

OECD FDI Qualities Reviews

# **Assessing sustainable investment impacts in Chile**

Preliminary findings (January 2022)



## Foreword

This preliminary report provides a first assessment of the impacts of foreign direct investment (FDI) on sustainable development in Chile over the past decade. This assessment will be used and further expanded in the forthcoming OECD FDI Qualities Review of Chile. The final Review will also include an assessment of the policy and institutional framework that influences the sustainable development impacts of FDI and provide policy guidance on how to improve these impacts, leveraging OECD tools such as the OECD FDI Qualities Policy Toolkit and the OECD Policy Framework for Investment.

This report provides a snapshot of how FDI has contributed to national sustainable development objectives in Chile in recent years, focusing on the diversification of FDI, trade, the integration in global value chains (GVC), productivity, innovation, skills and gender equality. It also allows Chile to compare itself with other countries with similar natural endowments and economic characteristics. It aims to support the Government of Chile, including InvestChile and the Undersecretariat for International Economic Relations, in deciding where to focus investment attraction efforts and how to ensure that FDI helps Chile to achieve sustainable, inclusive and resilient growth during the recovery from the COVID-19 crisis.

The report shows that the importance of FDI for the Chilean economy has grown over time. In addition to providing an important source of capital, FDI has benefited various areas of sustainable development. Foreign firms contribute significantly to Chilean exports and thereby to Chile's integration in GVCs. Foreign firms are, on average, also more productive, engage more in R&D and employ higher shares of skilled workers than domestic firms. Productivity and exports have been supported by significant FDI in capital-intensive mining and energy and in the financial sector. Further diversifying FDI within and particularly beyond these sectors will be important to promote a knowledge-based, innovative and inclusive economy. Currently, sectors receiving most FDI in Chile report comparatively low R&D intensity levels. Moreover, few regions in the country seem to benefit from FDI, namely Antofagasta, Atacama and Santiago.

The final report will include four chapters and a set of policy recommendations. Chapter 1 will provide an overview of Chile's sustainable development trajectory and will examine FDI trends and characteristics and the potential for diversification; Chapter 2 will analyse the contribution of FDI to trade and GVC integration, including value chain linkages between foreign and domestic firms; Chapter 3 will assess the role of FDI for productivity, innovation, skills and women's economic empowerment; and Chapter 4 will provide an assessment of the policy and institutional framework that supports the sustainable impact of FDI. This draft includes elements of Chapters 1-3, while Chapter 4 and the policy recommendations will be added in the next interaction.

This preliminary report was prepared by Letizia Montinari, under the guidance of Martin Wermelinger, Head of the Investment Qualities and Incentives Team, and is developed as part of the OECD work on sustainable investment (FDI Qualities). Overall support and guidance was provided by Ana Novik, Head of the OECD Investment Division, and Stephen Thomsen, Deputy Head of the OECD Investment Division. Stratos Kamenis provided valuable comments. It draws on analyses based on OECD data (TiVA indicators, FDI database, National Accounts database, R&D statistics and AMNE analytical database), Central Bank of Chile FDI statistics, Financial Times' fDi Markets Greenfield FDI database, Thomson Reuters' Mergers and Acquisitions (M&As) database, Chile's Quinta Encuesta Longitudinal de Empresa (2016/2017) and Encuesta Nacional Industrial Annual (2019), and US Bureau of Economic Analysis (BEA)'s Activities of US Affiliates of Foreign Multinational Enterprises (Box 1).

## Summary of preliminary findings and next steps

Chile has made impressive progress in terms of economic growth and poverty reduction in recent decades. Despite this progress, the country faces important sustainable development challenges, including increasing productivity growth and the living standards of its citizens, promoting economic diversification, improving labour market outcomes, tackling climate change and reducing social inequality. These challenges have been made even more pressing by the two unprecedented shocks, the 2019-2020 social protest and the COVID-19 pandemic. Responding to these challenges will be key for Chile to achieve its sustainable development goals and foster a more prosperous, equitable and resilient economy during the pandemic recovery and beyond.

As a small open economy rich in natural resources, Chile is heavily dependent on trade and FDI to sustain its economic growth. The importance of FDI to the Chilean economy has increased over time, as evidenced by its growing share of inward FDI stock in GDP, which reached 110% in 2020 and is now higher than that of countries with similar economic and natural characteristics. However, FDI flows to Chile have steadily declined since 2012, in part due to falling commodity prices and more recently due to the economic downturn caused by the COVID-19 crisis.

Almost 40% of FDI is concentrated in the mining sector, mainly in copper mining. However, the share of mining FDI has declined over the last decade to the benefit of other sectors, including finance and energy (especially renewable energy) as well as trade and manufacturing. Geographically, FDI is mainly concentrated in the mining-rich regions of Antofagasta and Atacama as well as in the country's main economic centre Santiago. The high concentration of FDI in a few sectors and regions raises doubts as to whether FDI in Chile benefits all segments of the population and contributes to the development of all regions equally. The vast majority of investors come from Europe (Spain, the Netherlands, the UK) and North America, while a much smaller proportion come from other Latin American countries, despite their geographical proximity. In recent years, the share of investment from the People's Republic of China, in particular Mergers and Acquisitions (M&A), has grown significantly, mainly in the energy and construction sectors.

Chile participates in GVCs mainly by exporting primary and intermediate products, which are then further processed and exported by third countries (forward participation in GVCs), like many natural resource producing countries. Its share of foreign inputs in gross exports (backward participation) is small, however in line with its market size and distance from main manufacturing hubs. Its high level of forward participation and low level of backward participation denotes an upstream position in GVCs, i.e. specialisation in activities that are far from final demand in the production chain.<sup>1</sup>

Foreign firms appear to contribute significantly to Chile's integration in GVCs, particularly but not exclusively through exports of natural resource products: in 2019 they accounted for 66% of gross exports

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<sup>1</sup> Backward participation in GVCs is defined as the share of foreign value added in a country's gross exports. Forward participation is defined as the share of domestic value added incorporated in the exports of foreign countries. A low level of backward participation and a high level of forward participation implies specialisation in upstream activities. Relatively upstream activities are the production of raw materials (but also intangible goods such as R&D or industrial product design). Downstream activities include the assembly of manufactured products or after-sales services to customers.

of goods (72% of gross exports in mining and 74% in manufacturing) and 85% of gross exports of services.<sup>2</sup> Moreover, foreign firms are more trade-oriented than domestic firms, as they export a larger share of their sales and import a larger share of their inputs. Their trade orientation, however, seems to be lower in Chile than in other countries.

Foreign companies participate significantly in domestic value chains. They source their inputs mainly from the domestic market (73% of total intermediate goods in 2016), particularly from Chilean small and medium-sized enterprises (SMEs). In addition, most of the production of foreign affiliates feeds back into domestic value chains (almost 70%), and is mainly sold to domestic SMEs. In general, these foreign-domestic value chain linkages appear to be more important in Chile than in other small open economies. However, further analysis is needed to shed light on the implications of such value chain linkages, e.g. in which sectors they occur and whether they are likely to be a channel for FDI spill-over.

FDI contributes to aggregate productivity given its concentration in capital-intensive sectors, such as mining and energy, and financial services. These sectors, however, are less R&D intensive than, for example, real estate and business services, which receive smaller shares of FDI. Foreign firms are, on average, more productive than domestic firms, especially in sectors with large shares of FDI. Foreign firms are also more likely than domestic firms to engage in R&D activities and to employ higher shares of skilled workers (e.g. with a university degree or higher).

Foreign firms outperform domestic firms in the dimensions of productivity, wages, skill intensity and export intensity even when factors such as firm size and sector of activity are taken into account. Moreover, the activities of foreign firms generate important multiplier effects in the host economy. For example, it is estimated that a 1% increase in the sales of foreign enterprises generates a 0.6% increase in the total labour costs of these foreign enterprises. This additional expenditure in labour input can support the living standards of local workers employed by foreign firms if this increase results in higher wages per worker or more local workers have the opportunity to work for foreign firms.

The next iteration of this report will expand this analysis in several areas:

- It will further assess the role of FDI in sectors with greater potential for future productivity growth and sustainable and inclusive development, such as sectors that can generate more and better jobs, including for women (e.g. service sectors), the most innovative sectors (e.g. high-tech and digital), and renewable energy. The report will also assess Chile's diversification potential and identify sectors and value chain activities with good prospects for sustainable development and where Chile could focus its FDI attraction efforts.
- It will further discuss the role of FDI in supporting Chile's exports, particularly exports of services, and how these can make a significant contribution to economic diversification and productivity growth.
- It will provide additional analysis on the contribution of FDI to productivity, innovation and skills development, examining in more detail the role of FDI in manufacturing and services, particularly in sectors that offer better prospects from a sustainable development perspective. In addition, it will also examine the contribution of FDI to labour market outcomes, such as quality jobs and the economic empowerment of women.

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<sup>2</sup> In this report, 'foreign firms' are foreign affiliates of Multinational Enterprises (MNEs) located in Chile. Hence, the terms 'foreign firms' and 'foreign affiliates' are used interchangeably. Firms are defined as foreign when foreign investors own at least 10% of their equity stocks. This is in line with the OECD Benchmark Definition of Foreign Direct Investment, according to which "lasting interest" in an affiliate that is resident in an economy other than that of the direct investor is evidenced when the direct investor owns at least 10% of the voting power of the direct investment enterprise.

