -Relatively high economic growth -Relatively high internationalization -Low amount of micro-data available
Poland					Exceptional export performance -Large number of SMEs with innovative export programs -Low cited by literatures -Low availability of data through government and statistical offices
Spain					-Average number of SMEs compare to other selected countries -Relatively high economic growth -Smaller number of population -Low amount of data are available
Sweden					-Slow economic growth/GD growth -Large number of SMEs involve in exporting activities -Highly cited through literatures -High concerns with security/confidentiality of the statistical data

Table 3.8 - Mature Exporter Benchmark Country Selection (Continued)

Criteria / Mature Exporters	Compatibility in Export Activities	Export Success	Data Availability	Overall Ranking	Key Decision Factors
United Kingdom					-High emphasis on exports to increase future economic growth -Experienced in exporting but declining in its export growth since traditional sectors become less competitive -Steady economic growth driven by development of, i.e. ICT sector and Knowledge industries -Highly cited through scholars/literatures
United States					-Population is very high -Large number of SMEs with high potential to export -High economic growth -High export income and export volume -Good amount of data is available through research data centers
 **High**  **Good**  **Average**  **Low**  **Not Related**					

The United States, Canada, Germany, and Sweden all ranked equally for the first place in the mature exporters category for various reasons while Poland and the United Kingdom ranked second in the comparison since they have growing economies and are experienced in internationalization, especially exporting. In summary, the five benchmark countries chosen for this research are the United States, Canada, Germany, Sweden, and the United Kingdom.

3.3 Case Studies

The information distributed by official statistical institutions is produced using two types of sources: surveys, such as censuses and sample surveys and registers, including

administrative data (Desrosières, 2007). There is a fundamental difference between register and survey data sources. Surveys especially conducted to generate statistics for the research purposes. They allow researchers to generate large amount of data in a relatively short period of time; however, the method is time consuming and hard to distribute geographically. On the other hand, business register (BR) is a structured list of all the businesses, including all enterprises, their products and export activities. It is mainly used as a managing tool and a mean for developing sample frameworks in the production of statistical business data at official statistical agencies (Desrosières, 2007). Survey data are likely to be samples, whereas business register data are closer to the population and are extracted from administrative files.

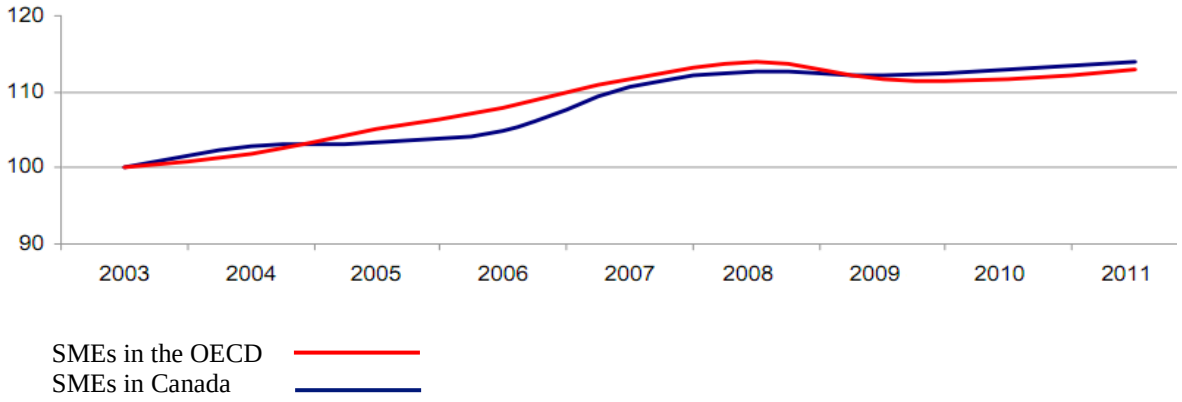
This thesis concerns export and business registers, as well as sample surveys, which are collected by governments about SMEs and their international activities and are primarily created for administrative purposes, for instance tracking the existence of businesses, their activities, and dissemination of products across borders. It discusses how governments and statistical offices collect business micro-data for SMEs, especially export data, and how they achieve a balance between confidentiality protection and availability of information for researchers. The accessibility of statistical data is of great interest for researchers in both the private and public sectors. Nevertheless, it is important that statistical offices have the ability to guarantee the anonymity of data in order to increase the willingness of respondents to provide it. Thus, this thesis uses case studies from the five major exporters chosen as benchmark countries with the intention of analyzing and comparing the export micro-data collection methods and accessibility used in various highly internationalized countries. Information obtained from secondary data were used to evaluate the countries' economic, entrepreneurship, and internationalization performance while various legal, administrative, methodological, and technical procedures for collecting, protecting, and releasing micro-data were also examined.

3.3.1 Case study 1 - Canada

3.3.1.1 SME in the Canadian Economy

Canada's economy is driven by a large number of small and medium-sized firms and the share of SMEs in the overall number of firms is substantially higher in Canada than the OECD average. The highest impact that SMEs have on the Canadian economy is in employment (See Appendix B). Among exporters, the total export value of SMEs is higher than other size groups and the increase in the number of exporting SMEs has resulted in both employment and revenue growth. On average, SME exporters are more innovative and growth oriented that their counterparts within the OECD. Figure 3.5 shows the Canadian SME export growth since 2003.

Figure 3.5 – SME Export Growth in Canada (OECD, 2010)



3.3.1.1 Micro-data Availability

The expansion of micro-data studies in Canada has been the result of growing academic demand for availability of micro-data. Researchers have begun to desire more precise use of micro-data studies, which requires micro-data on firms' internal and external activities regarding internationalization and growth. Statistics Canada is the main statistical institution in Canada with responsibility for collecting a variety of data. As the national

statistical agency, Statistics Canada takes strong action to ensure the confidentiality and privacy of micro-data provided by businesses, organizations, and individuals. The agency provides micro-data in the forms of summaries, graphs, and tables.

3.3.1.1.1 Surveys and Statistical programs for SMEs in Canada

According to Statistics Canada, there are few surveys and statistical programs available include information about SMEs and internationalization (Table 3.9). Appendix E provides detailed information on available Statistical Canada's surveys and statistical programs as well as sample survey.

Table 3.9 - List of Survey and Other Statistical Programs in Canada (Statistics Canada, 2010, 2011)

Survey	Record #	Status/Frequency/ Data Release date	Sample Size	Description
Business Register (BR)	1105	Active - Biannual	No sampling is done	• Iis used as the principal frame for the economic statistics program of Statistics Canada (STC). • Its role is to provide Statistics Canada with a complete quality frame in terms of coverage and a set of stratification variables such as industrial classification, revenue, number of employees and total assets.
Small and Medium-Sized Enterprises Data Warehouse (SME Data Warehouse	5157	Active - Occasional / July 2008 October 2010	All businesses in Canada based on Statistics Canada's Business Register – No sampling is done	Provides complete business demography statistics and performance indicators on SMEs in Canada.
Small Business Profiles	5028	Active - Biannual	No sampling is done	Presents selected revenue, expense, profit and balance sheet items plus financial ratios on SMEs in Canada.

Table 3.9 - List of Survey and Other Statistical Programs in Canada (Continued)

Survey	Record #	Status/Frequency/ Data Release date	Sample Size	Description
Financial and Taxation Statistics for Enterprises	2510	Active - Annual	No sampling is done	Cover business activity within a year. Statistics are used in two broad ways: 1. Provide a measure of financial position and performance of incorporated businesses by industry aggregations. 2. Used as the benchmark for the quarterly estimates of corporate profits in the Canadian System of National Accounts (CSNA).
Survey on Financing of Small and Medium Enterprises	2941	Inactive - Occasional	Sampling frame contains 1,999,000 enterprises	Is designed to find out: • Types of financing SMEs are using. • Collect information on SMEs' recent attempts to obtain new financing.
Survey of SME Needs and Satisfaction	N/A	Inactive - 1998-2000 / Feb 2002	Entrepreneurs who seek external financing	Is prepared for the Small Business Policy Branch as part of the SME Financing Data Initiative

3.3.1.1.2 Methods Accessing SMEs' Micro-data in Canada

Researchers obtain access to business micro-data through various methods. Research data centers are part of a Statistics Canada initiative to make data more available to researchers in order to support the research community (See Appendix C & D). They provide a rich source of micro-data for researchers under secure conditions and are staffed with Statistics Canada employees. Research Data Centers consist of fifteen research centers, six branches, and the head research data center in Ottawa. Data centers are located throughout Canada to prevent researchers from having to travel to Ottawa in order to access micro-data. Prior to accessing micro-data, researchers are required to submit a proposal for their specific research project; if the proposal is approved and access is granted, the contract will be signed and the research team will be granted access to the specific micro-data indicated within the approved research project and only for the purpose of completing their research (Statistics Canada, 2011). Researchers must complete a security check; upon successfully passing the

check they are required to sign a contract with Statistics Canada and take the Oath or Affirmation of Office and Secrecy.

Another method of providing micro-data for research use is to compile anonymized Public Use Micro-data Files (PUMFs), which was introduced by Statistics Canada in the early 1970s (Boyko & Watkins, 2002). The program has been useful for researchers, especially those from university and government research departments. However, there are several issues related to the use of the program, including decrease in the value of data because of the anonymization process (Ronning, 2006).

Remote Data Access (RDA) is available to all researchers and facilitates access to micro-data since direct access to micro-data is restricted according to the Statistics Act, which states that only Statistics Canada staff and deemed employees may access confidential micro-data (Boyko & Watkins, 2002) (See Appendix D). Indirect access to confidential micro-data by researchers outside of Statistics Canada through their own computers allows them to fulfill their research needs. Before researchers can access the micro-data, agency staff members inspect the data and computer outputs in order to ensure data confidentiality (Statistics Canada, 2011). At the beginning, RDA is available free to researchers. However, there will be a minimal charges and user fees after the evaluation period that must be paid to Statistics Canada (Statistics Canada, 2011). There are two basic types of RDAs: remote execution and remote facilities (Statistics Canada, 2011). Remote execution requires researchers to send their own program files directly to data providers and receive the result after that the confidentiality is approved. While remote facilities allow researchers to directly access the micro-datasets, run the program themselves and receive results in real time.

