

Canada's Participation in the Global Innovation Economy:

Patterns of Entry and Engagement in Asia and Beyond

Introduction

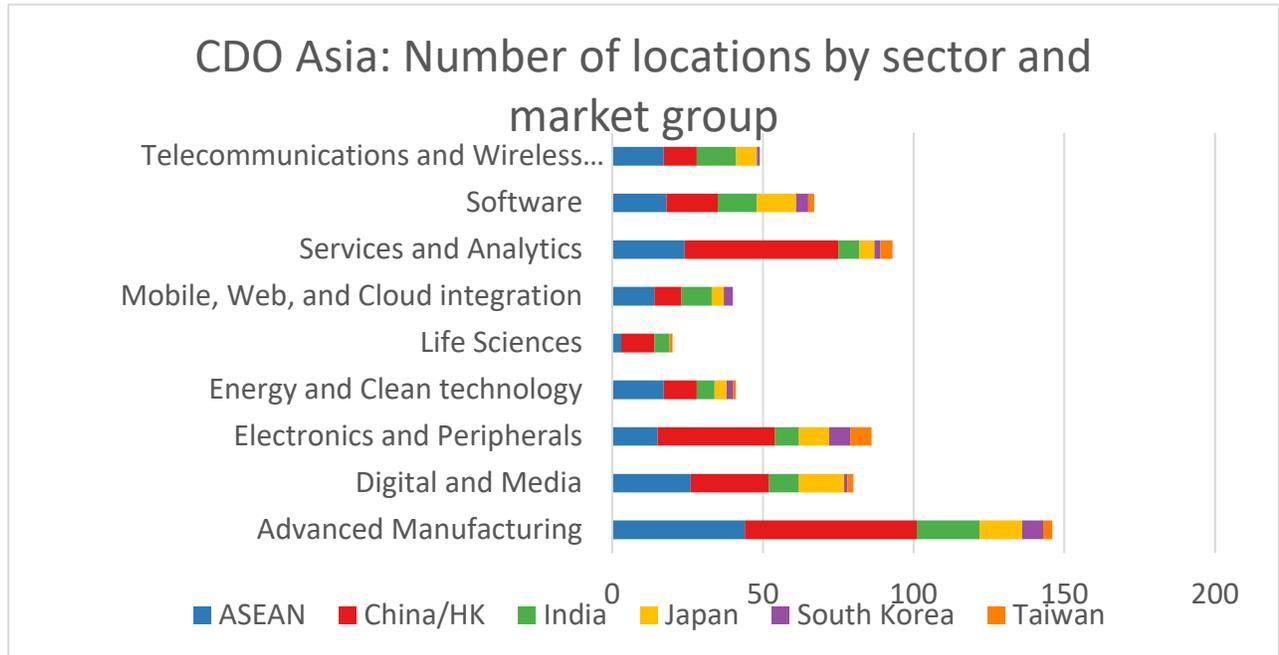
The original research for this project was carried as part of the Munk School's CanAsiaFootprint mapping project that tracked Canada's presence in Asia by collecting publicly available Canadian company-level data. For the purposes of the mapping project, a sample group of countries (the "A-16") was chosen that includes the six major Asian economies—China, Hong Kong, India, Japan, Taiwan and the Republic of Korea (South Korea)—in addition to the ten member states of the Association of Southeast Asian Nations (ASEAN). The interactive map has recently been updated, with about 1600 locations in the A-16 and can be viewed on the site of Business Council of Canada, the Munk School of Global Affairs and the Asia-Pacific Foundation.

This report covers a subset of this CanAsia database—companies that are part of the innovation economy, the focus of the Creating Digital Opportunity (CDO) project, and in particular, the "micro-multinationals", i.e. companies that, apart from Asia, have locations in either the USA or Europe or both. The CDO dataset consists of 199 companies that have locations in Asia (A-16); the micro-multinational dataset consists of 120 companies. Since the initial CanAsia map research began in 2013/4, a number of companies have exited the CDO dataset—through M&A, bankruptcy or exiting the Asian market. Similarly, new companies have established in Asia. Looking at what happened to these companies could be a useful avenue for further research.

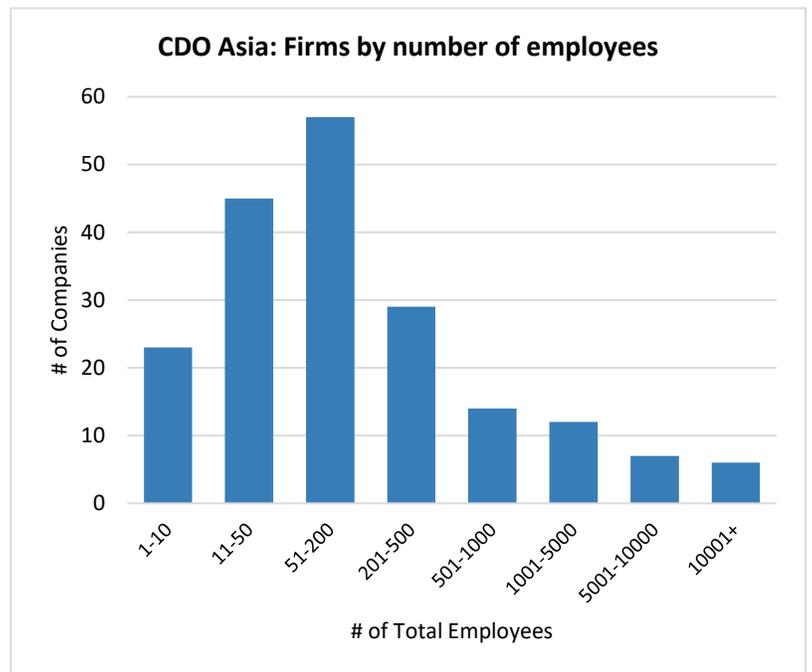
Industry classifications were initially created by dividing companies by their three digit NAICS codes. However, NAICS code classifications are not ideally suited to companies in the innovation economy. Instead, we have classified the firms in the dataset by modifying PWC data map categories, then adding advanced manufacturing to capture the automotive sector, and cleantech. The resulting categories, while arbitrary, do a much better job of capturing the types of high-tech companies that have located in Asia and beyond.

