2 The contribution of FDI to productivity, innovation and integration in GVCs

This chapter examines the contribution of foreign direct investment to productivity, innovation and the integration of the Canadian economy into global value chains. It analyses productivity differences between foreign and domestic firms and the extent of value chain linkages between foreign multinationals and Canadian firms, an important channel of productivity spillovers. It also assesses the role of foreign firms in innovation and the local capacity of domestic firms, particularly small and medium-sized enterprises to benefit from the diffusion of knowledge and technology brought by FDI.

2.1. Summary of key findings

Foreign direct investment (FDI), particularly greenfield investment (i.e. new establishments by foreign companies), is an important driver of Canada's trade and integration into global value chains (GVCs). In Canada, greenfield FDI is concentrated in a small number of highly export-oriented sectors, including mining and energy, ICT and electronics and transport equipment. The integration of the Canadian economy in GVCs is limited, however. Since much of the FDI Canada attracts, particularly greenfield investment, is export-oriented, multinational enterprises (MNEs) account for a sizable share of Canada's trade and integration in GVCs. Foreign MNEs are responsible for 57% of export value and are more involved in GVCs than domestic firms, particularly in terms of backward linkages.

Canadian labour productivity has lagged behind that of a number of other OECD economies such as the United States, Australia, Switzerland and Germany. To some extent, low productivity growth over the past decades is attributed to lagging investments, poor innovation performance and constraints in the business environment. Affiliates of foreign MNEs established in Canada appear to be more productive than domestic players in most sectors of the economy. This foreign productivity premium is particularly higher in finance and insurance, construction, and utilities, where foreign firms are 50% more productive than domestic firms. The scale of foreign firms' productivity premium also varies depending on the capacities of domestic firms, with Canadian multinationals exhibiting narrower performance gaps than Canadian non-multinationals as a result of their greater access to trade networks, advanced technologies and innovation.

Affiliates of foreign MNEs in Canada are on average more R&D-intensive than domestic firms. The results of an OECD business consultation conducted for this study show that foreign firms are considerably more engaged in innovative business activities, including product and process innovations as well as joint product development with other firms. Differences in R&D intensity between foreign MNEs and domestic firms are particularly large in professional, scientific and technical sectors and in information and cultural industries. In the past five years, R&D investments made up a large part of greenfield FDI in creative industries (91%), financial services (42%), and ICT and electronics (34%).

Sell and buy linkages between affiliates of foreign MNEs and domestic firms can strengthen the potential for productivity spillovers, by facilitating domestic firms' participation in GVCs and the transfer of knowledge and technology. Domestic buy linkages exist if foreign MNEs source intermediate inputs and services from domestic firms, while sell linkages emerge when foreign MNEs supply intermediates that are further processed by domestic firms or sell final products. Foreign affiliates established in Canada source a sizeable share of their inputs from the domestic market, in particular from domestic non-MNEs, which account for approximately 40% of total inputs. Similar results hold for other large open economies such as the United States, France, and Italy, with large domestic markets for intermediate inputs. Moreover, more than 60% of the production of foreign affiliates in Canada feeds back into domestic value chains, of which 22% is used as an input by domestic non-MNEs.

For productivity and innovation spillovers to materialise, domestic firms, particularly small and medium-sized enterprises (SMEs), should have the necessary capacities to become successful suppliers and partners of foreign MNEs and absorb the knowledge, skills and technologies that FDI brings to the host economy. Canadian SMEs are on average more engaged in product and business process innovation than many other peer economies such as Australia, the United States, Japan and the European Union as a whole. Among Canadian firms, more R&D capacity is also found in smaller enterprises, which represent 21% of R&D expenditures and 25% of R&D personnel. However, the digital capacities of Canadian SMEs appear to lag behind that of peer OECD economies, including with regard to the use of Artificial Intelligence (AI) and cloud computing services as well as the provision of ICT training to their employees, pointing towards potential weaknesses in fostering strategic partnerships with technology-intensive investors.

Policy considerations

- **Policy efforts to diversify the type of FDI that Canada attracts towards high-productivity and R&D-intensive sectors and activities could continue and be scaled up further.** In Canada, only a few sectors are reported to attract the majority of FDI, which is concentrated in the management of companies and enterprises (where investments may be ultimately redistributed to other sectors), finance, trade and mining and oil and gas extraction.
- **Beyond targeting and prioritising new R&D-intensive investments, Canada's government agencies responsible for investment and innovation promotion could enhance collaboration to facilitate knowledge-intensive investments from established foreign multinational enterprises (MNEs).** Encouraging expansion by existing investors is a prevalent entry mode for R&D-focused FDI. These foreign MNEs could benefit from developing partnerships with local universities and applied research institutions, collaborating with science and technology parks, accessing qualified R&D talent, and engaging in entrepreneurial networks and open innovation programs, including innovation testing and piloting infrastructures/platforms.
- **Canada could consider revising market access restrictions to FDI where these limits the positive impacts of international investment on productivity growth, innovation, and integration in GVCs.** Currently, Canada is ranked the fourth most restrictive economy in the OECD according to the 2020 OECD FDI Regulatory Restrictiveness Index. Fewer restrictions for investments in more productive, innovative, and knowledge-intensive sectors can increase the direct impact that foreign firms have through their own activities on sectoral and aggregate productivity growth. Openness to FDI may not only improve productivity in industries that get market access, but also those in downstream sectors that benefit from potentially better access to high quality inputs and services domestically.
- **Comprehensive supplier development programmes in line with investors' needs could be designed to strengthen the productive and innovative capacities of Canadian firms, in particular SMEs.** Although supplier linkages between foreign and domestic firms in Canada are common, Canadian SMEs exhibit a low adoption of advanced technologies as well as digital tools and processes, which may limit the extent of collaboration with foreign investors, and therefore the potential for knowledge and technology spillovers.

2.2. The contribution of FDI to trade and integration in GVCs

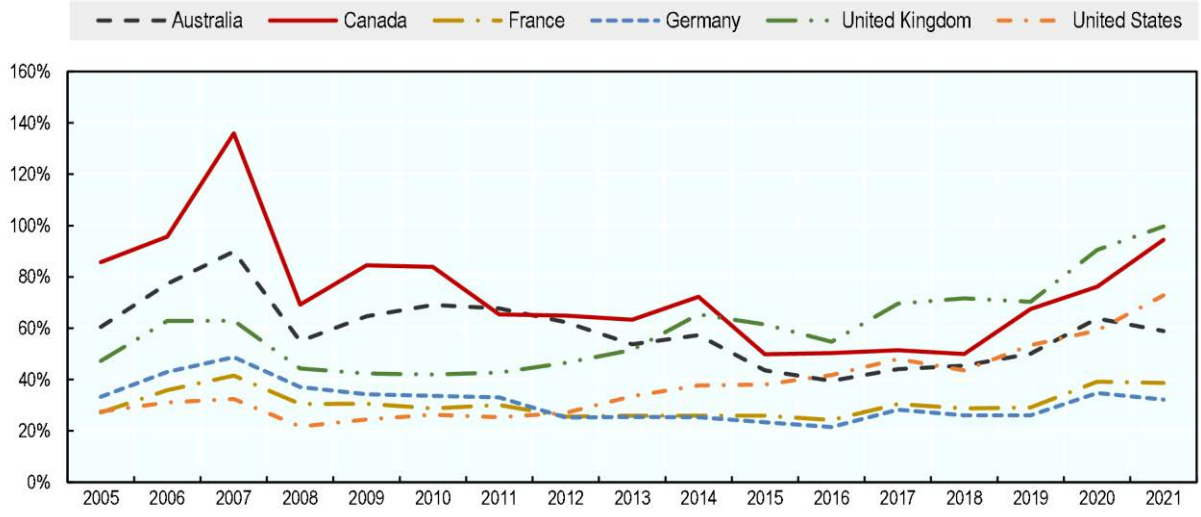
While exports are important for the Canadian economy, its focus on the early production stages of the supply chain and closer to raw materials, has constrained its deeper integration into global value chains (GVCs). The spread of production across multiple countries through GVCs can include more firms in international trade, leading to productivity enhancements and access to knowledge, technology and skills. FDI, in turn, has the potential to drive improvements in exporting and GVC participation. Foreign multinationals are often more intensive exporters that have positive impacts on other firms' exporting though their business connections and spillover effects on domestic firm competitiveness. The presence of multinational firms can strengthen the host economy's international connections and market linkages. Domestic firm exporting can also be supported through foreign investments bringing enhanced productivity, innovations and new technologies, and improved access to finance (Kastratović, 2020[1]).

2.2.1. International trade and investment have shaped the Canadian economy, but integration in GVCs remains limited

Natural resources and proximity to the US market make Canada an attractive destination for foreign investment. However, relative to GDP, inward and outward stocks of FDI both declined following the global financial crisis, recovering only gradually in the late 2010s and with greater recent growth in outward net FDI stocks (Figure 2.1). Relative to GDP, Canada's inward net FDI stocks are the 11th largest in the OECD area and are greater than those of several other large economies. This is despite the comparative restrictiveness of FDI policies; Canada was ranked the fourth most restrictive economy in the OECD in the 2020 FDI Regulatory Restrictiveness Index (Figure 2.2)

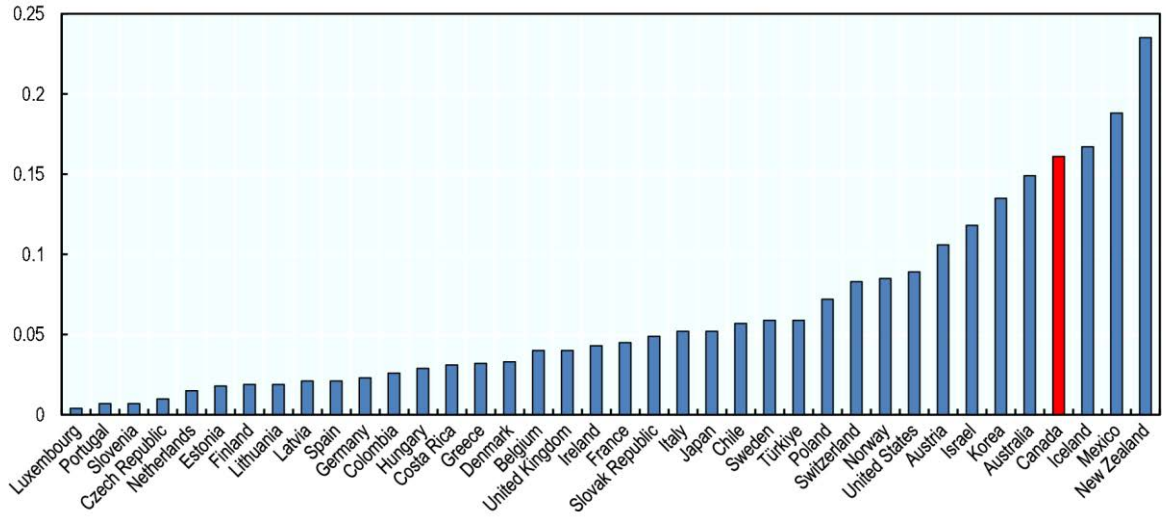
Under the Investment Canada Act, investments in certain sectors of strategic importance for national security are screened to ensure that they do not have a negative impact on critical infrastructure. While screening mechanisms are increasingly common among OECD economies and serve legitimate policy objectives related to national security, other market access barriers such as foreign ownership restrictions may hamper Canada's investment performance. Such restrictions are relatively highest in network sectors (e.g. media and telecommunications) and air transport. For instance, in telecommunications both ownership and board composition must be at least 80% Canadian in operators with more than 10% of market share (OECD, 2023[2]). Access to public procurement contracts is also limited to regional trade agreement partners and signatories to the WTO's Government Procurement Agreement (OECD, 2022[3]). The need for such restrictions should be evaluated with a view to removing those that have large economic costs and limit the Canadian economy's potential to attract productivity-enhancing investment.