- It will offer an assessment of the policy and institutional framework, including institutional coordination mechanisms that influence the impact of FDI in the area of trade integration/GVC, FDI diversification, productivity, innovation, skills, and women's economic empowerment.

# 1. Trends and characteristics of FDI in Chile

## Chile's sustainable development trajectory

Chile has experienced remarkable economic growth and reduced poverty, and has significantly improved the quality of life of its citizens in recent decades. Rapid economic growth has been supported by strong institutions and a sound macroeconomic framework (OECD, 2021<sup>[1]</sup>). Despite this progress, the Chilean economy has continued to be characterised by some structural weaknesses, including its specialisation in natural resources, low levels of labour productivity and high income inequality relative to the OECD average, as well as environmental challenges related to natural resource exploitation and pollution.

In recent years there has been growing social discontent with Chile's socio-economic system. High income inequality and unequal distribution of the benefits of economic growth have raised questions about the sustainability of the country's growth trajectory. In this context, the COVID-19 pandemic has further exposed Chile's vulnerabilities, plunging the country into one of the worst economic recessions in decades (OECD, 2021<sup>[1]</sup>; World Bank, 2021<sup>[2]</sup>).

Chile's economic growth has been largely driven by natural resources, such as copper, agriculture, forestry and fisheries. Although the natural resource sector has been an engine of productivity and growth, it has also increased the country's vulnerability to external shocks such as fluctuations in commodity prices. While successive governments have sought to expand the manufacturing base and support the development of services, Chile's economic model today remains dependent on the natural resource sector.

As a small open economy, Chile depends heavily on trade and foreign direct investment (FDI) to sustain its economic growth. The negative impact that the COVID-19 crisis has had on trade and FDI in Chile, as in most countries, has further slowed its economy. Moreover, trade and FDI remain largely concentrated in the natural resources sector, particularly copper, agricultural and fishery products, and finance. Exports of services, which provide an opportunity for economic diversification and growth, account for a smaller share of total exports (OECD, 2021<sup>[1]</sup>; UNCTAD, 2021<sup>[3]</sup>).

Although high compared to other Latin American countries, productivity in Chile remains below the OECD average, with many workers employed in activities that generate little value added per hour of work. This gap in productivity is a consequence of relatively low levels of innovation and skills compared to other countries. It is also partly explained by an unequal population of firms: a small number of large and very productive firms and a wide range of small and medium-sized firms with weak productivity performance (OECD, 2021).

Persistently low productivity levels have led to growing income inequality over the years. The COVID-19 crisis has further exacerbated these inequalities, with more than half of the population in Chile now economically vulnerable and at risk of poverty (OECD, 2021<sup>[1]</sup>). Among the most vulnerable groups of workers are women, who continue to be discriminated against along important economic dimensions. Despite recent progress in education, significant gender gaps remain, particularly in the labour market. Gender pay and employment gaps are higher in Chile than in the average of OECD countries (OECD, 2021<sup>[4]</sup>).

Chile faces today numerous environmental challenges. CO<sub>2</sub> emissions and energy consumption have increased in line with the strong economic growth of recent decades. The country still relies on fossil fuels to meet its energy needs. Less than a third of the total energy supply in Chile stems from renewable sources, while nearly half of the electricity is generated from renewable sources, primarily hydro and solar (IEA, 2021<sup>[5]</sup>). Air pollution, water scarcity and pollution, habitat loss and vulnerability to climate change are some of the most pressing environmental challenges facing the country (OECD/ECLAC, 2016<sup>[5]</sup>).

Recently, Chile has made a number of environmental commitments, including achieving carbon neutrality of its economy by 2025, which, if implemented, may reverse these trends.

In the aftermath of the crisis and once the recovery is underway, responding to these challenges will be key to enabling Chile to achieve its sustainable development goals, becoming a more prosperous, equitable and resilient economy. The experience of other economies shows that FDI can make a significant contribution to sustainable development goals. However, the effects of FDI in promoting sustainable and inclusive growth are not automatically positive. Chile's policy and institutional framework, including coordination between different responsible institutions, will play a crucial role in maximising the benefits of FDI.

### Box 1. Databases used to assess FDI trends and impacts in Chile

**Central Bank of Chile's FDI statistics:** provides flows and stocks of inward and outward FDI for Chile, from 2012 to 2020, by economic sector and country of origin.

**Financial Times' fDi Markets Greenfield FDI database:** is a database of crossborder greenfield investments covering all countries. It provides real-time information on capital investment and job creation by economic activity, source country, and location (region). For this study, crossborder greenfield investment projects directed to Chile from 2003 to 2021 were selected, from all countries of origin and covering all economic activities. Economic activities were reclassified to correspond to the ISIC Rev4 sectoral classification. Greenfield investment projects in the agriculture and construction sectors are not covered by the database.

**Thomson Reuters' Mergers and Acquisitions (M&As) database:** provides coverage of global Mergers & Acquisitions (M&A) deals by country of acquiring company, country of the acquired company and economic activity. For this project, cross-border M&A deals targeting Chilean companies from 2005 to 2021 were selected. For some deals, the information on the location (headquarters) of the company was retrieved from the business description of the acquired company.

**Quinta Encuesta Longitudinal de Empresa (ELE5):** consists of a representative sample of firms from all economic sectors in 2016 and 2017. It includes 6,480 firms, 549 of which are foreign-owned (a foreign investor directly owns 10% or more of the ordinary shares). ELE5 provides information on the activities of foreign firms and their contribution to several outcomes, including value added, employment, R&D activities and skills intensity in Chile.

**Encuesta Nacional Industrial Annual (ENIA) of 2019:** covers the population of companies in 22 manufacturing industries (ISIC, Rev.4) active in Chile in that year, corresponding to 4,254 companies, 285 of which are foreign-owned (a foreign investor directly owns 10% or more of the ordinary shares). The database provide insights on foreign-owned firms operation in relation to several outcomes, including value added, employment, export, import and skill intensity.

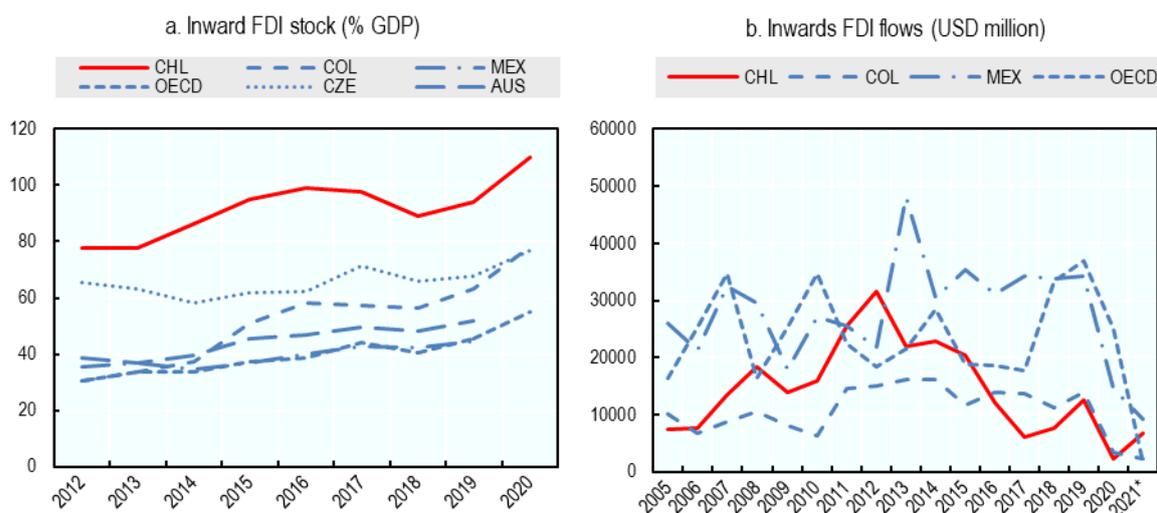
In addition, several other OECD and non-OECD databases have been used to study FDI trends and impacts in Chile, including OECD FDI statistics, OECD TiVA (Trade in Value Added) indicators, OECD AMNE analytical database, OECD National Accounts, OECD R&D statistics, Bureau of Economic Analysis (BEA)'s Activities of U.S. Affiliates of Foreign Multinational Enterprises, and Chile's R&D Expenditure and Personnel Survey.

## FDI stocks as a share of GDP have increased in the past decade

Chile with its open economy and rich endowment of natural resources is a particularly attractive destination for foreign direct investment (FDI). The relevance of FDI to the Chilean economy is demonstrated by the stock of inward FDI as a share of GDP, which grew from 77% in 2012 to 110% in 2020. Although as of 2019 this sharp surge was mainly caused by a drop in GDP following the Covid-19 crisis, the share is higher than in most OECD countries, including in Latin America such as Colombia and Mexico. It is also higher than in OECD countries of similar economic size, for example the Czech Republic, and rich in natural resources such as Australia (Figure 1, Panel a).

