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Foreign Direct Investment and Trade in Agro-Food Global Value Chains

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Foreign direct investment (FDI) and trade are driving forces in agro-food global value chains (GVCs), allowing companies to spread their activities across countries in complex production chains. This study explores the landscape of FDI in the agriculture and food sectors, using a novel database of mergers and acquisitions (M&As) covering the period 1997-2017. The study finds that FDI plays an important role in driving participation in agro-food GVCs, underscoring the close interdependencies between FDI, trade, and the various other channels that multinational enterprises (MNEs) use to engage with GVCs. The results from a survey of agro-food MNEs suggest that FDI decisions are underpinned by a diverse range of strategic motivations that go beyond commercial considerations and market-related factors. In particular, open, transparent and predictable trade and investment policies can have a strong positive influence on agro-food FDI. The study also highlights the importance of a broader set of policy areas, including dynamic agricultural innovation systems, policies to support supply chain linkages, and strong and effective laws governing responsible business conduct.

Keywords: Agriculture, FDI, GVCs, Multinational Enterprises, MNEs, Mergers and Acquisitions, M&As

JEL Codes: F21, F23, F60, Q17, Q18

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Table of Contents

Tables

Figures

Boxes

Executive summary

Foreign direct investment (FDI) and trade are driving forces in global value chains (GVCs), allowing companies to spread their activities across countries in complex production chains. In the agriculture and food sectors, increased FDI and trade flows have been underpinned by economic growth in emerging and developing economies, falling transportation and communication costs, and reductions in barriers to trade and investment. Other structural factors, such as rising demand for high quality processed food products and improvements in contracting and marketing arrangements, have contributed to more interconnected economies and the fragmentation of agro-food production across borders.

This paper seeks to shed light on this topic by mapping the landscape of agro-food FDI, and estimating its impact on participation and domestic value creation in GVCs. It also aims to improve our understanding of the strategic factors that drive multinationals' investment decisions, as well as the role of policy in influencing cross-border investment.

Agro-food FDI is explored by observing variations across sectors, countries and geographic regions in cross-border mergers and acquisitions (M&As) between 1997 and 2017. The results indicate that the landscape of agro-food FDI has evolved significantly over the past two decades, with important implications for the development and transformation of agro-food GVCs.

FDI in the agriculture and food sectors remains small relative to industry and services. Within the agro-food value chain, however, food processing accounts for the lion's share of cross-border investment activity, with large multinational food and beverage companies playing a critical role in driving FDI activity. Investments in primary agricultural production, while smaller in size and number, are propelled by the oil seeds, forestry, fishing and raw milk sectors. The services sector (which includes a diverse range of business activities ranging from wholesale and retail trade, to transport and logistics, other business services, and investment and holding companies) is the largest source of FDI inflows in agriculture and the second-largest source of inward investment in food.

Looking across regions, companies in North America and the European Union are the source of half of FDI inflows in agriculture and more than two-thirds in food processing. They invest in agriculture with a broad geographic reach: the European Union, Asia, Central and South America, and Oceania are among the most attractive destinations. In the food sector, however, FDI inflows remain highly concentrated in the European Union and North America. Agriculture and food firms typically invest within their own region, highlighting the important influence of proximity on cross-border investment decisions. Investment appears to be concentrated around specific regional hubs, suggesting that volatility in FDI flows could have important consequences for countries on the periphery.

This study finds evidence of a positive and significant link between FDI and indicators of participation and domestic value added creation in agro-food GVCs. Both inward and outward agro-food FDI are found to have a positive impact on forward participation (i.e. exports of value added included in third country exports). This suggests that FDI plays an important role in stimulating productivity and the capacity of downstream industries to export. The link between FDI and backward participation (i.e. the use of foreign imports in the production of exports) is less obvious, and may depend on strategic and operational factors at the firm level (e.g. whether foreign firms are more likely to use domestic or imported intermediates in the production process, or whether FDI outflows aim to secure imports from upstream industries). The results also indicate that both inflows and outflows of agro-food FDI are positively associated with domestic value added creation.

The positive relationship between FDI and participation in agro-food GVCs reflects the close interdependencies between the various channels that multinational enterprises (MNEs) use to engage with GVCs – in particular, trade, foreign investment and contracts with suppliers and customers. In addition, agro-food MNEs tend to invest in foreign markets through a variety of different ways (the most common ones being joint ventures with local partners, cross-border M&As, and Greenfield investments).

The results from a survey of multinationals, while not statistically representative and subject to numerous potential biases, suggest that a diverse range of strategic motivations underpin FDI decisions. Agro-food MNEs may invest out of a desire to expand their reach to new markets; complement exports; access inputs, raw materials and agricultural land; and improve access to distribution systems. Commercial and return factors are central to the investment decisions of large-scale asset managers and institutional investors, who often view investments in agriculture and food processing as part of a strategy to diversify their portfolio of assets and hedge against (or gain exposure to) inflation. Furthermore, many firms invest in order to improve their environmental footprint, reflecting growing consumer demands for responsible sourcing and sustainable supply chains.

Firms evaluate a range of factors when choosing to invest in a particular market. Gravity-related factors such as size of the economy, proximity to consumer markets and fast growing economy are often the most relevant considerations. High quality institutions, low levels of corruption, political stability and good governance are also fundamental criteria. While many MNEs do invest in unstable environments, they typically expect to be compensated for their risk-taking with higher rates of return.

Firms seeking to enter new markets generally prefer low levels of concentration in the target sector, as it allows them to grow and compete with local firms on an equal footing. However, in some instances firms may prefer high levels of market concentration. This is particularly the case for large-scale MNEs seeking to acquire an established local player with a dominant position and access to local production and distribution networks.

The survey also gathered evidence on the influence of various policies on MNEs' propensity to invest in foreign markets. The results provide a number of valuable insights for policy makers:

- Since FDI and trade are closely intertwined, policy settings cannot be treated in isolation. The liberalisation of trade and investment policies can have a strong positive influence on agro-food FDI. Conversely, unfavourable policy settings in one domain can create significant disruptions for FDI along the entire value chain.
- Uncertainty surrounding trade and investment policies can have a significant negative influence on agro-food FDI. A lack of transparency and predictability in trade and investment policies can create additional costs for firms, and result in them reducing the size of their overall investment.
- Bilateral and regional trade agreements, simplified customs procedures and harmonised technical requirements can help to encourage inward investment. Trade policy measures that negatively influence FDI include export restrictions, Sanitary and Phytosanitary measures (when applied in a discriminatory manner), and services trade restrictions.
- High tariffs in the target market can constitute an impediment to FDI, if they increase the cost of imported intermediates that serve as inputs into the production process. However, in some instances tariffs may have the perverse effect of boosting FDI inflows. By making exports to the target market less profitable, tariffs can encourage MNEs to invest in local production to avoid trade costs ("tariff jumping") and benefit from the same protections enjoyed by local firms.

