

Global Value Chains in Canada

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Introduction

Intuitively, the idea of global value chains (GVCs) is relatively easy to understand - making a product or delivering a service involves many steps and increasingly these steps are separable and can be located anywhere in the world based on where it is most efficient to perform. Formalizing this simple concept, however, is much more challenging and developing measures has proven even more difficult. In this chapter, we analyze and explore data coming out of the recently completed Survey of Innovation and Business Strategies (SIBS) with a view to better understanding how Canadian companies are engaged in GVCs and the barriers that they face when in participating in GVCs. We also, to the extent that it is possible, compare the results for Canada to those from the EU as well as attempt to call on other sources of data to provide a better understanding of global value chains in Canada.

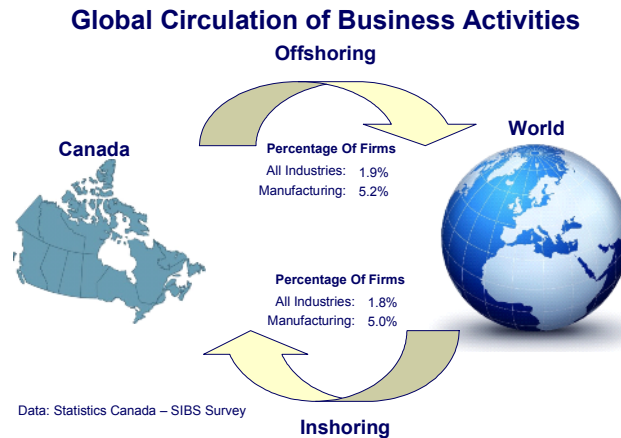
Trends in Offshoring and Outsourcing in Canada

The concepts of offshoring and outsourcing are intimately related to GVCs. If “global value chain” is the noun that describes how activities are organized globally, offshoring and outsourcing are the verbs that describe the movement of activities in and out of the country. Offshoring is essentially the movement of an activity outside of the country but the activity continues to be performed within the ownership structure of the firm. For example, a manufacturer located in Canada who opens an assembly plant in a foreign country would be considered to be offshoring the activity of goods production. Inshoring is the opposite of offshoring in that the activity that was once performed in a foreign location is moved into Canada. In contrast, outsourcing implies that that the activity is now being purchased from a supplier external to the firm. For example, a company located in Canada contracts a firm to supply it call center services from a foreign location, in this example, it would be outsourcing of call center services. While outsourcing does not necessarily require the source to be foreign, in our analysis, outsourcing will be synonymous with foreign

		Ownership	
		Within the Firm	Outside the Firm
Nationality	Within the Country		Domestic Outsourcing
	Outside the Country	Offshoring	Offshore Outsourcing

outsourcing (sometimes referred to as offshore outsourcing). Like offshoring, outsourcing has an opposite in the form of insourcing, when a foreign supplier is replaced by a domestic one.

Although there has been a great deal of attention given to offshoring and outsourcing in the media and in policy circles, it turns out that both of these trends are fairly rare. Possibly even more importantly, the trends appear to be much more circular than is commonly thought; a roughly similar number of activities appear to be moving into Canada as out.



For companies located in Canada (including foreign companies located in Canada)¹, between 2007 and 2009, only 1.9 percent of companies offshored a business activity. For manufacturing the rate was more than twice as high but still only 5.2 percent. What may be more striking though is that the movement is much more of a circular movement rather than a one-way outflow. A nearly equal number of firms moved activities into Canada as moved activities out; 1.8 percent of firms overall and 5.0 percent of manufacturers “inshored” activities. Unfortunately the data does not allow us to know the actual value of what was offshored or inshored or the employment associated with those movements and therefore we cannot know to what extent the scale of one is greater or less than the other, but we are clearly left with a picture of a small number of firms moving activities, and are nearly as likely to be moving activities into Canada as out. The scale of activities being moved in terms of their value or employment is an important missing element of this picture as there is a considerable difference in these trends by size of firms. 10.9 percent of large firms, for example, offshored some activities while only 2.4 percent of medium and 1.2 percent of small firms did so.

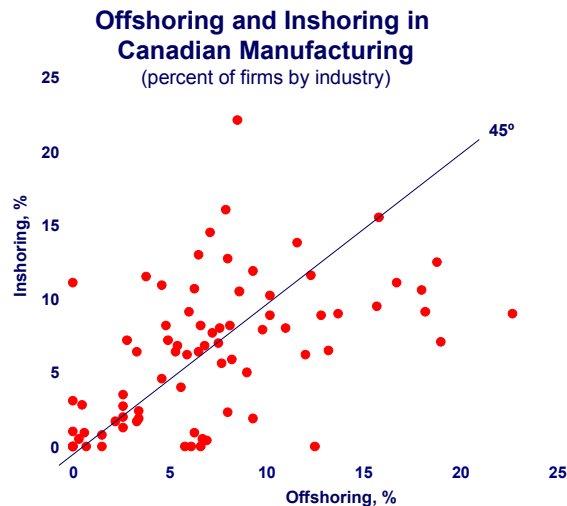
¹ Throughout this analysis, we will often refer to “all industries” for simplicity. The SIBS survey, however, excludes a number of industries, mostly (although not exclusively) those with a high share of public sector involvement such as public administration, education and healthcare. For more details on the industries covered in the SIBS survey, please refer to Annex 1.

In terms of industries, there is a high degree of correlation between offshoring and inshoring. This suggests that some industries are simply more footloose than others and as a result are more likely to move activities both out of Canada as well as into Canada. Within the manufacturing sector, these industries include those producing electronics and related products such as household appliance manufacturing industry, telephone apparatus manufacturing and radio and television broadcasting equipment, but also includes transportation equipment manufacturing, and some specialized machinery manufacturing.

The number of industries for which there is net offshoring (percent of firms indicating that they offshore is greater than the number who inshore) only slightly outweighs the number of industries for which there is net inshoring. Within manufacturing the number of firms moving activities into Canada is greater than those moving activities out of Canada in motor vehicle manufacturing, broadcasting equipment manufacturing, communications equipment manufacturing, pharmaceutical manufacturing as well as a number of resource processing sectors. The reverse is true (net offshoring) mainly in electronics producing industries. Again, caution must be used in interpreting the figures as they indicate only the percentage of firms performing the activity and not the scale.

As already noted, larger firms, with their greater experience in operating globally, are far more likely to move activities...both in and out of Canada. From 2007 to 2009, 17.6 percent of large manufacturing firms relocated activities out of Canada while 12.1 percent moved activities into Canada compared to only 3.1 percent and 3.5 percent respectively for small firms. These figures also highlight the importance of scale. While large firms were much more likely to offshore activities compared to inshoring activities (17.6% compared to 12.1%), small firms were more likely to do the reverse (3.1% for offshoring compared to 3.5% for inshoring). In terms of numbers, small firms carry significant weight, but likely much less so when values or employment are considered.