3.3.1.2 Supporting Legislation

Canada has three federal privacy laws: the Privacy Act, the Personal Information Protection and Electronic Documents Act (PIPEDA), and the Statistics Act (Statistical Canada, 2011). The Privacy Act imposes commitments on 250 federal government agencies

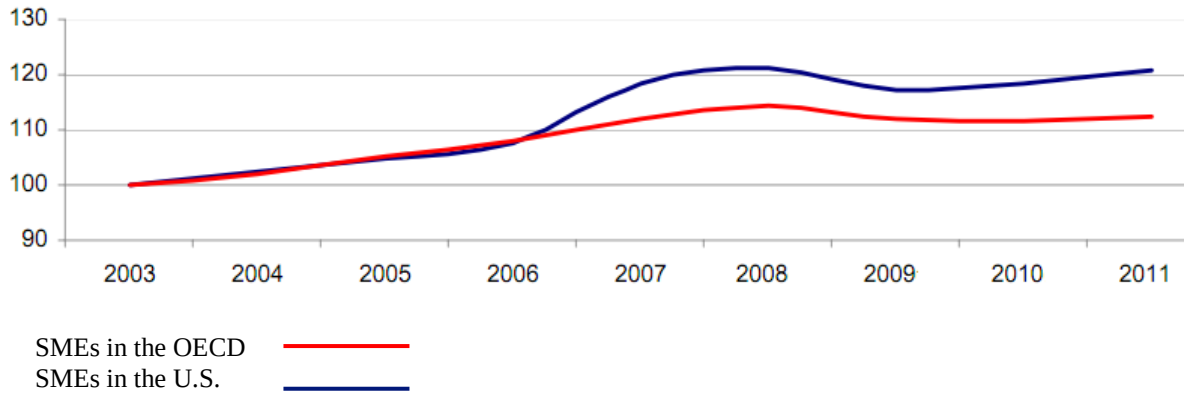
to respect privacy rights by limiting the collection, use, and disclosure of information (Privacy Legislation in Canada, 2009). PIPEDA also protects individuals by setting out the rules on how the private sector may collect, use, and disclose information (Department of Justice Canada, 2011). PIPEDA applies to all organizations engaged in any commercial activities. However, some provinces, including British Columbia, Alberta, and Quebec, have their own privacy acts which are similar to PIPEDA (Industry Canada, 2011). These laws regulate the collection, use, and access to micro-data by businesses and researchers. It should be noted that no specific legislation applies to researchers in Research Data Centers since they do not have any direct access to confidential micro-data, though the Statistics Act does set out the confidentiality requirements applied to all micro-data prior to release to researchers.

3.3.2 Case study 2 - United States

3.3.2.1 SME in the U.S. Economy

The United States is characterized by a large number of SMEs but its most notable feature is a high level of SME contribution to employment and economic growth, which means that, on average, SMEs employ more people than their OECD counterparts (See Appendix B). Their contributions to economic and export growth is also higher than the OECD average (OECD, 2005). Exporting SME manufacturers generate more than twice the revenue of non-exporters and labour productivity is more that seventy percent higher than their non-exporting counterparts. Figure 3.6 shows the changes in the United State's amount of enterprises export since 2003.

Figure 3.6 - SME Export Growth in the US (OECD, 2010)



3.3.2.2 Micro-data Availability

The Census Bureau is one of more than seventy federal agencies that have the main role of collection and distribution of various data from businesses, households, and government sectors for a variety of statistical and research purposes. It follows the mission statement of being a "leading source of quality data about the Nation's economy and people" and is responsible for the protecting the confidentiality of data while increasing the freedom of data access. However, the Census Bureau has been facing growing challenges to meet the data needs of the research community while still maintaining data confidentiality. Confidential data are accessible by both employees and non-employees who receive Special Sworn Status.

3.3.2.2.1 Surveys and Statistical programs for SMEs in the United States

According to US Census Bureau and National Small Business Association, there are various surveys on SMEs' business activities. Table 3.10 and Appendix F also provide detailed information regarding statistical programs in the U.S. and surveys provided by the U.S. Census Bureau.

Table 3.10 - List of Survey and Other Statistical Programs in the U.S. (U.S. Census Bureau, 2011; National Small Business Association, 2010, 2011)

Survey	Frequency / Data Release Date	Sample Size	Description
U.S. Bureau Business Register	Frequency for updating data varies from every quarter to every 5 years	Covers all domestic businesses	• Provides the most complete and consistent database of U.S. businesses for statistical program use. • Is used throughout Census Bureau economic data programs, but data for individual establishments are not available for public use • Is integral to the Census Bureau's economic census and most economic surveys.
Statistics U.S. Businesses	Annual / since 1989	All U.S. businesses with paid employees	• Provides detailed enterprise-level information on U.S. businesses, classified by geography, industry, and enterprise size
United States Small Business Administration	-Business Dynamic Statistics – Annually -Business Employment Dynamic - Quarterly	All businesses and enterprises	• Is the voice for small businesses in the Federal Government and the source for small businesses' statistics • Provides data and links to data on businesses/SMEs with and without employees. • Provides data on: Statistics of U.S. Businesses, Business Dynamics Statistics, Business Employment Dynamics, and Non-employer Statistics
Survey of Small and Medium-sized Businesses	Annually	Entire U.S. small business community	Small businesses were questioned on employee benefits, access to capital, economic outlook and presidential politics, etc.
Survey of Business Owners	Every 5 years since 1972	Approximately 2.3 million businesses	• Provides complete and regularly collected information on selected economic and demographic characteristics of the business and their owners
Small Business Taxation Survey	Annually	on-line among more than 300 NSBA members	Provides information on the taxes influence on America's small-business community
Small Business Technology Survey	Annually	NSBA's small business members	SMEs' use of technology, the time and cost of technology, doing business on-line, social media, telecommuting and innovation
Health Care Survey of Small Businesses	Information Not Available	Information Not Available	Information Not Available

Table 3.10 - List of Survey and Other Statistical Programs in the U.S. (Continued)

Survey	Frequency / Data Release Date	Sample Size	Description
Business R&D and Innovation Survey	Annually	Information Not Available	• Is conducted jointly by the U.S. Census Bureau and the National Science Foundation (NSF). • Collects a variety of data on the R&D activities of companies operating in the U.S. • Is replaced the Survey of Industrial Research and Development (SIRD), which has been the official federal source of data on R&D in the business sector since the 1950s.
Survey of business owners	Every 5 years	Information Not Available	Information on number of firms, sales, employees, and payroll of businesses
Annual Capital Expenditure survey	Annually Since 1994	Information Not Available	Data on capital spending for new and used structures and equipment by U.S. nonfarm businesses with and without employees.

3.3.2.2.2 Methods Accessing SMEs' Micro-data in the United States

In order to increase data privacy, the Census Bureau limits the amount of specific data provided to researchers in the form of public micro-data files and tabulations. However, there are other techniques used to increase access to more detailed micro-data. These methods include on-site access to micro-data at the Census Bureau, remote online access in data centers and census information centers through the Advanced Query System, and, in the case of Census Bureau approval, data would also be available to researchers via Remote Secure Sites as Special Sworn Status personnel. There are also regional statistical offices that are responsible for providing data accessibility to researchers, such as the D.C. and Puerto Rico data centers.

3.3.2.3 Supporting Legislation

The Census Bureau provides confidentiality protection through government-wide legislation, such as the Privacy Act, Confidential Information Protection and Statistical Efficiency Act (CIPSEA), the Freedom of Information Act (FOIA), and agency-specific legislation, such as Title 13, United States Code, of 1954, which requires the U.S. Census Bureau to protect the confidentiality of data.

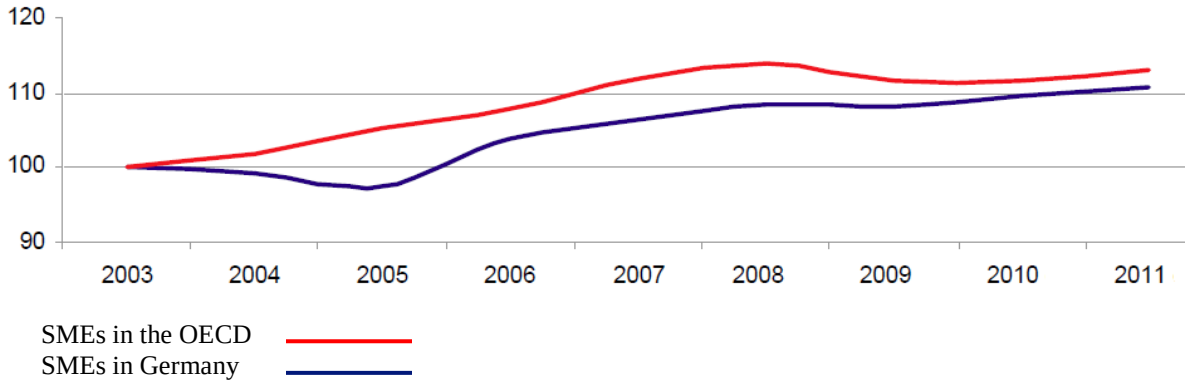
3.3.3 Case study 3 - Germany

3.3.3.1 SME in the German Economy

The German economy is the largest amongst the OECD member countries and the European Union (EU); the largest mature exporter and a leading exporter of information and communication technology equipment, machinery, and chemicals; and takes the advantage of the extremely skilled labour force (OECD, 2005). Like most other OECD countries, Germany also faces significant challenges to sustaining its economic growth and its SME sector mostly contains medium and small firms. According to EU statistics, one in five EU SMEs is German, which means that Germany's SMEs are larger than their average OECD and EU counterparts (OECD, 2010c).

German SMEs are almost identical in structure to the OECD average, with about two million employees in total and an average of three employees per firm more than the OECD average in 2010 (OECD, 2010c). German SMEs managed to grow as fast as their OECD counterparts in terms of number of enterprises, employment in enterprises, and trade and export value (See Appendix B). Overall, statistics on SMEs show that in most of the areas Germany performs within the OECD average activities and growth, whereas, in some other areas, such as internationalization, it exceeds the standards. Figure 3.7 illustrates the changes in the German SMEs' amount of enterprises export since 2003.

Figure 3.7 - SME Export Growth in Germany (OECD, 2010)



3.3.3.2 Micro-data Availability

According to the German Council for Social and Economic Data (RatSWD), research data centers are institutions with a primary focus on providing the high-quality and easily-accessible micro-data that are required for research and statistical analysis, while maintaining data protection, confidentiality, and security. Moreover, these research data centers intend to improve their cooperation with data users specially research community and data producers/collectors. They enable access to anonymous micro-data files and controlled remote data access for guest researchers in the research centers following strict data protection regulations (United Nations, 2007).

3.3.3.2.1 Surveys and Statistical programs for SMEs in Germany

Even though most of the data provided by the German Statistics Office are collected through the administrative sources; there are number of surveys available conduct information regarding SMEs and their International activities (Table 3.11).

Table 3.11 - List of Survey and Other Statistical Programs in Germany (German Federal Statistics Office, 2011)

Survey	Data Release Date	Sample Size	Description
Business Register (Statistisches Bundesamt Deutschland)	Since 1996	All businesses/ enterprises and local units	• It is a database of enterprises and local businesses • Economic structures in Germany contains of evaluations of business register data on the number of enterprises and their employees
Annual Trade Survey	Annually Collected by: Nomenclature Générale des Activités Economiques dans I'Union Européene" (Statistical Classification of Economic Activities in the European Community)	Information Not Available	Provides information on the structure of enterprises which is important in terms of economic policy, for instance, to evaluate both profitability and productivity in the area of trade.
Germany Business Survey	Quarterly	About 1.200 in each quarter	Information Not Available
The Role of Banks versus Venture Capital in Financing Small Enterprises in Successful European Regions (Germany)	March-October 2001	over 800 high-tech SMEs and venture capital firms	Focuses on the funding of SMEs in Germany against the specific background of increasing integration of Germany's financial space, and the dramatic transformation of regional and local banking systems and the emergence of a venture capital market
Survey on SME Access to Finance	Annually	Information Not Available	Information Not Available

3.3.3.2.2 Methods Accessing SMEs' Micro-data in Germany

There are four publicly-supported research data centers (FDZ) in Germany, including the Research Data Center of the German Federal Statistical Office (FDZ-FSO), the Research Data Center of the Federal Employment Agency at the Institution for Employment Research (FDZ-BA), the Research Data Center of the German Pension Insurance (FDZ-RV), and the Research Data Center of the Statistical Offices of the Lander (FDZ-SOL) (Zuhlke, et.al, 2004; Rehfeld & Mika, 2006; Kohlmann, 2005). They have made substantial improvements to the data available to researchers. Two other major data centers, the German Micro-data Lab at ZUMA and the International Data Service Center at IZA, have also worked very closely and successfully with researchers (Bender, et al., 2008). The research community

generally makes extensive use of the research data center services and there has been a significant increase in the use of anonymous micro-data by researchers.