- A clear, transparent and predictable investment policy framework is a fundamental component of an attractive investment climate. Other investment policies with a positive impact on agro-food FDI include strong investor protections (including compensation for expropriation), strong protection of land tenure and land rights, and tax incentives. Restrictions on FDI and screening of FDI have a strong negative influence on investment decisions.
- Dynamic agricultural innovation systems are crucial to facilitate agro-food FDI. The most relevant policy priorities identified by respondents include strong protection of intellectual property rights, well-developed research networks and innovation clusters, and well-funded agro-food R&D institutions and public extension services.
- Policies to support supply chain linkages can play an important role in facilitating MNEs' business activities. Priorities include a well-developed regulatory framework for contract farming and/or system of contract enforcement, strong capabilities of domestic firms, and highly integrated supply chains.
- Promoting the use of the *OECD-FAO Guidance for Responsible Agricultural Supply Chains* can encourage agro-food MNEs to observe internationally agreed standards for responsible investment in agricultural supply chains, and integrate risk-based due diligence into their corporate management systems.
- Measures to facilitate land acquisition by investors should be accompanied by appropriate safeguards to protect the existing legitimate tenure rights of smallholders and rural communities, and protect against risks arising from large-scale transfers of land tenure rights. The *Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security* and the *Principles for Responsible Investment in Agriculture and Food Systems* provide guidance for policy makers to promote secure tenure rights and equitable access to land, fisheries and forests.
- Developing a sound and enabling investment climate for agro-food FDI requires addressing a broad set of policies areas beyond trade and investment policies. Governments should pay close attention to laws governing responsible business conduct, employment and labour market regulations, agricultural support policies, environmental policies, and taxation.

1. Introduction

The rapid growth of foreign direct investment (FDI) and trade has influenced the structure and organisation of global value chains (GVCs) in the agriculture and food sectors. Whereas in the past agriculture and food products were largely produced for domestic consumption or for exports as final products, agro-food GVCs are now global in their reach, with activities spread across several countries (Greenville, Kawasaki and Beaujeu, 2017b). Agro-food GVCs have witnessed deeper integration in recent decades, with the rising importance of emerging and developing economies both as suppliers and as markets for agro-food products. The agro-food sector has also benefited from closer connections with other sectors in the wider economy, including services. Furthermore, parts of the value chain have been subject to tighter vertical co-ordination and increased market concentration – driven by the growing presence of large multinational enterprises (MNEs) (Maertens and Swinnen, 2015; OECD, 2019a).

These changes in agro-food GVCs were brought about by a combination of policy reforms and structural shifts in agro-food markets. Economic growth and urbanisation in emerging and developing economies have underpinned a noticeable shift from commodity-based trading to increased trade of high-value products such as fruits and vegetables, meat, dairy and fish. Innovations and advances in transport and logistics (e.g. cold chains, bulk transport and storage), as well as information and communications technologies, have facilitated trade in fragile and perishable agro-food products. In addition, rising food prices in the late 2000s may have created new incentives for cross-border investments in land for agricultural production (Arezki, Deininger and Selod, 2015; Cotula et al., 2009; Hallam, 2009; Maertens and Swinnen, 2015).

On the policy front, FDI and trade in the agro-food sector have been spurred by the liberalisation of investment, falling tariffs, and reductions in trade-distorting subsidies for agricultural producers. In particular, access to a more competitive and diverse set of imported intermediate inputs has generated growth in the agro-food sector by allowing countries to leverage their comparative advantage in different stages of production (Greenville, Kawasaki and Jouanjean, 2019; OECD, 2019a). The proliferation of public and private standards[1] have also helped to grow trade by reducing information asymmetries between trading partners and focusing greater attention on food quality and safety, as well as ethical and environmental concerns (Maertens and Swinnen, 2008; Swinnen and Vandeplas, 2009). Improvements in contracting and marketing arrangements have also been essential in building trust among value chain participants, facilitating the fragmentation of agriculture and food production across borders (Greenville, Kawasaki and Beaujeu, 2017b).

[1] The proliferation of private standards over the past few decades has also had a negative effect on the trade of agricultural products, by raising barriers to market access and imposing additional requirements on exporters in developing countries (Thorstensen, Weissinger and Sun, 2015).

Box 1. FDI and GVCs: Definitions and interrelationships

What is FDI?

Foreign direct investment (FDI) refers to cross-border transactions "establishing a lasting interest by a resident enterprise in one economy *(direct investor)* in an enterprise *(direct investment enterprise)* that is resident in an economy other than that of the direct investor." The OECD's Benchmark Definition of FDI establishes a minimum threshold of direct or indirect ownership of 10% or more of the voting power of the enterprise as the basis of evidence for a direct investment relationship. FDI transactions (flows) and positions (stocks) consist of three types of financing: i) acquisition or disposal of equity capital; ii) reinvestment of earnings that are not distributed as dividends; and iii) inter-company debt (payables and receivables, loans, debt securities) (OECD, 2009).

What are GVCs?

Global value chains (GVCs) are a prevalent feature of the international production landscape. In today's global economy, companies increasingly spread their activities across several countries in complex production chains. The geographic dispersion of production can cover the full spectrum of business operations, including the sourcing of raw materials, product design, production, marketing, distribution and support to the final consumer.

In recent decades, falling obstacles to trade and investment, lower transportation costs, migration flows, and the advent of modern communication technologies have facilitated the "unbundling of activities" and rapid emergence of GVCs (OECD, 2013a). Although this phenomenon is known to be widespread in manufacturing and services, recent work has demonstrated that the fragmentation of production is also prevalent in the agriculture and food sectors (Kowalski et al., 2015; Lopez Gonzalez, 2016; Greenville, Kawasaki and Beaujeu, 2017a, 2017b; Greenville, Kawasaki and Jouanjean, 2019).

How does FDI influence GVCs?

Broadly speaking, multinational enterprises (MNEs) engage in GVCs in three ways: through trade (both intra-firm and arm's length), foreign investment, and strategic partnerships. FDI is a central component of many multinationals' GVC strategies as it allows them to structure activities geographically and establish channels for trade in goods, services and intangible assets. FDI is also associated with the rise of strategic partnerships, or non-equity contract-based cross-border relationships. Licensing, research collaborations, franchising and integrated product offerings are all examples of strategic partnerships, which play an increasingly important role in GVCs today (Andrenelli et al., 2019).

FDI is a driving force in agro-food GVCs and can positively influence factors such as productivity, production growth and quality (UNCTAD, 2009). However, the impact of FDI on agro-food GVCs is likely to differ markedly depending on the strategic motivation underlying an MNE's investment decision. For instance, investors may be motivated by the desire to secure access to land and water resources, to improve efficiency by taking advantage of low labour costs, or to gain a foothold in foreign markets (Hallam, 2010; Fiedler and Iafrate, 2016). In addition, FDI can be classified as "horizontal" (establishment of affiliates in different markets with similar business functions – e.g. setting up supermarkets in many countries); "vertical" (upstream or downstream from the firm's core business – e.g. investing in a dairy farm upstream from a dairy processing plant); or "conglomerate" (investing in a sector unrelated to the firm's core business). Thus, the impact of FDI on agro-food GVCs depends upon the nature of the investment: whether imports of intermediate inputs are required as part of the production process, and whether final goods or intermediates destined for export markets are being produced.

FDI in the agriculture and food sectors may be further affected by market-related factors and differences in policy settings across countries. At the host country level, factors such as size of the economy, distance, macroeconomic stability, and other structural and institutional factors are likely to influence MNEs' investment decisions (Spinelli, Rouzet and Zhang, 2018). FDI attractiveness may also be influenced by investment and trade policies, such as the availability of specific investment incentives, investment restrictions, tariffs, technical requirements, quality standards, and the presence of bilateral and regional trade and investment agreements. Other policies likely to play an important role include incentives to undertake research and development (R&D), the regulatory framework for contract enforcement, and agricultural, environmental, taxation and labour market policies (OECD, 2014).