Figure 2.1. Inward net FDI stocks as a share of GDP in selected economies, 2005-2021



Source: OECD FDI Statistics (2023[4]), https://stats.oecd.org/

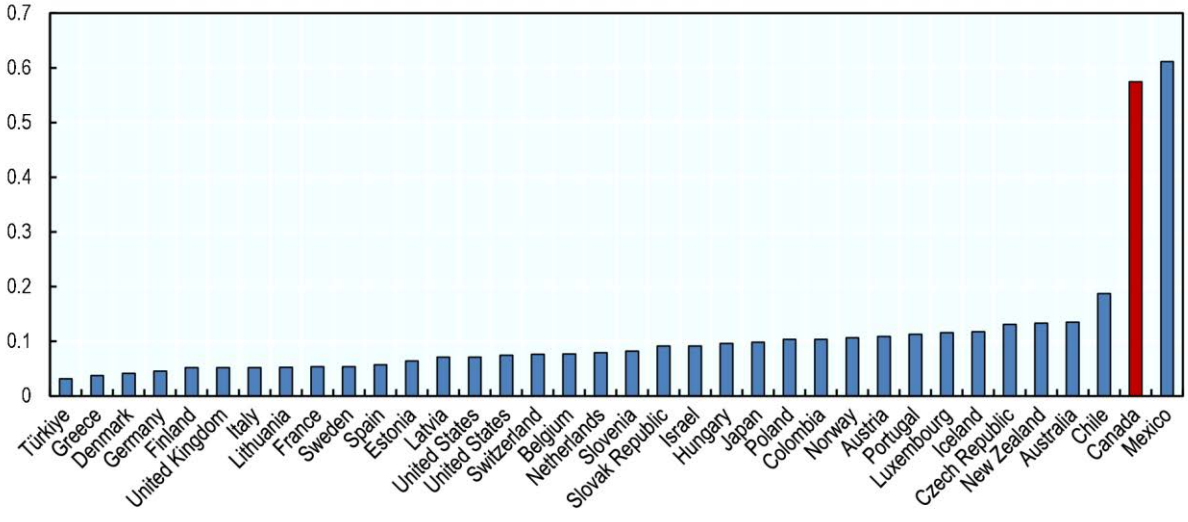
Figure 2.2. FDI Regulatory Restrictiveness Index, 2020



Note: The FDI Regulatory Restrictiveness Index measures statutory restrictions on foreign direct investment on a scale from 0 (open) to 1 (closed).
Source: OECD FDI Regulatory Restrictiveness Index (2023), https://stats.oecd.org/Index.aspx?datasetcode=FDIINDEX

Investment inflows and trade performance are closely connected; Greenfield FDI, i.e. new establishments by foreign companies, are relatively concentrated in a small number of highly export-oriented sectors, with much of it originating in the United States. Over 2003-22, most greenfield FDI came from the United States (45%), followed by the Netherlands (14%) and France (6%) and was directed towards projects in mining and energy (34%), ICT and electronics (17%) and transport equipment (10%) (Financial Times, 2023[5]). These sectors were among the more important contributors to the rapid expansion of Canadian exporting in the 1990s, on the back of deepening trade with the United States under new trade agreements. The US accounts for three quarters of exports and Canada's exports are among the least diversified by market in the OECD. At 0.57, its export destination Hirschman-Herfindahl Index has been quite consistent over the past decade and is not surprisingly exceeded only by Mexico's (0.61) (Figure 2.3.).

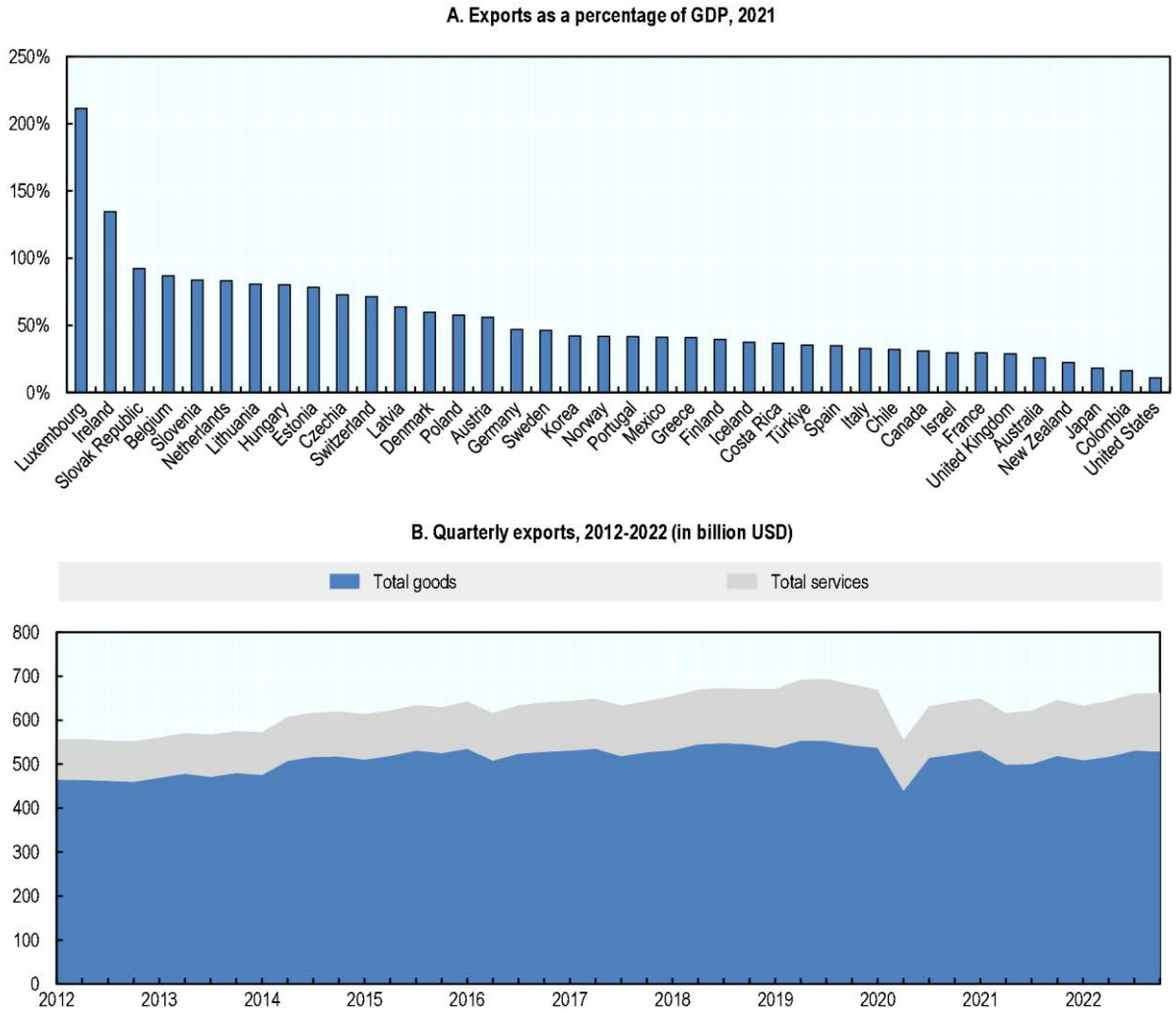
Figure 2.3. Hirschman-Herfindahl Index by goods export destination for OECD countries, 2021



Note: The index varies from 0 to 1, with higher values indicating less export diversification.
Source: Authors' calculation based on the OECD Bilateral Trade in Goods database (2023[6]), https://stats.oecd.org/

Exports as a share of GDP have since declined from the peak of 44% in 2000 and are below that of most other OECD economies, but above the export share in some of the larger advanced economies – including the United States, Japan, Australia, United Kingdom and France (Figure 2.4., Panel A). Export performance has proven to be fairly resilient to recent disruptions with exports of goods and services in 2022 gradually returning to pre-pandemic levels (Figure 2.4., Panel B). Energy exports were particularly affected at the beginning of the COVID-19 pandemic. The share of mineral fuels and oils in total export value fell from 22% in 2019 to 18% in 2020, before rebounding to 24% in 2021. Stronger demand and higher prices in 2022, an effect of post-COVID19 economic rebound and inflation pressures stemming from the war in Ukraine, further boosted exporting through much of 2022. Supply chain disruptions affecting exporting from motor vehicle production and other manufacturing sectors appear to be easing as well. While it is not yet clear to what extent foreign-owned firms directly contributed to this recovery, the sectors that contributed most to the recent growth – such as motor vehicle manufacturing and the energy sector – include those with significant foreign involvement.

Figure 2.4. Export performance and trends



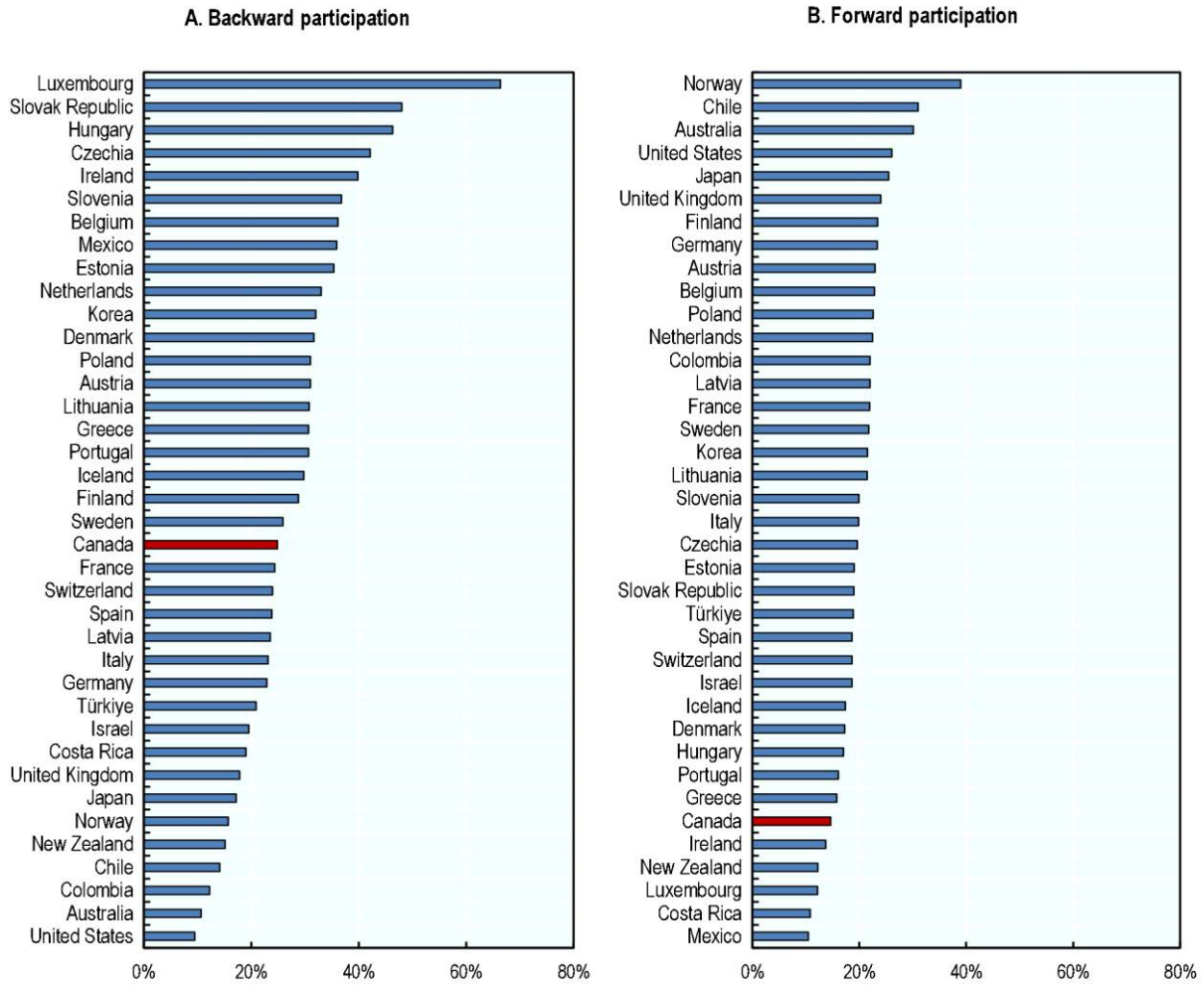
Source: OECD International Trade Statistics (2023[7]), https://stats.oecd.org/; Statistics Canada, Exports and Imports of Goods and Services, (2023[8]), https://doi.org/10.25318/1210013401-eng

While goods are by far the most important element of exports, manufacturing is a less important source of exports than in much of the OECD. Goods account for 82% of total export value. Canadian exports are thus somewhat more service-oriented than Australia's (89% goods exports), but much less service-oriented than the exports of the United States and United Kingdom, where goods represent only 69% and 49%, respectively, of total exports. Most goods exports are from the manufacturing sector (65%), followed by mining and quarrying (23%) and agriculture, forestry and fishing (6%). Canada is thus among the OECD countries whose exports are least reliant on manufacturing. Measured across five major sectors, Canadian goods exports are relatively diversified in their composition; the Hirschman-Herfindahl Index in 2021 was 0.54. Only Colombia (0.38), Turkey (0.39), Chile (0.45), Mexico (0.49) and Australia (0.53) had more diversified exports by sector.