3.3.3.3 Supporting Legislation

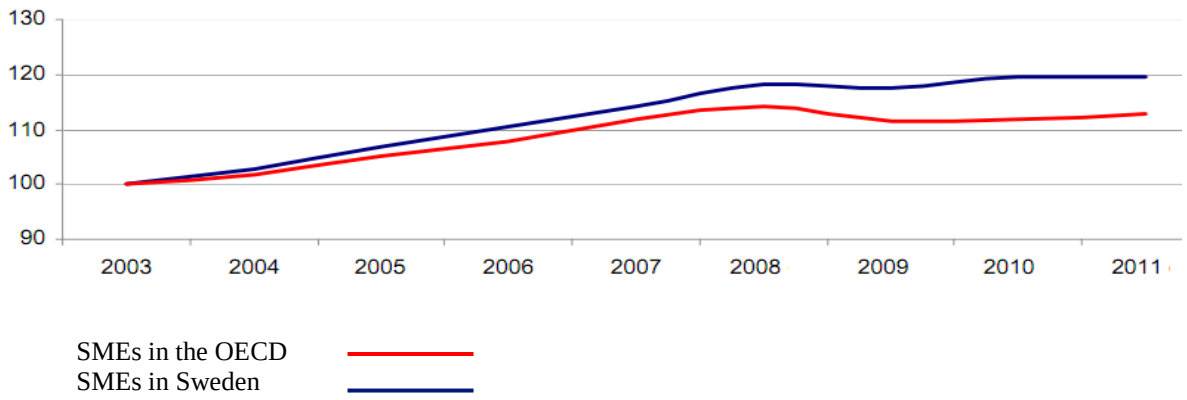
Germany has two major confidentiality protection Acts. The Federal Data Protection Act covers the data processing of federal agencies and private sectors, such federal government. Data Protection Acts of the Länder covers all the public data processing of the agencies of the Länder, such as universities.

3.3.4 Case study 4 - Sweden

3.3.4.1 SME in the Swedish Economy

New SMEs and enterprise growth are very important for the Swedish economy, of which the sector is an essential part since SMEs account for more than 99 percent of all Swedish enterprises. However, it is worth noting that the Swedish SME sector is heavily dominated by micro and small enterprises which account for the majority of the estimated 585,621 SMEs operating alongside 987 large firms (Dutta, 2009). The average size of Swedish SMEs is considerably below the OECD average, with the majority of enterprises having up to nine employees and about five percent having between 10 and 49 employees (See Appendix B). Overall, Swedish SMEs employ an average of three persons compared to the EU average of 4.2 persons (OECD, 2010a). Sweden is an open economy which is mainly dependent on external trade, and SMEs largely help to increase export value in the country. Figure 3.8 shows the changes in the enterprises export amount through years since 2003.

Figure 3.8 - SME Export Growth in Sweden (OECD, 2010)



3.3.4.2 Micro-data Availability

There has been an increase in use of quality micro-data which can meet the needs of researchers; thus, Statistics Sweden, as the main statistical office in the country, provides confidential micro-data to ensure that the quality micro-data can be utilized by authorized users, particularly researchers. The arrangement for releasing micro-data is in accordance with legislation concerning the confidentiality protection of micro-data which provides the limits for availability and accessibility of micro-data. Statistics Sweden mainly grants access to micro-data to public authorities, universities, and research institutions but also releases micro-data and makes them accessible to authorities in other countries with the caveat that the data can only be released to the third parties for the research purposes and statistical analysis.

3.3.4.2.1 Surveys and Statistical programs for SMEs in Sweden

Statistical Sweden's Business Register provides all types of SMEs' business, international, and economical activities. According to 2010 Business Register, about 965,987 Swedish enterprises are identified; about 57 per cent of them are sole traders. Table 3.12 provides information on number of surveys available conduct information regarding SMEs and their International activities (See Appendix G).

Table 3.12 - Survey and other statistical programs in Sweden (Statistics Sweden, 2011)

Survey	Responsible Agency	Data Release Date	Sample	Description
Statistical Business Register (Statistics Sweden)	Statistics Sweden	Annually, Last published 2011	All enterprises, government offices and organizations	• BR is a base register in the Statistics Sweden's register system and is a collection of all businesses/enterprises and their activities. • Main tool for creating a sample framework in the production of statistical data in the Statistics Sweden.
International enterprises survey				
Foreign controlled enterprises	Swedish Agency for Growth Policy Analysis	June 2011	The Survey is addressed to all group heads, subsidiaries and branches in Sweden which according to the register or other information are foreign controlled in terms	Examine the scope and changes in foreign control of enterprises, branches and local establishments in Sweden.
Research and development in international enterprise	Swedish Agency for Growth Policy Analysis	May 2011	All enterprises	• Every other year sample surveys on R&D of major Swedish controlled enterprise groups in Sweden and abroad conducted in Sweden by main foreign controlled enterprise groups. • Main variables are R&D expenditure, R&D person-years and educational level.
Structural study of the business sector in Sweden	Swedish Agency for Growth Policy Analysis	January 2007	Information Not Available	Information Not Available
Swedish enterprise groups with affiliated abroad	Swedish Agency for Growth Policy Analysis	August 2011	All enterprise groups in Sweden that have at least one subsidiary abroad	• Information on the number of enterprise groups and number of employees by sector, size class, degree of internationalization, & country of location • Data on exports and imports of goods by manufacturing and service groups.

Table 3.12 - Survey and other statistical programs in Sweden (Continued)

Survey	Responsible Agency	Data Release Date	Sample	Description
Newly started enterprises survey				
Follow-up on newly stated enterprises in Sweden	Swedish Agency for Growth Policy Analysis	April 2010	Information Not Available	Information Not Available
Newly started enterprises annually	Swedish Agency for Growth Policy Analysis	May 2011	Information Not Available	Information Not Available
Newly started enterprises quarterly	Swedish Agency for Growth Policy Analysis	December 2011	Information Not Available	Information Not Available
Structure of the Business Sector				
ICT usage in enterprises	SCB	2010	Information Not Available	

3.3.4.2.2 Methods Accessing SMEs' Micro-data in Sweden

Statistics Sweden releases completely anonymous micro-data to researchers for a specific time and project under the guidance of an authorized employee of the data/statistical institution (See Appendix H). They also follow a strict screening procedure which requires a written description of the researcher's project, the period during which the data are to be used, and any other people who are involved in the research project. Consequently, micro-data users should pay for accessing micro-data in order to cover the costs involved in supplying it. Micro-data are also available through an online remote access system known as Micro-data Online Access (MONA), which provides secure access to Statistics Sweden micro-data (Statistics Sweden, 2011). Overall, Statistics Sweden provides micro-data through data centers, remote access data (MONA) centers, and the release of secure licensed micro-data files.

3.3.4.3 Supporting Legislation

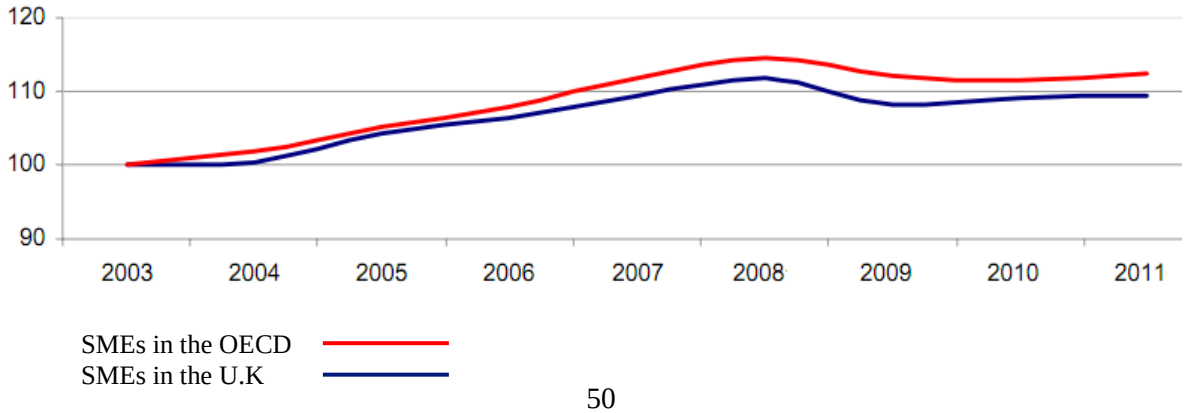
The Swedish Secrecy Act specifies the importance of protecting data confidentiality by Statistics Sweden while releasing data to researchers and other authorized users. There is also a specific modern Statistics Act which regulates the use of statistical data but makes an exception for making micro-data accessible for research purposes and statistical analysis. Besides the Statistics Act, there are specific Personal Data Acts which are based on the Data Protection Directive and apply to the collection and release of micro-data, especially personal information.

3.3.5 Case study 5 - United Kingdom

3.3.5.1 SME in the UK Economy

The United Kingdom has a proportionately high share of large enterprises, which have a higher impact on jobs and growth than in other countries. However, the average number of people employed per SME, 5.9 persons, is much higher than the average employment in other OECD countries (OECD, 2010c) (See Appendix B). The United Kingdom also exceeds the average internationalization activities of the OECD. Figure 3.9 shows the UK SME export growth.

Figure 3.9 - SME Export Growth in the UK (OECD, 2010)



3.3.5.2 Micro-data Availability

Allowing research on micro-data and making micro-data available to researchers is a strong part of the United Kingdom's official statistics system. There is a high level of micro-data access which requires further analytical strength of available data and has led to advances in the collection of data and the design of statistical sources. The Central Statistical Office (Office for National Statistics) is the UK's main source of micro-data and is highly intended to increase data accessibility for researchers. The organization is highly concerned with the confidentiality of micro-data and has thus put in place various legislation regarding data privacy.

3.3.5.2.1 Surveys and Statistical programs for SMEs in the United Kingdom

This section shows the available surveys of SMEs in the United Kingdom conducted by the UK National Statistics (Table 3.13).