Notwithstanding the substantial literature on foreign participation in the agriculture and food sectors, there has been little analysis of the impact of FDI on participation and domestic value added creation in agro-food GVCs. Previous studies have largely focused on the impacts of trade policies on GVC participation, with some peripheral analysis of FDI and investment policies. For instance, Kowalski et al. (2015) and Greenville, Kawasaki and Beaujeu (2017b) find evidence of a positive and significant link between FDI and indicators of GVC participation in the agricultural and food sectors. Other research to date has generally focused on micro-level analysis or on commodity-specific value chains (see for example, Dolan and Humphrey, 2000; Reardon et al., 2003; Dries, Reardon and Swinnen, 2004; Dries and Swinnen, 2004; Webber and Labaste, 2010). Furthermore, even less is known about the influence of government policy on FDI in the agro-food sector, and the specific policy and market conditions that affect investment decisions taken by agro-food MNEs.

Much of the shortcomings in the literature come down to a lack of readily available data and information on the structure of FDI within individual sub-sectors of the agro-food value chain. Most international databases of FDI statistics, such as those provided by UNCTAD, the IMF, the OECD and Eurostat, consider the agriculture and food processing sectors at aggregate levels. While some information is available from investors themselves and from countries receiving FDI, data are often lacking due to the sensitivities surrounding investments and investors' desire for confidentiality (Fiedler and Iafrate, 2016).

This study aims to address some of these gaps by deepening the understanding of three key questions:

- How does FDI vary across countries and sectors of the agro-food value chain?
- How does FDI influence participation and domestic value added creation in agro-food GVCs?
- How do policies influence FDI in the agro-food value chain?

To address the first question, a database of cross-border mergers and acquisitions (M&As) developed by Dealogic is used as a proxy for FDI activity. The database includes more than 160 000 cross-border M&A transactions over a period of 21 years, from 1997 to 2017. From this, nearly 7 700 inward transactions (i.e. when an agricultural or a food company is the target firm) and 7 000 outward transactions (when an agricultural or a food company is the acquiring firm) are used to generate a global picture of FDI in the agro-food value chain. M&A data represents a subset of FDI activity, and other forms of investment, such as intra-company loans, reinvested earnings, divestments and Greenfield investments, are not included in the analysis. Whilst the M&A dataset is not exhaustive, it provides a useful representation of cross-border investment activity in the agro-food value chain.

Responding to the second question requires linking the M&A database with agro-food GVC indicators. To achieve this, the transactions recorded in the Dealogic database are aggregated according to the 57 sectors (of which 22 are agro-food sectors) and 141 countries and regions in version 10 of the GTAP database. This allows for an econometric estimation of the impact of inward

and outward FDI on indicators of participation and domestic value added creation in agro-food GVCs. The agro-food GVC indicators used in this study cover four years (2004, 2007, 2011 and 2014), and were first described and studied in detail by Greenville, Kawasaki and Jouanjean (2019). The analysis conducted here seeks to extend this work by bringing foreign investment into the core of the discussion on agro-food GVCs.

The third and final dimension explored in this study relates to the role of policy in influencing FDI in the agro-food value chain. It draws on responses to a survey of multinationals to provide insights into the specific market and policy factors that underpin cross-border investment decisions. The results are not statistically representative and subject to numerous potential biases, but nonetheless provide useful indications for policy makers seeking to facilitate cross-border investment and strengthen participation in agro-food GVCs.

2. How does FDI vary across countries and sectors of the agro-food value chain?

This section explores the landscape of foreign direct investment (FDI) in the agriculture and food sectors, and explains how it has evolved over the past two decades. It begins with an overview of global trends and the structure of agro-food FDI across regions. Following this, a database of cross-border mergers and acquisitions (M&As) developed by Dealogic[2] is used to examine cross-sectoral investment flows and regional trends in FDI. Finally, measures of centrality are calculated to illustrate the relative importance of individual countries and sub-sectors in driving agro-food FDI. The changes and trends observed have important implications for the development and transformation of agro-food GVCs.

2.1. The evolving landscape of agro-food FDI

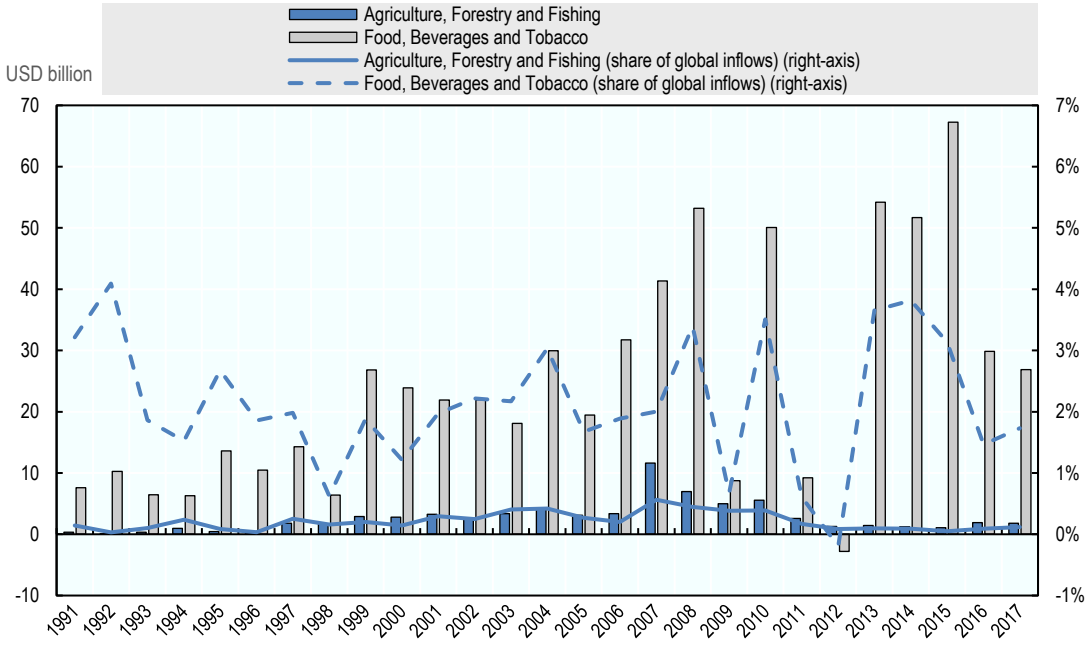
Increasing global FDI activity in the agriculture and food sectors has been driven by a number of mutually reinforcing structural shifts, including strong economic growth in emerging and developing economies, growing urbanisation and rising demand for high quality and processed food products. The liberalisation of trade and investment, reduced transport and communications costs, and increasing food prices also contributed to this trend.

In spite of these developments, FDI in agriculture and food remains small relative to other industries. Global FDI inflows in primary agriculture grew to a peak of USD 11.6 billion (or 0.6% of total FDI inflows) in 2007, in the midst of the food price crisis, but decelerated sharply in the period following the global economic crisis (Figure 1). Overall, FDI inflows in food processing were significantly larger than in primary agriculture, reaching USD 53 billion in 2008. After a sharp contraction and substantial fluctuations, FDI in food processing returned to pre-crisis levels, accounting for 3.8% of global FDI inflows in 2014. In contrast, primary agriculture has consistently accounted for less than 0.6% of global FDI inflows since the early 1990s.

[2] Dealogic is a commercial data provider. Data on M&As are sourced through direct deal submissions by banking and legal contributors involved in such transactions, and are coupled with extensive research of a broad range of sources, such as regulatory filings, corporate statements and reports, among other available sources (Mistura and Roulet, 2019).