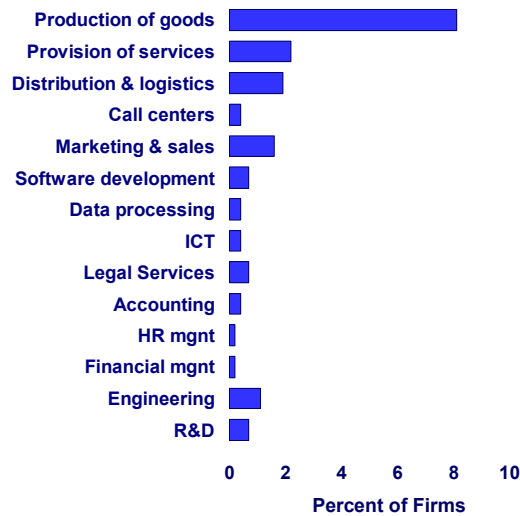
A key aspect in the conceptual framework of global value chains is the idea of activities. While we traditionally talk about industries (such as the electronics industry) or even firms within an industry, each industry or firm undertakes a series of similar activities. For example, most firms will need to worry about financing, human resource management (HR), information and technology management, legal issues and so on. For some firms, and especially the larger ones, these will be handled more formally with a specific person designated to deal with those issues, or for the largest firms, they could have entire divisions to handle such activities. For smaller firms, the owner or manager may handle many, if not all, of those activities. Within a global value chains framework, what becomes



Data: Statistics Canada – SIBS Survey

important is whether the firm performs these activities within the firm and within the home country, or if they are undertaken outside of the home country (offshored) or outside the firm (outsourced). One might also ask why different firms organize themselves in different ways and how this contributes to their competitiveness and productivity. The Survey of Innovation and Business Strategy (SIBS) identifies fourteen business activities that are thought to be integral to the operation of most firms and are key to understanding offshoring and outsourcing.

Outsourcing of Business Activities In Manufacturing

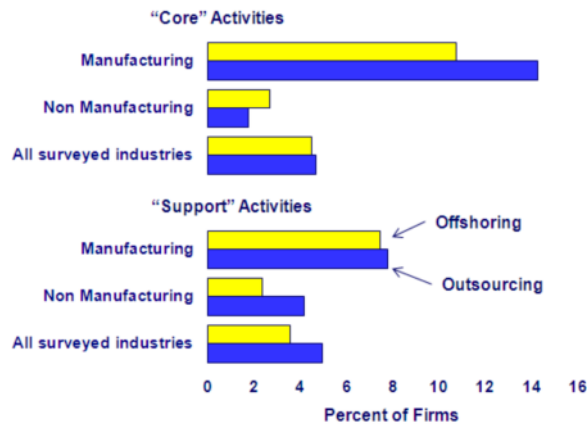


Data: Statistics Canada – SIBS Survey

Of the fourteen activities

identified in the survey, two could be considered “core” in that they are the primary activity of the firm which are the production of goods for goods producing industries and the provision of services for service industries. This is in contrast to other activities which could be considered “support” activities in that most firms would perform these activities, but they are not the primary activities of the firm. These include such as activities and human resource management (HR), accounting and IT support.² Overall, there is not a

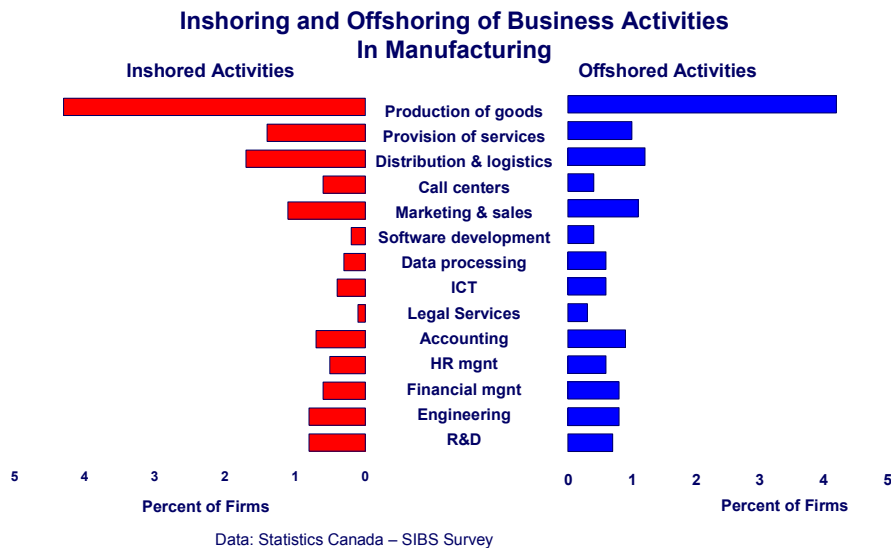
Offshoring and Outsourcing in Canada



Data: Statistics Canada – SIBS Survey

large difference for offshoring and outsourcing between core and support activities. There is a modest preference in favour of outsourcing support activities compared to offshoring which is not unexpected given that firms could more easily contract out these types of activities. Manufacturers are much more involved in offshoring and outsourcing than are other industries which may stem from a higher level of competition in these highly tradable industries forcing them to look for any cost advantage possible. It is also

² The concept of “core” and “support” activities is taken from the EuroStat survey on offshoring and outsourcing.



notable that manufacturers more actively offshore and outsource core activities and in particular the production of goods. This may, in fact, suggest that the idea of core and support activities does not fit with the reality. Manufacturers may, for example, believe that research and development, marketing or brand management are much more their core activities rather than actual production.³

Looking at the fourteen activities covered in the survey in more detail, the most footloose activity (the activity most likely to be offshored or inshored) by manufacturers, as already noted, is the production of goods. In terms of offshoring, the production of goods was nearly four times as likely to be offshored as the next most footloose activity; distribution and logistics. For inshoring, it was about three times, based on the number of firms offshoring or inshoring that activity. Thus, here too the data sheds light on the debate in the media and policy circles; despite the focus on the increased tradability of services, it is the production of goods that remains the most internationally mobile activity - and by a wide margin. Additionally, and based on the number of firms, there is a tendency towards net inshoring with 4.3 percent of manufacturing firms inshoring the production of goods compared to 4.2 percent offshoring.

Other activities demonstrating a tendency for net inshoring are service provision as well as distribution and logistics, call centers, and R&D. Data processing, ICT, Legal and Accounting, are among those with net outward movements.