Table 3.13 - Survey and other statistical programs in the UK (Bullock & Milner, 2011; Office for National Statistics, 2011)

Survey	Data Release Date	Sample	Description
The National Small and Medium-sized Business Surveys	First Panel – 1991-93-95 Second Panel – 1997-99 Third Panel - 2002 Fourth Panel - 2004 Fifth Panel - 2008	Information Not Available	Questions on business/SME characteristics; (workforce and training; innovative activity, R&D and other innovation expenditure; commercial activity and competitive situation; factors affecting expansion and efficiency)
UK Survey of SME Finances	Information Not Available	businesses with fewer than 250 employees	Information Not Available
Annual Business Survey	Annually	Approximately 62,000	The main structural survey conducted by NSO, crosses all economic sectors collecting financial data from businesses
Business Register and Employment Survey for Businesses	Annually – since 2006	Information Not Available	Provided a rich dataset contains of annual employee and employment quality measures for businesses/enterprises

Table 3.13 - Survey and other statistical programs in the UK (Continued)

Survey	Data Release Date	Sample	Description
Assessing the Impact of the National Minimum Wage on Small and Medium Enterprises	June - October 1999	employment-size stratified sample	Information Not Available
The Impact of National Minimum Wage on Small and Medium-sized Businesses in the Cleaning and Security Sector	November 2000 - January 2001	cleaning and security services industries where low paid workers	Information Not Available
The Role of Banks versus Venture Capital in Financing Small Enterprises in Successful European Regions (UK)	March -October 2001	over 800 high-tech SMEs and venture capital firms	focuses on the funding of SMEs in different regions in Europe against the background of increasing integration of Europe's financial space, and the specific context of dramatic transformation of regional and local banking systems and the emergence of a venture capital market
The National Statistics Small Business Forum	Since 2003	Information Not Available	Included all business surveys on behalf of government

3.3.5.2.2 Methods Accessing SMEs' Micro-data in the United Kingdom

The Economic and Social Research Council (ESRC) data archive is the largest such statistical archive in the UK and is a great source of data for research and analysis. Users are required to contact the archive in order to obtain permission to access data. Micro-data are also available in other formats, such as online access, CD-ROMs, and tapes (Office of National Statistics, 2011). There is also EDINA, the UK national academic data center, which provides data and resources to universities and research institutions in the UK by delivering access to a range of online data services throughout the UK research community and has about six-thousand registered users in more than two-hundred institutions. There are also a number of data centers responsible for collecting and processing various data, such as the Economic and Social Data Service (ESDS) center which is responsible for economic and social science data (Office of National Statistics, 2011).

Overall, UK data centers play a significant role in the research community. Centers provide easier and cheaper (sometimes free of charge) access to micro-data and assist researchers with more efficient data. For instance, the UK Data Archive is a source for researchers to access ESDS data. However, although micro-data are released by the UK statistical office on a large scale, researchers are still aiming for more detailed micro-data access.

3.3.5.3 Support Legislation

The Statistics and Registration Service Act (SRSA) provides data confidentiality regulations which apply to the Office of National Statistics (ONS) in order to ensure its compliance with the SRSA. The ONS must also take into consideration the UK Statistics Authority Code of Practice (CoP) when releasing data. Registered users can access data under an End User License but they are required to be authorized users and both individuals and institutions require permission through the Access to Special License and Secure Data Service.

3.4 Summary

This chapter highlighted the method used to select five sample OECD countries for this study. It also explained the sources of data used for conducting case studies for each of the countries. Data obtained through online database from OECD statistics, Economic and Enterprise Factbooks, European Statistics (Eurostat), the Central Intelligence Agency, and other central statistical institutions, such as Statistics Canada, German Federal Statistical Offices, Statistics Sweden, Census Bureau and the UK national statistics.

Chapter 4

Findings

4.1 Introduction

Research based on export micro-data and the availability of micro-data to researchers should be an important component supported by national statistical institutions and governments. One of the advantages of making this data accessible is that the availability of micro-data, especially in relation to trade and economics, allows policy makers and analysts to find and analyze complexities which give them an accurate view of the functioning of the economy. It is also important to improve confidentiality protection methods for micro-data because this can, in turn, increase the availability and usefulness of the export micro-data collected.

This section answers several questions regarding methods for improving access to Canadian export micro-data for research purposes and improving statistical methods for confidentiality protection. The cases which were provided in chapter 3 have been compared based on the availability of micro-data, methods for researchers to access micro-data, and legislation related to micro-data in each of the studied OECD countries - Germany, the United States, Canada, Sweden, and the United Kingdom.

4.2 Micro-data Collection and Compilation

In the majority of the OECD countries, the National Statistical Office (NSO) is entirely in charge of business data collection (OECD, 2010c). The NSO is in charge of official statistics in Canada, Sweden, and the United kingdom; where as Germany and the United States are the only countries within the sample that NSO is not responsible for collection of official statistics on SMEs internationalization (OECD, 2010b). There are

ministries, agencies and research institutions in charge of SMEs' micro-data collection, compilation, analysis and/or publication of the data. Almost all the studied countries have different behavior toward specific business micro-data, for instance only main data are presented in the Statistics of US Business which comes from the US Census Bureau's Business Register that merges administrative, survey and economic micro-data. In most of the sample countries, including US and Germany, the main strategy is to collect SMEs' business and export micro-data through the integration of survey based data and administrative data or business registers. In Sweden, for instance surveys on economic data have been modified to the accounting and financial systems of the enterprises. Taken as a whole,

- In the majority of the countries NSO is in charge of the micro-data collection.
- NSO plays an important coordinating role except in Germany where NSO has outsourced SME data collection.
- Micro-data sources are usually integrated (e.g. administrative and survey data).
- Generally viewed barriers, include lack of quality data, low response rate, and large size of SME population.

4.3 Review of Surveys and Statistical Methods for Collecting Micro-data

Access to business micro-data is difficult, but most statistical institutions make all or at least part of the SMEs' data available to researchers. Majority of the micro-data are collected through surveys that are conducted by statistical offices, such as Statistics Canada, the Census Bureau, German Federal Statistical Office, Statistics Sweden, and the UK National Statistics. Survey results are utilized to integrate information, such as number of SMEs, SMEs' access to finance, expenditure, R&D and innovation, needs and satisfactions, and financial and taxation statistics. Given the policy issues and researchers' needs for SME business micro-data for further research in the IE field, these statistical surveys help

statistical institutions to gather required data. Table 4.1 shows the list of available surveys and statistical programs in the five studied countries.

Comparison between available data collection methods illustrate that a particular demand for SME statistics is mainly related to finance and administrative dimensions. However, there is lack of data linkage in most of the studied countries, which reduces the quality of the existing data. Also, business data are not internationally comparable; in order to increase international comparability of SME statistics, countries require strengthening their inventory of business data/statistics and improving data quality and comparability. Countries also need more integrated business register, which require policy makers to identify the legal barriers that prevent statistical authorities from having access to administrative data, such as tax data. Section 4.6 contains further discussion and analysis of Availability of business micro-data through surveys and statistical programs.

Table 4.1 - Surveys and other Statistical Programs

Country	Surveys or other Statistical programs
Canada	• Small and Medium-Sized Enterprises Data Warehouse (SME Data Warehouse) • Small Business Profiles • Survey on Financing of Small and Medium Enterprises and Survey of SME Needs • Financial and Taxation Statistics for Enterprises • Business Register (BR) • Survey of SME Needs and Satisfaction
The United States	• Survey of Small and Medium-sized Businesses • Small Business Taxation Survey • Small Business Technology Survey • Health Care Survey of Small Businesses • Business R&D and Innovation Survey • Survey of Business Owners • Annual Capital Expenditure Survey
Germany	• Annual Trade Survey • Germany Business Survey • Survey of SMEs' Access to Finance • The Role of Banks versus Venture Capital in Financing Small Enterprises in Successful European Regions (Case of Germany)

Table 4.1 - Surveys and other Statistical Programs (Continued)

Country	Surveys or other Statistical programs
Sweden	• **International enterprises survey** - Foreign controlled enterprises - Research and development in international enterprise - Structural study of the business sector in Sweden - Swedish enterprise groups with affiliated abroad • **Newly started enterprises survey** - Follow-up on newly stated enterprises in Sweden - Newly started enterprises annually - Newly started enterprises quarterly • **Structure of the business Sector** - ICT usage in enterprises
United Kingdom	• UK Survey of Finance for Small and Medium-Sized Enterprises • Global Entrepreneurship Monitor (GEM UK) • The National Small and Medium-Sized Business Surveys • Assessing the Impact of the National Minimum Wage on Small and Medium-sized Enterprises • The Impact of the National Minimum Wage on Small and Medium-sized Businesses in the Cleaning and Security Sector • The Role of Banks versus Venture Capital in Financing Small Enterprises in Successful European Regions (Case of the UK)

4.4 Review of Methods Supporting Researchers to Access Micro-data

There are various ways which statistical offices can use to support the research community and the case studies in chapter 3 illustrate different methods. Table 4.2 shows the available methods for presenting micro-data and making them accessible to researchers with a brief explanation for each method.

Following the association between current access modes demonstrates that Germany has the most reliable resources and process for releasing micro-data to researchers while maintaining its confidentiality. Table 4.3 illustrates the available access methods in the five benchmark countries.

Table 4.2 - Available Methods for Accessing Micro-data

Available Method	Description
Statistical Tables and Data Cubes	-Usually available in the form of tables. -Both standard tables and special tables generated at the request of the researcher. -Some offices release very detailed matrices, known as data cubes, which researchers can manipulate to support their own needs. - Provide more detail and flexibility to researchers to generate their own data tables. -High confidentiality protection.
Special Data Services	-Data are available at the request of researchers, usually at marginal cost.
Remote Access Facilities	-Available in many countries -Arrangements that allow researchers to produce statistical outputs from micro-data files through computer networks, without the researchers actually 'seeing' the micro-data. - Because of the additional controls that are available through RAF, and the fact that micro-data do not actually leave the statistical offices, access to more detailed micro-data can be provided
Data Laboratory / Data Centers	-On-site access to more identifiable micro-data, typically with stringent audit trails and Statistical officers' supervision. -The access to more detailed data creates some inconvenience to the researcher, because of the requirement of working at the statistical institutes.
Anonymised Micro-data Files **- Public Use Files (PUFs)**	-Micro-data files that are disseminated for general public use outside the Statistical offices. -They have been anonymised and are often released on a medium such as CD-ROM, sometimes through a data archive. -The level of confidentiality protection in Public Use Files should be such that identification is not possible even when matched with other data files
Anonymised Micro-data Files **- licensed files**	-Licensed files are also anonymised but distinct from Public Use Files in that their use is restricted to approved researchers. -Even if advertised as generally available to the public, they are not released before an undertaking or contract is signed by the researcher
Collaboration	-Working through the officer instead of directly accessing micro-data
In-house Analysis	-Statistical Institute officer working on tasks -Researchers assisting officer with its functions

Table 4.3 - Micro-data Accessibility in Selected OECD Countries

Canada	Statistics Canada	• Remote Data Access: remote execution and remote facilities • Online Remote Access to Data • Public use Micro-data Files • Publicly available data • Research Data Centers
United States	The Census Bureau	• Online Access / Remote Access to Data • Remote Secure Sites • Remote online access in data centers and census information centers • Onsite access to micro-data at the Census Bureau • Public Use Micro-data Access (PUMS) • Tape/CD-ROM
Germany	German Federal Statistical Office	• Controlled Remote data access centers • Workplaces for guest researchers • CAMPUS-Files • Research Data Centers: - Research Data Center of the German Federal Statistical Office (FDZ-FSO) - German Micro-data Lab at ZUMA - International Data Service Center at IZA - Research Data Center of the Federal Employment Agency at the Institution for Employment Research (FDZ-BA) - Research Data Center of the Statistical Offices of the Lander (FDZ-SOL) - Research Data Center of the German Pension Insurance (FDZ-RV)
Sweden	Statistics Sweden	• Online Remote Access • Micro-data Online Access (MONA) • Research Data Centers authorized employees • Licensed Files
United Kingdom	→ UK National Statistics / Office of National Statistics → Government Statistical Service	• End user license data (EUL) • Data supplied under special condition • Special License and Secure data • Secure Data Service Data • Online Access to Data • CE-ROM and tape

The mode of access to statistical institutions micro-data depends on the type of the data required and on the methods that will be used to analyze the micro-data (See Appendix I). In Canada, the data access interface considers the wide range of users' needs. Various

applications have been developed to automatically upload micro-data products onto the Statistical Canada website, where tabulation tools allow users to manipulate micro-data to meet their requirements. On the other hand, the Micro-data Access Division (MAD) is the original unit within Statistics Canada that is responsible to manage and provide access to the restricted micro-data through being the center of expertise and coordination for disclosure review, providing real-time remote access to micro-data and providing support and services to the group of Data Centers (Goldmann, 2010). Table 4.4 outlines the access variety in Canada, eligible users and conditions accessing the micro-data ranging from open statistics on the right to the confidential data on the left.