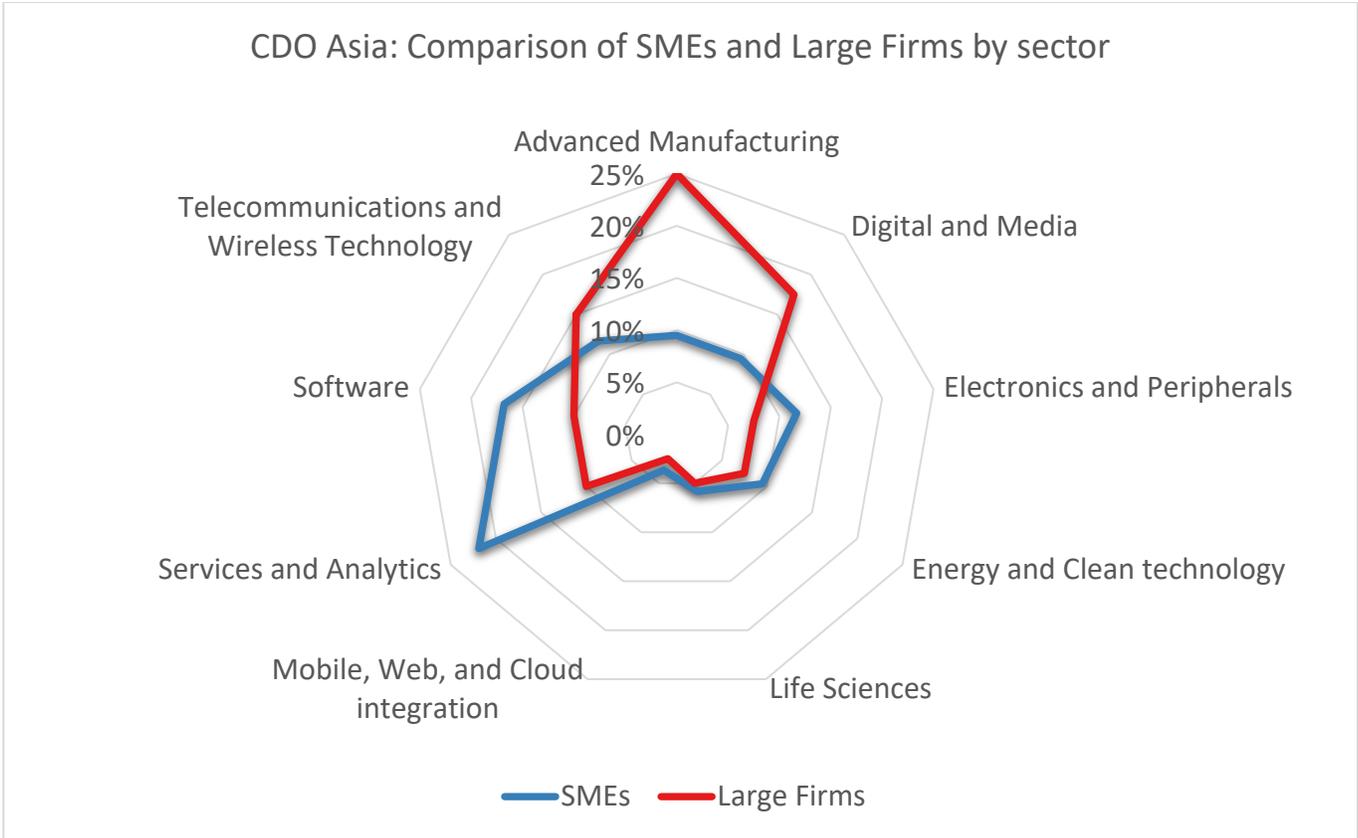
The graph below shows the number of locations for each sector—advanced manufacturing, which includes automotive and aerospace has the largest number, but the overwhelming majority of locations are services-

related.

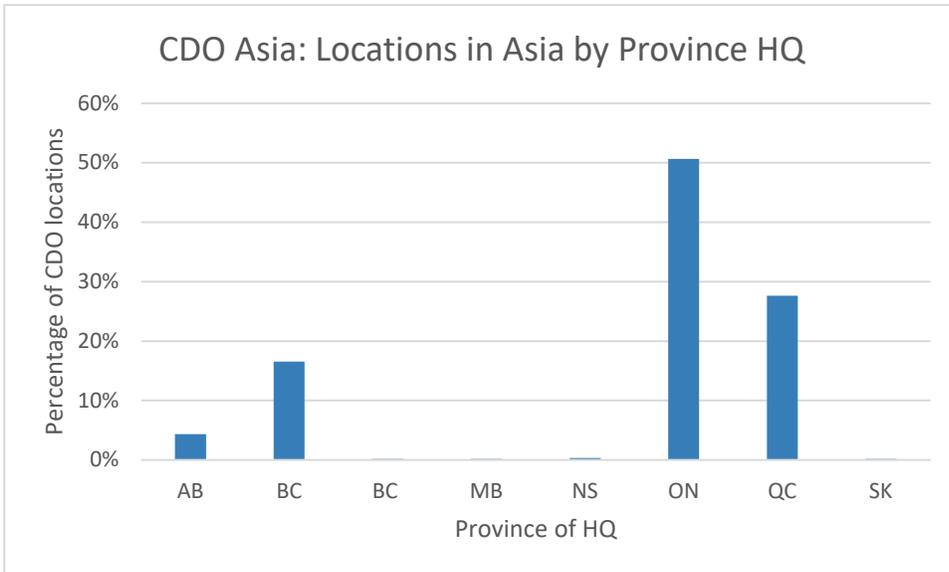


Categorization by size was done by drawing a distinction between large firms – those with greater than 500 employees – and small and medium enterprises (SMEs) – firms with employees less than or equal to 500 employees. The 199 firms in the CDO dataset consist of 48 Large Firms and 151 SMEs. The graph above indicates the breakdown by sector in Asia for the entire CDO dataset. SMEs are an important part of this study-- approximately three quarters of the companies in the CDO dataset have 1-500 employees. The SMEs in the CDO dataset have over 13000 employees in total across all of their global locations.