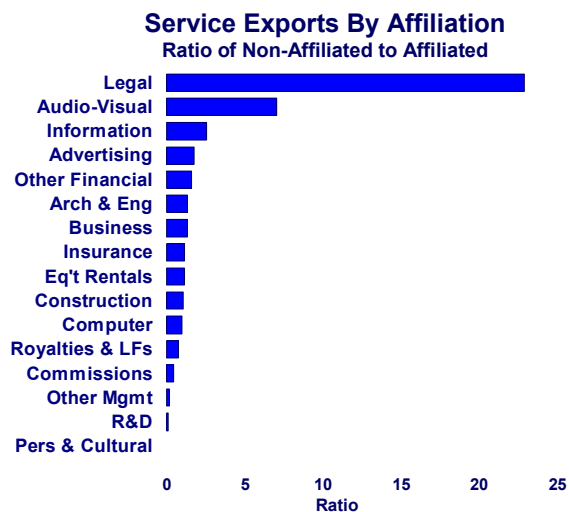
Outsourcing involves buying a good or service from abroad at arm's length (not produced within the ownership structure of the firm) and generally under a contract. Not surprisingly, this is far more common than offshoring as it does not involve equity ownership of operations abroad. Overall, 4.1 percent of firms outsourced between 2007 and 2009, but the share was much higher for manufacturers, of which 10.1 percent outsourced over that period. Nearly double the share of firms which offshored over the same period.

³ This would appear to be the case for Apple, which contracts out most of its production but the well-studied examples of the ipod and iphone demonstrate that most of the value of these products comes from innovation, design and marketing.

Like offshoring, by far the most common activity to outsource by manufacturing firms was the production of goods. This was followed by the provision of services, distribution & logistics, and marketing & sales.

By comparing the trends in offshoring and outsourcing these results also reveal information about the types of activities that manufacturers tend to like to do themselves abroad and those that they are willing to buy at arms length. For manufacturers, legal services are far more likely to be purchased at arm's length. This is a reassuring result given the known preference for frequently hiring outside legal council, particularly in foreign markets. There is also a strong preference for contracting the provision of services, production of goods, distribution & logistics, and marketing & sales. Alternatively, companies are more likely to keep financial management, HR and accounting internal.

This overall trend can be confirmed through alternative data sources. Canada is one of the few countries that collects data on services trade by affiliation; whether the services trade occurs between parties that are wholly or partially owned by a common parent. It is doubly useful in that it measures the value of transactions rather than the number of firms, as is the case with the SIBS data. Taking the ratio of the value of non-affiliated to affiliated trade reveals a strikingly similar pattern to the SIBS data. For those service activities that have similar definitions between the two sources, legal services stands out as being dominated by arms-length transactions, as does advertising services. On the other hand, other management services, which would include accounting and HR services, stands out as being done largely within the structure of the firm; that is more affiliated trade than non-affiliated trade. While the chart depicts only service exports, the trend is nearly identical for service imports with a correlation coefficient of 0.977 between the ratios for the two.



Data: Statistics Canada, data for 2008

Firms which either outsourced or offshored activities indicated that by far the most important reason for doing so was cost. Reduction of non-labour costs was indicated as the most important factor while reduction of labour costs, was ranked second. This was also the case for manufacturers and non-manufacturers alike. Although substantially less important than costs, manufacturers cited access to new markets as the third most important factor while non-manufacturers chose access to specialized knowledge and technologies as third. Both groups indicated that lack of available labour and tax or other financial incentives were not particularly important factors. This paints a fairly clear picture of the drivers of outsourcing. These results clearly show that, and as one might expect, the most important factor driving firms to outsource is indeed costs. This also supports the view that it is predominantly pull factors that drive offshoring and outsourcing; the emergence of large supplies of low cost labour as well as large and growing markets that

are driving offshoring and outsourcing, rather than push factors that make Canada an unappealing location from which to do business. Again, this would be consistent with the earlier findings that these movements are a circular flow and not a one-way exodus.

When conducting offshoring our outsourcing roughly one-fifth of firms indicate that they encountered obstacles in doing so. Interestingly, the proportion was about the same for small firms compared to the average. For respondents overall, foreign legal or administrative obstacles

Top Obstacles when Offshoring or Outsourcing*

Obstacle	% of Firms
Distance to producers	55.5
Identifying providers	54.9
Language or cultural	45.1
Tariffs	43.9
Foreign legal or admin	41.3
Lack of mgmt expertise	37.4
Cnd Legal or Admin.	33.4
Distance to customers	32.7
Concerns of employees	32.0
Lack of financing	30.5
Tax	25.0
International standards	24.5
Social Values	20.4
IP	8.3

*Those indicating medium or high motivation, manufacturers.
Data: Statistics Canada – SIBS Survey

Top Motivations for Offshoring or Outsourcing*

Motivation	% of Firms
Non-Labour Costs	69.4
Labour Costs	67.3
Access to Knowledge	43.9
New goods or services	41.5
Access to New Markets	37.8
Focus on Core Business	37.7
Delivery Times	34.3
Logistics	26.5
Following comp or clients	24.9
Lack of Labour	24.6
Tax or Financial	18.1
Other	5

* Those indicating medium or high motivation
Data: Statistics Canada – SIBS Survey

were identified as being the most significant obstacle followed by language or cultural barriers and distance to producers. For manufacturers (shown) the priorities were somewhat different. Distance to producers was identified as the most important barrier followed by difficulties in identifying potential or suitable providers and language or cultural barriers.⁴ For both groups, sourcing providers and dealing language and cultural issues and foreign legal or administrative issues were identified as being significant which supports the role of the Canadian trade commissioner service (TCS) in overcoming obstacles such as these. Tariffs also rank among the top for manufacturing firms suggesting the need for continued tariff reductions. Interestingly, concerns about conflicting with social values, concerns of employees and IP concerns were all identified as least important for both groups

⁴ These indications of obstacles are based on combining high and medium responses. There are some instances, however, where a response was marked high for a significant share of respondents without a correspondingly large medium share which lowers the overall score for that response. Specifically, for all industries, Canadian legal or administrative barriers would be ranked first based on high responses alone, while tariffs would have been ranked second for manufacturers. This may indicate that while these obstacles were not as wide spread, for the firms that faced them, they were extremely important.

which may point to the ability of firms to address those issues themselves.

It is important to note, however, that these aggregate results disguise more specific results. Even though concerns with intellectual property (IP) is listed last, this was an important concern for a number of R&D intensive industries such as Aerospace and information and communications technologies. Similarly, it must be remembered that the single most important destination for offshoring and outsourcing by companies in Canada is the U.S. which would be expected to pose very different obstacles compared to low-wage destinations.