FDI flows to Chile have declined significantly since 2012, however (Panel b). A similar downward trend has been observed in many countries, reflecting a slowdown in international production and global value chains (UNCTAD, 2018<sup>[1]</sup>). The Covid-19 pandemic and its disruptive effects on economic activities, including those of foreign multinational enterprises (MNEs), further contributed to the decline in FDI flows in Chile like in most other countries. In Chile, as in the rest of Latin America, the decline was particularly sharp due to the drop in commodity prices and economic recession that followed the Covid-19 crisis (UNCTAD, 2021<sup>[2]</sup>). Early data for the first and second quarters of 2021, however, show a slight recovery in FDI flows to Chile.

**Figure 1. Since 2012 FDI as a share of GDP has increased, but inward FDI flows have fallen**



Note: Panel b: FDI flows for 2021 covers the first and second quarter of 2021.

Source: OECD FDI statistics

## FDI is largely concentrated in mining, energy and finance

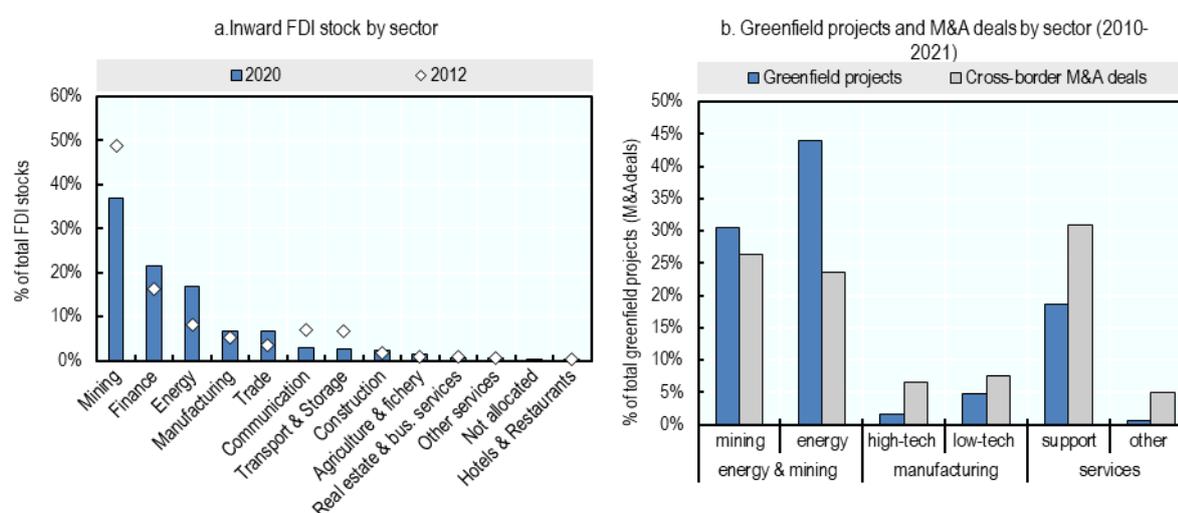
Chile's endowment of natural resources explains the large share of FDI in the mining sector (Figure 2, Panel a). In 2020, 37% of FDI stocks were in mining, particularly copper mining. While the amount of FDI stock to mining has remained more or less unchanged since 2012, the relative share of mining FDI has decreased. Meanwhile, FDI in financial services and the energy sector, and particularly renewable energy, have gained importance in Chile's FDI landscape. Over the 2012-2020 period, the share of FDI stocks in financial services increased from 16% to 21% and in the energy sector from 8% to 17%. The share of FDI

stocks also increased in manufacturing (food, chemicals and non-metallic mineral products) from 5% to 7% and in the trade sector from 3% to 7%.<sup>3</sup>

Chile's endowment of natural resources explains the large share of FDI in the mining sector (Figure 2, panel a). In 2020, 37% of FDI stocks were in the mining sector, particularly copper mining. While the amount of FDI stocks to the mining industry has remained more or less unchanged since 2012, the relative share of mining FDI has decreased. Meanwhile, FDI in financial services and the energy sector, and in particular renewable energy, has gained importance in Chile's FDI landscape. During 2012-2020, the share of FDI stocks in financial services increased from 16% to 21% and in the energy sector from 8% to 17%. The share of FDI stocks also increased in the manufacturing sector (food, chemicals and non-metallic minerals) from 5% to 7% and in the trade sector from 3% to 7%.

As regards the mode of entry of foreign investors, greenfield FDI projects are prevalent in energy (44%), mining (30%) and services (20%), particularly communication and business services, while lower shares are found in the manufacturing sector (7%) (Panel b). Within the manufacturing sectors, larger shares of greenfield FDI are found in low-tech industries such as food, while smaller shares are directed to high-tech industries such as machinery and equipment, transport equipment and electronics. M&A deals are concentrated in services (31%), particularly finance and transport, mining (26%) and energy (24%). A significant share is also directed towards the manufacturing sector (14%), in particular the low-tech food and chemical industries but also high-tech pharmaceuticals.

**Figure 2. Mining, finance and energy attract the bulk of FDI**



Note: Panel b: Support services include financial services, business services, communication, IT services, transport services, and retailing. fDi Markets' greenfield FDI data do not cover agriculture and construction, and therefore these sectors are not shown.

Source: Panel a: OECD elaboration based on Central Bank of Chile; panel b: OECD elaboration based on fDi Markets and Thomson Reuters

<sup>3</sup> The next iteration will further analyse the relative importance of FDI in labour-intensive sectors and those most promising for sustainability, such as services sectors, innovative sectors (e.g. R&D, computer and related activities) and renewable energy.

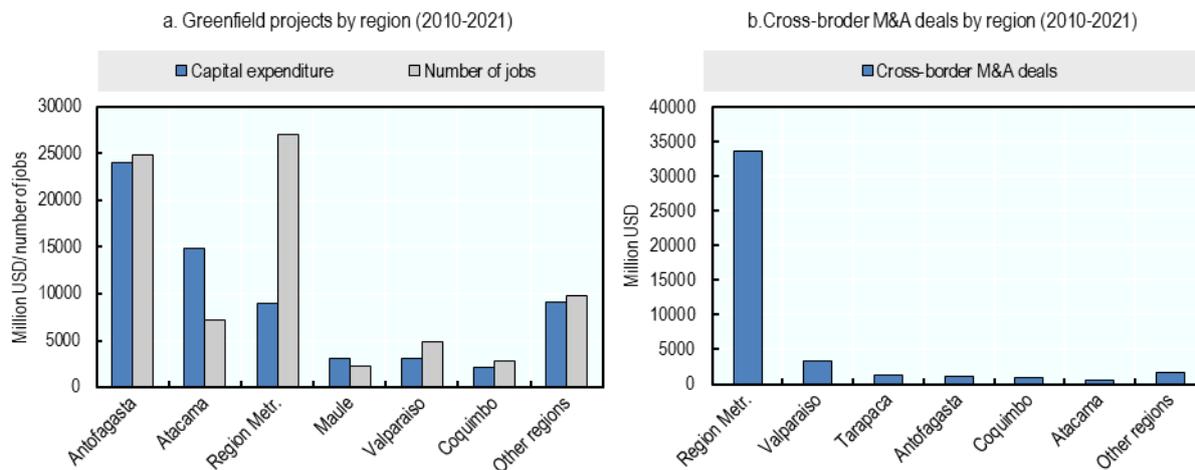
## Antofagasta, Atacama and Santiago attract most FDI

During the period 2010-2021 greenfield FDI was mainly concentrated in three regions: Antofagasta, Atacama and the Metropolitan Region (Santiago) (Figure 3, Panel a).<sup>4</sup> This is not surprising given that mines are located in Antofagasta and Atacama and that Santiago is the main economic centre of Chile. In addition, capital expenditure and jobs related to greenfield projects in these three regions are likely to have been even higher, given that around 23% of greenfield projects that took place in the 2010-2021 period do not provide information on the destination of the investment.

In terms of jobs created by greenfield projects, the Metropolitan Region outperformed Antofagasta and Atacama. While in Antofagasta and Atacama greenfield investments have been directed mainly to the mining and energy sectors, in the Metropolitan Region they have covered a wider range of sectors, focusing on the service sectors (communications, financial services, restaurants and hotels, transport services) and the food industry. A considerable number of jobs in the Metropolitan Region have also been created in renewable energy, a growing sector.

Most of the cross-border M&A deals in the period 2010-2021 took place in the Metropolitan Region (panel b). It is likely, however, that this figure is overestimated because the location of M&A deals is often based on the company's headquarters (HQ) in the data available for this study, even if the company's facilities are located in other regions. This is the case for several mining companies whose HQ is in Santiago, while their mining facilities are located in Antofagasta and Atacama. Moreover, information on the location of the acquired or merged company is not provided for about 36% of M&A deals, which took place in the period 2010-2021.