Table 4.4 - Micro-data Accessibility

Open Statistics →					**Restricted Data**
Service	Statistics Canada Website	Public use micro-data files	Custom services	Real-time Remote Access	Research Data Centers
Eligibility	General public	Postsecondary institutions Staff and students	Individuals or organizations	Researchers	Researchers
Conditions	Free at the Statistics Canada and Government Canada websites	Free for teaching and research purposes	Contract for services	Contract for services	Free for researchers from authorized and participating organizations/ institutions

4.5 Evaluation of Legal Framework

Researcher access to confidential micro-data raises two legal issues since it is a matter of privacy and a matter of maintaining confidentiality. There are very specific privacy policies and laws available in the studied countries which make some exceptions in order to make the micro-data accessible for research purposes and statistical analysis. Some countries, such as Canada, have a few federal privacy laws, such as

- The Privacy Act, which sets out rules for how institutions of federal government must deal with individuals' personal information (Statistics Canada, 2011).
- The Personal Information Protection and Electronic Documents Act: relates to data privacy. It governs the collection, use and disclosure of private and personal information by private sector organizations. It also facilitates the use of electronic documents (Statistics Canada, 2011).
- The Statistics Act: regulates access to, and use of, micro-data by businesses and the public (Statistics Canada, 2011).

4.5.1 How does a researcher attain approval to access confidential micro-data?

In order for researchers to gain access to Statistics Canada micro-data in the RDCs, they must apply through the SSHRC and demonstrate the scientific merits of their project, their ability and knowledge to carry-out the project, and also show that detailed micro-data is necessary to conduct the research. According to section 17 of the Privacy Act, "no person other than a person employed or deemed to be employed under this Act, and sworn under Section 6, shall be permitted to examine any identifiable individual return made for the purposes of this Act…" The Act also states that the micro-data cannot be disclosed by anyone who has been granted access to it. Statistics Canada has a very lengthy procedure for approving researchers who have applied for access as described above. According to Statistics Canada (2011), there are nine steps in the Canadian application process:

1. *Eligibility* – Individual researchers (including master's and doctoral students) affiliated with a Canadian post-secondary institution, or master's and doctoral students registered at a Canadian postsecondary institution.
2. *Prepare a project proposal* – Researchers are required to provide detailed proposals which will be checked for clarity and whether it is appropriate to be granted access to the detailed micro-data.

3. *List research contributions of the research team members* – This information will help to determine whether research team members have the knowledge and ability to complete the research.
4. *Register the CVs of the team members of the SSHRC website*
5. *Complete the online application form on the SSHRC website*
6. *Evaluation of a proposal*
7. *Complete the security screening process*
8. *Sign a micro-data research contract with Statistics Canada*
9. *Review the policies and procedures of the Research Data Center*

Table 4.5 summarizes the Statistics Canada application approval process:

Table 4.5 - Statistics Canada Application Approval Process (Statistics Canada, 2011)

	Academic Proposal	**Commissioned within SC**	**Commissioned by Federal Department**	**Commissioned by provincial/territorial Department**
Application Submitted to:	SSHRC	MAD	MAD	MAD
Peer reviewed by:	SSHRC	STC/Academic	Federal Department (within academic inst.)	Provincial/terrirorial (within academic inst.)
Institutional reviewed by:	STC (SMD)	STC (SMD)	STC (SMD,DACS,DG,Mgr-MAD)	STC (SMD,DACS, Mgr-MAD)

Acronyms: Statistics Canada (STC), Micro-data Access Division (MAD), Social Sciences and Humanities Research Council (SSHRC), Director General of Census Subject Matter (DG), Subject Matter Division providing the data (MAD), Manager of Micro-data Access Division (Mgr-MAD), Data Access and Control Services Division (DACS)

On the other hand, countries such as Sweden and Germany have specific regulations for protecting data confidentiality while releasing data to researchers and authorized users. Table 4.6 shows the supporting legislation in the five OECD countries.

Table 4.6 - Sample of Supporting Legislation for Micro-data Confidentiality Protection

Country	Supporting Legislation
Germany	• Federal Data Protection Act • Data Protection Act of the Länder
United States	• Privacy Act • Confidential Information Protection and Statistical Efficiency Act • Freedom of Information Act • Title 13, United States Code
Canada	• Privacy Act • Personal Informational Protection and Electronic Documents Act • Statistics Act
Sweden	• Swedish Secrecy Act • Statistics Act • Swedish Secrecy Act
United Kingdom	• Personal Data Acts • Statistics and Registration Service Act • UK Statistics Authority Code of Practice

Comparison between available methods to access micro-data (Table 4.3) and the supporting legislation for micro-data confidentiality protection (Table 4.6) illustrates that Germany has made a significant improvement to the data and service available to researchers and has the most publicly funded research data centers amongst the United States, Canada, Sweden and the United Kingdom.

4.5.2 How are security and data confidentiality Ensured?

The security and confidentiality of micro-data in Canada are controlled at three levels: physical access, computer security, and disclosure review (Goldmann, 2010). However, the methods used to ensure confidentiality protection depends on the modes of access and data disclosure. There are three types of micro-data disclosure, including *attribute disclosure*, which occurs when micro-data is exposed and can be ascribed to an individual, thus care must be taken to examine all data for their anonymity; *identity disclosure* occurs when released data can be combined to obtain confidential micro-datasets (Goldmann, 2010). The risks of disclosure vary by the type of results produced. Data checked by RDC analysts

are carefully screened to ensure that confidentiality is not violated, thus satisfying researchers with their requirements.

4.6 Availability of Micro-data through Surveys and other Statistical programs

Overall, comparing surveys and statistical programs from each bench mark countries states that data compilation seems to be the area where less concerns are expressed which is derived from data collection obstacles. Low response rate and quality of data collected through surveys are the major weaknesses of the survey base micro-data collection for SMEs international activities. The volume of the data collected is also perceived as problem in five countries. Only three countries are concern with the volume of data compiled, including Canada; while others are concern about the quality of the data collected based on the accounting and financial standards, quality of data classification based on economic activity and cost of data validation, such as Germany. Confidentiality has also become a concern when collecting micro-data for SMEs' business and economic activities. Data quality and reliability are also questioned when data are collected using sample surveys.

Against all the identified concerns and obstacles, countries need to developed strategies to improve the existing situation and also develop plans for future data collection, especially survey strategies. To reduce the burden on respondents, countries increase the use of administrative sources in order to lead to a common data collection and overcome the issue of a unique questionnaire. Countries can also develop tools for better monitoring of the statistical response of enterprises. Shorter and clearer questionnaires, smaller samples, sample rotation and exclusion of smaller enterprises are some of the methods for overcoming problems with countries' surveys and statistical programs issues in making micro-data available to users. In addition, for more efficient use of administrative sources some countries, such as Canada and the United Kingdom, are building bridges between

different sources of data, i.e. register and survey data. For instance in Sweden administrative data replace business surveys every two years.

In all the countries statistical resources are not available to public and are not allowed to address SMEs' specific issues. Therefore, countries increase the use of administrative data and a complete inventory of available SME data. In summary,

- Issues of concern:
    - Data collection: all countries are facing extreme responsive issues; mostly countries face duplication in data collections.
    - Data compilation: low response rate, data quality concerns
    - Data dissemination: insufficient feedback to SMEs, data availability concerns, inadequate class size
- Key obstacles:
    - Low response rate
    - Sample size and quality of survey
- Strategies
    - Increase use of administrative data
    - Improve and enrich the data quality
    - Inventory of available SME data and sources
    - Improve Business Register

In summary, most of the data required by the policy makers for decision making purposes, is produced by statistical institutions through surveys, business register, and data analysis generated from business and organizations; thus, it is important to publish the most reliable information. As a result of the analysis, administrative data, also known as Business Register (BR), are the most promising micro-data sources for future research especially in the Canadian context. It is because of the following reasons:

- The BR (maintained by the Business Register Division) is the main source of information on businesses. Its role is to provide statistical offices with a complete and quality coverage of important variables, such as SMEs' number of employees, revenue, and total assets.
- The BR contains investigation, collection and response information for businesses. It maintains unduplicated, complete and up to date active SMEs.
- Data are extracted from administrative files and other surveys.

4.7 Summary

This chapter reported the available methods for researchers to access micro-data. Then, specific countries were evaluated based on the available access methods, legislation, and methods of protecting micro-data confidentiality. It proved that the main challenge for statistical offices is to ensure non-disclosure of confidential micro-data. The final part presented the availability of, and process for accessing, micro-data in Canada as well as methods of disclosure protection. The study confirmed that Statistics Canada is faced with challenges in order to meet researcher demand for micro-data. These challenges can be overcome either by using the currently-available methods and existing programs or finding ways to provide additional services without increasing costs, since Statistics Canada is also faced with budgetary constraints. The Statistics Act is clear on who can have an access to the open and restricted micro-data and the conditions under which this access can be provided.

Chapter 5

Discussion

5.1 Introduction

Official statistics are collected in most countries not only for government use but also for the research community which plays an important role in policy analysis and assessing business internationalization. In order to remain at the cutting edge of the research in IE field, researchers highly require high-quality micro-data to be available for researchers, economic analysts, and policy makers in order to allow them to answer complex questions and make policy decisions which are planned and evaluated on the basis of government micro-data. If they do not have access to official statistical data, researchers must attempt to collect their own data, which often turn out to be of lower quality and higher in cost. Providing access to micro-data collected by government and/or statistical institutions to researches is not only the way to reduce the cost of collecting official statistics, but also granting them more efficient official micro-data.