Offshoring and Outsourcing in Europe

Eurostat, the statistical agency of the European Union, was the first statistical organization to design an economy-wide survey of offshoring and outsourcing. The survey was then implemented on a voluntary basis in 13 European countries. The Eurostat survey served as an important model for the design of the global value chains portion of the SIBS survey undertaken in Canada. It is important to note when comparing results, however, that there are also a number of differences between the two surveys. The Eurostat survey, for example, covers only enterprises with more than 100 employees while the SIBS survey normally covers enterprises with more than 20 employees, although for the following comparisons, the SIBS data was modified to conform to the Eurostat standard. The Eurostat survey covers most of the economy excluding only the financial sector while the SIBS survey also excludes a number of sectors with high levels of public sector involvement such as education, healthcare and public administration as well as travel, tourism and cultural industries. Finally, the Eurostat survey asks about offshoring and outsourcing trends between 2001 and 2006, for the SIBS survey the point of reference is from 2007 to 2009.⁵⁶

Overall, companies in Canada appear to be somewhat less engaged in international sourcing than companies in the EU and far below that of Ireland, the UK and Denmark. One would expect there to be a correlation between the level of offshoring and outsourcing and the size of an economy. Larger countries can source a greater share of inputs from domestic markets and thus would be expected to participate less in global sourcing, all else being equal, just as larger countries tend to have a lower trade to GDP ratio. The data supports this



* 100 or more employees, 2007-2009 for Canada, 2000-2006 for EU

⁵ For a more thorough discussion of the global value chains portion of the SIBS survey, please refer to Annex 1. For more information on the Eurostat survey, refer to “International Sourcing in Europe” by Pekka ALAJÄÄSKÖ.

⁶ Note that all estimates for the EU as a whole that are reported in this section are estimates based on those EU members which participated in the survey.

to an extent; Italy and Germany both have relatively low levels of international sourcing compared to other EU countries, while the small countries tend to have higher levels. There are a few notable exceptions to this, however, such as Sweden and to a lesser extent the Netherlands, which one might expect to have higher levels of international sourcing, while Ireland, and especially the UK given its domestic size, show very high levels of international sourcing. Language may account for some of these differences, as smaller countries with non-widely spoken languages may face a natural barrier to offshoring and outsourcing while the opposite may be true for widely spoken languages and English in particular. Differences in industrial structures may also account for some of the difference. Still, given its size, Canada stands out as participating less in international sourcing.



Part of the explanation for this result, however, is less participation in international sourcing outside of manufacturing. Manufacturers in Canada appear to be just as engaged in international sourcing as their EU-based counterparts. But, outside of manufacturing Canada has among the lowest rate, less than only Italy and Sweden and only about half the level of the EU average. For manufacturing, but especially for non-manufacturing sectors

Ireland and the UK stand out for their particularly high levels of international sourcing. It is important to remember that there were important differences in the sectors covered by the two surveys, especially outside of manufacturing, and also different time-frames. But it is not clear how these differences would result in such a low rate of international sourcing for Canada compared to EU levels. A notable similarity between the Canadian case and that of the EU is that for both, the top partner for international sourcing is not low-wage countries but a close-by and rich partner; for Canada this was the U.S. while for European respondents it was other EU countries.

Another notable trend is that continental EU countries, for whom data exists, with the exception of Denmark, demonstrate a notable preference for offshoring compared to outsourcing. The reverse is true, however, for Canada and for the UK. For Ireland the two are even. It may be that Anglo-Saxon managers are more disposed to offshoring and outsourcing in general and between the two have a preference for outsourcing. It may also

be possible that Anglo-Saxon countries are generally more open to trade, but either of these two hypotheses would need to be confirmed with more rigorous analysis.

Looking once again at all sectors, but separating international sourcing into the type of activity being sourced, Canadian-based companies show a small preference for internationally sourcing “core business functions”. The EuroStat survey defines the production of goods and the provision of services as core business functions while all others, such as HR, Accounting and Finance are considered support functions. Both the UK and Ireland also demonstrate a modest preference for the international sourcing of core functions as do Italy and Sweden which contribute to the EU overall having a slight preference in that direction while the opposite is true for all of the other countries for which there is data. Much more work needs to be done to understand why this may be the case. Also, the Eurostat grouping of “core” and “support” activities may be misleading as they are clearly dependent on the sector; production of goods may be core for the manufacturing sector, but not for others while HR services may be considered core for HR firms, and as previously

International Sourcing in Manufacturing*



* 100 or more employees, 2007-2009 for Canada, 2000-2006 for EU
Data: Statistics Canada, Eurostat

Level of International Sourcing by Core and Support Function



* 100 or more employees, 2007-2009 for Canada, 2000-2006 for EU
Data: Statistics Canada, Eurostat

**Share of Enterprises Carrying Out International Sourcing
by Type of Support Activity***

	Overall Sourcing of Support Functions	Distribution and Logistics	Marketing Sales and After Sales Services	ICT Services	Administrative and Management	Engineering and Related Technical Services	Research and Development
Canada	6.3	1.4	1.2	2.4	1.8	1.5	1.0
EU	10	4.3	3.7	2.8	2.9	2.9	2.1
Denmark	19	6.0	4.3	7.5	4.8	5.8	4.3
Germany	8.2	2.3	3.1	0.8	1.4	2.3	1.2
Ireland	28.7	15.9	13.3	10.9	8.2	13.0	6.2
Italy	5.3	2.0	2.6	1.3	1.8	0.9	1.0
Netherlands	9.1	3.1	1.7	3.6	3.1	0.8	1.8
Slovenia	14.9	8.2	12.4	4.8	4.8	2.6	2.7
Finland	14.5	4.3	4.6	5.4	3.5	2.3	2.9
Sweden	3.2	1.4	0.9	1.1	1.4	0.4	0.8
UK	23.2	13.9	8.2	8.1	8.7	8.7	6.3
Norway	13.4	1.2	3.6	5.6	4.6	2.4	1.1

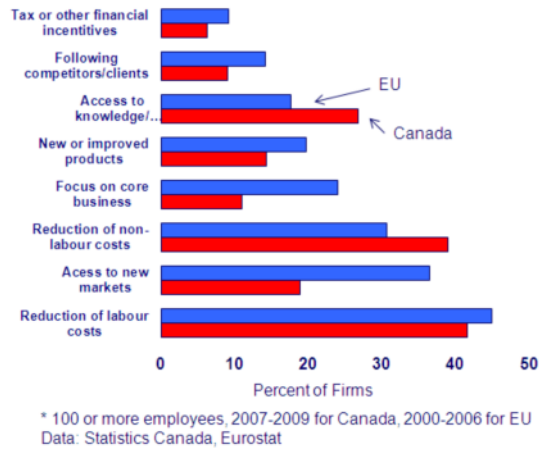
* 100 or more employees, 2007-2009 for Canada, 2000-2006 for EU
Data: Statistics Canada, Eurostat

noted, production of goods may no longer even be considered a core activity for manufacturing firms.