**Figure 3. Greenfield projects and M&A deals are concentrated in a few regions**



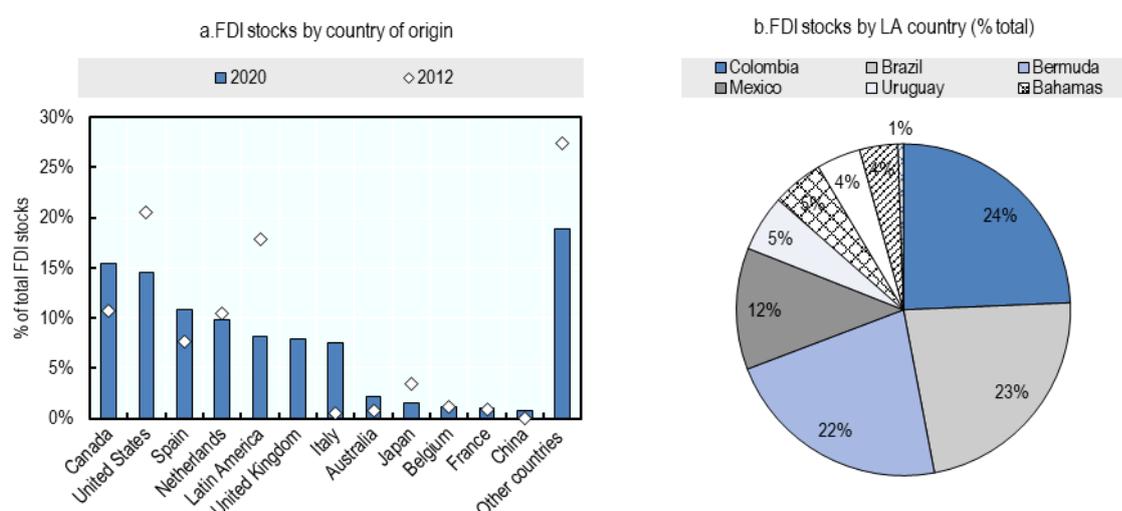
Source: Panel a: OECD elaboration based on fDi Markets; panel b: OECD elaboration based on Thomson Reuters

<sup>4</sup> In the next iteration, an assessment of each region's contribution to value added and employment will be provided to better understand how divergences in economic development between regions affect FDI trends and impacts.

## Companies from Europe and Northern America are the leading investors

According to FDI data from the Central Bank of Chile, in 2020, about 70% of the FDI stock came from Europe, particularly Spain, the Netherlands, the United Kingdom and Italy, and from North America, namely Canada and the United States (Figure 4). About 8% came from Latin America, a much smaller share considering the geographical proximity. The main investors from Latin America were Colombia, Brazil, Bermuda and Mexico. A very small share came from neighbouring Argentina. While FDI stocks from Canada, Spain, the United Kingdom, and Italy grew considerably between 2012 and 2020 in both absolute and relative terms, those from the United States and Latin America declined.<sup>5</sup>

Figure 4. 70% of FDI comes from Europe, Canada and the United States



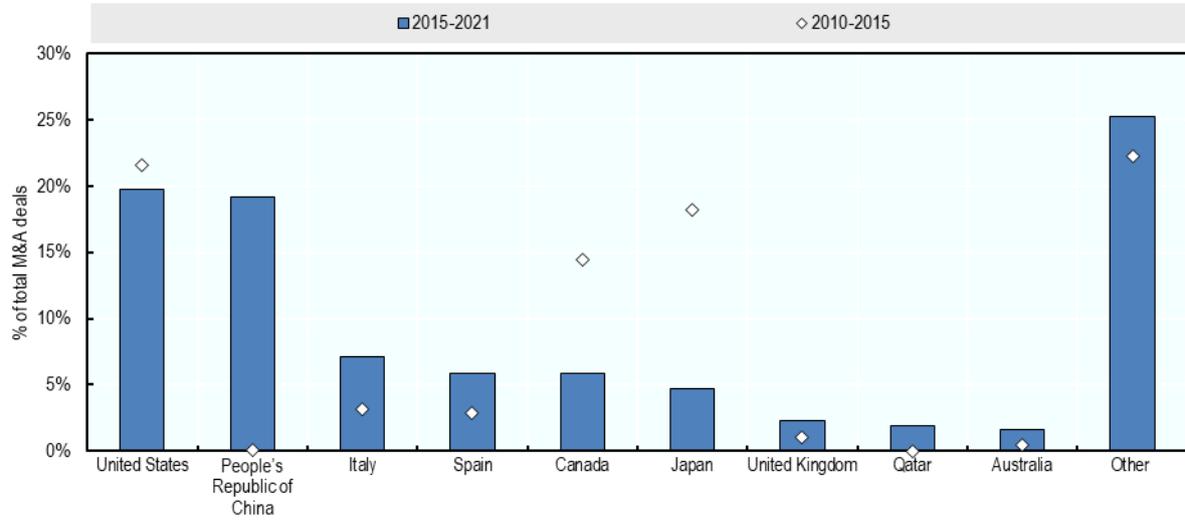
Source: OECD elaboration based on Central Bank of Chile

The FDI data also show that in 2020 about 5% of FDI stocks came from the Cayman Islands and Bermuda, suggesting that some multinational companies invest in Chile through their subsidiaries located in these countries.<sup>6</sup> The use of M&A data provides a more accurate picture of the origin of these investments. The data show that most of the cross-border M&A transactions in Chile in the last decade were concluded by European and North American firms, roughly confirming the picture that emerges from the Central Bank of Chile's FDI data (Figure 5). However, the data also show that in recent years a significant share of M&A transactions in Chile have been concluded by Chinese firms, mainly in the energy and construction sectors.

<sup>5</sup> The next draft report will discuss the drivers of these trends. For example, are regional investors investing primarily in manufacturing/services or mining/energy? And European and North American investors?

<sup>6</sup> The Central Bank of Chile's FDI data follow the principle of immediate host/investor country. Therefore, in some cases the data do not provide accurate information on the country of origin of the investment. This may happen, for example, when the investment of the (ultimate) parent company in a foreign country is held through another (immediate) subsidiary in a third country.

Figure 5. M&A deals by Chinese companies have grown dramatically over the past five years



Source: OECD elaboration based on Thomson Reuters

## 2. The contribution of FDI to trade and integration in global value chains

### Foreign firms support Chile's exports and participation in GVC

Participation in GVCs brings new opportunities for productivity growth and innovation. Countries participate in GVCs by using imported inputs in their exports (backward participation in GVCs) or by providing intermediate inputs to third country exports (forward participation). Productivity spillovers can occur from both backward and forward participation in GVCs. Backward participation enables countries to use inputs that are not available in the domestic economy or that have an advantage in terms of price or quality, while upstream participation allows countries to acquire technology and knowledge from export destinations (Criscuolo and Timmis, 2017<sup>[7]</sup>).

Chile's level of forward integration into GVCs is high, as would be expected from a net exporter of natural resources. Like many natural resource producers, Chile exports mainly primary and intermediate products, which are then further processed and exported by other countries. Its level of forward integration in GVCs, measured by its share of value added in other countries' exports, is 31%, which is higher than most OECD countries and similar to other natural resource producers, notably Saudi Arabia (40%), Norway (39%) and Russia (37%) (Figure 6, Panel A). In contrast, Chile's level of backward participation is low, which means that the amount of foreign inputs used in domestic production is small. Its level of backward participation, captured by the share of foreign value added in its exports, is 14%, which is lower than most OECD countries, although in line with its market size and distance from the main manufacturing hubs (OECD, 2015<sup>[3]</sup>).

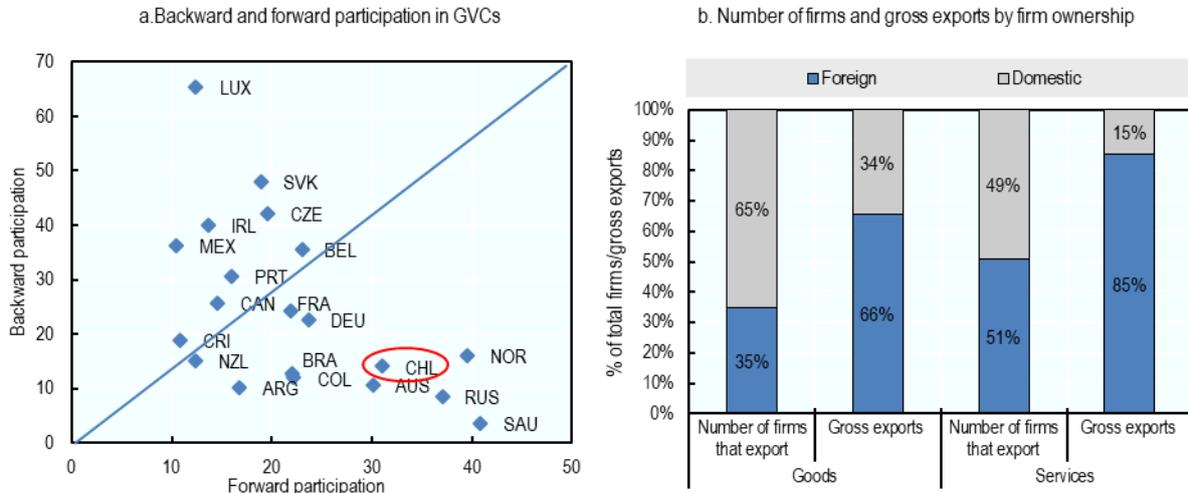
Chile's high level of forward participation and low level of backward participation suggest a relatively upstream position in GVCs: the country is specialised in the early stages of the production process, i.e. in the extraction of raw materials (Anràs et al., 2012<sup>[4]</sup>). Other Latin American countries such as Brazil, Colombia and Argentina also appear to be positioned relatively upstream in GVCs, while Mexico and Costa Rica are positioned more downstream, probably due by their greater specialisation in processing and assembly (OECD, 2015<sup>[3]</sup>).