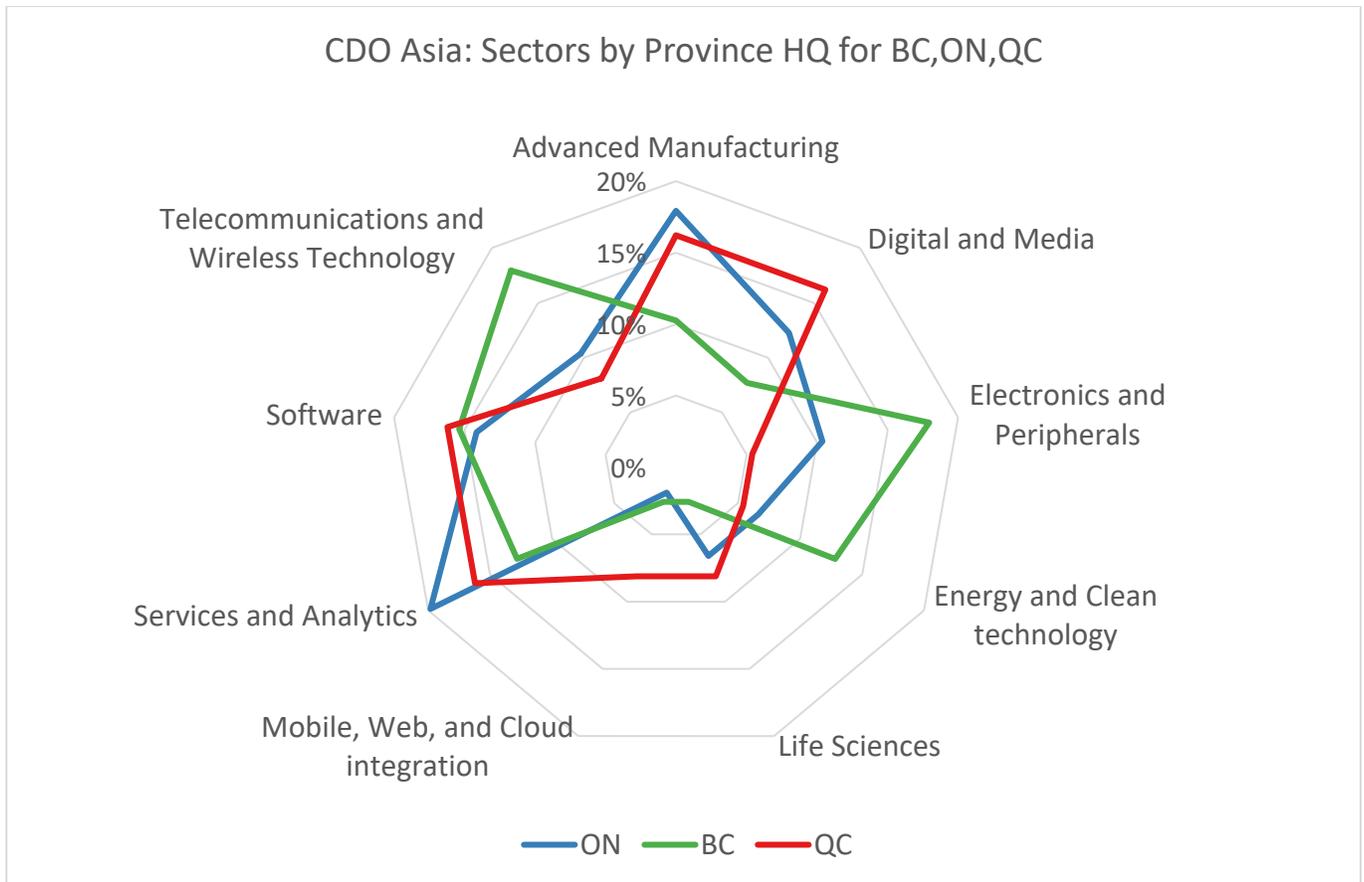




This graph demonstrates the differences in sector concentration between large firms and SMEs, by comparing the number of companies in that sector as a percentage of the overall CDO dataset. Our findings indicate that larger firms tend to be more concentrated in the Advanced Manufacturing and Digital and Media sectors compared to SMEs, that are more concentrated in the Software, and Services and Analytics sectors. As we will observe below, the choice of sector impacts the global engagement patterns.