Ensuring the confidentiality of firms' micro-data is not only essential for legal reasons but also to maintain the trust of researchers and the public. It is important to increase public confidence that the available micro-data are being used properly and are highly protected and confidential. Confidentiality protection is the key to maintaining this trust and is the dominant issue from the perspective of statistical institutions. Additionally, statistical offices are also concerned about the cost of not only collecting micro-data and creating documents, but also the costs of protecting data by creating access tools and safeguards. Although costs are mostly covered by the budgets provided to statistical offices, there is no supplementary budget which can be used to pay for the costs of additional data collection,

protection, and access. Researchers are also not provided with any type of funding to contribute to these extra costs.

Overall, access to micro-data causes statistical offices a serious challenge. On the one hand, they need to provide researchers, policy makers and analysts with the best data available, on the other hand, they run the risk of disclosing confidential information which would damage the integrity of the statistical office and the willingness of respondents to engage with statistical institutions in future surveys and data collections.

5.2 Micro-data Access

There are several approaches to micro-data access depending on the characteristics of the data in question and the applied confidentiality. For example, confidential data are available through data centers, public scientific use files, on-site access, remote access or online access and public and special tabulations. These approaches provide anonymized data for a specified research topic within a specified period and to specified people (i.e. authorized researchers and/or granted and deemed employees). The dissemination of anonymized micro-data is an issue which has become an increasingly important research topic and requires various methods for accessing the data. Anonymized micro-datasets have also become important because of increasing interest from researchers in accessing them while reducing the risk of identifying individuals who contributed to the data. Therefore, the main driver related to researchers' interest in accessing the micro-data is the increased demand for activities, such as policy analysis, which require more in-depth information and analysis than what is possible with the datasets currently released by statistical organizations. However, there are problems with providing more detailed micro-datasets to researchers because of the confidential nature of the data so statistical offices are looking for solutions to maintain the confidentiality of the data while also providing researchers with the specific information they need. Most of the data collected by statistical offices and those used for official statistics have been obtained through studies guaranteeing confidentiality. Thus, protecting confidentiality and creating anonymized micro-datasets for access by researchers can help to

increase the security of the data. Some of the statistical offices have also intended to provide researchers with micro-datasets in which information content has been reduced sufficiently for the risk of identification to be minimal. Some datasets are also only available to academic researchers with relatively little bureaucratic procedure and significantly lower costs. Overall, statistical offices have developed various standard methods for increasing confidentiality protection of the business micro-datasets. Differences in accessibility methods reflect the conditions, attitudes, legal issues, and past practices found in different countries, as well as the degree of risk that would be acceptable in releasing micro-datasets (Nanoupolous & King, 2009).

Statistical agencies, such as Statistics Canada, the U.S. Bureau of the Census, and the German Federal Statistics Office, have the resources and legal standing for collecting sensitive micro-data from private businesses and individuals regarding their international activities (Duncan & Lambert, 1989). For much economic, social, and scientific research, the availability of trade and business micro-data is crucial. However, micro-data cannot be released without restriction. As discussed in chapters 3 and 4, Germany is among the OECD countries that have developed a variety of secure and convenient micro-data access methods and regulations which guarantee the confidentiality of the business micro-data for research purposes. Several micro-data centers and remote access labs make it easy for researchers to access the necessary micro-data from different countries; these methods not only increase the security of the data but also reduce collection and access costs and increase the efficiency and quality of the micro-data (Ichim, 2009).

5.3 Disclosure and protection techniques

In order for an individual to qualify for accessing micro-data they should be either a statistical office employee or non-employees who have received Special Sworn Status in countries such as the United States or become deemed employees in some other countries, including Canada. In order for a non-employee to be qualified to access micro-data, researchers must belong to a research or academic institution within OECD countries which

are subject to the pledge of confidentiality (Ichim, 2009). A detailed proposal is also required which must clearly state the purpose of the research and the methods to be used, as well as the required data, and must have a track record for working with sensitive and confidential data. However, there is no right of access to confidential business micro-data under the privacy acts and regulations unless through anonymized micro-datasets or if the researchers have been on the premises of OECD and had their output subjected to checks in order to assess whether they have maintained confidentiality in the past (Ichim, 2009).

Overall, disclosure and accessibility methods relating to micro-data vary from country to country and depend on matters such as legislation (Ahmad, Backer & Yoon, 2010). Some OECD countries, including those located in Northern and Western Europe, such as Sweden, the United Kingdom, and Germany, have strong legislation supporting confidentiality while others, such as Canada, have very few general privacy acts. In countries, such as Germany, where researchers have more access to their required data, statistical offices have built strong relationships with their micro-data users in order to promote the responsible use of the data. Such activities, which have created a trusted, protected, responsible, and educated micro-data user network, can be considered as best practice for other countries, especially Canada. In most cases, increasing trust is the main source of improving the confidentiality of the data which can be gained through educating users. Trust can be supported through methods, such as screening and training users and applying penalties for misconduct (Ahmad, Backer & Yoon, 2010).

Statistics Canada can increase the accessibility of micro-data by ensuring that their users are researchers from authorized academic, research, or government institutions who can provide a detailed proposal to demonstrate their need for accessing the data in question. Statistics Canada should then provide complete training programs to their users before they receive permission to access the data. These training programs support researchers with data protection techniques and legal processes to prevent the accidental disclosure of micro-data. The following recommendations can also increase the accessibility of micro-data to researchers through Statistics Canada:

- Access to micro-data should be easy and user-friendly.
- Access methods should be flexible and responsive to unpredictable changes in the micro-data and the supporting legislation.
- Micro-data access arrangements should respect legal rights and legislation.
- Micro-data should be compatible with specific quality standards; accessibility methods should be of especially high quality; methods, techniques, and instruments should be employed in the collection, archiving, and distribution of micro-data.
- There should be an improvement in the efficiency of scientific research and expensive and unnecessary duplication of data collection efforts must be avoided.
- The performance of micro-data access should be frequently evaluated in order to increase the support to data availability.

Corresponding to the above recommendations, Canadian statistical offices that make high quality micro-data available to researchers should also recognize legal constraints. The important factor to reinforce the international access to business micro-data is the development and distribution of best practice methods, including legislation and codes of practice.

5.4 Issues with Confidentiality Protection

A number of conclusions have been drawn from comparing accessibility methods and regulations in the five selected countries related to the issues that prevent statistical offices, especially Statistics Canada, from releasing confidential business and export micro-data and making them accessible to the research community despite the growing demand for business micro-data by researchers.

- A broad range of security policies for accessing micro-data are applied throughout the OECD region, while Canada itself has various specific pieces of legislation for improving confidentiality protection and the anonymity of micro-data.

- Definitions, language, and terms relating to micro-datasets differ between countries.
- Data models also differ from country to country; for example, Canada provides access to non-identifiable data.
- Different legislative models of micro-data access are used in OECD countries; some countries have easier rules and give data access to everyone through different access methods, such as Germany, while others restrict access to specific groups of users. Canada is among the countries with a tough and lengthy procedure (nine steps, as explained in chapter 4) for authorizing researchers to access the micro-data.

5.5 Conclusions and Recommendations

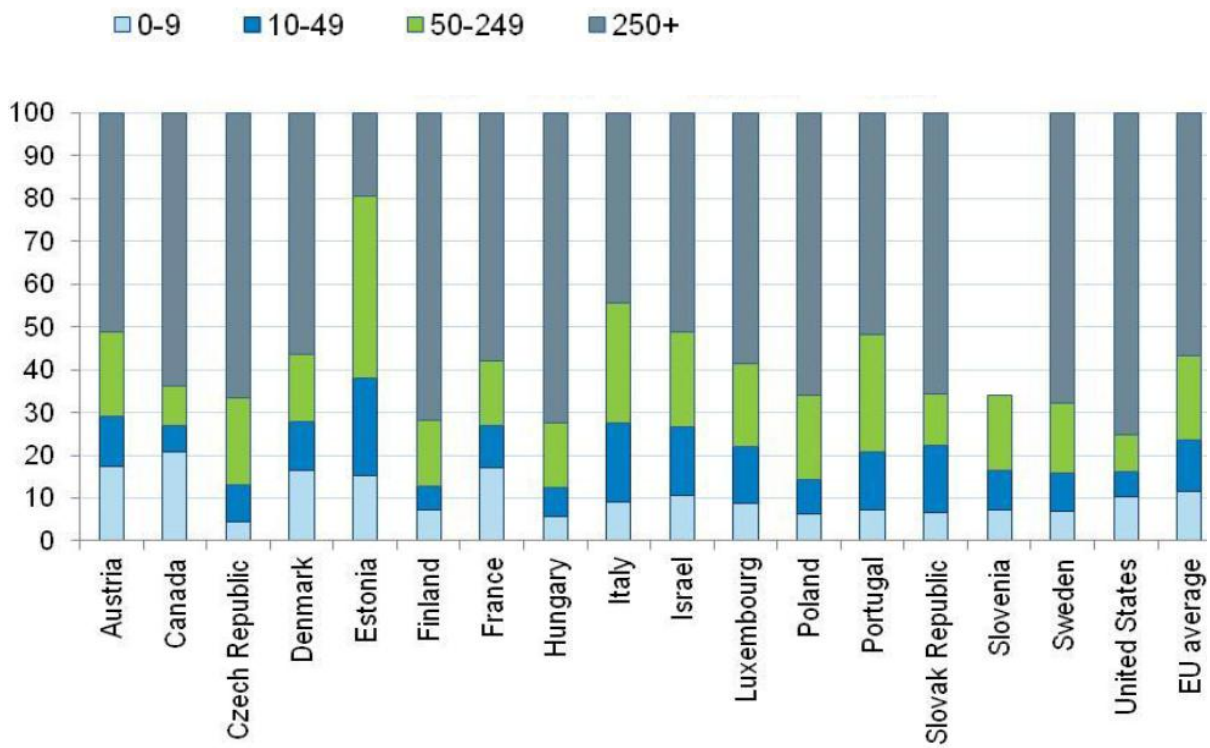
Overall, international access to Canadian micro-data is an important and necessary goal since researchers need secure access to high-quality and protected business micro-data. For managing the confidentiality of micro-data related to firms' internationalization, the availability of business micro-data should be consistent with legal arrangements to ensure the confidentiality protection of micro-data; the procedure for researchers to access micro-data, the use and users of micro-data should be made clear and publicly available (Hong & Lowry, 2007). Micro-data should also be available for statistical purposes; if the use of micro-data is incompatible with the statistical purposes then micro-data access should not be provided to researchers. A specific arrangement would be required to assist in the case of uncertainty about whether or not to provide micro-data to a researcher.

Although data access centers are well developed, they require some changes to make access easier in Canada, such as by creating more locations; for instance, the German FDZ-SOL has 16 local unites all over Germany where access to micro-data is available (Goldmann, 2003). Remote access processes have already been a successful method used by national and international statistical institutions located within the OECD (See Appendix J). The remote micro-data access method increases the full utilization of export micro-data while limiting the risk of disclosing confidential micro-data (See Appendix D). It provides

researchers with direct access to the micro-data at a specially arranged workplace within their own institution via a secure internet connection. Statistics Canada should also consider improving the use of this access method while addressing the related issues and finding technical solutions that comply with Canadian legal requirements.