Multinational enterprises (MNEs) are one of the main drivers of GVCs as they contribute significantly to cross-border trade (Criscuolo and Timmis, 2017<sup>[7]</sup>). A recent study by InvestChile (2021<sup>[6]</sup>) shows that foreign affiliates of MNEs contribute significantly to Chile's gross exports and that their contribution is not limited to the natural resource sector.<sup>7</sup> According to the study, in 2019 about 35% of firms exporting goods and 51% of firms exporting services were foreign-owned. They accounted for 66% of gross exports of goods (72% of gross exports in mining and 74% in manufacturing) and 85% of gross exports of services (92% of gross exports in IT services, 96% in engineering services, 96% in telecommunication services, 83% in financial services) (Panel b).

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<sup>7</sup> The study uses information from the Internal Revenue Service (Servicio de Impuestos Internos) on taxpayers who are legal persons. Foreign enterprises are active enterprises for which at least 10% of their final ownership belongs to a legal or natural person domiciled or resident abroad.

**Figure 6. Chile’s integration in GVCs is supported by foreign firms ‘exports**



Note: Panel a: Backward participation in GVCs is measured as foreign value added embodied in a country's gross exports, as a percentage of the country's total gross export; forward participation is measured as domestic value added embodied in other countries' gross exports, as a percentage of the country's total gross exports.

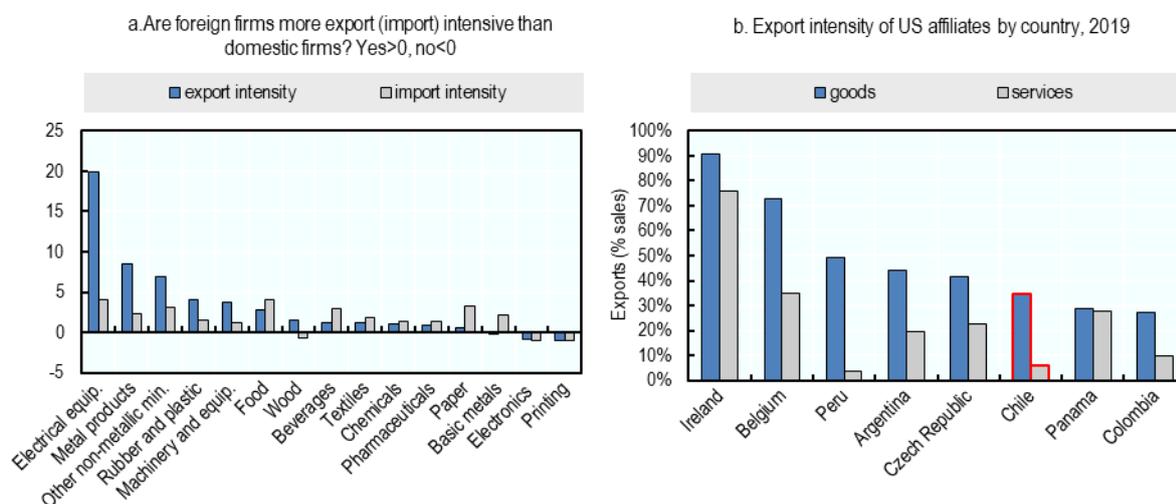
Source: Panel A: OECD TiVA (2021); panel b: InvestChile (2021<sub>[6]</sub>)

**Foreign firms are more trade-oriented than domestic firms**

Foreign firms in Chile are more trade-oriented than domestic firms, as they export a larger share of their sales and import a larger share of their inputs. According to the Encuesta Nacional Industrial Annual (ENIA), which covers all firms in the manufacturing sector in 2019 (Box 1), foreign firms on average exported 27% of their sales and imported 23% of their inputs, while domestic firms exported 6% of their sales and imported 7% of their inputs. Foreign firms trade more intensively than domestic firms in almost all sectors, although the gap with domestic firms is larger in metal products of electrical equipment, other non-metallic minerals, and rubber and plastics, where many foreign firms operate (Figure 7, Panel A).

The data also show significant participation of foreign firms in the domestic value chain (the next section analyses the extent of value chain linkages between foreign and domestic firms). Foreign firms purchase most of their inputs locally and sell their output mainly in the domestic market. In addition, data from the US Bureau of Economic Analysis (BEA) show that US foreign affiliates (majority-owned), which represent a significant share of foreign firms in Chile, export less intensively in Chile than in other countries. In particular, the data show that US foreign affiliates in Chile export on average 35% of their sales from goods and 6% from services (panel B). These shares are lower than those observed in other Latin American countries such as Peru and Argentina and in smaller open OECD economies such as Ireland and the Czech Republic.

**Figure 7. Foreign affiliates in Chile trade more than domestic firms, but less than in other countries**



Note: Panel a: export intensity: gross exports over sales; import intensity: gross imports overall intermediate inputs. The indicator in panel a measures the relative difference between export (import) intensity of foreign and domestic firms. Values above 0 indicate that foreign firms are more export (import) oriented than domestic firms and vice versa. Panel b: export intensity in good (services): exports of good (services) over sales of goods (services).

Source: Panel a: Encuesta Nacional Industrial Annual 2019 (ENIA); panel b: Bureau of Economic Analysis (BEA)'s Activities of U.S. Affiliates of Foreign Multinational Enterprises (MNEs)

## The extent of linkages between foreign and domestic firms is significant

While foreign firms foster integration into GVCs through their import and export activities, which in turn bring benefits in terms of access to networks, global markets, knowledge and technology, their participation in domestic value chains can also contribute to the productivity growth of domestic firms (OECD, forthcoming<sup>[7]</sup>). In particular, buyer-supplier relationships (so-called value chain linkages) can enable productivity improvements through access to new technologies, knowledge and better or cheaper inputs.

Supplier relationships - when foreign firms purchase inputs from domestic firms - can be a channel for technology and knowledge transfer, for example when foreign firms train suppliers to ensure a certain level of input quality (Javorcik, 2004<sup>[8]</sup>). Buyer relationships - when foreign firms sell their production as inputs to domestic firms - can help the latter to become more productive mainly through access to better quality inputs (Criscuolo and Timmis, 2017<sup>[7]</sup>). Many foreign firms in industries (such as machinery) and the digital economy also offer training to their customers on the use of their products and information on international quality standards (Jindra, 2006<sup>[9]</sup>).

Indicators based on the OECD's AMNE analytical database show that, in 2016, foreign firms in Chile purchased most of their intermediate goods locally (73% of total intermediate goods), while a smaller share was purchased internationally (27%) (Figure 8).<sup>8</sup> The share of locally sourced inputs is higher than in other small open economies, for example Portugal (62%), Czech Republic (54%), Slovakia (51%), Ireland (45%). In general, this share tends to be higher in larger economies, as foreign affiliates in those countries can rely on a larger domestic market for intermediate goods. This is for example the case in the United States (82%), Italy (71%) and France (70%).

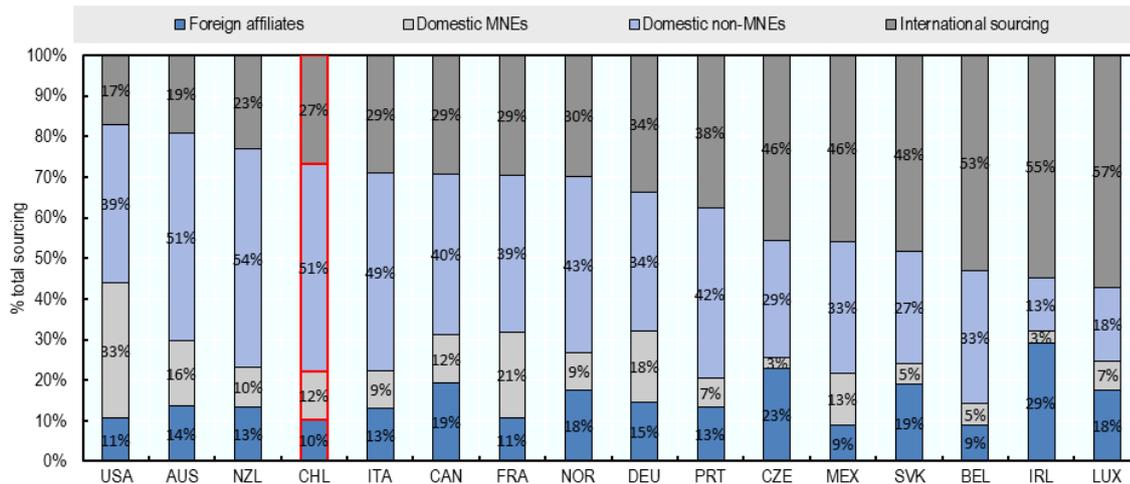
Chilean-owned firms benefited the most from local sourcing of foreign affiliates. The majority of locally sourced inputs were purchased from domestic firms (supplier linkages): 63%, of which 12% from domestic

<sup>8</sup> A new release of the OECD's AMNE analytical database will become available in Spring 2022.