Canada's participation in GVCs has been restrained as a result of its limited manufacturing exporting and reliance on the early production stages of the supply chain. The Canadian economy makes moderate use of imported inputs in producing goods and services for export (backwards participation) and exports few goods and services that are later used in destination countries' exports (forward participation) (Figure 2.5.). In 2018, foreign value added contributed to the 25% total value of Canadian gross exports. This was close to the median of OECD member countries. Domestic value added accounted for just 15% of re-exported goods, however; one of the lowest rates among OECD members. A large share of Canadian exports is ultimately destined for the United States's domestic market, limiting the scale of forward GVC linkages through the export of intermediate products. To the extent that this form of GVC participation has deepened in the past decade, it has mostly been driven by sector change and the growing importance of the mining sector in providing materials for value chains' early stages. Meanwhile, the fragmentation of automotive supply chains has increased Canada's backward linkages in GVCs (de Backer and Miroudot, 2016[9]).

The limited integration in GVCs means that Canada may miss out opportunities for productivity growth and innovation. Productivity spillovers may occur from both backward and forward participation in GVCs, by enabling countries to use inputs that are not available in the domestic economy or that have an advantage in terms of price or quality; but also by accessing technology and knowledge brought from export destinations (Criscuolo and Timmis, 2017[10]). Further GVC integration could be particularly important for Canada's export performance by developing comparative advantages in selected stages of the production process rather than having to master the production of entire products.

Figure 2.5. Backward and forward participation in global value chains by OECD economies, 2018



Note: Backward participation in GVCs is defined as the foreign value added share of gross exports. Forward participation in GVCs is defined as the domestic foreign value added share of foreign gross exports.
Source: OECD Trade in Value Added (TiVA) Database (2023[11]), https://stats.oecd.org/

2.2.2. Foreign firms play a major role in driving Canada's export performance

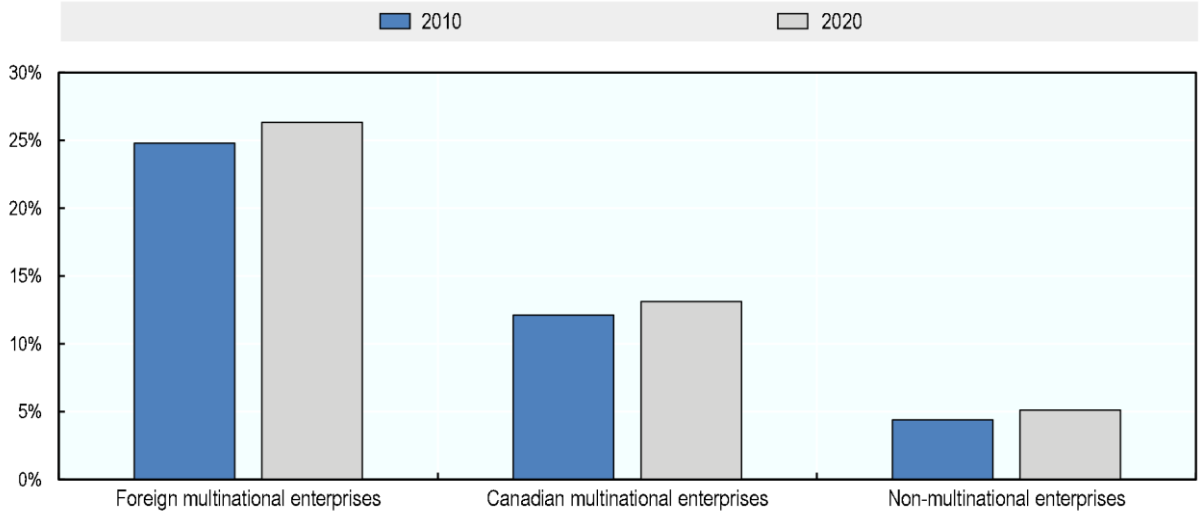
FDI strengthens Canada's export capacities. Foreign firms are highly involved in trade, directly boosting Canadian exporting. They also indirectly contribute to exporting by domestic firms by strengthening their international connections and enhancing competitiveness. Foreign multinationals are responsible for 57% of Canadian export value, including 59% of merchandise exports and 48% of commercial service exports, despite accounting for just 30% of operating revenues in the corporate sector (which includes foreign and Canadian multinational enterprises, as well as non-multinational enterprises). Not surprisingly, much of this comes from subsidiaries of US firms, which accounted for 48% of the value of merchandise and commercial service exports by foreign MNEs in 2020.

Relatedly, exports are also relatively more important to foreign firms. In 2020, merchandise and commercial service exports represented 25% of the operating revenue of foreign MNEs, compared with just 12% and 4% for Canadian multinational and non-multinational enterprises, respectively (Figure 2.6.). All three firm categories increased their export orientation over the previous decade; this share increased by 1.5 percentage points for foreign multinationals, by 1.0 percentage points for Canadian multinationals

and by 0.7% for non-multinationals. Goods exports are the largest component of total exports across all three firm categories, but are relatively more important for foreign MNEs, for which they represent 85% of exports. In comparison, merchandise exports account for 82% of the total of Canadian multinationals and 77% of non-multinationals.

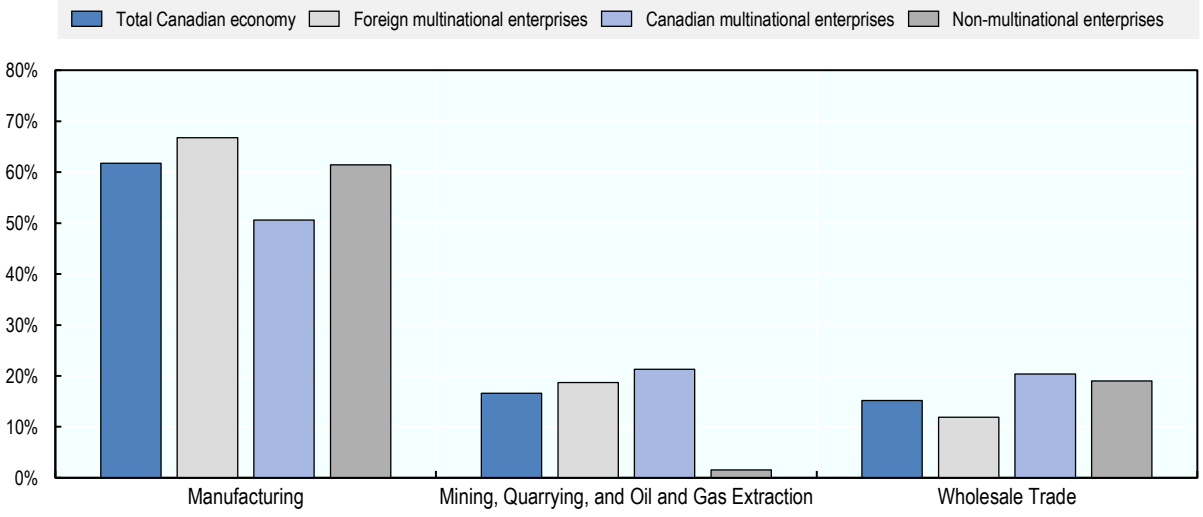
Foreign multinationals do not appear to contribute much to export sector diversification. Export values by sector are similar to those of the Canadian economy as a whole, led by manufacturing (67% of foreign firms' exports and 62% of Canadian merchandise exports); mining, quarrying, and oil and gas extraction (19% and 17%, respectively); and wholesale trade (12% and 15%, respectively) (Figure 2.7.).

Figure 2.6. Merchandise and commercial service exports as a share of operating revenue



Source: Statistics Canada (2023[12]), Activities of Multinational Enterprises in Canada, https://doi.org/10.25318/3610060401-eng

Figure 2.7. Exports as a share of operating revenue in selected sectors, 2020



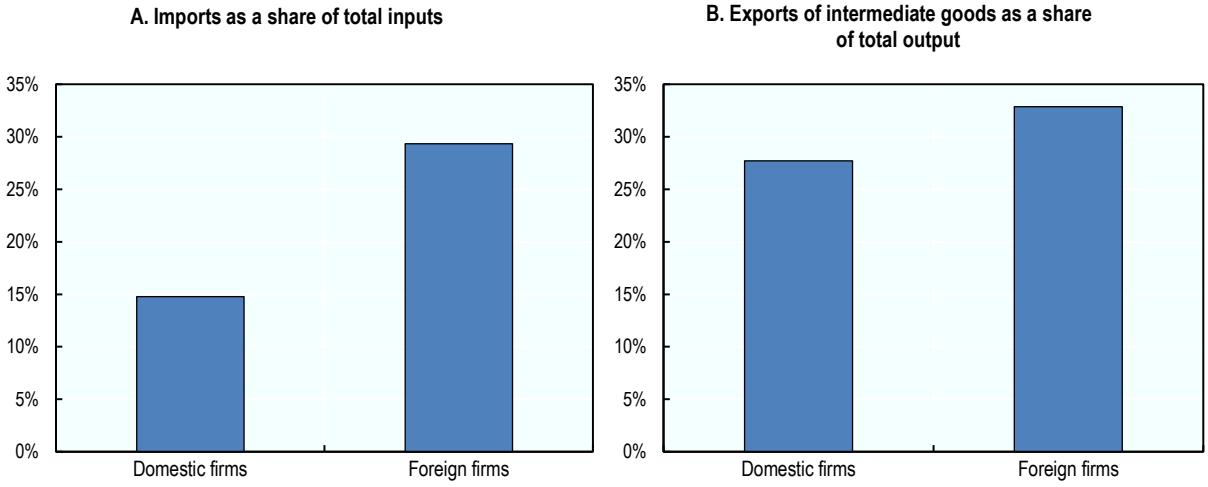
Source: Statistics Canada (2023[12]), Activities of Multinational Enterprises in Canada, https://doi.org/10.25318/3610060401-eng

While foreign firms have a particularly strong presence in a number of export-intensive sectors such as manufacturing, these businesses are more trade-oriented than domestic firms across much of the economy. Foreign firms are the most active exporters in most sectors. Only in wholesale trade, retail trade, real estate and rental and leasing, health care and social assistance, and other (non-public administration) services are Canadian multinationals more export-oriented. Non-multinational enterprises are the most export-oriented in finance and insurance, though foreign-owned firms account for just 1.2% of total exports from this sector. The export performance of foreign firms also does not appear to be just a result of size differences. Larger businesses are responsible for most exports. Firms with 250 and more employees were responsible for 66% of exports in 2021, despite their accounting for less than half of value added. Foreign firms are not particularly large, however. Foreign multinationals, on average, employed 18% fewer workers than Canadian multinationals in 2020, though this gap has narrowed somewhat from the 23% difference in 2010 (Statistics Canada, 2023[12]).