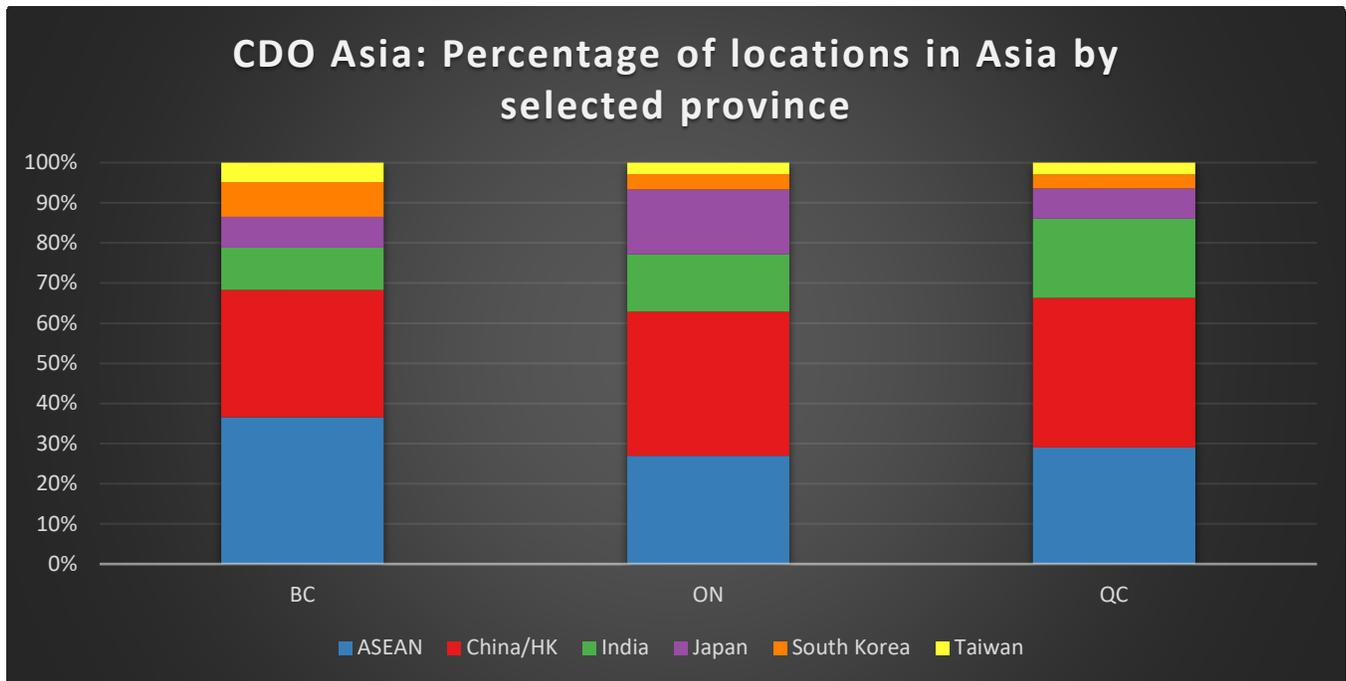


In examining the CDO dataset, over 90 percent of the locations in Asia are part of companies headquartered in Ontario, Quebec, or British Columbia. Under 5% are headquartered in Alberta, and headquarters in the remaining provinces account for less than 1% of locations.



Given that over 90% of companies in the dataset are headquartered in Ontario, British Columbia, or Quebec, examining differences between these provinces is useful. Companies headquartered in BC tend to focus on the Telecommunications, Energy and Clean technology, and the Electronics and Peripherals sectors. Companies in Quebec have a greater presence in the Digital and Media, Software, and Life Sciences sectors in comparison to the two other provinces, and are also present in the Advanced Manufacturing, and Services and Analytics sectors. Ontario has a greater proportion of companies in the Services and Analytics sectors, in addition to the Advanced Manufacturing sector.

The locations of headquarters and the locations in Asia were also compared to examine a possible relationship. In the graph below, one can observe a few patterns. ASEAN member states and China/HK remain the most prevalent locations for all three provinces. For companies headquartered in British Columbia, there is a greater emphasis on ASEAN, South Korea, and Taiwan than for companies headquartered in Ontario and Quebec. Ontario has a relatively greater proportion of locations in Japan, while Quebec has a greater proportion of companies in India in comparison to the other selected provinces.



Focus on Micro-Multinationals

The research for this report continues to focus on understanding how Canadian firms are participating in innovation economy markets. We have investigated first entry markets, incorporating data on the movement of these Asia-based Canadian firms between the United States, Europe and Asia – and within Asia itself. This project understands that there will be notable trends and differences due to factors such as size and industry sector, which is why we draw these divisions throughout the data analysis.

We hope that by comparing the movement patterns across markets and according to size and industry sector, we will be able to draw some conclusions and reaffirm assumptions about how Canadian companies in the innovation economy are participating in developed and high growth markets.

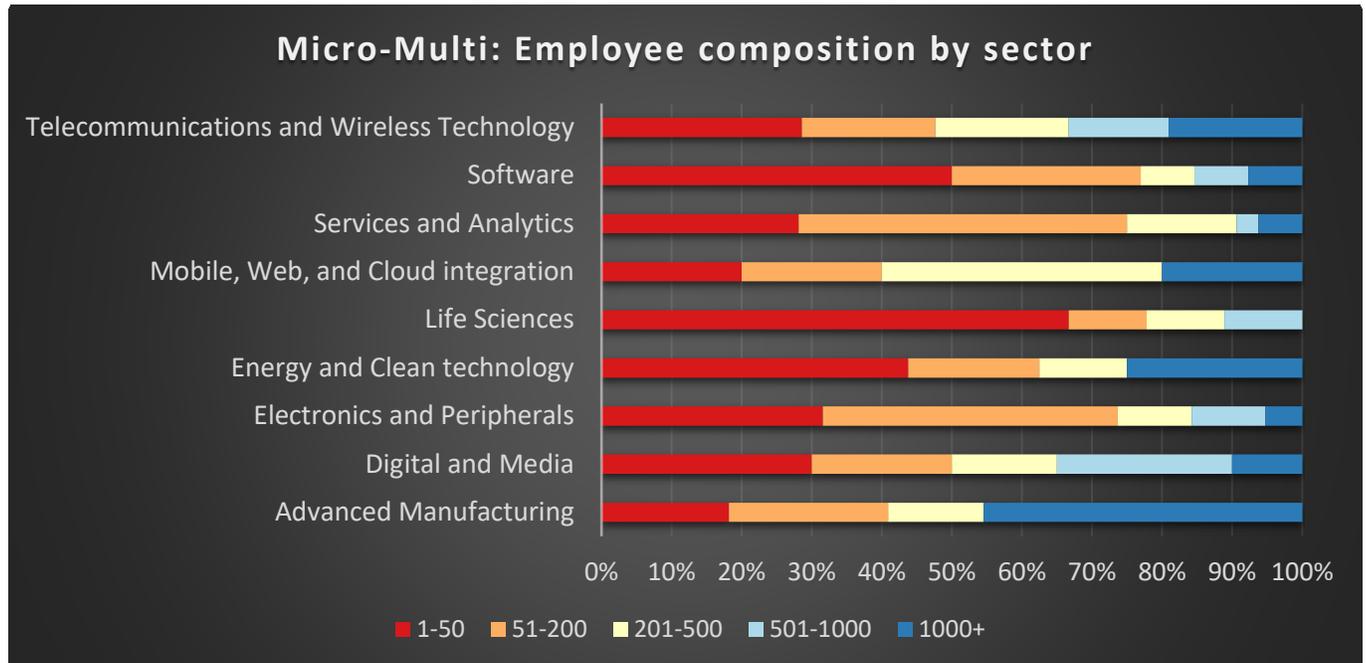
In addition, as we continue our research on the CDO dataset, it is important to reiterate that because much of this activity is carried out by SMEs in the services sector, it is likely not captured by official trade or investment statistics. As such, this research will add to the knowledge base on Canada's participation in the global innovation economy.