MNEs and 51% from domestic non-MNEs, which include many small and medium enterprises (SMEs). A smaller share, 10%, was bought from other foreign firms established in Chile. The data also reveal that foreign affiliates in Chile rely less on international sourcing (27%) than in other small open OECD economies, for instance Portugal (38%), Czech Republic (46%), Slovakia (48%). Normally, the share of inputs bought internationally tends to be higher in small economies due to their smaller domestic market for intermediate goods.

**Figure 8. In Chile, foreign firms source inputs mainly from Chilean firms**

Sourcing structure of foreign affiliates by country, 2016

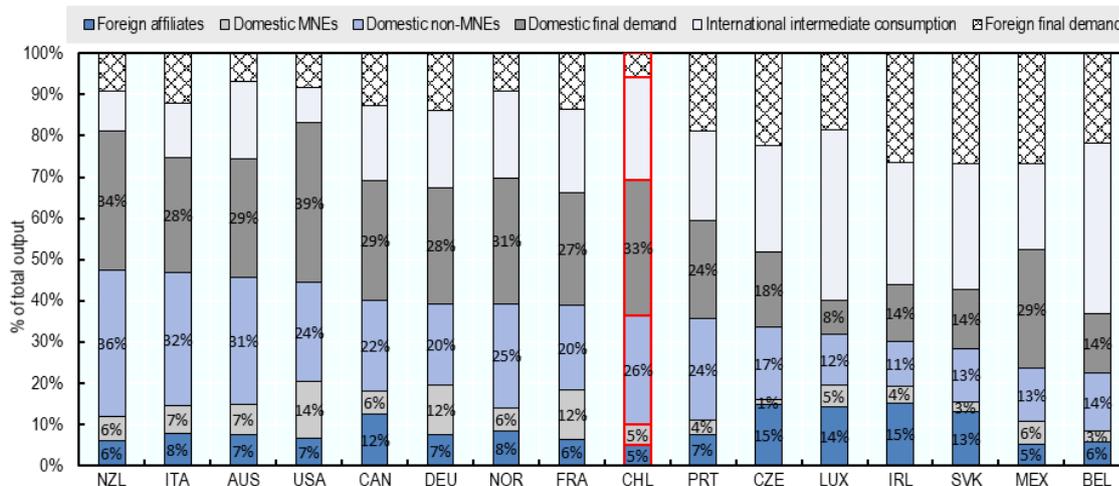


Source: OECD analytical AMNE database

The indicators also show that in Chile almost 70% of foreign affiliates' output feeds back into domestic value chains. In 2016, 36% of the output of foreign affiliates was used as input by local firms, and 33% was sold in the domestic market for final goods and services (Figure 9). The share of foreign affiliates' output that stays in Chile is higher than in other small open economies such as Portugal (60%), the Czech Republic (52%), Ireland (44%), the Slovak Republic (43%) and Belgium (37%).

**Figure 9. Foreign firms sell intermediate products mainly to Chilean firms**

Output use of foreign affiliates, Chile vs other OECD economies, 2016



Source: OECD analytical AMNE database

Moreover, the share of output sold to Chilean firms (buyer linkages) is significant: in 2016, intermediate products sold by foreign affiliates to domestic firms accounted for 31% of their output (26% was sold to non-domestic MNEs and 5% to domestic MNEs), while inputs sold to other foreign firms located in Chile corresponded to 5% of output. The extent of sell linkages is greater in Chile than in other small open economies, for example Portugal (28%), the Czech Republic (18%), Luxembourg (17%) and Ireland (15%). In general, the importance of buyer-supplier linkages in Chile suggests that foreign affiliates are well integrated into the domestic economy. Nonetheless, further analysis is needed to understand the implications of such value chain linkages, for instance, in which sectors they occur and whether they act as a channel for FDI spillovers.

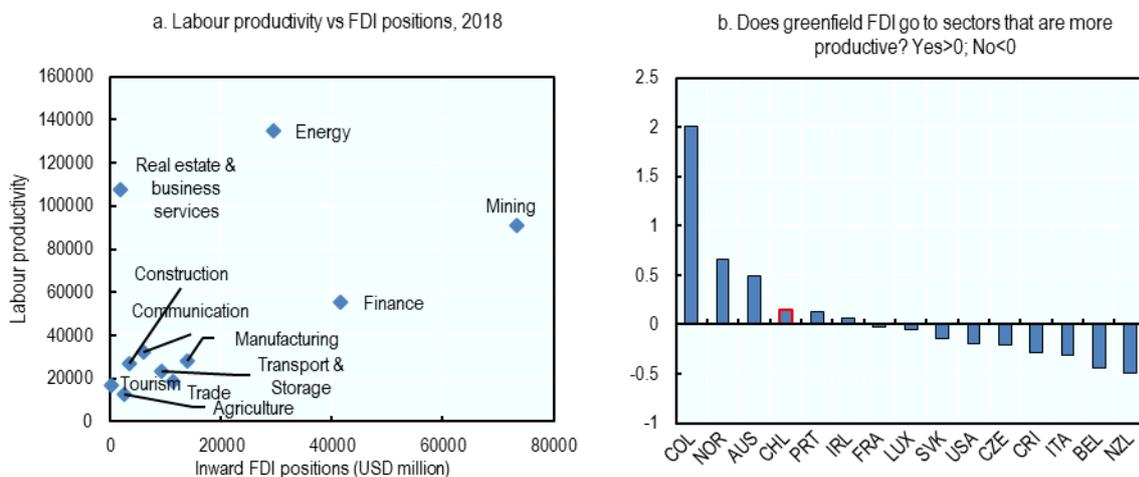
## 3. The contribution of FDI to productivity, innovation and skills

### FDI is concentrated in capital-intensive and more productive sectors

FDI influences the productivity and competitiveness of the domestic economy through the activities of foreign firms. These affect outcomes such as value added, employment, innovation and skill development, either directly or indirectly through spillovers to domestic firms (e.g. through the transfer of technology and knowledge). At the same time, outcomes such as productivity, innovation, skill intensity, vary considerably across sectors depending on their technological intensity and level of sophistication (OECD, 2019<sub>[10]</sub>).

In Chile, FDI is concentrated in the capital-intensive mining and energy sectors and in financial services, which are relatively more productive, i.e. where an hour of work produces more value added on average than in other sectors (Figure 10, panel A). In contrast, smaller shares of FDI are directed to sectors with lower average labour productivity levels, such as agriculture, manufacturing, construction, tourism, trade, transport and communications. Real estate and business services are an exception as, although highly productive, they receive a low share of FDI (panel b). An indicator based on greenfield FDI data compares Chile with other OECD economies with similar economic and natural resource characteristics. This indicator shows that a positive relationship between FDI and productivity also exists in other countries that are important producers of natural resources, such as Australia and Norway. As with Chile, the mining and energy sectors appear to be the main drivers of this positive association.<sup>9</sup>

Figure 10. FDI is concentrated in sectors that are more productive



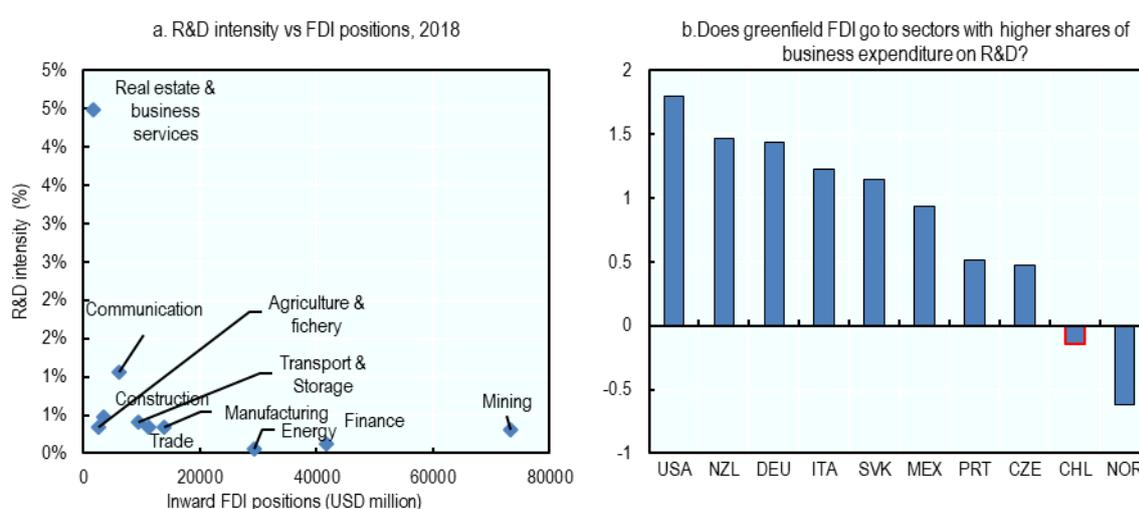
Note: Panel a: labour productivity is value added per hour worked; Panel b: shows an FDI qualities indicator based on greenfield FDI and productivity data. The indicator is calculated for 12 sectors, with manufacturing as a whole. See OECD (2019<sub>[10]</sub>) for details about methodology of calculation. Data for Chile refer to 2018; data for other countries refer to the latest available year, which ranges from 2016 to 2020. Greenfield FDI data do not cover agriculture and construction.