Within the category of support functions, levels of sourcing for individual activities are highly correlated to overall sourcing levels, but there are important differences between countries. 8.2 percent of Germany firms internationally sourced support functions, for example, but only just over one-quarter of those sourced distribution and logistics. By contrast, more than half of Irish firms sourced distribution and logistics and nearly 60 percent of UK-based firms did. This, may suggest that German firms consider distribution and logistics a key component of firm competitiveness, and thus too important to source. An interesting possibility since German firms tend to be heavily concentrated in manufacturing and Germany is often held up as an example for the efficiency of its logistics system. On the other hand, roughly one-third of firms engaged in sourcing, sourced marketing and sales in both Germany and the UK, while nearly half did so in Italy and Ireland. For both logistics and marketing, Canadian-based companies were on the lower-end of the spectrum, not sourcing heavily internationally. This may be due to the U.S. being by far the most important international customer for Canadian-based firms and the high-level of proximity means that Canadian firms can serve this market without the need for international sourcing. The opposite is the case though for ICT services with roughly 40 percent of Canadian firms engaged in support function sourcing activity which ranks among the leaders in the EU such as the Netherlands, Denmark and Ireland and is ahead of the UK. Germany stands out as not very engaged in international sourcing of ICT services, which may reflect the presence of an important domestic supplier. Both R&D and Engineering and other technical services are considered high-skilled activities and are likely important sources of competitive advantage for a firm. Thus, as one might expect, they are also among the least internationally sourced activities and are likely kept close to home. Canada, in particular, stands out along with Germany, for not internationally sourcing many of these activities while the UK and Ireland are among the highest.

There are a great deal of similarities between the motivations reported for outsourcing by Canadian-based firms and those in the EU. For example, reduction of labour costs shows up as number one for both and with fairly similar number of firms reporting that as an important factor.⁷ A roughly similar number also reported reduction of non-labour costs as a leading factor, although this was somewhat more important for Canadian-based firms compared to their EU counterparts. Interestingly, access to new markets was reported as the second most important factor by EU firms, but only ranked fourth for Canadian. Conversely, access to specialized knowledge or technologies was reported as being far more important for Canadian firms than for EU firms. But, just as we reported earlier for Canada, there is clear evidence that and important driver of international sourcing is the changing global environment including the emergence of large and fast-growing low-wage economies, enabled by falling tariffs and new technologies, rather than the push of non-competitive environments which would have been indicated if high taxes were given as being an important push factor.

Motivation factors for international sourcing*



Affiliated Trade

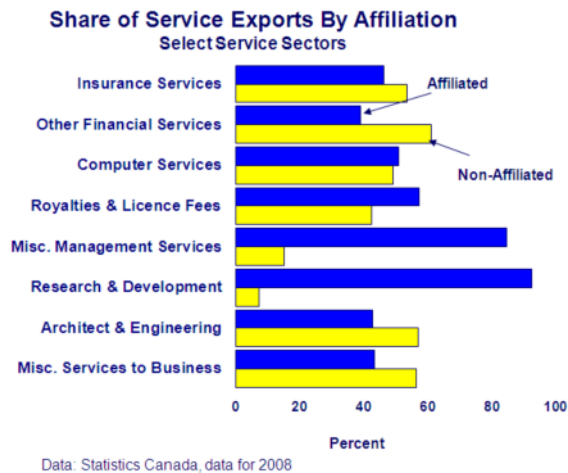
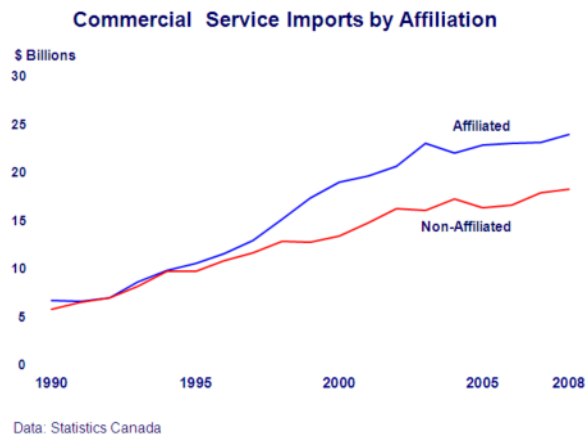
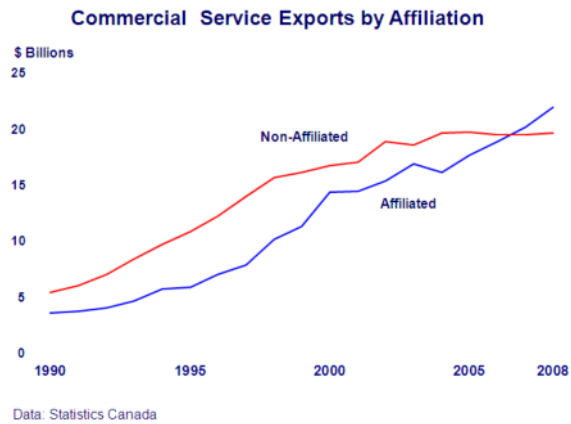
The findings from the SIBS survey are expressed as a percentage of firms. As previously noted, almost uniquely among countries, Canada possesses a dataset that decomposes international trade in services between affiliated and non-affiliated trade; that is trade that occurs between two related parties and that which is conducted at arms-length. This data can thus be interpreted as service activity offshoring and outsourcing respectively. And, not only does it add a value dimension to the SIBS data, but it also provides a time dimension as well.

Overall we see that for Canada, services trade has been growing faster than goods trade, especially in the post 2000 period: Even though the growth in services trade decelerated, especially for exports, growth of goods trade decelerated even more sharply. We also observe that trade between affiliated companies grew significantly faster than non-affiliated trade. For service imports, affiliated and non-affiliated trade were at similar levels and growing at similar rates in the early 1990s, but in the late 1990s, the growth rate of affiliated service imports accelerated creating a gap between affiliated and non-affiliated trade of approximately \$5 billion that persisted throughout the following decade. For service exports, trade between affiliated parties also accelerated in the late 1990s and not

⁷ Note that this figures differ somewhat than those reported earlier in this paper for Canada which combined both high and medium responses and were for firms with 20 or more employees rather than the 100+ employees to be consistent with the EuroStat data.

only closed the gap between affiliated and non-affiliated trade but surpassed non-affiliated trade in the late 2000s.