In last year's research, we determined that 37% of the micro-multinational data set went to Asia first. In 2016, we investigated further to discover more about these "Asia-first" firms.

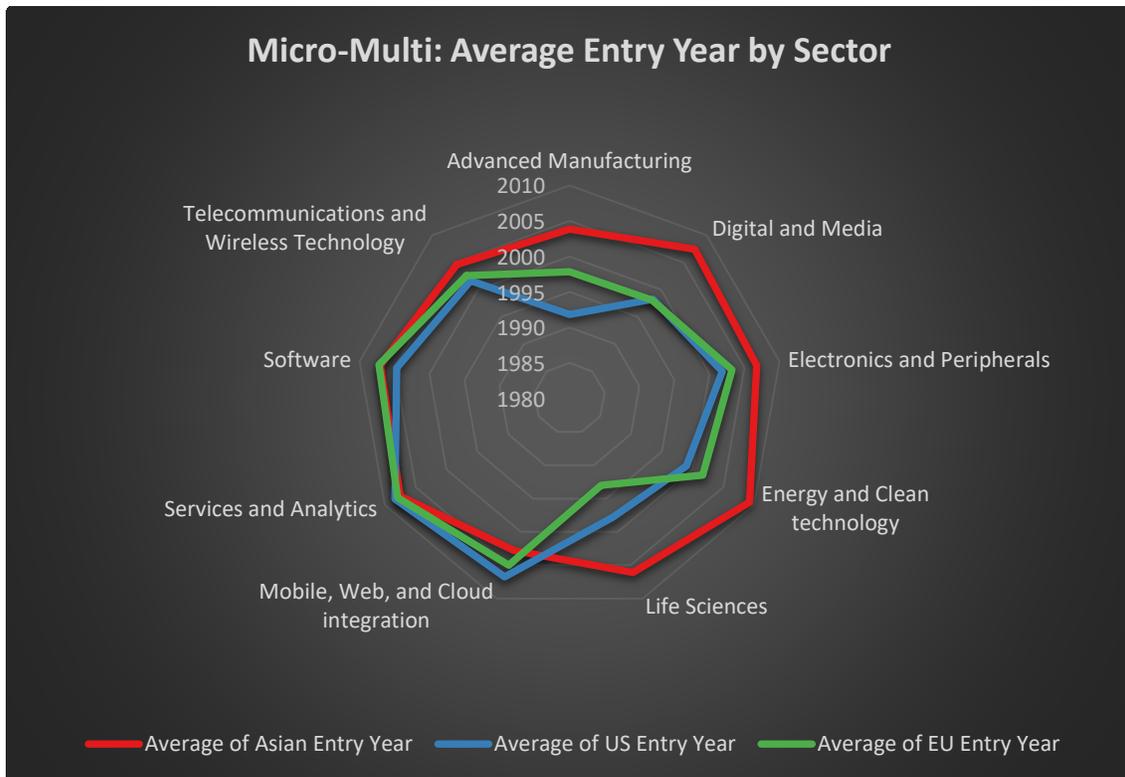
Trends across Industries

CDO firms are heavily weighted towards the services sector. Unsurprisingly, there is a greater percentage of manufacturers among the large firms. In the graph below, which represents the breakdown of the employee categorization by sector, differences between sectors are revealed. The data indicates that SMEs form the majority of companies in each sector, but with a higher percentage of large firms in the advanced manufacturing,