<sup>9</sup> The next iteration will provide a more detailed analysis of the relationship between productivity and FDI in manufacturing and services.

Source: Panel a: OECD elaboration based on OECD National Accounts and Central Bank of Chile; panel b: OECD elaboration based on Financial Times' fDi Markets and OECD National Accounts.

Sectors that attract more FDI - mining, energy and financial services - are less R&D intensive, however (Figure 11, Panel A). In contrast, sectors that have lower shares of FDI, notably real estate & business services are more R&D intensive. A similar indicator to the one used in the productivity analysis shows that greenfield FDI is concentrated in sectors with relatively lower shares of business expenditure on R&D in Chile as well as in other resource-producing countries such as Norway (panel b). In contrast, in other comparator countries, including small open economies such as the Czech Republic and Portugal, the distribution of FDI is skewed towards sectors with higher shares of business expenditure on R&D.<sup>10</sup>

**Figure 11. FDI is prevalent in sectors with lower R&D intensity**



Note: Panel a: R&D intensity is expenditure on R&D over sales. Panel b shows an FDI qualities indicator based on greenfield FDI and business expenditure on R&D data. The indicator is calculated for 12 sectors, with manufacturing as a whole. See OECD (2019<sub>[15]</sub>) for details about methodology of calculation. Data for Chile refer to 2018; data for other countries refer to the latest available year, which ranges from 2016 to 2020. Greenfield FDI data do not cover agriculture and construction.

Source: Panel a: OECD elaboration based on Chile's R&D Expenditure and Personnel Survey 2018 and Central Bank of Chile; panel b: OECD elaboration based on Financial Times' fDi Markets and OECD Research and Development Statistics.

## Foreign firms are more productive, engage more in R&D activities and are more skill-intensive

The Quinta Encuesta Longitudinal de Empresa (ELE5) (Box 1) is used to gain insights into the performance of foreign firms compared to domestic firms. According to the data, significant shares of both domestic and foreign firms are found in trade, professional services, finance and manufacturing, while significant shares of domestic firms are also found in real estate, administrative services and agriculture (Table 1).

<sup>10</sup> As with productivity, in the second phase of the project further analysis will be carried out to shed light on the link between FDI and R&D/innovation within the manufacturing and services sectors.

**Table 1. Distribution of companies by ownership and sector of activity**

Sector	Foreign companies		Domestic companies	
	<i>number</i>	<i>percentage</i>	<i>number</i>	<i>percentage</i>
Agriculture	11	2%	513	9%
Mining	24	4%	221	4%
Manufacturing	44	8%	611	10%
Energy	16	3%	46	1%
Construction	11	2%	451	8%
Trade	164	30%	1,443	24%
Transport & storage	23	4%	363	6%
Hotels & restaurants	8	1%	144	2%
Information & communication	29	5%	177	3%
Finance	85	15%	370	6%
Real estate & administrative services	40	7%	665	11%
Professional services	87	16%	649	11%
Other services	7	1%	278	5%
Total	549	100%	5931	100%

Source: Quinta Enquesta Longitudinal de Empresa (ELE5)

Data on sales, cost of intermediates and employment are used to calculate productivity of firms in the sample. Using this information, an indicator is constructed which measures the relative productivity gap between foreign and domestic firms. The indicator shows that foreign firms have a productivity premium in all sectors, except hotels & restaurants and energy (Figure 12, Panel A). Productivity premia tend to be higher in sectors with larger presence of foreign firms and which attract more FDI, such as trade, mining, professional services, and manufacturing. When comparing large firms only (84% of foreign firms in the sample are large), however, productivity gaps become smaller or even disappear, with the exception of finance where the gap increases. A similar indicator compares the productivity of foreign and domestic firms in Chile and other OECD and Latin American countries in the manufacturing sector (Panel b). The results show that in almost all countries foreign firms are on average more productive than domestic firms.

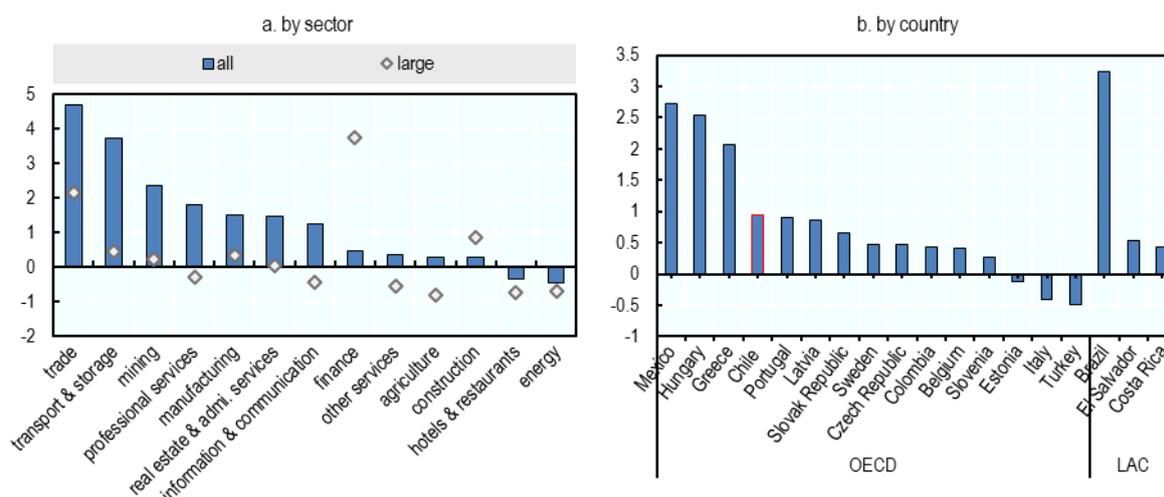
Foreign firms are also more likely to engage in R&D activities than domestic firms in all sectors, with the exception of transport & storage, mining and hotels & restaurants (Figure 13, Panel A). While this result is noteworthy for the mining sector as it attracts a significant amount of FDI, it is less surprising for transport & storage and hotels & restaurants, as a low percentage of foreign firms operate in these two sectors (jointly around 5%). Similarly, the high foreign premium observed for other services appears to be driven by a few foreign players (1%). The lower R&D propensity of foreign mining companies could be explained by the fact that they carry out R&D in other countries, e.g. in their home country or closer to main R&D centres. The results are still valid when comparing only large firms, although the gaps become considerably smaller. Moreover, a foreign premium is observed for all types of R&D activities (panel b). The data indicate that 11% of foreign firms engage in basic research, compared to 6% of domestic firms, 12% in experimental development, compared to 5% of domestic firms; and 9% in applied research compared to 4% of domestic firms.

The data also show that foreign firms are more skill-intensive, i.e. they employ higher shares of employees with a university degree or higher, than domestic firms in most sectors, excluding other services and hotels & restaurants (panel a, Figure 14). These foreign premia are higher in construction, real estate & administrative services, mining and trade and remain even when restricting the sample to large firms. A similar indicator, calculated for Chile and other OECD and Latin American countries for firms in the manufacturing sector, shows that the results vary widely across countries (panel b). Foreign firms are more

skill-intensive than domestic firms in all Latin American countries except El Salvador, and in some OECD countries, including Colombia and Mexico.

**Figure 12. Foreign firms are more productive than domestic firms**

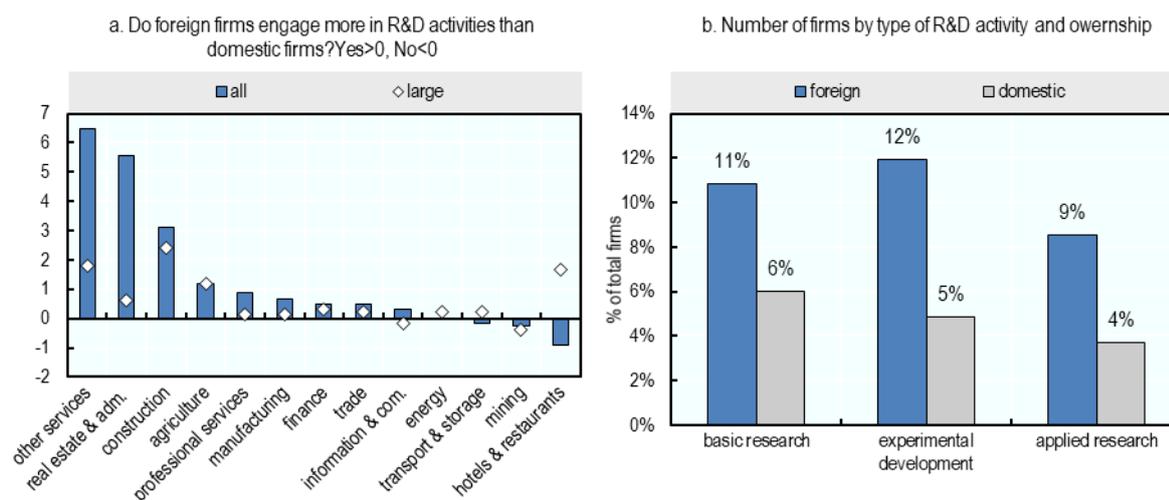
Are foreign firms more productive than domestic firms? Yes>0; No<0



Note: Panel a: the indicator measures the relative difference between the productivity of foreign and domestic firms; labour productivity is value added per hour worked; large companies are companies whose sales exceed 100,001 UF; data refer to 2017. Panel b: the indicator measures the relative difference between the productivity of foreign and domestic manufacturers; data for Chile refer to 2019; data for other countries refer to the latest available year, which ranges from 2010 to 2019.