The ratio of affiliated to non-affiliated trade by sector may provide an indication of the types of activities that firms prefer to keep within the structure of the firm and those that they are more willing to purchase externally. Looking at the most important service exports, we see that, R&D services and Miscellaneous Management Services are most often conducted between affiliates. This likely suggests that these services are difficult to contract and are considered strategic to the operation of the firms. For example, while it may be possible to contract R&D services, it would be difficult to monitor that type of activity and resulting IP may be in dispute. Likewise for management services, while there would be a role for external accountants or HR advisors, most of those activities are performed “in-house”. On the other end of the scale, insurance, other financial services architectural & engineering and miscellaneous services to business all show a weak preference towards arms-length transactions. Legal services, on the other hand (not shown) indicate a strong preference for arms-length transactions. Canadian service imports largely show the same trends, although interestingly



both computer, and architectural and engineering services show a modest preference for affiliated trade for imports.

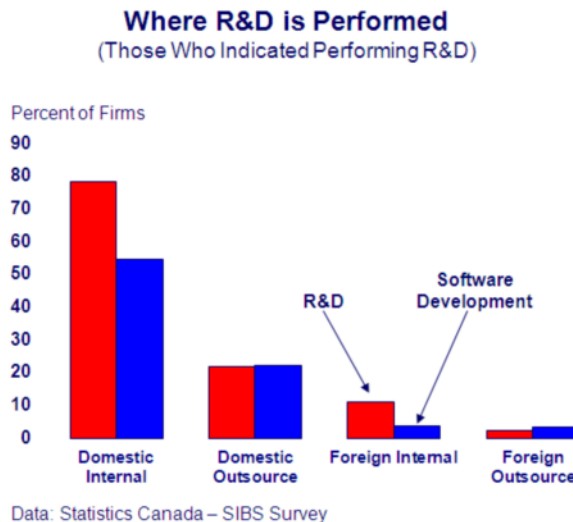
Research and Development

Research and Development (R&D) is often considered to be a “high-valued activity” in that it employs high-knowledge/high-skilled workers and pays relatively high wages. R&D is also thought to have considerable spillovers that accrue to the local or national economy making R&D one of the most sought after activities by most countries.⁸

Just under half of firms in industries covered by the SIBS (43.1%) and more than three-quarters (77.8%) of manufacturing firms reported doing R&D. Outside of manufacturing, the only industry where more than 50% of firms reported doing R&D was information and cultural industries. Within manufacturing, the share was the lowest in food, beverage, textile and clothing manufacturing where nearly one-third of firms reported not doing any R&D. Interestingly, many of the resource-based manufacturing industries fall around the average. Not surprisingly, in those industries that one might associate with being more technologically advanced, such as chemicals, pharmaceuticals, computers and telecom equipment, the share of firms reporting doing R&D was significantly higher, and often greater than 90%. Of note, the motor vehicle parts manufacturing industry (at 77.5%) is lower than motor vehicle manufacturing (88.9%) and Aerospace products and parts manufacturing may be lower than might be expected at 86.0%.

Large firms appear to be more innovative by this measure, with only 13.5% of large manufacturers not reporting doing any R&D, compared to 16.8% for medium and 24.2% for small firms. And this pattern holds for nearly every industry. There are a few exceptions though, such as; chemicals, pharmaceuticals and machinery industries, where small and medium-sized firms have a higher probability of conducting R&D than do larger firms.

Of those firms performing R&D, the vast majority perform at least some of that R&D within the firm (as opposed to contracting it out). For example, 78.4 percent of enterprises overall and 91.3% of manufacturers which reported doing R&D did some of that R&D within their Canadian operations. 11.1 percent (10.8 percent of manufacturers) have international operations that perform R&D (i.e. outside of Canada and within the enterprise).



⁸ For a more formal and complete analysis see Hall (2011) in this volume.

The figures are much higher than the comparable figures for other activities such as software development, showing a clear preference for R&D to be performed within the firm. This is an expected result, as R&D is considered to be an activity that is core to the operations of the company and thus done internally. However, that does not imply that R&D is not also done outside the firm, such as through a contract. Here these shares for domestic outsourcing and foreign outsourcing are more comparable to what we observe for other activities, such as software development. An alternate interpretation may be that firms must perform some R&D internally in order to have the capacity to contract R&D externally. It is possible, for example, that a firm would require practicing R&D staff internally in order to identify potential contractors, to design projects, or to monitor work.

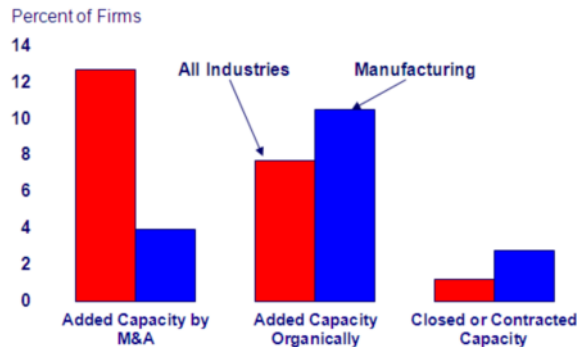
A somewhat smaller share of large firms do R&D within their Canadian operations compared to small and medium firms. This likely represents subsidiaries of foreign multinationals which do not conduct R&D in Canada. However, these same large firms are also somewhat more likely to contract out some of their R&D to other companies in Canada, and are far more likely to conduct some R&D outside of the country - they are three times more likely to be conducting some of their R&D within an affiliated company outside of Canada and close to four times as likely to be contracting out some R&D to a non-affiliated firm in another country compared to the average. This clearly reflects the larger proportion of multinational firms (both foreign and Canadian) among larger firms.

The differences can be quite striking between industries as well. In some R&D intensive industries, Chemical and Pharmaceutical industries, for example, there is a much more narrow difference between the number large firms that conduct R&D and the average. In other words, in the most R&D intensive sectors, the proportion of small and medium firms conducting R&D is closer to the proportion for large firms, presumably because R&D is that much more of an integral activity for firms in those industries.

R&D is not a very footloose activity. R&D facilities are expensive to set-up with lots of fragile and immobile equipment. Possibly even more importantly, skilled employees are important for R&D and these are difficult and expensive to move. When looking at how firms expand or reduce capacity in R&D within Canada, the SIBS data reveals that for the economy overall mergers and acquisitions (M&As) was the most common method through which R&D activity was expanded (although this was much less important for manufacturers).