Statistics Canada should also consider the availability of funding. Improved access to micro-data involves relatively high costs borne by researchers; therefore, providing funding would give researchers a lower initial cost when accessing micro-data. Funding also allows for the provision and usage of high-quality micro-data, which would help Canada to become an innovative provider of new ideas. It should be appropriate for micro-data collected for official statistical purposes to be used by researchers for statistical analysis as long as confidentiality is protected. Legal arrangements to protect confidentiality are required before releasing micro-data and legislation should clearly state the conditions for resealing micro-data, the conditions for using the micro-data, and the purposes for using them and the consequences for breaches of confidentiality.

Appendix A- Export values by Enterprise Size Class in OECD countries, as a share of total exports (OECD, 2005)



Appendix B - SMEs Basic Figures

Germany

	Number of Enterprises	Employment
Micro	1559595	4307401
Small	258391	4864478
Medium-sized	44490	4444863
SMEs	1862476	13616742
Large	9217	8729597
Total	1871693	22346339

United States

	Number of Enterprises	Employment
Micro	2390227	3531217
Small	148990	2954789
Medium-sized	22075	2286346
SMEs	2561292	8772352
Large	4815	5755612
Total	2566107	14527964

Canada

	Number of Enterprises	Employment
Micro	401028	757603
Small	27400	537181
Medium-sized	3962	388773
SMEs	432390	1683556
Large	852	878376
Total	433242	2561933

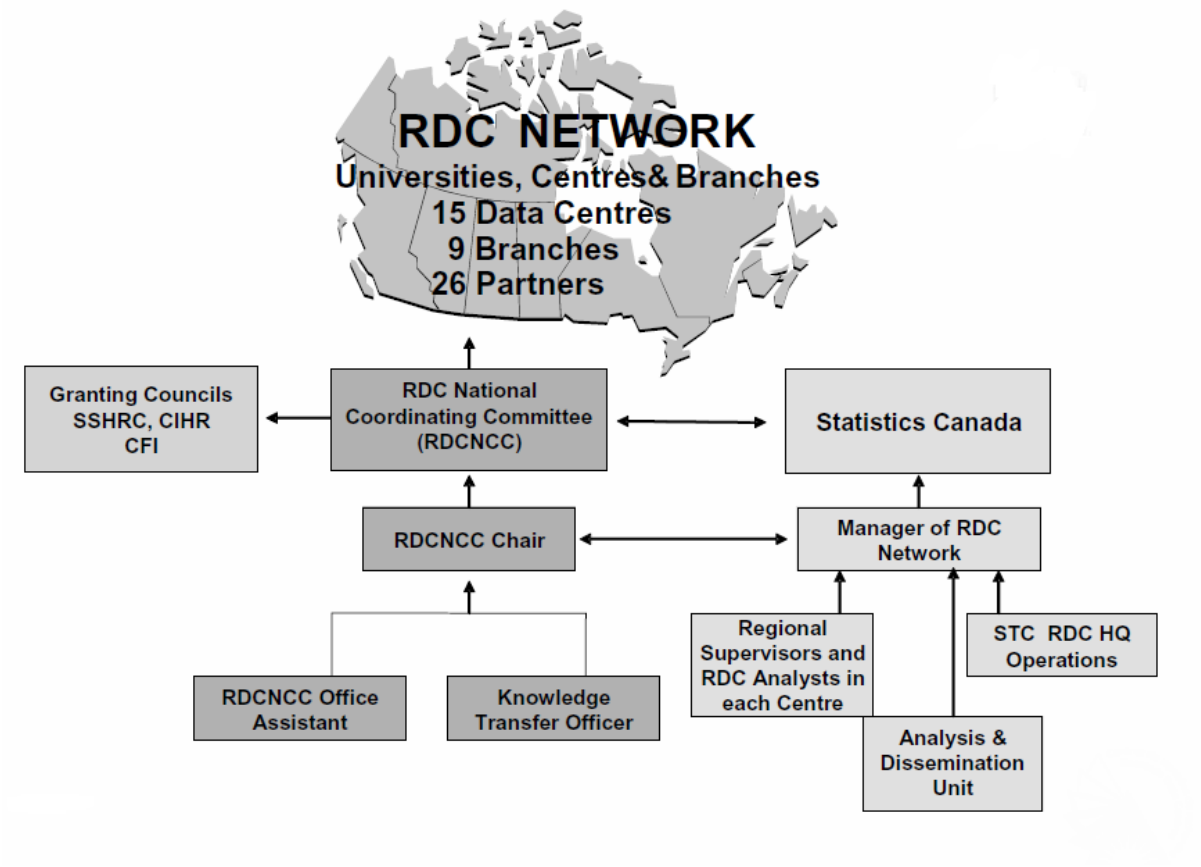
Sweden

	Number of Enterprises	Employment
Micro	554202	709499
Small	26707	619007
Medium-sized	4712	526768
SMEs	585621	1855274
Large	987	1033556
Total	586608	2888830

United Kingdom

	Number of Enterprises	Employment
Micro	1466304	3978629
Small	166842	3118346
Medium-sized	26800	2708026
SMEs	1659946	9805001
Large	5973	8372209
Total	1665923	18177209

Appendix C - Structure of the Canadian Research Data Center Network



Appendix D - Location of Research Data Centers and Branches in Canada

Appendix E – Canada[1]

1. **Name of institution:** Statistics Canada/Statistique Canada.

Nature of institution: Statistical office.
Contact information: Small Business and Special Surveys Division and Unité des petites enterprises.
Web site of the institution: www. Statcan.ca
Other institutions responsible for producing the statistics: Industry Canada Small Business Research And Policy Branch.
Contact information for other institutions: www.ic.gc.ca

2. **Legal arrangements governing data collection**

Statistical data is collected in conformity with the requirements of the Statistics Act.

Obligation to reply

The legislation which assigns to Statistics Canada its wide scope for data collection also makes it mandatory for all respondents to provide the information requested unless an order is obtained to make response voluntary. The Act considers refusals or the provision of false or misleading information as criminal offences subject to penalties. Although the legislation does not contain one clearly articulated provision that conveys the obligation of respondents to provide requested information, the Agency relies on a combination of sections to establish that obligation. Guidelines to help determine which survey should be mandatory and which to carry it out on a voluntary basis upon a ministerial order have been developed. They form part of the Policy on Informing Survey Respondents.

Legislation on confidentiality

Two provisions of the Act underline the core character of the confidentiality commitment the Agency makes to its respondents and reinforce its application in actual practice. One provides that each employee must swear an oath not to divulge confidential information and the other provides penalties for breaches of confidentiality. The legislation makes a formal commitment to respondents that the information they provide will never be released to anyone in a form that will identify them without their authorization.

3. **Criteria used to determine size classes**

Number of employees and turnover together with some legal form determine size classes.

[1] **Source:** OECD. (2004). SME Statistics: Toward a More Systematic Statistical Measurement of SME Behaviour. *2nd OECD Conference of Ministers Responsible for Small and Medium-Sized Enterprises*. Istanbul, Turkey.

4. **Databases on enterprises by size class**

- Survey on Financing of Small and Medium Enterprises (SME)
- Small Business Profiles (SBP)
- Employment Dynamics (ED)
- Labour Force Surveys (LFS)
- Longitudinal Employment Analysis Program (LEAP)

5. **Reference unit**

Collection of data
Administrative information + triennial sample surveys + monthly surveys + data linkage

Methods of collection

1) Administrative information - Details of businesses that have a business number with CCRA - Canada custom and Revenue Agency.
2) Survey Feedback - Frame changes detected by statistical programs during the conduct of their respective inquiries.
3) Profiling - Inquiries designed to maintain the Business Register up to date.

Frequency of the collection

The Business Registry is updated once a month. New businesses and businesses that have ceased activities are identified by processing the current version of the Business Number file from the Taxation Authorities. All businesses are updated on a continuous basis using survey feedback and results of frame inquiries.

Agency collecting the data: Statistics Canada.

6. **The SME business frame is based on**

SME business frame based on Statistical sources.

7. **Sources of data**

Reference unit for source of data: Enterprise.
THE BUSINESS REGISTER: is a structured list of businesses engaged in the production of goods and services in Canada.

Appendix F – United States[2]

1. **Name of institution:** Bureau of the Census (US Department of Commerce).

Nature of institution: Statistical Agency
Contact information:
Address: 4700 Silver Hill Road, Washington DC 20233
Telephone: +1-301-763-2558
E-Mail: webmaster@census.gov
Web site of the institution: www.census.gov
Other institutions responsible for producing the statistics
The Office of Advocacy at the US Small Business Administration sponsors the .Statistics of US Business. Series of reports, which present annual data on enterprises by size class. The Census Bureau compiles these reports using data on hand from its business register and from the economic census.

Contact information for other institutions

Office of Advocacy
US Small Business Administration
Address: 409 3rd Street SW
Washington, DC 20416
Telephone: +1-202-205-6533
E-Mail: advocacy@sba.gov
Web Site: http://www.sba.gov/advo/

2. **Legal arrangements governing data collection**

Title 13, United States Code

- Section 131 gives authority for the economic census (covers years ending in .2. and .7.)
- Section 182 for surveys that furnish annual and other interim current data on the subjects covered by the census
- Section 193 for other preliminary and supplemental statistics

[2] **Source:** OECD. (2004). SME Statistics: Toward a More Systematic Statistical Measurement of SME Behaviour. *2nd OECD Conference of Ministers Responsible for Small and Medium-Sized Enterprises*. Istanbul, Turkey.

Obligation to reply

Title 13, United States Code, Section 224 provides mandatory collection authority for the economic census and most annual economic surveys; however, most other sub-annual economic indicator surveys do not have mandatory authority.

Legislation on confidentiality

Title 13, United States Code has the following confidentiality provisions regarding the Census Bureau.s Collections.

Section 9. Information as Confidential; Exception

Neither the Secretary, nor any other officer or employee of the Department of Commerce or bureau or agency thereof, or local government census liaison, may: (1) use the information furnished under the provisions of this title for any purpose other than the statistical purposes for which it is supplied; or (2) make any publication whereby the data furnished by any particular establishment or individual under this title can be identified; or (3) permit anyone other than the sworn officers and employees of the Department [of Commerce] or bureau or agency thereof to examine the individual reports.

No department, bureau, agency, officer, or employee of the Government, except the Secretary [of Commerce] in carrying out the purposes of this title, shall require, for any reason, copies of census reports which have been retained by any such establishment or individual. Copies of census reports which have been so retained shall be immune from legal process, and shall not, without the consent of the individual or establishment concerned, be admitted as evidence or used for any purpose in any action, suit, or other judicial or administrative proceeding.

Section 214. Whoever, being or having been an employee or staff member referred to in subchapter II of chapter 1 of this title, having taken and subscribed the oath of office, or having sworn to observe the limitations imposed by section 9 of this title, or whoever, being or having been a census liaison within the meaning of section 16 of this title, publishes or communicates any information, the disclosure of which is prohibited under the provisions of section 9 of this title, and which comes into his possession by reason of his being employed (or otherwise providing services) under the provisions of this title, shall be fined not more than $5 000 or imprisoned not more than 5 years, or both.

3. Criteria used to determine size classes

Number of employees, number of persons engaged and turnover together with legal form determine size classes.