Source: Panel a: Quinta Encuesta Longitudinal de Empresa (ELE5). Panel b: Encuesta Nacional Industrial Annual (ENIA) of 2019 and World Bank Enterprise Survey (WBES).

**Figure 13. Foreign firms are more likely to engage in R&D activities**

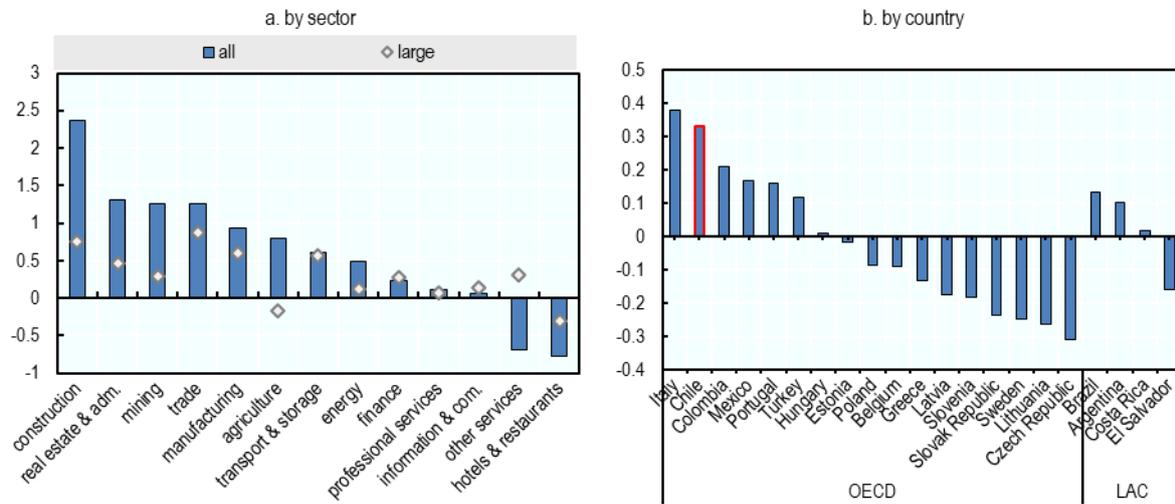


Note: Panel a: the indicator measures the relative difference between the share of foreign and domestic firms engaging in R&D activities; data refer to 2017.

Source: Quinta Encuesta Longitudinal de Empresa (ELE5)

**Figure 14. Foreign firms employ higher shares of skilled employees**

Do foreign firms have higher shares of skilled employees? Yes > 0, No < 0



Note: Panel a: the indicator measures the relative difference between foreign and domestic firms in terms of share of skilled workers; skilled employees are employees with a university degree or higher; data refer to 2017. Panel b: the indicator measures the relative difference between foreign and domestic manufacturers in terms of share of skilled workers; data for Chile refer to 2019; data for other countries refer to the latest available year, which ranges from 2010 to 2019.

Source: Panel a: Quinta Encuesta Longitudinal de Empresa (ELE5). Panel b: Encuesta Nacional Industrial Annual (ENIA) of 2019 and World Bank Enterprise Survey (WBES).

## Foreign firms generate important multiplier economic effects

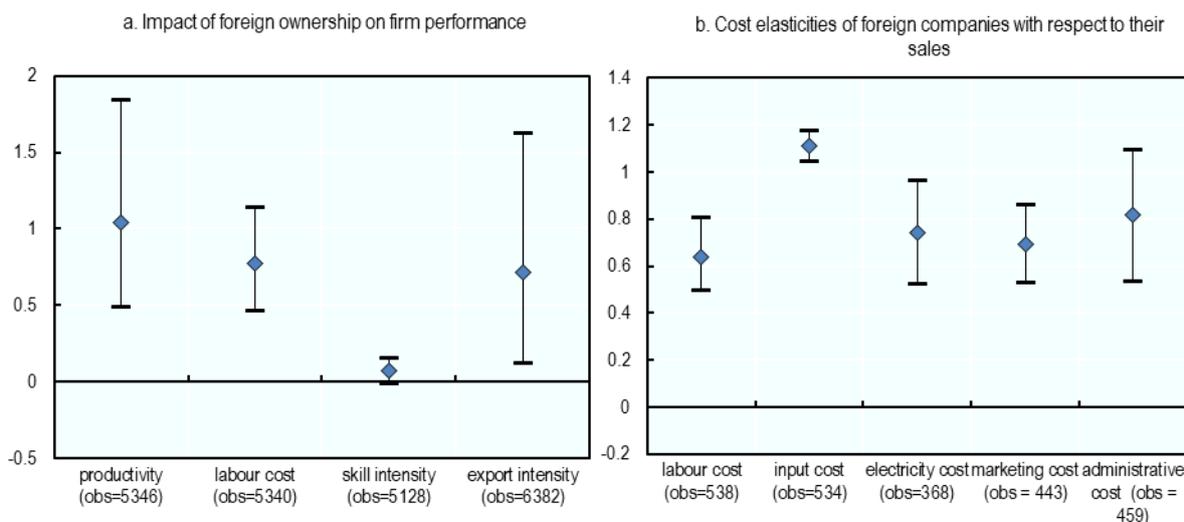
Further empirical analysis based on ELE5 confirms the existence of foreign performance premia in relation to several outcomes such as productivity, wages and salaries (labour cost), skill intensity, and export intensity (Figure 15, Panel A). In particular, the analysis shows that foreign ownership is positively and significantly related to productivity, wages and salaries, skill intensity and export intensity, irrespective of firm size and sector. The results indicate that foreign ownership has an impact of around 100% on firm productivity (foreign firms are twice as productive as domestic firms), just under 10% on wages and salaries and skills intensity and 70% on export intensity. Overall, these results are consistent with predictions from economic theory: due to the sunk cost of investing abroad, foreign firms are more productive and export more intensively than purely domestic firms (Melitz, 2003<sup>[11]</sup>; Helpman, Melitz and Yeaple, 2004<sup>[12]</sup>). Foreign firms also tend to use better technology, which may explain their higher skill intensity (OECD, 2019<sup>[10]</sup>). Previous empirical studies for Chile have also found similar results (OECD, 2015<sup>[3]</sup>).

The activities of foreign enterprises also generate important multiplier effects in the host economy. Foreign enterprises, like all enterprises, incur various types of costs, i.e. labour, materials, energy and marketing and so on. These costs are paid to various domestic suppliers of goods and services, such as material suppliers, workers, electricity suppliers and other stakeholders. When foreign enterprises pay these suppliers of goods and services, these stakeholders receive income that will increase their capital or be used for other expenses. These interactions can serve to further grow the economy as each stakeholder receives more income and expands their business.

Using a cost elasticity model and the sample of foreign firms, it is possible to empirically estimate the impact of an increase in the revenue of foreign firms on different components of their domestic value chain. The model predicts that an increase in the revenue of foreign firms leads to an increase in each factor of

the domestic value chain. For example, it is estimated that a 1% increase in the sales of foreign enterprises generates a 0.6% increase in the total labour costs of these foreign enterprises. This additional expenditure in labour input can support the living standards of local workers employed by foreign firms if this increase results in higher wages per worker or more local workers have the opportunity to work for foreign firms. (Panel b). Estimates show similar multiplier effects for other elements of the domestic value chain. In particular, a 1% increase in the sales of foreign firms is associated with a 1.1% increase in expenditure on intermediate products, 0.74% in electricity, 0.7% in marketing costs and 0.82% in administrative costs.

**Figure 15. Foreign firms perform better and generate a multiplier impact on the economy**



Note: The figures show percentage impacts estimated from regression models and their respective 95% confidence interval. The model in panel a assesses the impact of foreign ownership on firm performance, whereas the model in panel b quantifies cost elasticities of foreign firms with respect to their sales. Dependent variables (e.g. productivity) and foreign sales are in logarithms. Foreign ownership is a dummy variable that takes value 1 if a foreign investor owns directly 10% or more of the ordinary shares and 0 otherwise. All regressions control for firm size and sector fixed effects.

Source: OECD elaboration based on Quinta Encuesta Longitudinal de Empresa (ELE5).

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