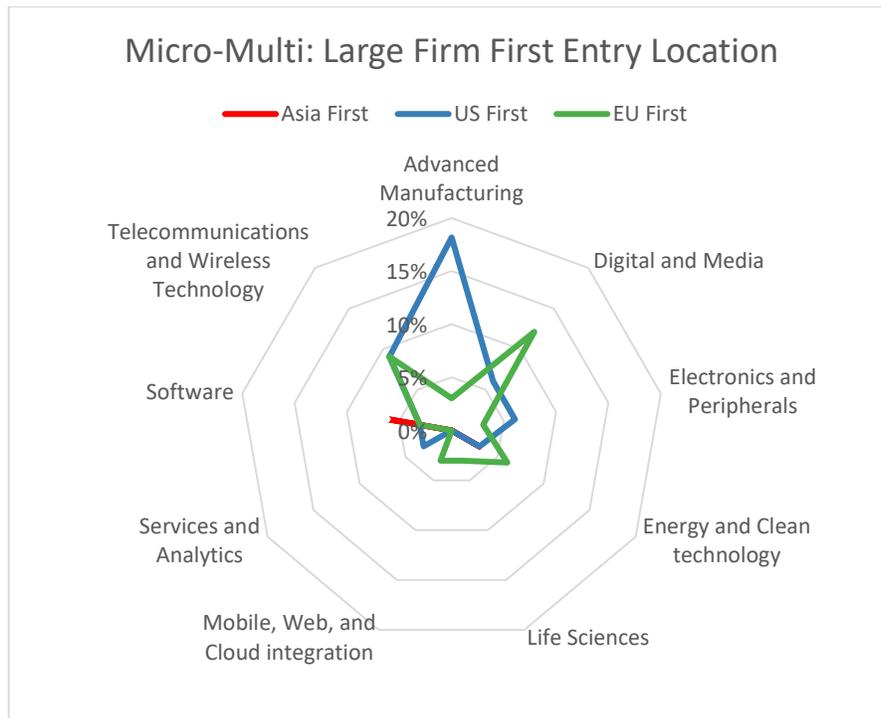
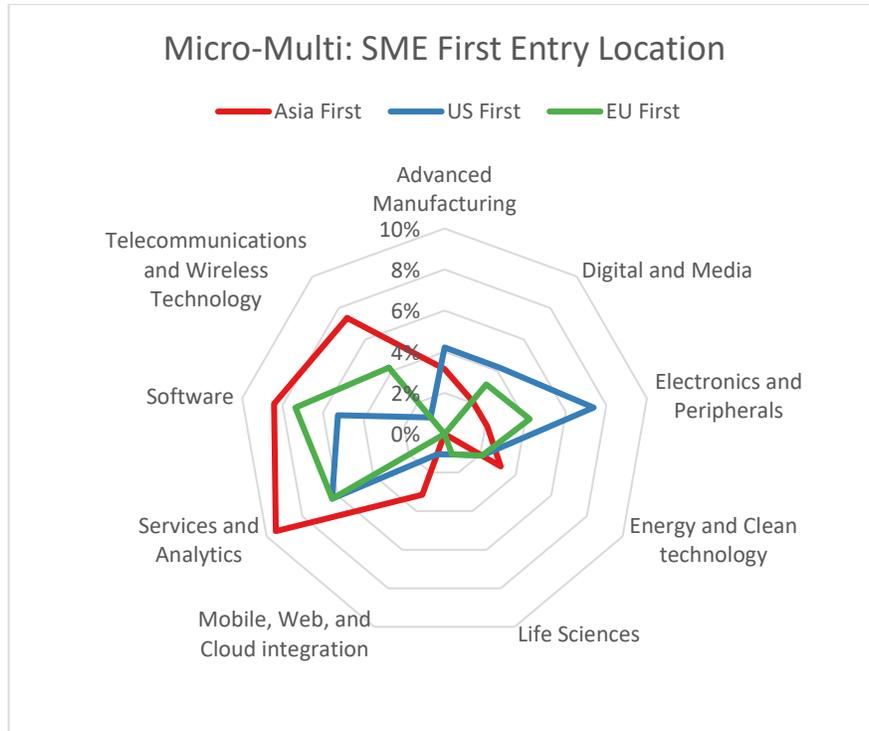
telecommunications, and the digital and media sectors. In the software, life sciences, and services and analytics sectors, the SME concentration is most pronounced.



As a result of the differing compositions of sectors, some further trends are illuminated. Across the micro-multinational dataset we compared the average entry years by sector and location. The results are indicated in the graph below, where we observe that the USA had the earliest average entry year for many of these firms, particularly in the advanced manufacturing sector. The European Union had the earliest average entry year in the life sciences sector. These results appear to indicate a preference for firms moving early in sectors in which the market abroad for that sector is highly developed. However, these patterns are changing, as the differences in average entry year between Asia, the US, and the EU are declining.

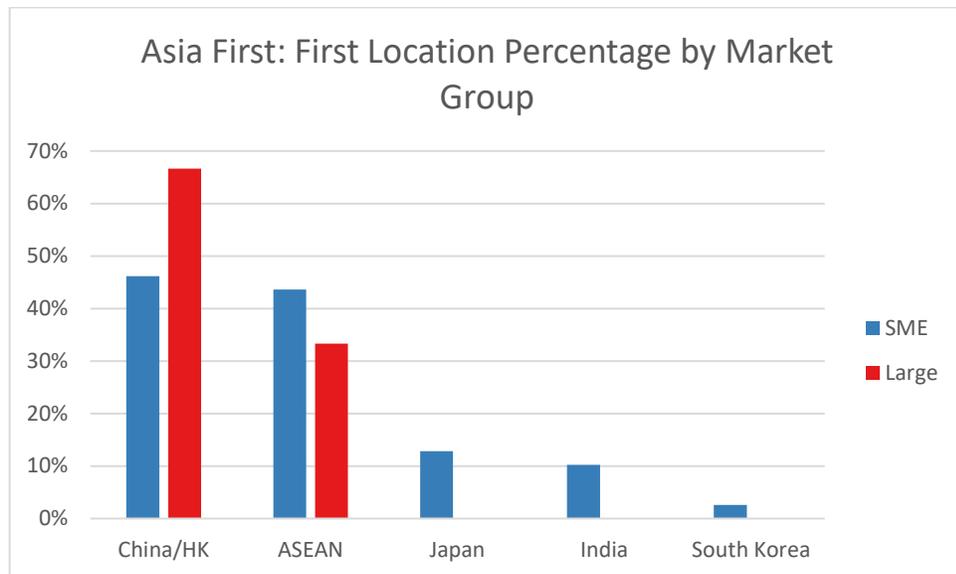


From a comparison of the differences between first entry locations of large firms and SMEs, another picture emerges. For SMEs, Asia is by far the most prevalent first entry location in the software, services and analytics, and telecommunications sectors, while the US is favoured for the electronics and peripherals sector. However, for larger firms, the most common entry location is the US, particularly in the advanced manufacturing sector. In the digital and media sector, the EU was the most common entry location. Therefore, of the large firms in the micro-multinational dataset, few chose Asia as their first overseas market, while for SMEs the opposite is true. In order to further understand the data, analysing the companies that did choose Asia as their first overseas location is necessary.