Not surprisingly, foreign firms also appear to be more involved in GVCs than domestic firms, particularly in terms of backward linkages. Foreign firms in Canada import 29% of their inputs, while domestic firms import just 15% of their inputs (Figure 2.8.). Foreign firms in the real estate activities, basic metals, and rubber and plastics products sectors are particularly dependent on imported inputs, though foreign investment also tends to be concentrated in sectors where importing supplies a greater share of final demand in Canada.[1] Foreign value added contributes less to supplying total domestic demand in several sectors that attract high levels of foreign investment, such as manufacturing and mining and quarrying. These two sectors, along with total business sector services, have also seen a decline in the relative importance of foreign value added over 2010-18 (OECD, 2023[11]).

The differences between foreign and domestic firms seem to be less important in terms of forward linkages. Exports of intermediate products account for 33% of the output of foreign firms; somewhat more than the 28% from domestic firms. Intermediate exports are relatively more important to domestic firms in utilities industries[2], chemicals, rubber and plastics products; and other transport equipment and to foreign firms in accommodation and food service activities; electrical equipment; and arts, entertainment and recreation and other service activities.

Figure 2.8. Imported inputs and exports of intermediate goods by firm ownership, 2016



Source: Authors' calculations based on OECD Inter-Country Input-Output Tables (2023[13]), http://oe.cd/icio

2.3. Productivity trends and FDI spillovers

FDI inflows can be associated with improved productivity, which is needed to boost Canada's growth prospects. Not only are foreign firms typically more efficient than average in host countries, and thus direct contributors to productivity growth, their presence can indirectly boost productivity among domestic firms where knowledge and technology spillovers are fostered (OECD, 2019[14]). Domestic firms that supply foreign entrants can see productivity gains through their improved access to product and service quality standards, knowledge, technology and finance. Other firms may benefit from imitating more productive peers or by hiring workers that have gained new knowledge and skills through their work with foreign and internationally-oriented firms (OECD, 2022[15]). Realising this potential in Canada depends in large part on the establishment of stronger linkages between firms. The type, motives, origin and sector of the investment, as well as the scale and structure of the investing firm all affect the local embeddedness of foreign firms and the extent to which the host economy can benefit from productivity spillovers (OECD, 2022[15]).

2.3.1. Canada's labour productivity growth continues to underperform relative to leading OECD economies

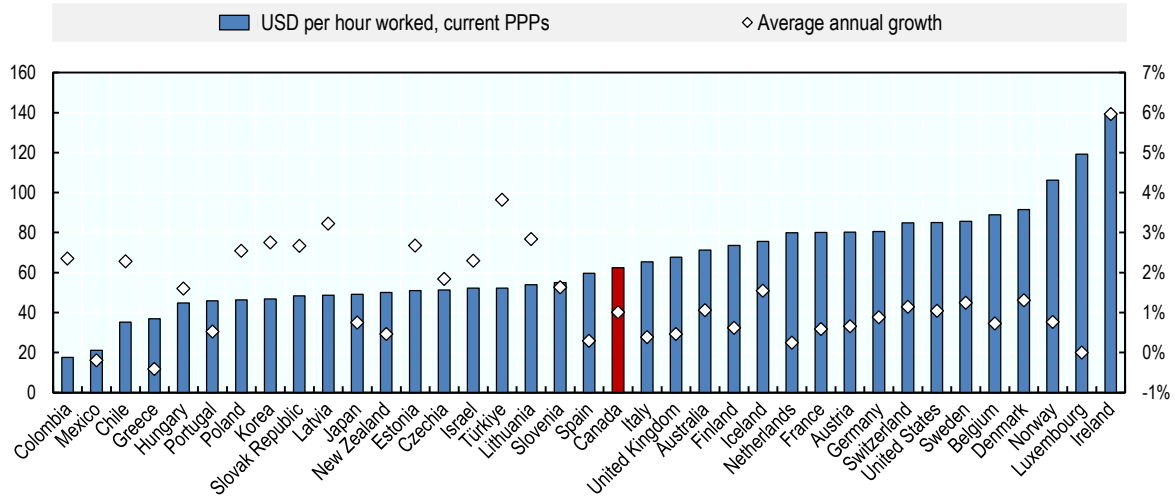
Although Canada's labour productivity has trailed behind that of the United States and several other advanced economies like Australia, the United Kingdom, France, and Germany, there is significant potential for improvement through strategic investments and collaborations. According to OECD (2023[2]), productivity growth has been restrained by insufficient capital deepening and investment by firms. Despite these challenges, Canada's labour productivity, at USD 62 per hour worked in 2021, is close to the median among OECD countries (Figure 2.9). While this level is lower than that of the United States and most European countries, and notably below the G7 average of USD 74, it underscores the opportunity for Canada to leverage foreign direct investment (FDI) to enhance productivity.

Canada's recent labour productivity growth has been relatively modest, averaging just 1.0% over 2012-2021, ranking 21st among 37 OECD member countries with comparable data. Factors such as depressed oil prices and limited investment in the sector during 2014-2022 have contributed to this trend. However, Canada has the potential to overcome these challenges with targeted FDI that fosters innovation, improves market efficiency, and addresses barriers such as inter-provincial trade differences in technical standards and regulations, along with limitations on labour mobility. By strategically leveraging FDI to enhance innovation, address regulatory barriers, and stimulate investment, Canada can unlock its economic potential and strengthen its competitiveness on the global stage.

The 2023 OECD Economic Survey of Canada highlights the need to accelerate reduction in internal barriers to trade and investment, which may have large economic costs and limit the efficiency and scope of labour markets (OECD, 2023[2]). A wide range of policy actions can potentially increase business sector productivity, including improvements in infrastructure, reforms to improve vocational education and skills development, cutting red tape in setting up businesses and strengthening competition law and regulation. As seen in Section 2.2.1, fewer restrictions for investments in more productive, innovative and knowledge-intensive sectors (e.g. telecommunications, information technology, professional and technical services) can increase the direct impact that foreign firms have through their own activities on sectoral and aggregate productivity growth (OECD, 2022[15]). Openness to FDI may not only affect productivity in industries that get market access, but also those in downstream sectors that benefit from potentially better access to high quality inputs and services domestically.

Figure 2.9. Labour productivity in OECD countries

GDP per hour worked in 2021 and average annual productivity growth in 2012-2021



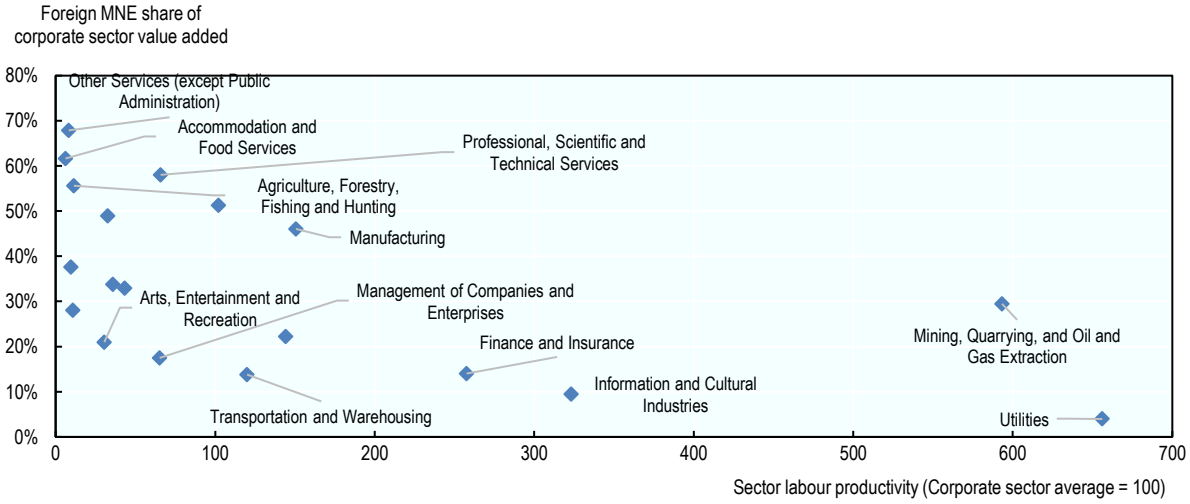
Source: OECD Productivity Statistics Database (2023[16]), https://doi.org/10.1787/pdtvy-data-en

2.3.2. Foreign firms are more productive than domestic firms in most sectors

Overall, foreign firm activity in Canada appears to be concentrated in less productive sectors (Figure 2.10). The two sectors where foreign firms account for the highest shares of value added – other services (except public administration) and accommodation and food services – have the lowest productivity levels. Similarly, professional, scientific and technical services as well as agriculture and manufacturing, which exhibit relatively high foreign firm activity, are found among the lower productivity sectors. By contrast, utilities and mining, oil and gas extraction, information and cultural industries and financial services exhibit lower shares of foreign firm value added but are significantly more productive than the rest of the economy. This concentration of foreign firm activity in low-productivity sectors contributes to foreign firms having, on average, 23% lower value added per worker than their domestic counterparts.

Although additional analysis is required to fully understand the impact of foreign firm activity on sectoral and overall labour productivity, the concentration of foreign firms in sectors with lower labour productivity levels can be attributed to combination of market entry strategies, sector characteristics and potentially the regulatory landscape. For instance, in certain sectors, foreign firms might focus on activities that don't necessarily leverage high technology or automation, which are typically associated with higher productivity, while in other sectors productivity spillovers from FDI might not be fully realised due to barriers related to workforce skill gaps or incompatible infrastructure. Regulatory environments, trade policies and local competition may also shape the strategic decisions of foreign firms, impacting where and how they invest, and consequently affecting their productivity levels.

Figure 2.10. Foreign firms' share of value added and sector productivity



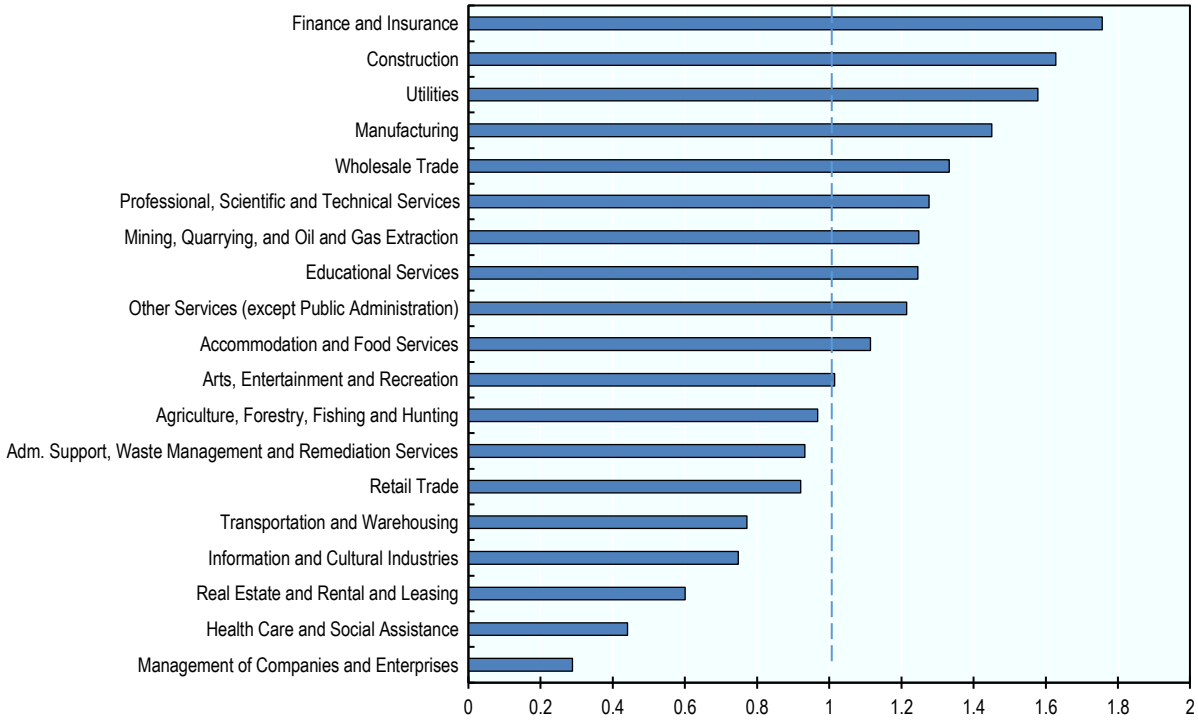
Note: The corporate sector includes foreign multinational enterprises, Canadian multinational enterprises and non-multinational enterprises.
Source: Authors' calculations based on Statistics Canada (2023[12]), Activities of Multinational Enterprises in Canada, https://doi.org/10.25318/3610060401-eng

Analysing productivity gaps at sector level shows that foreign firms are more productive than domestic ones in most sectors (the indicator in Figure 2.11. is above 1 in 11 out of 19 sectors). The foreign premium is highest in the financial and insurance, construction and utilities sectors, where foreign firms are more than 50% more productive than domestic firms. On the other hand, foreign firms are relatively less productive than domestic firms in healthcare and social assistance, real estate, rental and leasing services as well as in the management of companies and enterprises, possibly due to the presence of few highly productive domestic players.