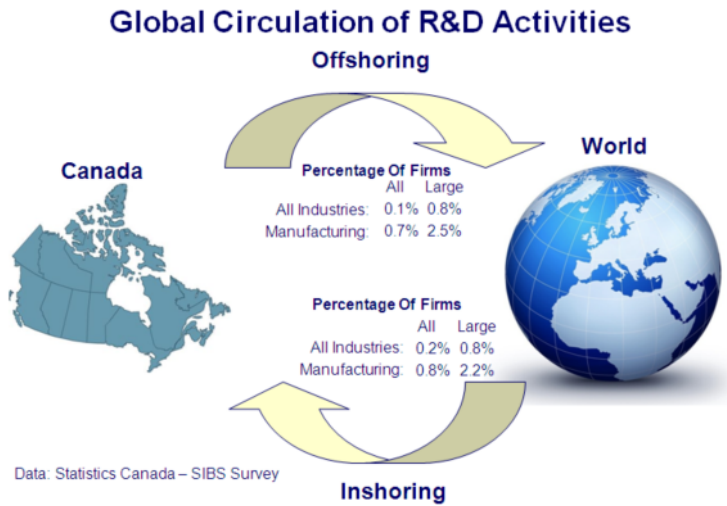
M&As, however, are more about changing ownership of existing R&D rather than a true expansion. Just under eight percent of firms indicated that they added capacity within Canada organically, that is through opening a new facility or expanding existing capacity, between 2007 and 2009. For manufacturing, it was even higher at 10.5 percent and far more important than expanding capacity through M&As. But, as predicted, R&D activity was rarely

Changes in R&D Capacity within Canada
(Those Who Indicated Performing R&D)

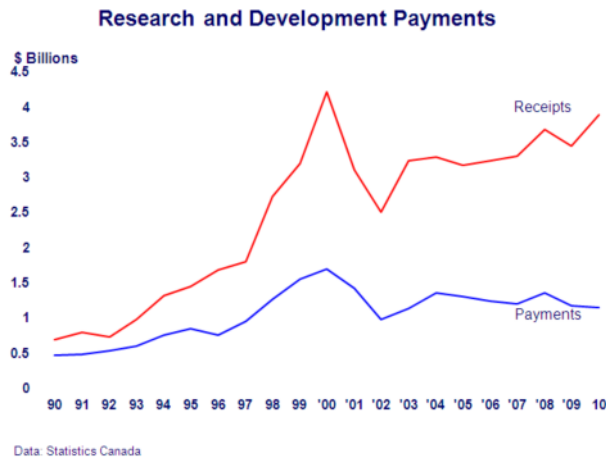


Data: Statistics Canada – SIBS Survey

eliminated. Only 1.3 percent of firms, and 2.8 percent of manufacturers, closed R&D operations or reduced capacity from 2007 to 2009. Given that this period includes the global financial crisis, these low values are even more notable and reinforce the idea that while R&D may be globalizing, it is can be characterized more as an expansion of R&D activity rather than a movement.



Although R&D activities are less footloose than many other activities, we do see a circular flow similar to that described for offshoring and insourcing more generally. And, similar to the overall picture, there is evidence of a modest net tendency in favour of inshoring (i.e. inshoring is greater than offshoring as measured by the number of firms participating in both activities). Again, it is important to be cautious when interpreting these figures as they represent the number of firms offshoring or inshoring rather than values, but this may indicate that Canada possesses a comparative advantage in



undertaking R&D activities, which is a surprising finding given the ongoing concern in Canadian policy circles about Canada's underperformance in innovation and R&D. Business expenditure on R&D (BERD) as share of GDP was only 1.0% for Canada in 2008, compared to an OECD average of 1.6%.⁹

But, this finding that Canada may be an attractive location for international R&D activity

⁹ OECD Main Science and Technology Indicators, 2011/1

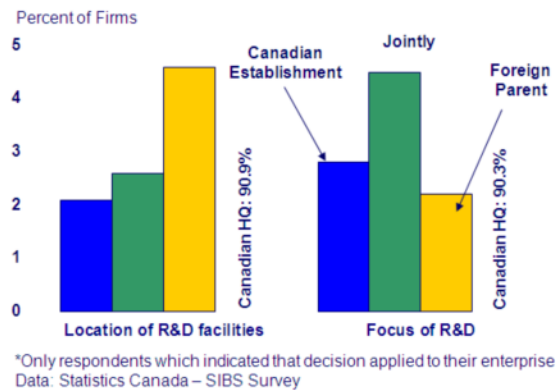
is further supported by evidence from Canada's international balance of payments which provides the value of R&D payments. This data shows that Canada has maintained a surplus in international R&D payments, which grew from relatively modest levels in the early 1990s to a fairly substantial surplus by 2010. Indeed, R&D receipts, in 2010 were nearly four times as large as payments and at \$3.9 billion R&D receipts are fairly significant in scale as well.

An important aspect of global value chains is understanding who, within the chain, makes decisions about offshoring and outsourcing. This is especially true for decisions about the location of R&D since, as we have already seen, R&D activities are not as footloose as other activities and thus decisions about their location can have long-lasting impacts.

Most firms in the Canadian economy, especially small and medium-sized firms, have no foreign operations. Thus, by definition, the decision by these firms where to locate R&D activities or whether to outsource is made in Canada. On the other hand, a Canadian-owned company with subsidiaries abroad could delegate some of the decisions to the foreign subs, but if a decision is made at the headquarters, it will be made by the Canadian headquarters. Foreign-controlled companies can choose to make decisions at the foreign headquarters, the Canadian HQ or at the Canadian subs, or some combination of the above. Understanding where these foreign-owned enterprises, which have the most options, make their decisions is thus an important issue for policy-makers in Canada.

40.9 percent of large manufacturing firms responding to the SIBS survey indicated that they were foreign-owned.¹⁰ But, despite this high degree of foreign ownership, only 27.8 percent of large manufacturers indicated that decisions on the location of R&D facilities were primarily made by the foreign parent. An additional 10.5 percent indicated that the decision is made jointly by the Canadian head office and the foreign parent. The rest indicated that the decision was primarily made by the Canadian head office or by the Canadian subsidiaries. By contrast, when it comes to determining the focus of R&D the decision was delegated to the Canadian operations to an even greater extent. For example, 22.3 percent indicated that the decision relating to the focus of R&D was made solely by the foreign parent. Whereas 14.4 percent indicated that the decision is made jointly by the foreign parent and the Canadian head office. This indicates that most multinationals, including foreign-owned companies, delegate at least some of the decision making on where to locate R&D activities to their Canadian operations and delegate to an even greater extent on the focus of that R&D.

Primary Location Where Decisions about R&D are Made*



¹⁰ Those reporting that the enterprises' head office was located outside of Canada.

Conclusions

The objective of this chapter was to develop a better understanding of how companies located in Canada participate in global value chains (GVCs) with a focus on offshoring and outsourcing through the analysis of a newly constructed dataset based on the Survey of Innovation and Business Strategies (SIBS). This chapter also looked at the why firms undertake offshoring and outsourcing, the obstacles that they face, and importantly how the trends in Canada compare to other countries.