The sharp changes between years is indicative of potentially large and lumpy investments, as well as the sensitivity to global economic conditions and business opportunities available to foreign firms and investors. This is especially visible in food processing, where large-scale multinational enterprises (MNEs) play a critical role in driving FDI activity. To illustrate this point, the world's top 100 non-financial MNEs (ranked by foreign assets) in 2018 includes six firms from the food, beverages and tobacco sector, but zero firms from the agriculture, forestry and fishing sector (see Table A.1 in Annex A). Nonetheless, FDI in agriculture is also characterised by large commercial investments, with large-scale land acquisitions often exceeding 10 000 hectares and sometimes in excess of 500 000 hectares (Arezki, Deininger and Selod, 2015; Cotula et al., 2009; Hallam, 2010).

Figure 1. Global FDI inflows in agriculture and food, 1991-2017



Note: FDI data are aggregate and may include official, semi-official, estimated or calculated data. Calculations based on FDI data in USD billion, 2010 prices.
Source: FAOSTAT.

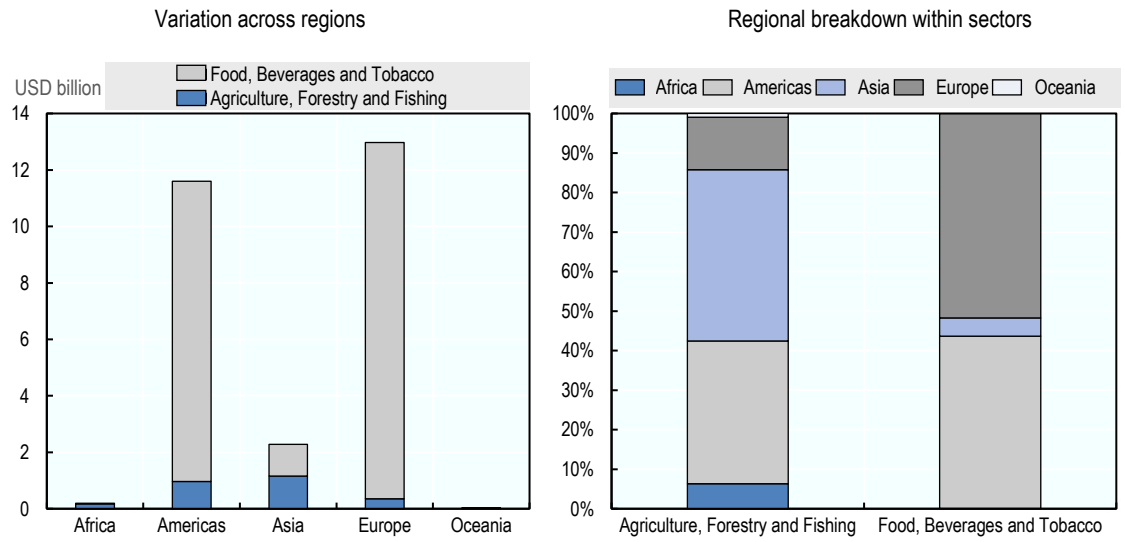
The food price hikes of 2007-08 and 2010-11 increased rates of return in agriculture, triggering a surge of interest from foreign investors in the agro-food value chain (Cotula et al., 2009). The price movements were driven by increased demand for agricultural commodities due to global population and income growth, along with several supply-side shocks, including falling stock-to-utilisation ratios in a number of key commodities, rising prices of petroleum and fertilisers, and droughts and harvest failures in major grain-producing regions. Biofuels mandates and subsidies placed further upward pressure on food prices, creating incentives for export-oriented investments in the cultivation of sugarcane, grains (maize), oilseeds (soya beans) and non-food crops (jatropha) in a number of developing regions around the world (UNCTAD, 2009). Furthermore, the policy responses of some governments – which included large food purchases for the accumulation of public stocks, export restrictions and import measures in some markets – greatly exacerbated the trend (Piesse and Thirtle, 2009; Headey, 2011). High food prices may have encouraged investment and trade in agro-food GVCs by increasing the potential returns for actors along the value chain, reducing credit constraints for farmers, traders and processors, and encouraging vertical integration (Maertens and Swinnen, 2015). Other research has suggested that the increased price volatility generated significant uncertainty, and may have curtailed investment (FAO et al., 2011).

The strong growth in agro-food trade during the 2000s also had important implications for agro-food FDI. Average applied agricultural tariffs have declined steadily over the past two decades due to commitments made under WTO agreements, unilateral actions by some countries, and liberalisation achieved through bilateral and regional trading agreements. These developments led to significant improvements in market access and a rising importance of Asia, South America and other developing regions in global agricultural production (OECD, 2016).

The increased weight of countries such as Brazil, the Russian Federation, India, Indonesia, the People's Republic of China (hereafter "China"), and South Africa in world agricultural exports coincided with a wave of investment liberalisation and an influx of agro-food FDI into emerging and developing economies. China in particular plays an increasingly major role in agro-food GVCs as a buyer and seller of value added (Greenville, Kawasaki and Jouanjean, 2019), and was the single largest recipient of FDI inflows in agriculture between 1991 and 2017 (for countries covered in the FAOSTAT database). Beyond China, other emerging economies such as Argentina, Indonesia and Brazil were the next largest recipients of FDI in primary agricultural production between 1991 and 2017. The leading countries for FDI inflows in food processing, on the other hand, are the United States, the Netherlands, Brazil and the United Kingdom.

These dynamics are reflected in aggregate FDI statistics at the regional level (Figure 2). Primary agriculture accounted for 85% of FDI inflows in Africa's agriculture and food sectors between 1991 and 2017, and 51% in Asia, compared with just 8% in the Americas and 3% in Europe. On a sectoral basis, Asia received 43% of global FDI inflows in primary agriculture over the same period, while the Americas attracted 36% of the total. FDI inflows in food processing were highly concentrated in Europe (52%) and the Americas (44%).

Figure 2. FDI inflows in agriculture and food by region, average annual 1991-2017



Note: FDI data are aggregate and may include official, semi-official, estimated or calculated data. Calculations based on FDI data in USD billion, 2010 prices.
Source: FAOSTAT.

Although the agriculture and food sectors account for a small share of FDI at the global level, the sector still represents an important source of foreign capital in many low and middle-income countries. Foreign participation in agro-food GVCs has the potential to foster economic development by boosting productivity, supporting the transfer of technology, standards and skills, and improving access to credit and markets (UNCTAD, 2009). Increasing global demand for high-value agricultural and food products creates opportunities for developing countries to attract export-oriented FDI and increase their trade in agro-food products, paving the way for reductions in rural poverty and higher rural incomes (FAO et al., 2011).

Results from a recent survey of investment promotion agencies conducted by UNCTAD (2016) suggest that strong investor interest in agro-food GVCs is likely to be sustained in developing countries over the coming years. In Africa and Developing Asia, agriculture was selected as the most promising industry for attracting FDI. Food and beverages ranked second and third in Africa and Developing Asia, respectively, and was the top ranked industry for attracting FDI in Latin America and the Caribbean and the Transition economies.

2.2. How does agro-food FDI vary across sectors and regions?

The lack of disaggregated data on FDI is a significant constraint to conducting analysis on the structure of cross-border investment and its impact on agro-food GVCs. FDI statistics constructed by international institutions such as UNCTAD, the IMF, the OECD and Eurostat provide data on the agriculture and food sectors only at aggregate levels. Moreover, these databases do not include all dimensions (country/sector and origin/destination) and contain many gaps and inconsistencies due to confidential or unreported data.