The productivity premium that foreign firms exhibit in most sectors in Canada suggests that knowledge and technology spillovers from FDI could be leveraged on to close productivity gaps in these sectors. These findings reflect evidence from other OECD economies where foreign firms tend to be larger and more technology- and export-intensive, both features associated with higher productivity levels. However, the ability to do so also depends on the capacities of domestic firms to absorb knowledge spillovers, which are assessed in Section 2.4.3.

Figure 2.11. Relative labour productivity of foreign multinational enterprises, 2020

>1 = foreign firms are more productive than domestic firms



Source: Authors' calculations based on Statistics Canada (2023[12]), Activities of Multinational Enterprises in Canada, https://doi.org/10.25318/3610060401-eng

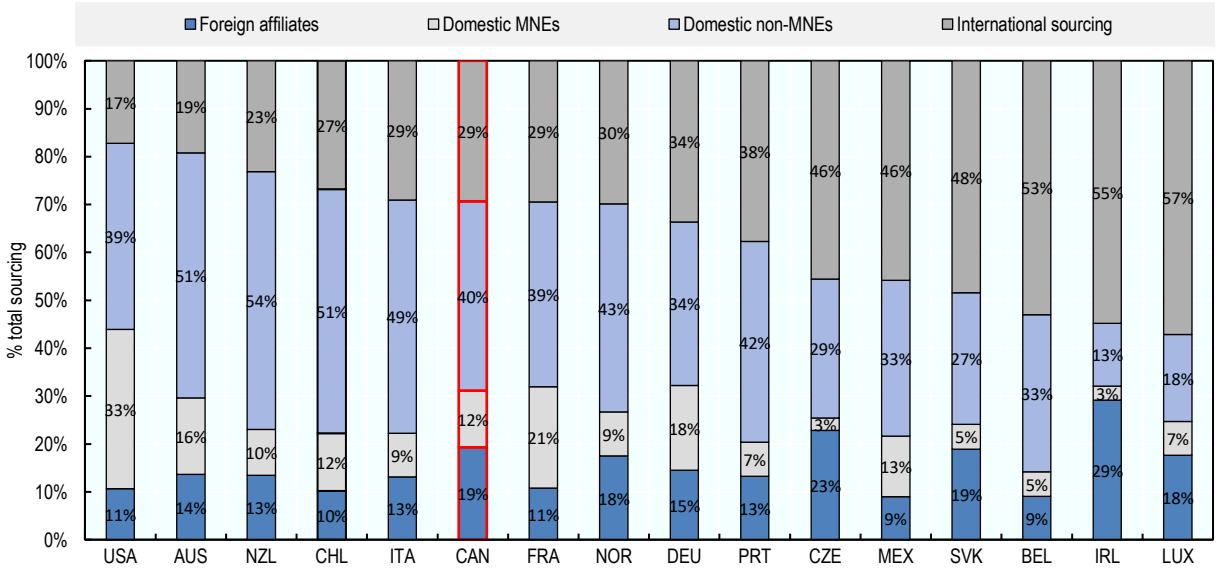
2.3.3. Foreign firms have built strong linkages with some domestic producers

Since more productive foreign firms may seek to limit potential knowledge and technology spillovers benefitting their competitors, positive effects on domestic firms' productivity are more often found among upstream suppliers (OECD, 2023[17]). Foreign investors usually require better quality inputs from local suppliers and are, therefore, willing to share knowledge and technology with them to encourage the adoption of more efficient business processes (OECD, 2023[17]). The training and on-the-job learning opportunities offered by foreign investors may also be extended to the workforce of domestic firms with which they develop buyer-supplier linkages to ensure efficiency and product quality. Moderate productivity gaps between firms tend to suggest similar levels of technological sophistication and the potential for positive spillovers between them (OECD, 2022[15]). However, foreign firms can also generate negative spillovers through unsustainable or irresponsible practices of their supply chains. If local companies are not quick to adapt, competition from foreign-owned companies may also result in the exit of some domestically-owned firms. Increased competition for talent may also make it more difficult for local companies to recruit skilled workers, particularly in more remote areas where the labour pool is smaller.

In comparison with peer OECD economies, foreign firms in Canada focus primarily on the domestic market for their sourcing of inputs (buy linkages) and the use of their outputs (sell linkages). In 2016, foreign affiliates purchased 19% of their intermediate inputs from other foreign affiliates in the country (Figure 2.12). This is the 5th-highest rate among OECD member countries and nearly double that of the United States (10.7%). Domestic firms still account for a considerable share of supply (about 62%), however, as international sourcing is relatively low. These linkages may provide a channel for knowledge and technology spillovers benefitting smaller Canadian businesses. Non-multinationals are particularly

important suppliers. They provide approximately 40% of foreign affiliates' inputs. The extent of domestic buy linkages is on the whole similar to that of other large economies such as the United States, the United Kingdom, France and Italy, and is explained by the relatively larger markets for intermediate goods in these countries. In terms of foreign affiliates' sell linkages, 69% of the output of foreign affiliates is sold to the domestic market. About 22% is bought by domestic non-MNEs, 6% by domestic MNEs and 12% by other foreign firms established locally (Figure 2.13). As with the Canadian economy as a whole, which has limited forward participation in GVCs, relatively little output from foreign affiliates is used in international intermediate consumption.

Figure 2.12. Sourcing structure of foreign affiliates by country, 2016

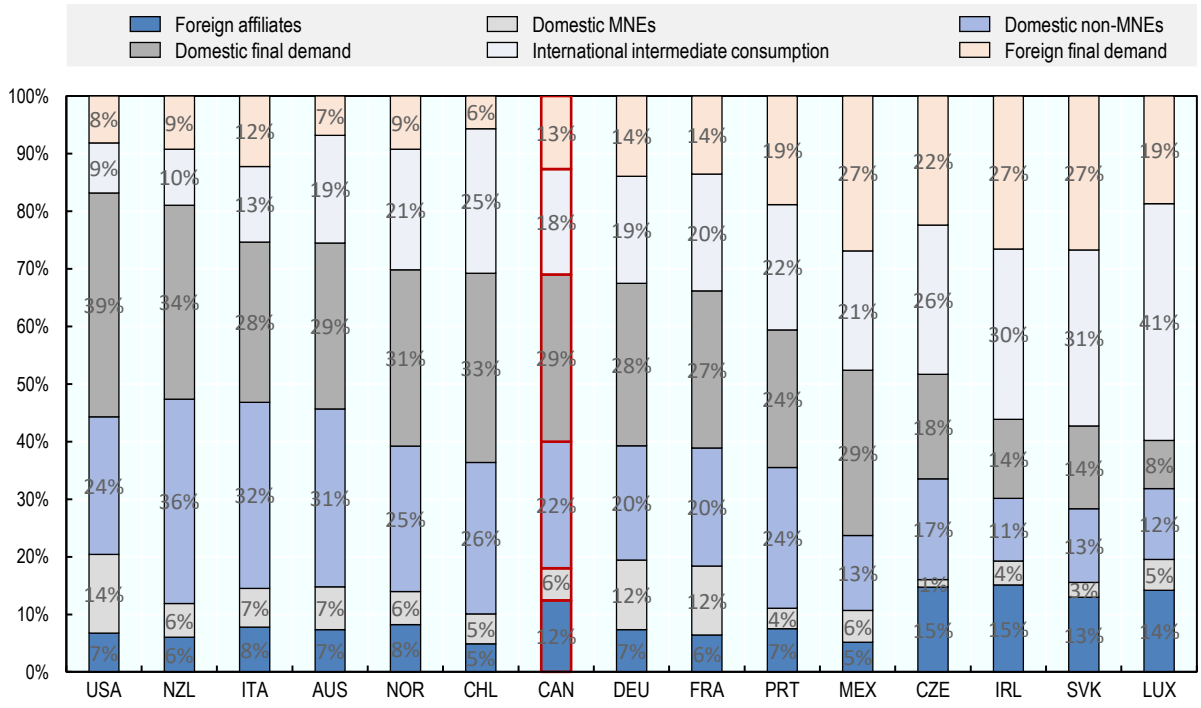


Source: OECD Analytical AMNE Database, (2016[18]), https://www.oecd.org/sti/ind/analytical-amne-database.htm

To some extent, the realisation of productivity spillovers from foreign firms is constrained by the limited supply of intermediate products by domestic firms. Foreign firms are more heavily dependent on imported inputs than their domestic counterparts. Merchandise and commercial services imports by foreign multinational enterprises were worth CAD 395 billion in 2020. This represented 43% of their operating expenses, a considerably higher share than among Canadian multinational enterprises (19.6% of operating expenses) and non-multinational enterprises (16%) (Statistics Canada, 2023[12]). This difference does not appear to be the result of the sectoral composition of foreign investment. In fact, merchandise and service imports as a share of operating expenses are highest in foreign multinationals in all sectors but finance and insurance, where these are highest in non-multinational enterprises.

While foreign firms import a greater share of their inputs than do domestic firms, both groups make similar use of inputs from the Canadian operations of foreign and domestic businesses. Among foreign firms, 73% of non-imported inputs originate in domestic firms, while this share among domestic firms is slightly higher (76%). Domestic firms make up a relatively large share of non-imported inputs in a number of manufacturing sectors, including wood and cork product; food products, beverages and tobacco; and fabricated metal products, as well as services sectors including human health and social work activities and public administration, defence and compulsory social security (OECD, 2023[13]).[3]

Figure 2.13. Output use of foreign affiliates, 2016



Source: OECD Analytical AMNE Database (2016[18]), https://www.oecd.org/sti/ind/analytical-amne-database.htm

Seizing the additional spillovers that could result from strengthening these business linkages between foreign and domestic firms will require that domestic firms have the capacities to adopt new technologies, improve quality and make production more efficient. This should be achievable for many businesses. As illustrated above, overall Canadian productivity is around the middle of OECD member countries and productivity gaps by firm ownership are moderate in most sectors of the economy. These challenges may be more significant for lower-productivity SMEs. Non-multinational firms, although they represent a substantial 41% of total Canadian employment and contribute 29.9% to the overall value added are typically quite small, with an average of only 2.6 employees per enterprise in 2020 (Statistics Canada, 2023[12]).