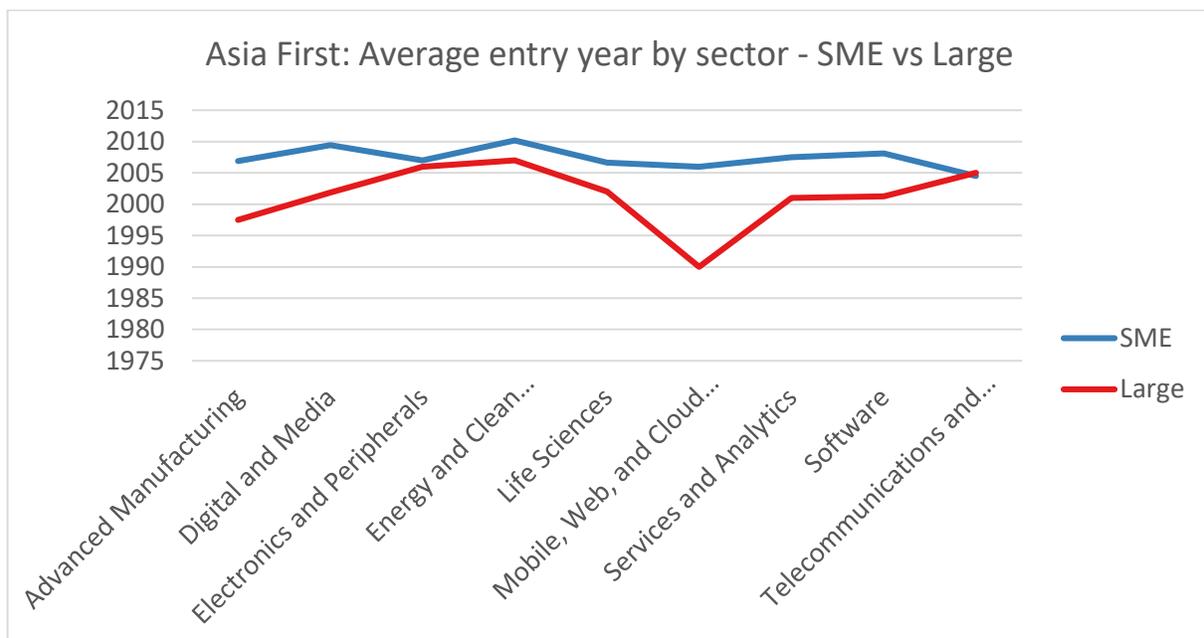


'Asia First' Companies

Within the "Asia First" dataset, the subset of firms from the multinational dataset who chose their first location outside of Canada in Asia, the differences between sectors, in addition to SMEs and large firms are highlighted. 43 companies of the micro-multinational dataset chose Asia as their first overseas location, representing over one third of the micro-multinational dataset. Additionally, of the companies that chose Asia First, 90 percent are SMEs. The graph below indicates that SMEs are more diverse in their first location choices, whilst large firms are more focused on China/HK and ASEAN as their first entry market. Overall, China/HK and ASEAN are the most popular first entry markets, with the preference for China/HK more pronounced for larger firms.

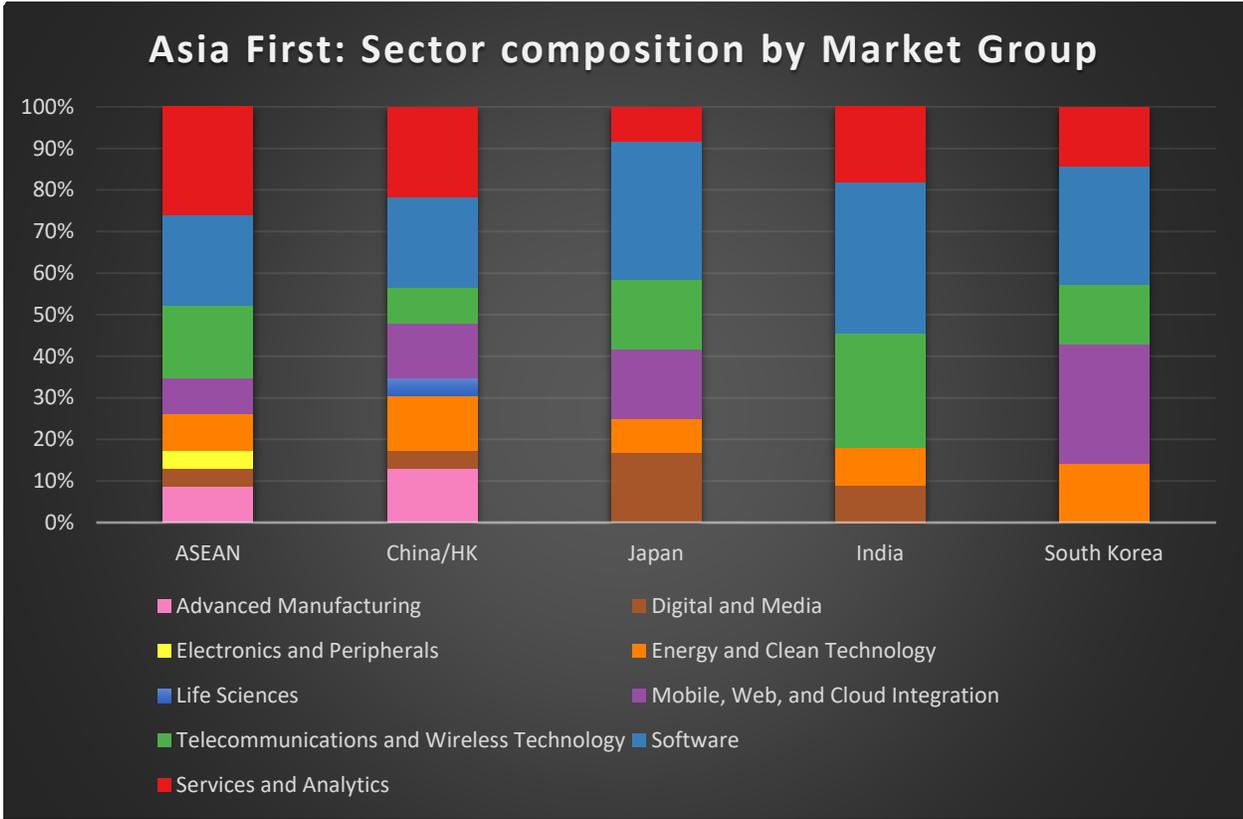


However, in comparing the differences in average entry year between sectors and firm size, we observe a different pattern. On average, larger firms enter the Asian market earlier, with the difference greatest in the mobile, web, and cloud integration sector. However, SMEs entered Asia before large firms in the telecommunications sector.