To address this issue, this study takes a database of cross-border mergers and acquisitions (M&As) developed by Dealogic as a proxy for FDI activity. M&A data represents a subset of FDI activity, but with nearly 10 000 transactions[3] recorded in the agriculture and food sectors over a 21-year period from 1997 to 2017, the database provides a detailed view of the landscape of agro-food FDI. The analysis focuses on cross-border M&As, i.e. deals where the acquiring and target firms are established in different countries. Furthermore, as per Mistura and Roulet (2019), only deals resulting in an equity ownership of 10% or more by the acquiring firm after the transaction are covered by this study.[4]

Using M&A data has a number of advantages. In particular, the Dealogic database provides comprehensive coverage of global M&A deal activity, allowing for a detailed analysis of bilateral relationships between countries and cross-sectoral interactions. M&As also account for an important share of cross-border investment activity, and are becoming an increasingly important form of market entry for FDI. However, a number of caveats associated with the use of M&A data should be mentioned here. Several important components of FDI are not included in M&A data, such as intra-company loans, reinvested earnings, and divestments (repatriated investments, reverse intra-company loans and repayments of debt to parent firms). Greenfield investments (building new facilities abroad) are also excluded from the coverage. Furthermore, capital disbursed for an acquisition may not necessarily flow across borders (e.g. when an acquisition is financed by

[3] The entire database includes more than 160 000 cross-border M&A transactions over a period of 21 years, from 1997 to 2017. From this, nearly 7 700 inward transactions (i.e. when an agricultural or a food company is the target firm) and 7 000 outward transactions (when an agricultural or a food company is the acquiring firm) are used to generate a global picture of agro-food FDI.

[4] The 10% ownership threshold was adopted, as it is the standard classification of a lasting interest by direct investors in a company as per the OECD Benchmark Definition of Foreign Investment and the IMF Balance of Payments Compilation Guide. A minimum ownership level of 10% is assumed to give investors an effective voice in the management of the company.

debt capital raised in the target country). In these instances, M&A transactions would not be recorded as FDI flows. Finally, the Dealogic database is not subject to official vetting by authorities and as such, the coverage may be uneven across time and countries. In spite of these shortcomings, M&A data provide a useful representation of the international market for corporate control of overseas assets, and can serve as a good proxy for the subset of FDI activity that opts for the M&A entry route (Mistura and Roulet, 2019).

To facilitate the analysis of FDI trends and interrelationships with indicators of participation in agro-food GVCs (explored further in Section 3), the M&A transactions recorded in the Dealogic database are aggregated according to the 22 agriculture and food sectors and 141 countries and regions in version 10 of the GTAP database (see Annex B for a detailed list of sectors and regions). Two indicators of FDI activity are computed: the deal value and the number of deals. The deal value, measured in USD million, provides a measure of the relative strength of countries and sectors in attracting or undertaking FDI. However, unreported data and investors' desire for confidentiality results in a significant proportion of transactions containing missing deal values (45% of inward investments in agriculture and 51% of inward investments in food). For this reason an alternative indicator based on the total number of deals, which can be seen as a measure of the relative intensity of FDI activity, is also analysed. While the number of deals indicator has superior coverage in terms of countries and sectors, it fails to account for differences in the size of individual transactions, which can be large. A side-by-side comparison of the two indicators therefore allows for a more nuanced interpretation of cross-border investment.

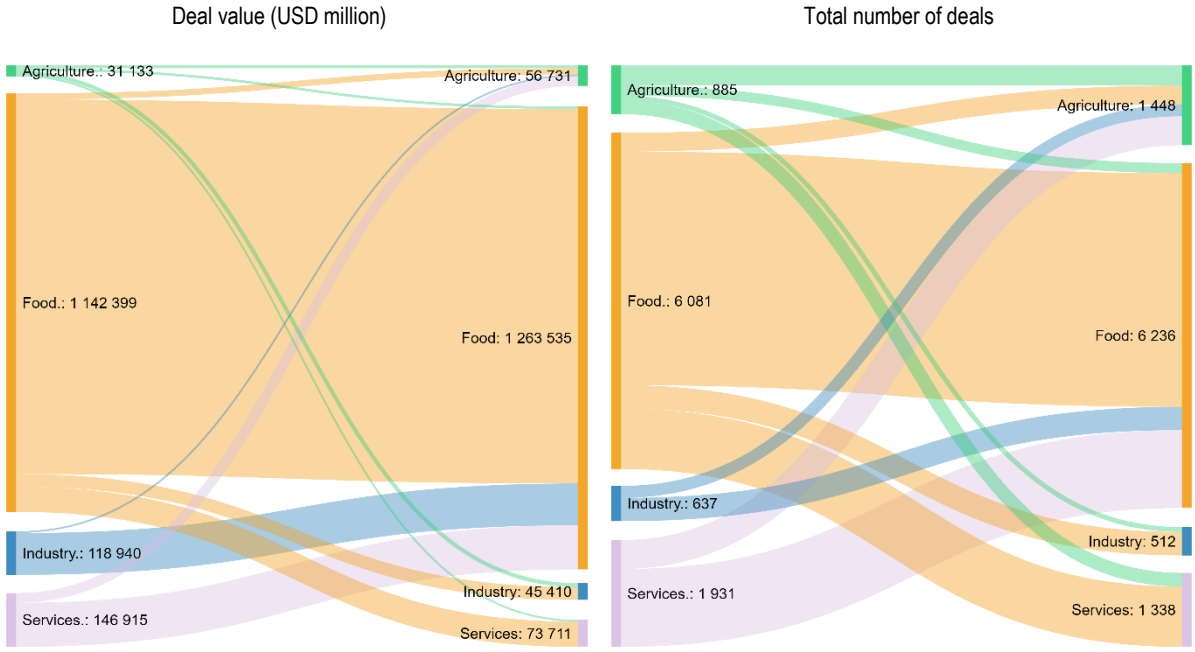
Figure 3 depicts the landscape of cross-border M&As over the entire period covered by the dataset (1997 to 2017) between four major sector categories: Agriculture, Food, Industry and Services (see Table B.1 in Annex B for a detailed list of sectors in the GTAP database, and how they correspond to broad sector categories). Investments flow out from the sectors on the left and into the sectors on the right (for example, agricultural firms made outward investments valued at USD 31.1 billion and received a total of USD 56.7 billion in inward investments). Only outward and inward investments from/to the agriculture and food sectors are depicted. Foreign investments between the industry and services sectors, which account for more than 90% of cross-border M&A activity in the dataset, are excluded as they are not the subject of this study (see Figure A.1 in Annex A for a complete picture of the landscape of cross-border M&A activity between 1997 and 2017).

Figure 3 allows for a number of important observations to be made:

- First, food processing is the predominant source and destination for cross-border investment activity: the value of outward investments from food is almost 37 times higher than primary agriculture, with nearly seven times the number of deals. Aggregate FDI inflows in the food sector were more than 22 times higher than primary agriculture, and the sector received over four times the number of inward investments.
- Second, the sheer weight of food-food FDI is clearly visible, reflecting the growing dominance of large multinational food companies in the agro-food value chain. Food companies accounted for 81% of inward investment in the food sector in terms of deal value, or 68% in terms of the total number of deals. Outward investments from the food sector were also primarily directed at other food companies, which constituted 89% of deal value and 69% of the number of deals.
- Third, the services sector plays an essential role in agro-food GVCs. Services represents the largest source of FDI in agriculture, accounting for 47% of inward investment in terms of deal value or 36% in terms of the total number of deals. It is also the second-largest source of inward investment in food, and the second-largest destination for outward investment from food (both in terms of deal value and deal count). To some extent, this is a reflection of the heterogeneous nature of the services sector, which includes a diverse array of business activities ranging from wholesale and retail trade, to transport and logistics, other business services, and investment and holding companies.