2.3.4. Acquisitions may involve productivity spillovers from FDI on domestic firms

More direct involvement of foreign firms that have acquired SMEs and other domestic firms may lead to new opportunities for SME growth and upgrading. As part of scaling up their innovation activities, Canadian SMEs frequently look for foreign investors or outright buyers. This also can allow these emerging businesses to expand their export capacity and presence to international markets. Canadian SME entrepreneurs who choose to be acquired are twice as likely to experience sales growth above their industry average, and as a result 13% of Canadian entrepreneurs (as many as 170,000 SMEs) plan to be acquired over the next five years, as of 2021 (Business Development Canada, 2021[19]). A significant share of this is being driven by venture capital (VC) investment, amount to 8 billion CAD in 2022 across Canada. Foreign investors made up 67% of the VC flows to Canadian companies, with US VC firms at 49% and non-US foreign firms at 18%, respectively (Consulting.ca, 2023[20]). Foreign VCs make relatively larger investments than domestic VCs, provide a higher chance of a successful exit for Canadian entrepreneurs and are likelier to provide pathways to access foreign markets (Kong, Nitani and Riding, 2015[21]). Although foreign VCs are more risk-averse on the Canadian market than domestic ones, opting to choose

beneficiaries that are likelier to succeed in the market, the dominance of the Canadian VC space by foreign firms and their relative success, provides a significant added benefit to the innovation and productivity of Canadian SMEs.

Started in 2013, a Canadian SME that manufactures and supplies network communication products and solutions for critical infrastructure scaled up significantly following a funding round in 2018 from a large multinational German automation products manufacturer. The latter supported the launch of its RAPTOR Series Platform, an industrial IoT communications networking platform that enables secure and reliable communications between devices, equipment, and the people managing critical infrastructure. After a significant slowing of innovation due to the COVID-19 pandemic, the German manufacturer fully acquired the Canadian SME in January 2023. A New Zealand-founded cloud accounting software company, expanded to Canada in 2018 and has since acquired two Canadian businesses in Calgary and in Toronto. The acquisition has led to increased automation and efficiency in customer services and increased the company's presence in Calgary's rapidly growing tech community. Similarly, a Montreal-based SME that provides an AI-driven data simulation and predictive analysis platform conducted a first round of institutional financing in 2020 led by the Canadian venture capital arm of foreign bank subsidiary. Thanks to its financing, the SME continues to expand its client base, specifically in HR and finance, with plans to grow internationally. The company has also bolstered its AI with new features specific to key issues such as ensuring compliance with the EU's General Data Protection Regulation (GDPR) and ISO 27001 standards.

2.4. FDI and the potential for innovation diffusion

Enhancing innovation will play a key role in driving deeper involvement in GVCs and boosting productivity growth in Canada (Box 2.1). Multinationals are often highly active in R&D and innovation. Their investments can help grow sectors that are more R&D intensive. The wider economy may also benefit from the new knowledge and technologies brought into the host economy through FDI. Like productivity improvements, positive spillovers on innovation can be transmitted through supply chain linkages and other types of strategic partnerships (e.g. R&D collaboration, joint ventures, technology licensing agreements). Domestic firms may also engage in joint projects with foreign firms to produce new products, improve processes and develop new innovations (OECD, 2022[15]; OECD, 2019[14]). Large multinational firms have increasingly taken part in the open innovation transformation by developing partnerships with smaller enterprises or by setting up innovation labs and accelerators where start-ups and other small firms can nurture new business ideas and business models.

2.4.1. Relatively low R&D expenditure constrains Canada's innovation performance

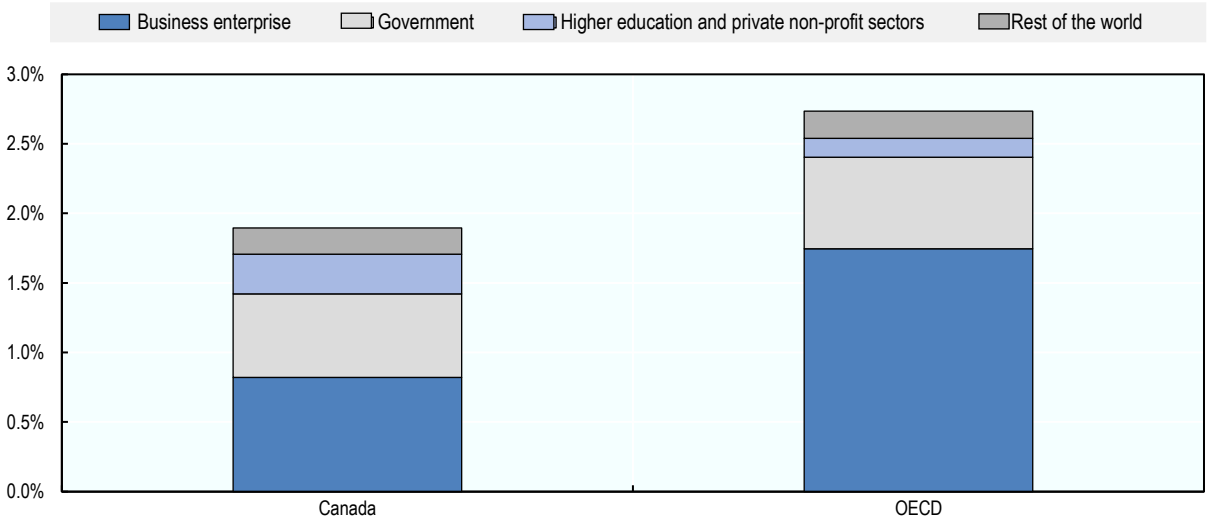
In addition to factors such as the tax structure and competition regulations (OECD, 2023[2]), several structural aspects play a role in shaping innovation in Canada. These include Canada's position within global value chains, its relatively small and geographically dispersed population, and the significance of natural resource sectors, which are generally less innovation-intensive (Council of Canadian Academies, 2009[22]). Encouraging more innovation is essential for the development of new products, services and production technologies that can enhance efficiency within Canadian businesses (OECD, 2022[15]). Moreover, Canada's investment in research and development (R&D) has not kept pace with growth seen in other OECD countries. While gross expenditure on R&D (GERD) increased across OECD member nations from 2.1% of GDP in 2000 to 2.7% in 2020, Canada's investments in this area remained relatively stable during the same period, moving from 1.9% to 1.8% (Figure 2.14).

With this growing gap in R&D intensity, Canada's share of patents filed across OECD member countries fell from a recent peak of 2.1% in 2010 to 1.9% in 2019. Higher education and government play important roles in research and development in Canada. While most (51.6%) of gross expenditure on R&D is

performed by the business enterprise sector, this is much less than the sector's average share across the OECD (72%) (Figure 2.15). The higher education sector, on the other hand, is responsible for 39% of GERD, more than double the OECD average of 16%.

Figure 2.14. Gross expenditure on research and development, 2020

As a percentage of GDP



Source: OECD Main Science and Technology Indicators (2023[23]), https://stats.oecd.org/Index.aspx?DataSetCode=MSTI_PUB

Box 2.1. Intangible capital and GVC participation

Intangible capital includes knowledge-based assets such as datasets and other computerised information, innovative property, and economic competencies such as firm organisation and business strategies that is often of particular importance to multinational enterprises (OECD, 2021[24]). Indeed, the total intellectual property of foreign multinational enterprises was CAD 13 billion in 2019, which represented 29% of the total in the Canadian corporate sector. Foreign firms accounted for the greatest share of corporate sector intellectual property in wholesale trade (57.3%); manufacturing (42.9%); and professional, scientific and technical services.

Intangible capital tends to play an important role at both the early and final stages of global value chains – through, for example, the activities of firms responsible for research and development and branding – where significant value addition takes place. Not surprisingly for a country with limited involvement in GVCs, Canadian intangible capital is responsible for a moderate share of global production and trade. A study of intangible trade balances in OECD countries in 2015 shows that Canada accounts for a slightly smaller share than Mexico of shares to intangible capital embodied in global production of final goods and services (Alsamawi et al., 2020[25]).

Although it does not capture the returns to intangible capital embodied in trade, it is notable that Canada's net international technological receipts are typically negative, despite an increase in recent years. The United States is the closest partner for these transactions, accounting for 61% of receipts and 52% of payments. Foreign firms are responsible for most international transactions involving innovation and technology. International technology receipts and payments of foreign multinational

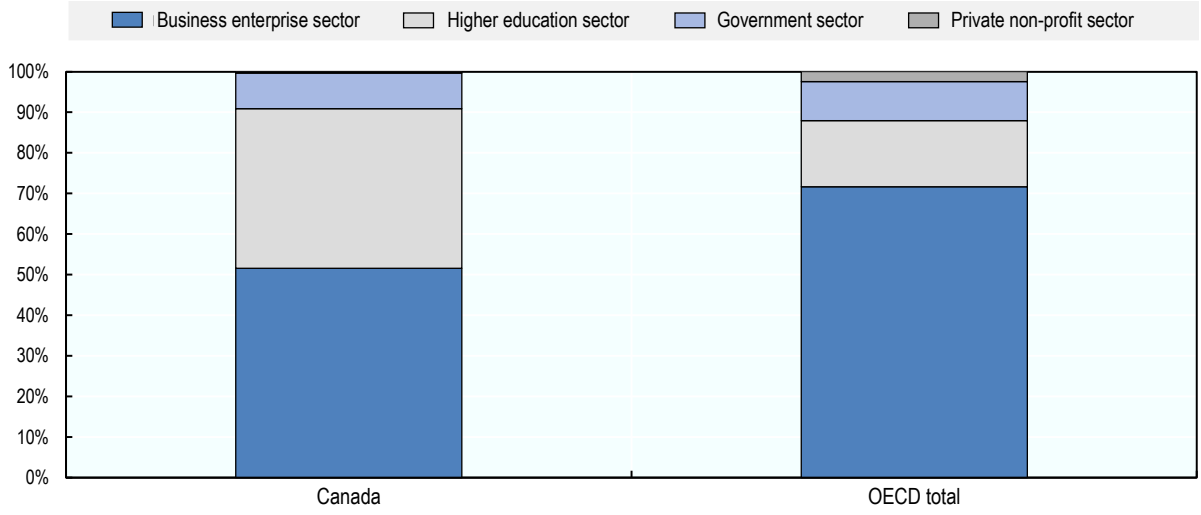
enterprises represented 73% and 72% of all international technology receipts and payments, across the Canadian economy (Statistics Canada, 2023[12]).

Constraints on foreign investment and the need for further development in innovation systems may be influencing Canadian engagement in global value chains. This can impact a firm's ability to fully utilise and capitalise on intangible assets (Statistics Canada, 2023[12]). International comparisons indicate that the benefits of intangible capital are closely tied to openness and support for innovation. Trade and investment policies can play a pivotal role in enhancing the returns on intangible capital. Additionally, innovation policies, including public funding for R&D, are shown to support increased returns on intangible capital (Alsamawi et al., 2020[25]). It's worth noting that trade policies should consider the effects of barriers in key industries on innovation. Although Canada's overall trade restrictions are not particularly severe, certain sectors, such as telecommunications, exhibit high levels of restrictiveness.