Our analysis indicates that offshoring and outsourcing are relatively rare compared to the media attention that it generates. Large firms do participate more in offshoring and outsourcing than do medium-sized firms and much more than small firms, although they are important differences between industries. Possibly more striking is the that these trends are not one-way outward flows as some would suggest, but rather circular movements with some activities leaving Canada while others move in through domestic sourcing and inshoring.

Supporting the finding that offshoring and outsourcing is characterized as circular flows is that pull factors (those attracting activities to other countries), such as; lowering costs, accessing new markets, and accessing needed skills or knowledge are the most important drivers compelling Canadian-based companies to engage in GVCs. Push factors (those that might drive activities out of Canada), such as uncompetitive domestic economic environments or taxes are considerably less important.

This is an important finding for policy makers as it changes the policy question from one of how to limit offshoring and outsourcing to one of maximizing the gains by establishing a policy environment that will attract and retain the highest valued activities to Canada while allowing others to be moved to where they are conducted most efficiently and thus improving the competitiveness of Canadian-based companies. If that is the case, then it is important to understand the barriers that companies in Canada face when participating in GVCs. The analysis of the survey results show that many of the most important obstacles are those that would be expected when dealing with unfamiliar markets such as identifying suppliers and dealing with local customs and laws, which may suggest a role for programs such as Canada's Trade Commissioner service. Tariff rates were also identified as an important obstacle for manufacturers, indicating that there is still room for tariff rates to be further reduced.

Comparing the level of engagement in GVCs by Canadian companies and those in the EU reveals that, on average, Canadian companies are about as involved in GVCs as those in the EU. This, however, hides considerable differences between countries. Compared to the leading countries, such as Ireland and the UK, Canadian companies are not nearly as involved in GVCs. This is particularly true outside of the manufacturing sector where levels of engagement in GVCs in the EU are higher than in Canada. While this may reflect differences in survey coverage, it is definitely an area that could benefit from more careful examination.

One of the most sought-after activities is research and development (R&D) due to perceptions that this activity supports high-paying jobs and produces significant spillovers to the host economy. Although Canada is often thought to be laggard in its R&D performance compared to other developed countries, evidence suggests that Canada may have a comparative advantage in this activity. Not only does the SIBS survey indicate that a somewhat greater proportion of firms inshored R&D than offshored it, but the balance of payments figures on the value of trade also indicate that R&D exports are substantially larger than R&D imports.

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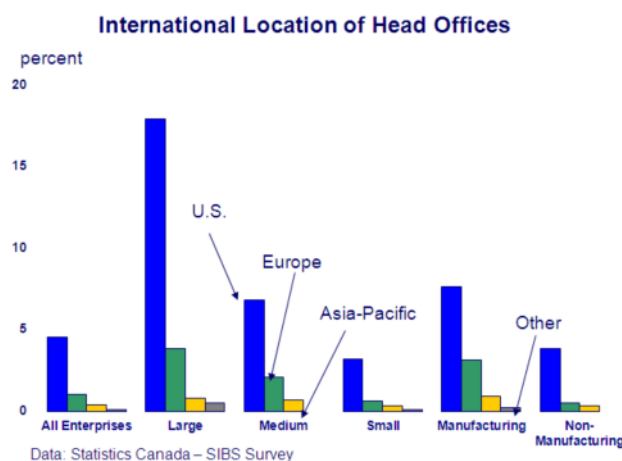
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Annex 1: Overview of the Survey of Innovation and Business Strategies (SIBS)

The Survey of Innovation and Business Strategy (SIBS) was undertaken in order to better understand the market and policy factors that encourage or discourage the adoption of entrepreneurial and innovation-oriented business strategies.¹¹ The survey also provides detailed information about global value chain management practices and activities in Canada, such as which activities businesses relocate to other countries and which ones they outsource to external suppliers.

Between January and April 2010, a sample of 6,233 enterprises in Canada with more than 20 employees and spanning 67 industries were surveyed. Questionnaires, which integrated various innovative features from other business surveys around the world, were sent to the CEOs or senior managers of these enterprises. The survey response rate was 70 percent.

Of the 6,233 surveyed enterprises, 70%, or 4,394 enterprises were manufacturers (NAICS 31-33). The remaining 1,839 enterprises represented a sample of non-manufacturing sectors of the Canadian economy¹². For the industries surveyed, the sample size was sufficient to allow for representative estimates to be produced. However, it should be noted the SIBS sample of surveyed enterprises does not represent a complete picture of the Canadian economy as some sectors were not included, such as; educational services, health care, arts and entertainment, accommodation and food services and public administration. Thus, measures that are reported as being for the total economy exclude these sectors.

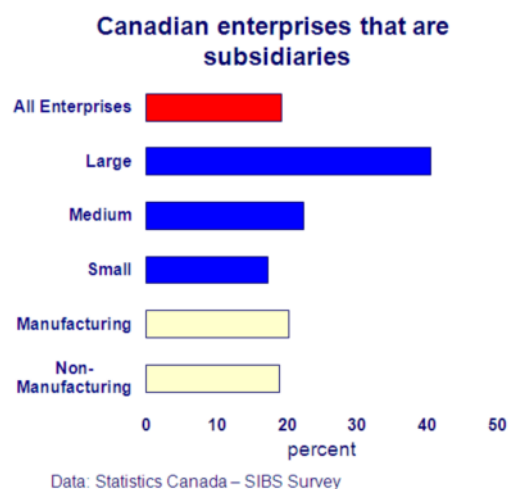


Of the respondents to the survey, nearly 1 in 4 enterprises, and 1 out of 2 in the manufacturing sector, reported as having some business activities outside of Canada.

The vast majority, 94 percent, of respondents were headquartered in Canada. For those with head offices in other countries, the U.S. was the main location (4.5%) while another 1.0% located in Europe and the reminder in Asia and

¹¹ The SIBS was a joint effort by Industry Canada, Foreign Affairs and International Trade Canada and Statistics Canada.

¹² These sectors include; agriculture, forestry and fishing, mining oil and gas extraction, utilities, construction, retail trade, transportation and warehousing, information and cultural industries, finance and insurance, real estate, professional services, and other sectors.



other locations. While the percentage of companies with Canadian head offices is high, it is significantly lower for large firms (77%) and manufacturing enterprises (88%).¹³

The SIBS survey also indicates that almost one in five enterprises operating in Canada (19%) are subsidiaries of other enterprise. For large firms, the percentage of subsidiaries is even greater, with 41% of large enterprises indicating they were a subsidiary of another firm.

¹³ The SIBS survey categorizes enterprises into three size groups; small enterprises are those with 20 to 99 employees, medium enterprises are those with 100 to 249 employees, while enterprises with at least 250 employees are considered large.