- Fourth, cross-border investments from agricultural firms into other agricultural firms play an important role. By cumulative number of deals, agriculture ranks second as a source of inward investment in agriculture (26% of deals) and first as a destination for outward investment from agriculture (42% of deals).
- Finally, agriculture emerges as the least important sector for food processing, both as a source of inward investment in food (1% of deal value and 3% of deal count) and as a destination for outward investment from food (1% of deal value and 6% of deal count). This somewhat surprising result could potentially be driven by differing policy settings across sectors and their impacts on the incentives for cross-border investment. For instance, food processing firms may find it easier to engage with suppliers through contract farming or other forms of strategic partnerships, rather than bearing all of the risk associated with in-house production of agricultural commodities.

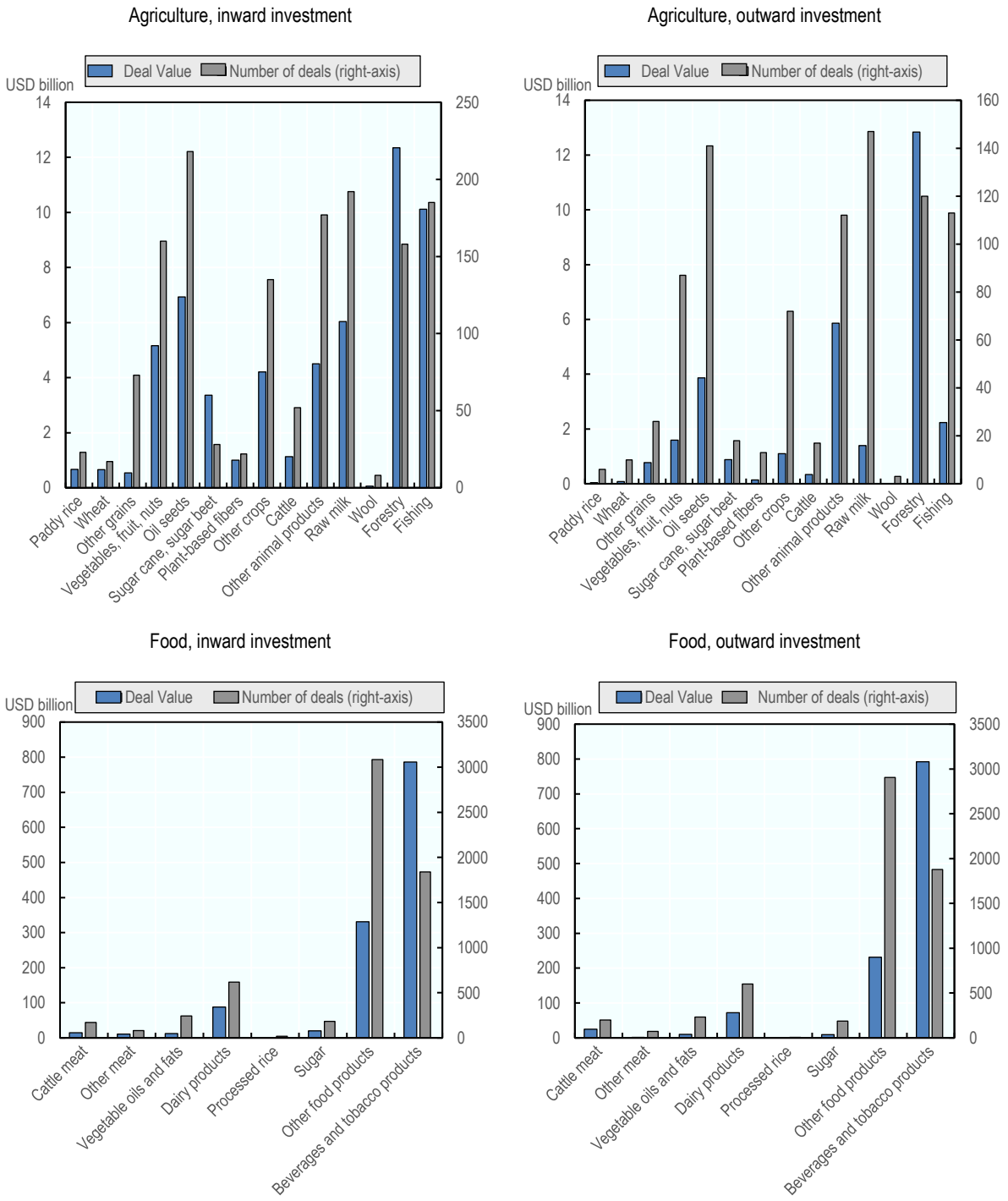
Figure 3. Cross-border M&A transactions between major sector categories, 1997-2017



Note: Cross-border investment flows from the sectors listed on the left (outflows) to the sectors listed on the right (inflows). See Table B.1 in Annex B for a definition of broad sector categories (Agriculture, Food, Industry and Services). The figures exclude cross-border investments between the industry and services sectors (see Figure A.1 in Annex A for a complete picture of global investment flows across industries).
Source: Author calculations based on Dealogic. Figures generated using SankeyMATIC (http://sankeymatic.com/build/).

Figure 4 offers a more detailed view of cross-border M&As within 22 agriculture and food sectors, aggregated over the entire period covered by the dataset (1997 to 2017). For agriculture, the leading sectors for attracting inward investment were forestry, fishing and oil seeds in terms of deal value, or oil seeds, raw milk and fishing in terms of the total number of deals. Outward agricultural investment was primarily driven by forestry, other animal products, and oil seeds in terms of deal value, or raw milk, oil seeds and forestry in terms of the total number of deals.

Figure 4. Cross-border M&As in agriculture and food, detailed sectoral breakdown, 1997-2017



Note: See Table B.1 in Annex B for a detailed list of sectors in the GTAP database, and how they correspond to broad sector categories (Agriculture and Food).
Source: Author calculations based on Dealogic.

In the food sector, the top ranking sectors for inward and outward FDI are other food products, beverages and tobacco, and dairy products. These results are consistent across the deal value and deal count indicators, although the beverages and tobacco sector has the highest deal value while other food products comes out on top in terms of the cumulative number of deals.

The sharp variations observed across sectors between the deal value and number of deal indicators suggests that the average size of investments can differ substantially from one sector to another. In agriculture, for instance, the average inward investment ranges from USD 12 million in wool to USD 187 million in sugar cane and sugar beet, and the average outward investment varies between zero for wool[5] to USD 155 million in forestry. Similarly, the average inward investment in food ranges between USD 35 million in processed rice and USD 755 million in beverages and tobacco, while the average outward investment varies from USD 2 million in processed rice to USD 781 million in beverages and tobacco. This suggests that market concentration and the presence of large, dominant multinationals within a sector may have an important influence on the nature of FDI flows in agro-food GVCs.

Transactions from the dataset have also been aggregated to broad regional categories, allowing for a detailed illustration of the structure of cross-border investment across geographic regions (Figure 5). Only inward FDI transactions are considered, reducing the dataset to nearly 7 700 investments in the agriculture and food sectors (an agricultural/food firm acquiring an industry/services firm, for instance, would not be included).[6] A link between a region and itself in Figure 5 refers to cross-border agro-food investments within that region (e.g. an investment by a US supermarket chain in a Canadian agricultural firm would be included in the band linking North America to North America). The band linking China with itself represents cross-border investments between China, Hong Kong, Macao and Chinese Taipei.