Source: OECD (2021[24]), Multinational enterprises and intangible capital, https://www.oecd-ilibrary.org/science-and-technology/multinational-enterprises-and-intangible-capital_6827b3c9-en; Alsamawi et al., (2020[25]), Returns to intangible capital in global value chains: New evidence on trends and policy determinants, https://doi.org/10.1787/4cd06f19-en; Statistics Canada (2023[12]), Activities of Multinational Enterprises in Canada, https://doi.org/10.25318/3610060401-eng

Figure 2.15. Gross expenditure on research and development by sector, 2020

As a percentage of gross expenditure on R&D



Source: OECD Main Science and Technology Indicators (2023[23]), https://stats.oecd.org/Index.aspx?DataSetCode=MSTI_PUB

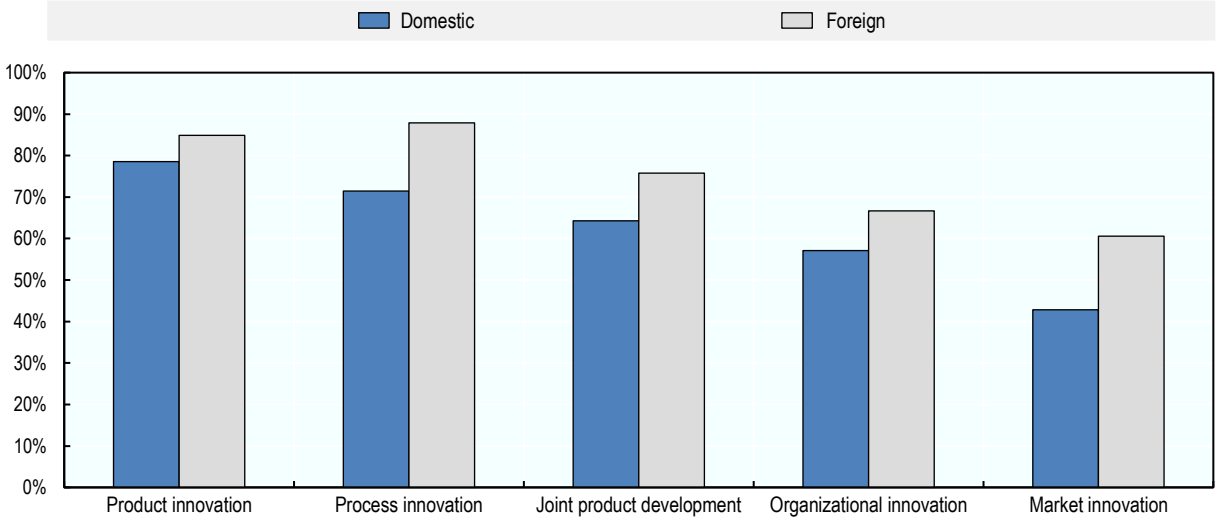
2.4.2. Foreign firms make significant contributions to innovation in Canada

FDI plays a major role in supporting innovation directly, as foreign affiliates invest in knowledge-intensive sectors and activities. Indeed, these businesses are often more innovative than average, both because of firm-level differences and because economic sectors with higher levels of R&D expenditure per unit of value added often attract larger shares of FDI (OECD, 2019[14]; OECD, 2022[15]). Large multinational enterprises typically depend on firm-specific knowledge, technologies or brands that make them competitive operating at a large scale and in multiple markets. Across OECD economies, foreign affiliates generate a greater share of their revenues through intangible assets than do domestic firms (OECD, 2021[24]).

Foreign firms are much more R&D-intensive than Canadian businesses and are considerably more engaged in business activities related to innovation. They amounted for the greatest share of intramural R&D expenditures in the corporate sector in 2020 (42%), while Canadian multinationals and non-multinationals were each responsible for 32% and 26%, respectively. Foreign firms are highly engaged in all kinds of innovative activities. According to the results of an OECD business consultation conducted for this study (Annex 1.A), which involved 24 domestic and 33 foreign businesses, foreign firms were more likely than their domestic counterparts to have been engaged in a wide array of innovative activities – including product innovation, process innovation, joint product development, organizational innovation and market innovation (Figure 2.16).

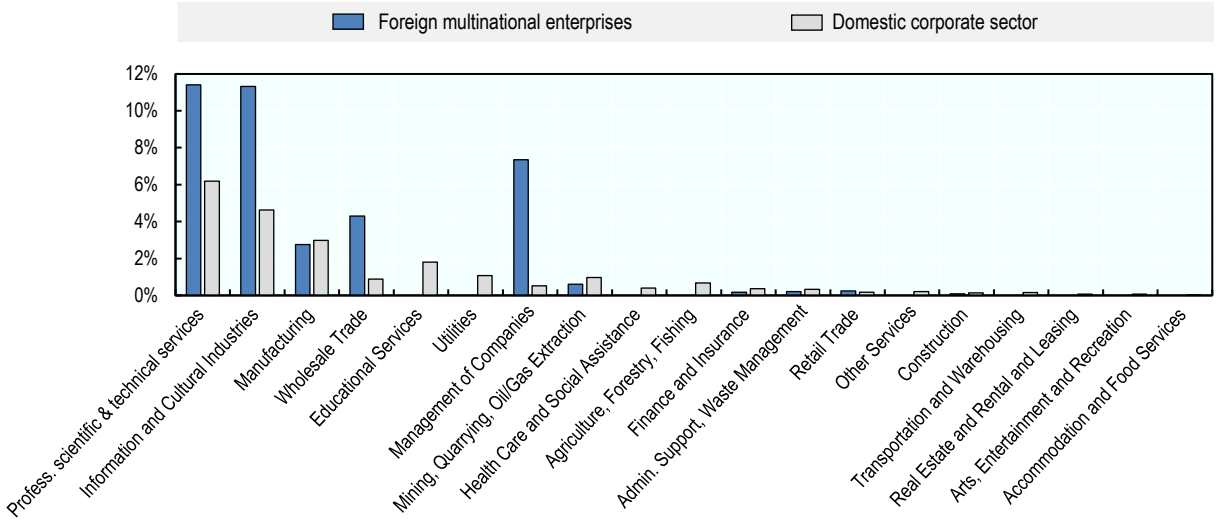
Although there is significant foreign investment in more innovative sectors of the Canadian economy, sectoral differences do not fully explain foreign firms' greater investment in R&D. Foreign multinational enterprises spend more on intramural R&D than domestic businesses in many sectors. This difference is especially clear in more R&D-intensive sectors, such as professional, scientific and technical sectors and in information and cultural industries (Figure 2.17).

Figure 2.16. Shares of surveyed firms engaged in innovative activities during the past three years



Notes: In total, 33 affiliates of foreign firms and 24 domestic firms were surveyed in 2022.
Source: OECD (2022[26]), Business Consultation on Sustainability Practices in Canada.

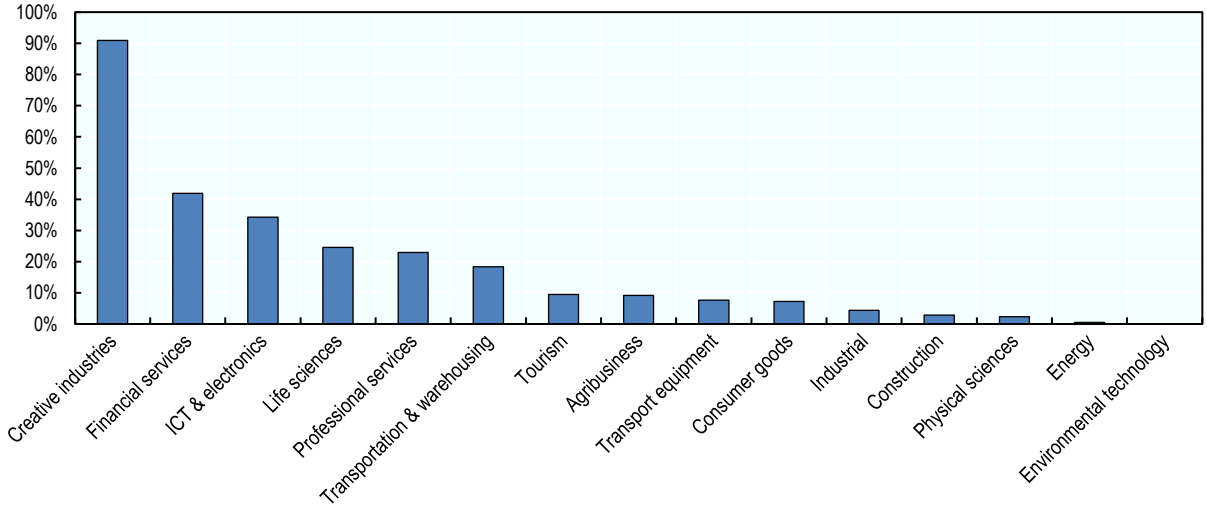
Figure 2.17. Intramural R&D expenditure as a percentage of value added by ownership and sector, 2020



Source: Statistics Canada (2023[12]), Activities of Multinational Enterprises in Canada, https://doi.org/10.25318/3610060401-eng

Data on greenfield FDI projects tell a similar story about the sectors in which FDI is driving innovation. Across all sectors over 2018-22, 21% of capital invested in greenfield FDI projects was in projects mainly for research and development activities. This share was particularly high in creative industries (91%), financial services (42%), and ICT and electronics (34%) (Figure 2.18). In the R&D-intensive pharmaceuticals sector, for example, large foreign firms are responsible for much of the investment made in innovation (Box 2.2).

Figure 2.18. Share of greenfield FDI in R&D activities by sector, 2018-2022



Source: OECD elaboration based on Financial Times (2023[5]), https://www.fdimarkets.com/

Box 2.2. Foreign MNEs as a driver of R&D in Canada: life sciences and pharmaceuticals

A major pharmaceutical MNE has reported conducting innovation activities in Canada in six therapeutic areas including pulmonology, cardiology, and women's health. Over the past ten years, the MNE has invested about $1 billion in Canadian R&D and research capacity building activities. As a part of these activities, in 2016, it partnered with San Francisco-based healthcare investment firm to invest 225 million USD into the launching of an engineered cell therapy company that it later fully acquired in 2019. With R&D housed at the MaRS Discovery District in Toronto, the company is pioneering methods for creating authentic cell types in the areas of neurology, cardiology, ophthalmology and immunology. This support has also continued into the COVID-19 pandemic, with the company committing 1.8 million CAD in 2020 towards its partnership research program with McMaster University's Population Health Research Institute (PHRI), on research across partner sites in Ontario and globally on potential COVID-19 treatments. Their collaboration involved several clinical trials in previous years, including the COMPASS trial, which involved 33 countries and more than 600 participating sites. The company has also made investments into activities at the Princess Margaret Cancer Centre, the Montreal Heart Institute and is currently funding the Chair for Clinical Epidemiology Research and Bleeding Disorders at McMaster University in Hamilton, Ontario.

Another leading global healthcare company has conducted R&D in multiple Canadian research centres and local labs. Between 2016 and 2022, the company conducted 55 clinical trials in 3019 patients in Canada, part of their 63.8 million CAD in R&D investment from 2016 to 2021. In April 2023, the company made their largest investment in Canada yet, announcing a collaboration with a British Columbia-based biotechnology company to develop bio-printed tissue therapeutics, which has the potential to significantly improve treatments for diabetes and obesity. The joint research and product development leverage the two companies' expertise in bioprinting technology as well asstem cell differentiation and cell therapy development and manufacturing. The company has also been supporting R&D in academic institutions, such as at the University of Toronto, through donations to establish a research network that will support healthier urban populations, especially in addressing root causes diabetes and other serious chronic diseases.

Source: OECD (2022[26]), Business Consultation on Sustainability Practices in Canada.