This is interesting since larger firms entered the Asian market first, yet the majority of companies that went to Asia first are in fact SMEs. Further broken down by sector, on average, telecommunications and wireless technology firms entered Japan and South Korea earliest, while advanced manufacturing firms entered ASEAN member states earlier than China or Hong Kong.

In examining the composition of the sectors within each market group, we can deduce the relative importance of sectors to each market. The graph below shows the percentage of locations by sector for each market group.



A few points stand out. Firstly, ASEAN and China/HK are the most diverse market groups, with many different sectors present. The relative importance of digital and media companies in Japan should also be highlighted, as is the importance of mobile, web, and cloud integration in South Korea. The relatively higher presence of companies in those sectors is likely due to the characteristics of that market. Japan has high levels of internet penetration and a vibrant digital media sector, whilst South Korea is well known for mobile infrastructure investment and development. Additionally, the majority of companies entering India first are software or telecommunications and wireless companies, which also appears logical given the strength of the Indian IT industry, and the large opportunities for telecommunications development. The locations for first entry in advanced manufacturing are also only present in ASEAN or China/HK, suggesting that those markets are the most desirable for first entry in the manufacturing sector.

Some Patterns in Asia First

As a result of these trends, the question of why companies move to certain locations arises. Some companies may choose to expand into Asia as a result of following their clients internationally as they expand. If their clients are present in Asia, firms may open locations in Asia in order to better assist their clients.

Other companies may have a growth strategy involving mergers and acquisitions, and expand into Asia as the result of those activities. Some companies may expand locations into Asia as a result of their participation in global value chains, whilst others may expand into Asia as a result of diaspora connections. Although it is possible that SMEs are simply following larger companies in expanding their presence in Asia, as could be argued from the differences in entry years, the diversity of SME locations and sectors entering Asia would challenge this assertion. In examining some of the companies who entered Asia first, some patterns do emerge.

Accedian Networks, a company in the mobile, web, and cloud integration sector does appear to have opened locations in Asia as a result of its partnerships and relationships with clients. Accedian has partnerships with KVVH and SK Telecom for example, who are both large actors in the Asian market. Additionally, many Accedian clients and partners also have presence in Asia, such as CENX and Juniper Networks.

Cogiscan Incorporated, a services and analytics firm, is heavily involved with partners in the electronics assembly market such as Fuji, Juki, and Totech. Given their role using information technologies to optimise manufacturing processes, it would make sense for Cogiscan to expand locations into Asia in order to better serve their clients, given that much of the electronics assembly market is in Asia. The sections of the global value chain in which Cogiscan participates would be well served by the solutions Cogiscan provides rather than in other locations, higher up the value chain. As a result, it is likely that Cogiscan's position in the value chain factored into their decision to expand first into Asia.

GuestLogix is a company specialized in merchandising and business intelligence in the travel industry, whose approach to business is built around partnerships. To this end, they have a number of partners, including Hong Kong-based Inflight Sales Group, Japan-based Panasonic, and Korea-based ITWell. The expansion into Hong Kong in 2011 allowed them to better partner and expand into the Asia Pacific airline market, and better leverage their partnership with Inflight Sales Group to increase their client base.

iBwave Solutions, a developer of in-building wireless design software, signed agreements with Chinese-based Cellular Microwave Technology, South Korea Telecom, and Comtel in its earlier expansion in China and South Korea, followed by the adoption of its products in ASEAN member states, such as the Philippines and Thailand. The strategy of iBwave was therefore to partner with other companies with an established presence to allow for fast and credible access into these new markets, from which they could grow.

ICAM Technologies, a software company specializing in software for machine tool simulations and numerical control post-processing, also established a presence in Asia as a result of Asia becoming the largest market for manufacturing software. ICAM developed strategic partnerships and marketing initiatives with various Japanese and Chinese manufacturing firms, such as Makino, Dalian Machine Tool Group, and Harbin Measuring & Cutting Tool Group, and ensured that ICAM's software is compatible with a wide range of CNC machines and controllers. It would therefore appear that part of ICAM's expansion into Asia was motivated by an attempt to gain a presence in an expanding overseas market.

Innovmetric Software is another example of such a pattern, since they first entered China in 2006. Their opening of a location in China was likely significantly affected by the desire to better serve their clients such as Faro, Leica, Perceptron, and Road Ahead Technology, who had already established a presence in China. These examples serve to demonstrate that one factor affecting the decisions firms make to expand into Asia is to better serve their clients, partially as a result of their clients expanding abroad too.

Sangoma Technologies is a telecommunications company that has grown largely through acquisitions, and their first location in Asia is in India. As we observed in an earlier graph, the telecommunications sector in India is quite significant for CDO companies in Asia. Sangoma considered India an easier market to develop into due to a

relative lack of language and cultural constraints in comparison to other markets in Asia, in addition to having a significant number of clients in India.

Conclusions

- Using new sectoral classifications has allowed for a more detailed identification of CDO company locations in Asia markets
- CDO companies in Asia are overwhelmingly services-related SMEs; the exception is advanced manufacturing where 45% are large firms
- There are clear differences between the location preferences of Canadian SMEs and Large companies: large firms expand internationally earlier than SMEs on average, yet SMEs are more likely to have their first overseas location in Asia
- Among the micro-multinationals, the 'Asia First' companies' first locations are concentrated in China/HK and ASEAN; large firms even more so than SMEs
- Different companies expand into different locations as a result of different factors, some of which involve the nature of the market itself, their participation in global value chains, and following their clients internationally

Future Study Considerations

- Expanding research to incorporate US-based primary locations.
- Supply chain mapping, including services, to determine if some Canadian SMEs are following larger Canadian or foreign companies
- More detailed industry analysis in order to understand what types of companies are consolidating within specific regions and linking this to any existing clusters that may exist within that region