A close inspection of Figure 5 reveals a number of interesting observations regarding the geographic structure of agro-food FDI:

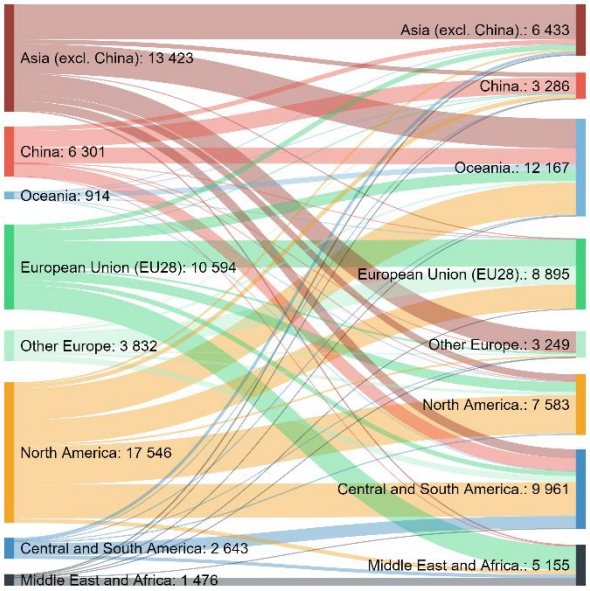
- The primary destinations for FDI in agriculture (by deal value) are Oceania, Central and South America, and the European Union (EU28). Oceania and Central and South America also recorded the highest average annual deal values in agriculture between 2008 and 2017 (Figure 6). These results were strongly influenced by a recent spate of large-scale agricultural investments: the top four investments accounted for 35% of FDI in agriculture in Oceania, 30% in Central and South America, and 50% in the EU-28. When ranked by the average annual number of deals, the European Union (EU28), Asia (excluding China), and Central and South America came out as the most attractive destinations for FDI.
- The regions driving cross-border investment in agriculture are North America, the EU-28 and Asia, all of which invest with a broad geographic reach. Taken together, North America and the EU-28 account for 50% of outward FDI to the agricultural sector (both by deal value and number of deals), while Asia in aggregate (including China) is responsible for 35% of outward FDI to agriculture by deal value, and 32% of the total number of deals.

[5] The next largest sector is paddy rice, with an average outward investment size of USD 9.1 million.

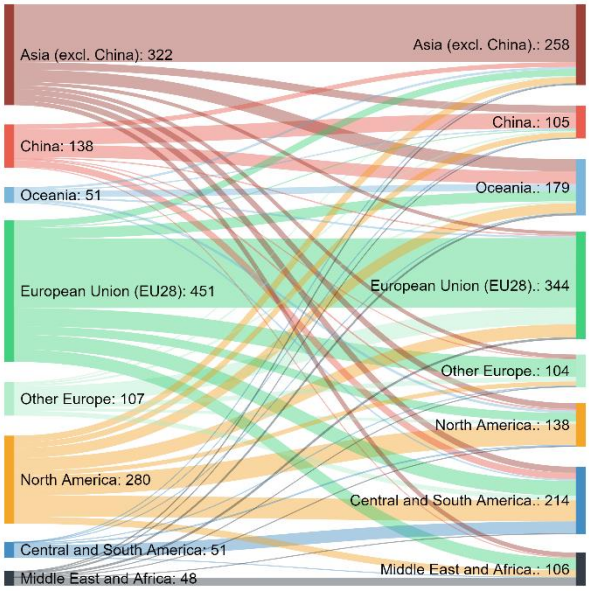
[6] Figure A.2 in Annex A provides a perspective on the geographic structure of outward FDI from the agriculture and food sectors.

Figure 5. Cross-border M&As (inward investment) in agriculture and food by region, 1997-2017

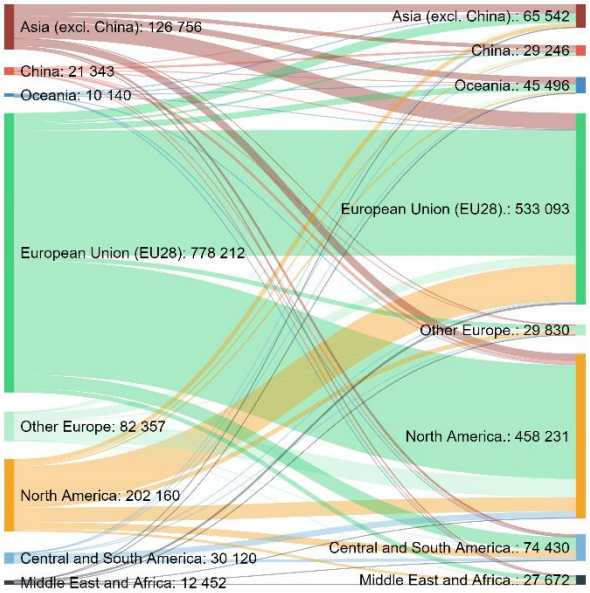
Agriculture, inward investment, deal value (USD million)



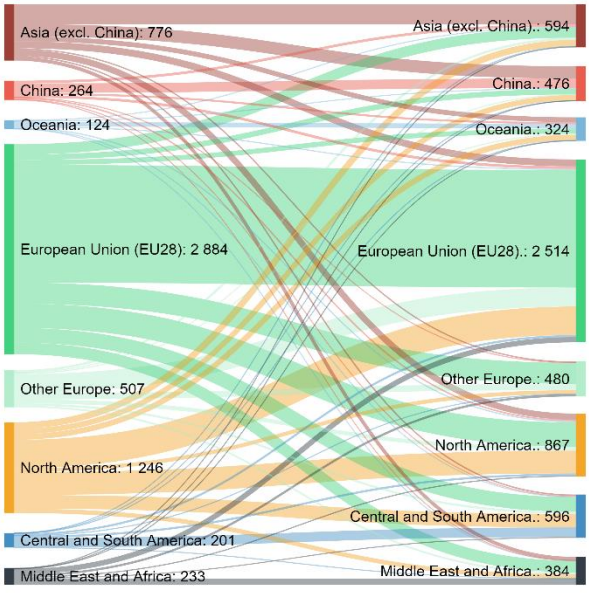
Agriculture, inward investment, total number of deals



Food, inward investment, deal value (USD million)



Food, inward investment, total number of deals



Note: Cross-border investment flows out from the regions listed on the left (outflows) and into the regions listed on the right (inflows). See Table B.1 in Annex B for a definition of broad sector categories (Agriculture and Food). Only inward agro-food investments (where the target firm is an agricultural or a food firm) are depicted here. See Figure A.2 in Annex A for a perspective on the geographic structure of outward agro-food FDI.
Source: Author calculations based on Dealogic. Figures generated using SankeyMATIC (http://sankeymatic.com/build/).

- Intra-regional investment is a critical component of FDI in agriculture. When firms decide to invest in a foreign country's agricultural sector, they are often most likely to invest within their own geographic region. With some exceptions, intra-regional investment is nearly always the most important destination for FDI in agriculture, both in terms of deal value and in terms of the number of deals.[7] North America is an interesting exception, as it made a large number of agricultural investments in Central and South America. These findings underscore the importance of proximity (in terms of geography, and perhaps cultural and institutional factors) in influencing FDI flows in agriculture. The proliferation of bilateral and regional trade agreements could also be an important factor, as many of these increasingly include provisions on investment and on the treatment of agriculture.
- FDI in the food sector is highly concentrated in the EU-28 and North America, which collectively absorb 78% of inward investment by deal value and 54% of the total number of deals. Consequently, developing regions such as Asia, Central and South America and the Middle East and Africa account for a much smaller share of inward FDI in the food sector than they do in the agricultural sector. When viewed in absolute value terms within individual regions, however, FDI in food remains several orders of magnitude larger than FDI in agriculture.
- The EU-28 and North America play an important role in driving FDI outflows to the food sector: together they accounted for 78% of the value of outward FDI to food, and 66% of the total number of deals.
- Intra-regional investment appears less important in the food sector when observing investment flows by deal value. The one exception to this is intra-EU investment in food, which represents 28% of the value of all FDI in the food sector. Looking at the number of deals indicator, however, reveals that intra-regional investment was the most important destination for FDI in food across almost all regions.[8] This suggests that proximity is also an essential driver of FDI in the food processing sector.