2.4.3. Canadian SMEs are well-positioned to collaborate with foreign investors on innovative and R&D projects, but are lagging in digital capacities

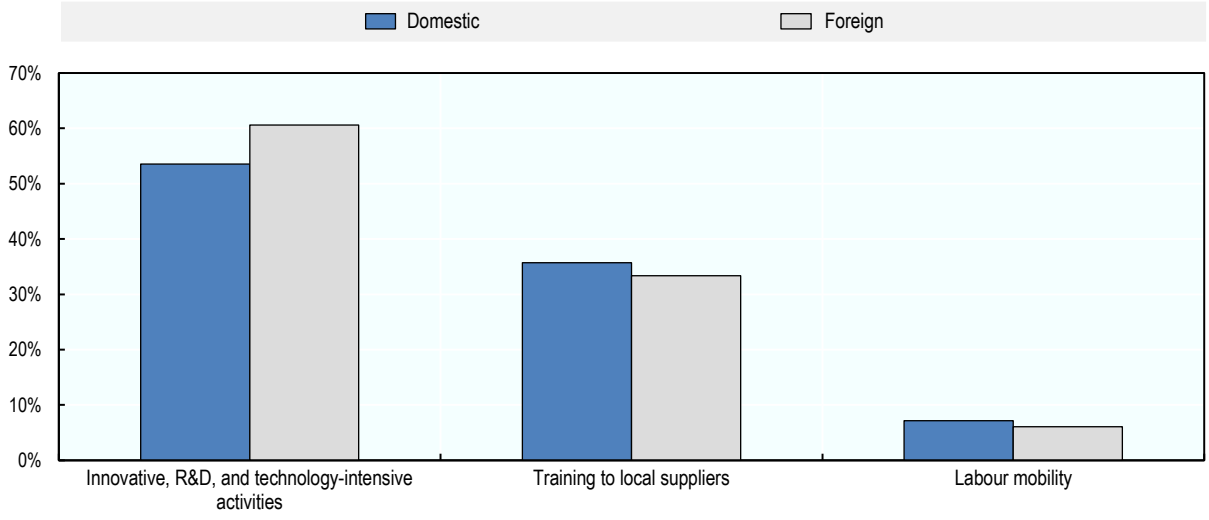
On average, Canadian SMEs tend to be quite innovative but less technologically-intensive than the smaller firms in other advanced economies, either because they are not commercialising their own innovations or because Canada's SMEs are a particularly heterogenous group. In either case, this seeming contradiction suggests that the potential among many small- and medium-sized businesses to absorb the international knowledge and technology flows that trade and FDI make possible could be further improved upon (OECD, 2023[17]).

Like productivity spillovers, knowledge, technology, and innovation capacities can spread from technologically more advanced foreign firms to others in the host country through information sharing with suppliers, workers moving between firms and imitation effects (OECD, 2022[15]). In addition, foreign and domestic firms may collaborate on joint projects to develop new goods and services or improved production processes. The OECD business consultation conducted for this study revealed that most of the recent partnerships of foreign multinational enterprises in Canada with domestic firms for joint product

development or service provision have included innovative, R&D and technology-intensive activities (Figure 2.19).

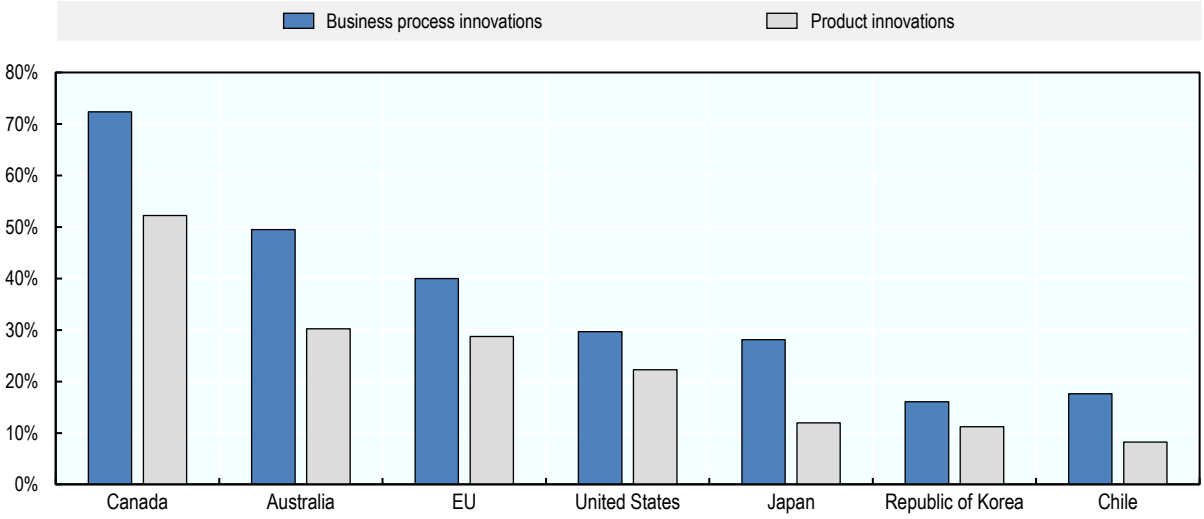
In the area of innovation and R&D, a number of sources reveal that Canadian SMEs are relatively more innovative and knowledge-intensive than those in many other OECD economies, even if are often acquired or transfer their patents to larger foreign firms rather than commercialising these themselves (Gallini and Hollis, 2019[27]). Among domestic firms, more of R&D capacity is found in smaller enterprises; 21% of in-house R&D expenditure and 25.6% of in-house R&D personnel are found in firms with 5 to 9 employees. Among foreign firms, 22% of in-house R&D expenditure and 20% of in-house R&D personnel are found in firms with 500 to 999 employees, the largest shares by size category (Statistics Canada, 2022[28]). Many SMEs introduce innovations in terms of new products or novel processes, marketing or forms of organization. In 2022, 72% of these firms had engaged in business process innovation, while 52% had engaged in product innovation, higher than in several other OECD economies (Figure 2.20.).

Figure 2.19. Shares of surveyed firms partnering with domestic firms for joint product development or service provision during the past three years



Note: In total, 33 foreign affiliates and 24 domestic firms were surveyed in 2022.
Source: OECD (2022[26]), Business Consultation on Sustainability Practices in Canada.

Figure 2.20. Share of SMEs introducing innovations, 2022

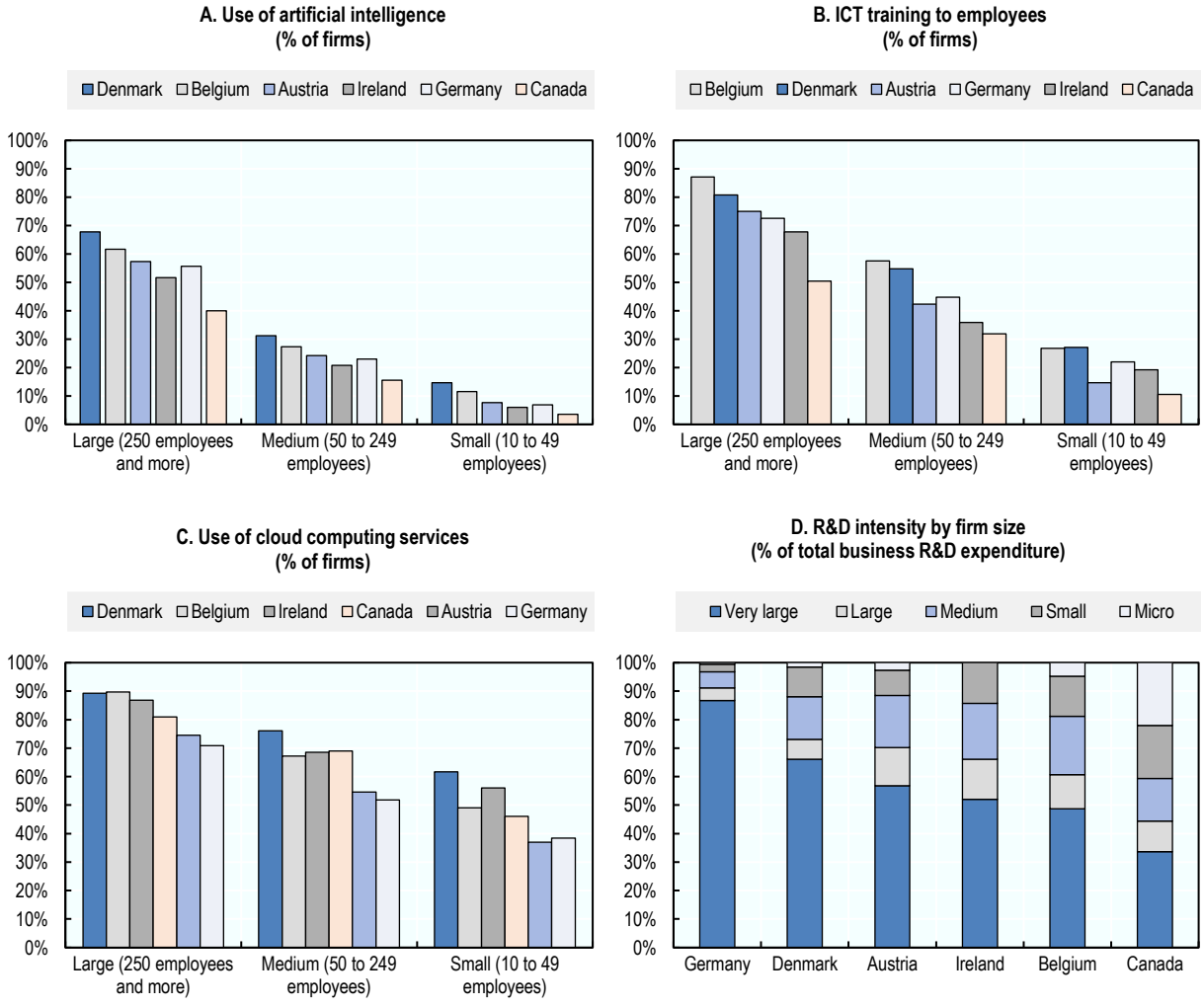


Note: Notes: SMEs include firms with 10 to 249 employees.
Source: European Commission (2022[29]), European Innovation Scorecard,https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european-innovation-scoreboard_en#eis-interactive-tool

Despite this record of innovation among Canadian SMEs, their relatively low use of advanced technologies as well as digital tools and processes may limit the impact of their innovations and potential to collaborate with technologically advanced foreign firms. Emerging digital technologies have the potential to help firms – especially SMEs – offer tailored products and services, create more efficient supply chains and increase participation in GVCs, and improve connections with markets and customers. Compared with a number of EU countries, the use of artificial intelligence by Canadian businesses is quite low, across all business size categories (Figure 2.21). Just 4% of small businesses (with 10 to 49 employees) use AI, well below the 11% of medium firms (with 50 to 249 employees) and 27% of large firms (with 250 and more employees). At 18%, businesses in the finance and insurance activities sector are the most likely to use AI and, as in many other OECD countries, AI use is particularly low in the construction sector (0.7% of firms). Similarly, the share of Canadian small businesses using Internet of things (9%) ranked 24th out of 28 OECD member countries with available data in 2021, while they also lag behind other OECD economies in terms of use of cloud computing services (e.g. finance and accounting software, customer relationship management systems, digital storage of files, etc.) and the provision of ICT training to their employees. Digital tools and processes at the workplace are key assets for technology and innovation absorption, managing organisational changes or enabling integration in GVCs through exports or linkages with foreign affiliates at home.

These findings suggest that Canadian SMEs could be further supported to become suppliers and partners of technology-intensive foreign investors. Policies targeting the absorptive capacity of local SMEs can take many forms (e.g. subsidies, grants, loans, tax relief, infrastructures, training programmes), target various aspects of SME performance (e.g. access to innovation assets, access to skills, access to finance), and be aligned with the scope and priorities of facilitation and aftercare services offered to foreign investors. Such a comprehensive approach could help align domestic supplier capabilities with the needs of foreign investors and further strengthen the spillover potential of FDI.

Figure 2.21. Share of SMEs with digital and R&D-intensive capacities



Notes: For R&D intensity, the following firm size categories are presented: i) very large firms: 500 employees or more; ii) large firms: from 250 to 499 employees; iii) medium firms: from 50 to 249 employees; iv) small firms: from 10 to 49 employees; v) micro firms: from 1 to 9 employees.
Source: OECD (2023[30]), ITC Access and Usage by Business Database, https://stats.oecd.org/Index.aspx?DataSetCode=ICT_BUS; OECD (2023[23]), Main Science and Technology Indicators, https://stats.oecd.org/Index.aspx?DataSetCode=MSTI_PUB

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Notes

[1] For example, utilities, information industries and construction are among the sectors with the least foreign direct investment and some of the highest shares of foreign value added embodied in domestic demand.

[2] Utilities industries include electricity, gas, steam and air condition supply and water supply, sewerage, waste management and remediation activities.

[3] Data refers to 2016.