4. Databases on enterprises by size class

Statistics of US business, a statistical product sponsored by the US small business administration and compiled by the census bureau, presents summary data for enterprises by size class. Similarly, the census bureau's annual county business patterns series present summary data for establishments and/or enterprises by size class. These products generally are available from web sites in electronic, downloadable formats, but they are not databases per se. Please see: Statistics of US business: Http://www.sba.gov/advo/stats/data.html

5. Variables

Number of enterprises, Number of establishments, Employment, Payroll

6. Sources of data

Reference unit for source of data: Establishment (enterprise) derived from establishments. For administrative sources: taxpaying entity: employer identification number

i. Census: title and main characteristics Economic census.
ii. Administrative source: title and main characteristics

Tax information from the Department of the Treasury, Internal Revenue Service (IRS):
1) business master file (master list of business taxpaying entities):
2) payroll tax returns:
3) business income tax returns:

7. Dissemination

a. Dissemination of SME designed by: Joint venture.
b. Strategy for SME stats compared to other business statistics

Specific interest in SME statistics comes from and through the US Small Business Administration (SBA). The census bureau works cooperatively with the SBA to produce statistical products (all based on existing general-purpose economic data; we have undertaken no collections that target SMEs specifically) that answer the needs of the SBA. The SBA, in turn, is in touch with small businesses and with users of SME statistical data and acts as an advocate for their interests.

c. Overall strategy for demand on SME stats: Nature and level of interest unknown.

Appendix G - Sweden [3]

1. **Name of institution:** Statistika centralbyran. Statistics Sweden

Nature of institution: Statistical office
Contact information: Karlavägen 100, Klostergatan 23
Web site of the institution: -

2. **Criteria used to determine size classes :** number of employees and balance sheet

3. **Reference unit:**

Statistical units: Institutional unit, Enterprise, kind- of activity unit (KAU), local KAU, and enterprise

4. **The SME business frame is based on**

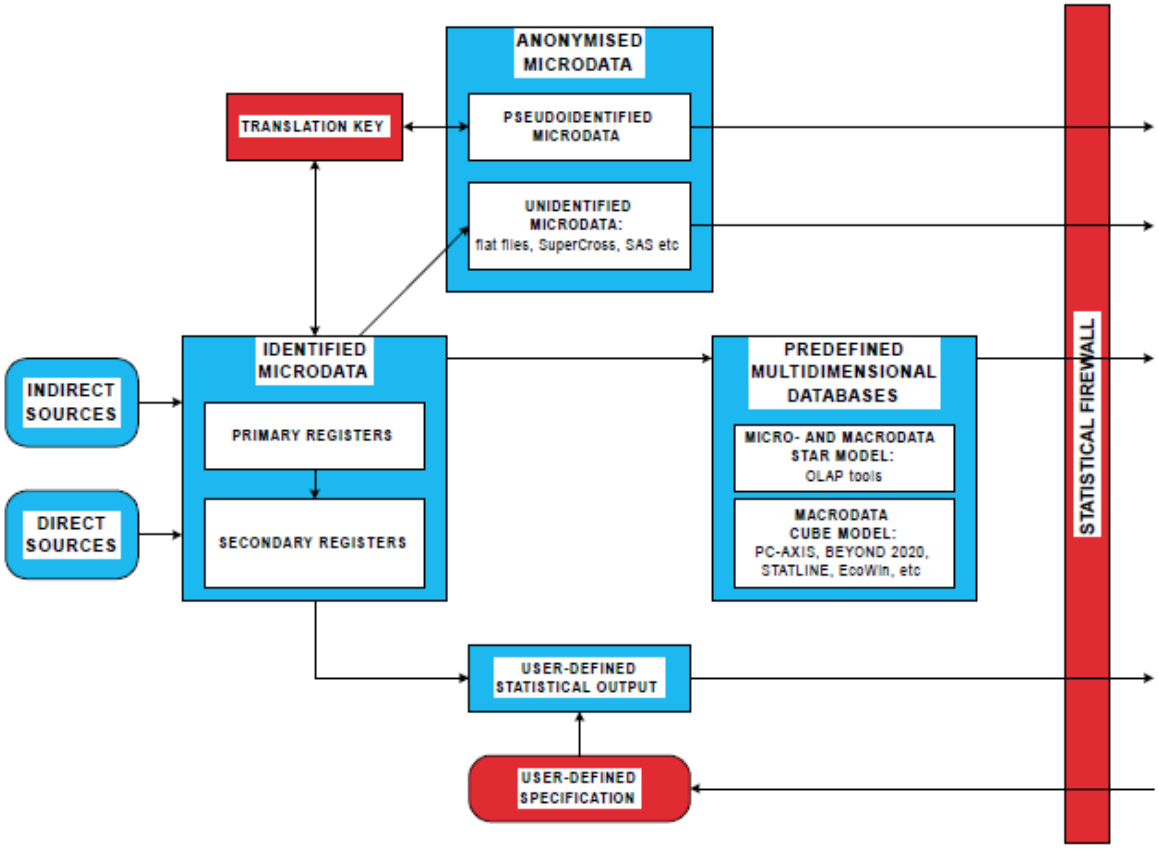
SME business frame based on: brings together several sources
Business frame additional comments: Data Sources for principal activity
An enterprise at birth: Every newly registered legal unit carries a code for its principal activity (by NACE rev.1) as it enters the Business Register (BR) at Statistics Sweden (SCB). This code is provided by the Swedish National Tax Board, and based on information from an .activity declaration. Which is mandatory for every person or group of persons who wants to register a new legal unit in Sweden? As the new legal unit enters the BR the system automatically generates one local unit, one local kind of activity unit, one kind of activity unit and one enterprise unit. All of these units, together with the Structural Business Statistics Survey + Administrative data: SRU (Standardized annual company reports)

Reference documents: Business Register

[3] **Source:** OECD. (2004). SME Statistics: Toward a More Systematic Statistical Measurement of SME Behaviour. *2nd OECD Conference of Ministers Responsible for Small and Medium-Sized Enterprises*. Istanbul, Turkey.

Appendix H- Access to processed statistical micro-data via a statistical firewall

"It visualizes how a more general and more automated monitoring of the confidentiality and availability of statistical data could be implemented at a statistical office like Statistics Sweden. A fundamental software component is the so-called statistical firewall. It will ensure that only anonymised micro-data and macro-data that satisfy disclosure risk criteria set by the responsible producer will be released to external users" (Sundgren, 2001, p. 295).

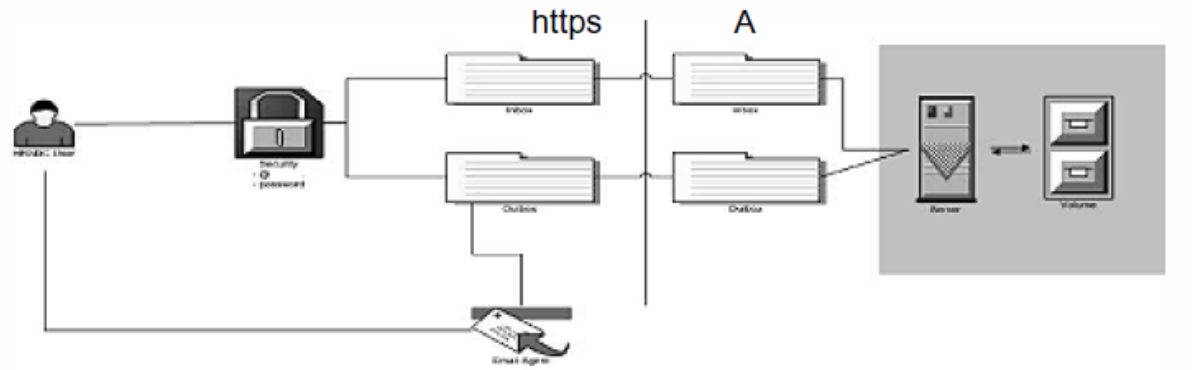


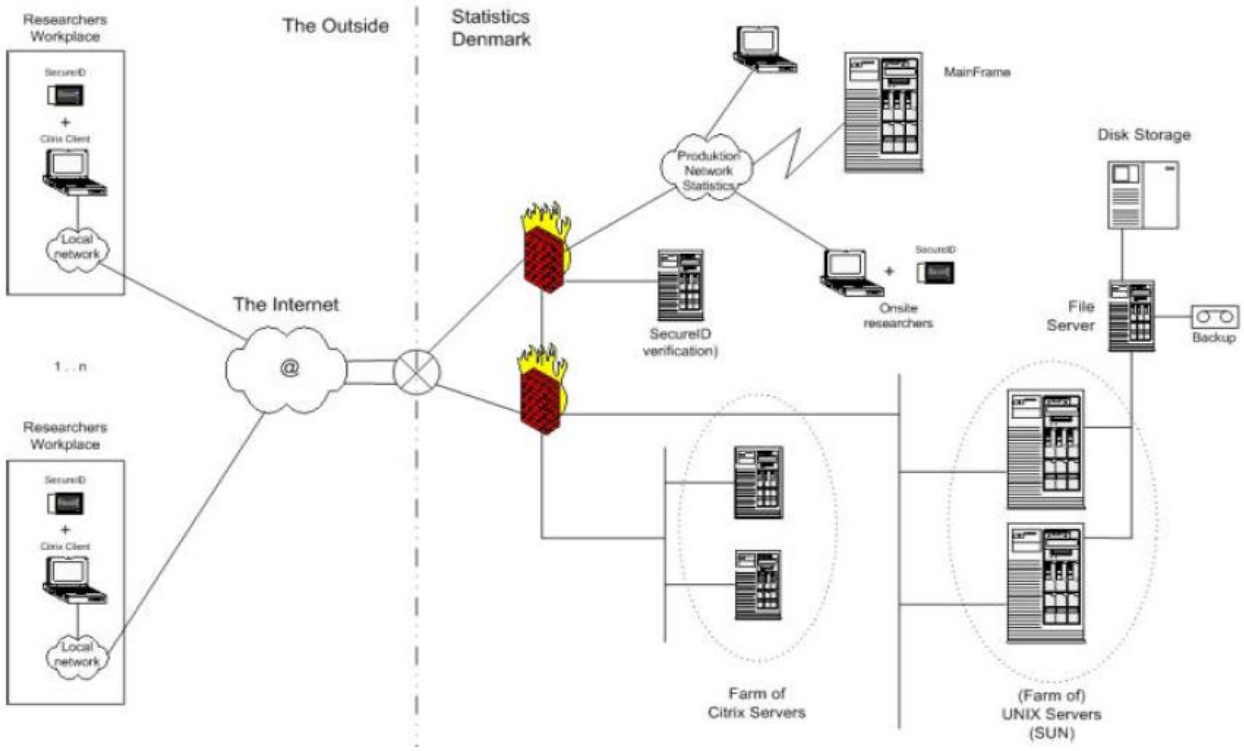
Appendix I - Current status of the most common modes of Access in OECD countries

	Public use files	Scientific use file	Public tabulation	Secure remote access	Onsite safe centers/ research data centers
Business Data	▒	▓	▉	▓	▓
Other economic and financial data	▒	▒	▓	▒	▒

▉ >9 countries ▓ 6-8 countries ▒ 3-5 countries ▒ < 3 countries

Appendix J - Real-time remote access service





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