The dataset was also split into two periods roughly equal in length (1997-2007 and 2008-2017), in order to examine how inward FDI in the agro-food sector has changed across regions (Figure 6).[9] The fastest-growing destinations for agricultural FDI were Other Europe, which witnessed a 16-fold increase in average annual deal value over the two periods under examination, and Central and South America, which underwent a four-fold increase. These sharp increases were primarily driven by a small number of large-scale deals. In terms of the average annual number of deals, agricultural FDI grew at the fastest pace in Oceania and China. This underscores the rising importance of emerging and developing economies in attracting FDI in primary agriculture (in the case of Oceania, the availability of land and natural resources coupled with favourable policy settings may have played a role). On the other hand, more developed agricultural producing regions such as the EU-28 and North America saw a decline in the average annual deal value (along with increases in the average annual number of deals).

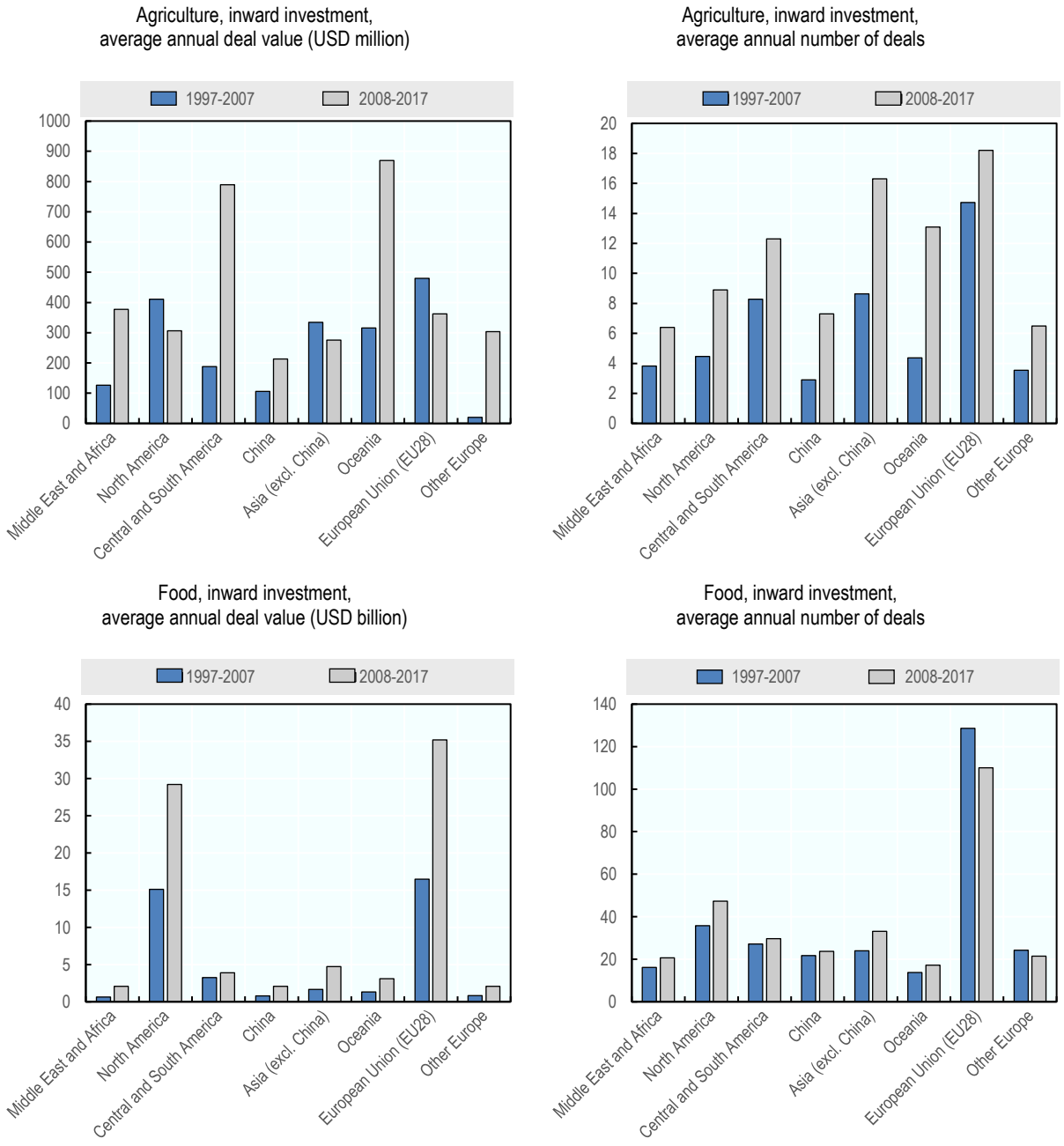
[7] The exceptions to this are Other Europe, which sent the largest share of its agricultural FDI (both by deal value and number of deals) to the EU-28, and North America, which had Central and South America as the biggest destination for its agricultural FDI (by number of deals).

[8] The exceptions to this are North America and Other Europe, both of which sent the largest share of their FDI in food (by number of deals) to the EU-28.

[9] Figure A.3 in Annex A illustrates regional trends in outward investment from the agriculture and food sectors.

The Middle East and Africa, Asia (excluding China) and China have all seen important growth in food FDI, both in terms of average annual deal value and in terms of the average annual number of deals. However, the average size and quantity of investments still pales in comparison to the levels observed in the EU-28 and North America.

Figure 6. Regional trends in cross-border M&As (inward investment) in agriculture and food



Note: See Table B.1 in Annex B for a definition of broad sector categories (Agriculture and Food).
Source: Author calculations based on Dealogic.

2.3. How do individual countries and sectors drive agro-food FDI?

Mapping the network structure of agro-food FDI can help to understand the extent to which cross-border investment is vulnerable or resilient to shocks along the value chain. This section uses network analysis to visualise the landscape of agro-food FDI, and measure the "centrality", or relative influence, of individual countries and sectors.

Measures of eigenvector centrality are computed to benchmark the relative importance of "nodes" in the network. Nodes can be defined at different levels of aggregation (e.g. at the country, sector, or country-sector level). Each node is assigned a relative score based on the concept that connections to more influential nodes contribute more to the score of the node in question than equal connections to less influential nodes. Therefore, nodes with a high eigenvector score are considered highly "central" because they are connected to many nodes which themselves have high scores.

Table 1 ranks the top ten most central countries for inward investment in agriculture and food, and compares this with the top ten destinations for investment (by number of deals). Figure 7 also provides a visual representation of the network structure of FDI in agriculture. The results indicate that the most central countries for inward FDI in agriculture are the United States, followed by Argentina, Brazil and Australia. These countries tend to be well integrated in both regional and global markets for agricultural commodities. Indonesia and China are highly successful in attracting FDI in agriculture (ranked first and third by number of deals, respectively). However, their ranking in terms of centrality is much lower, suggesting that a substantial number of investments come from neighbouring countries in Asia.

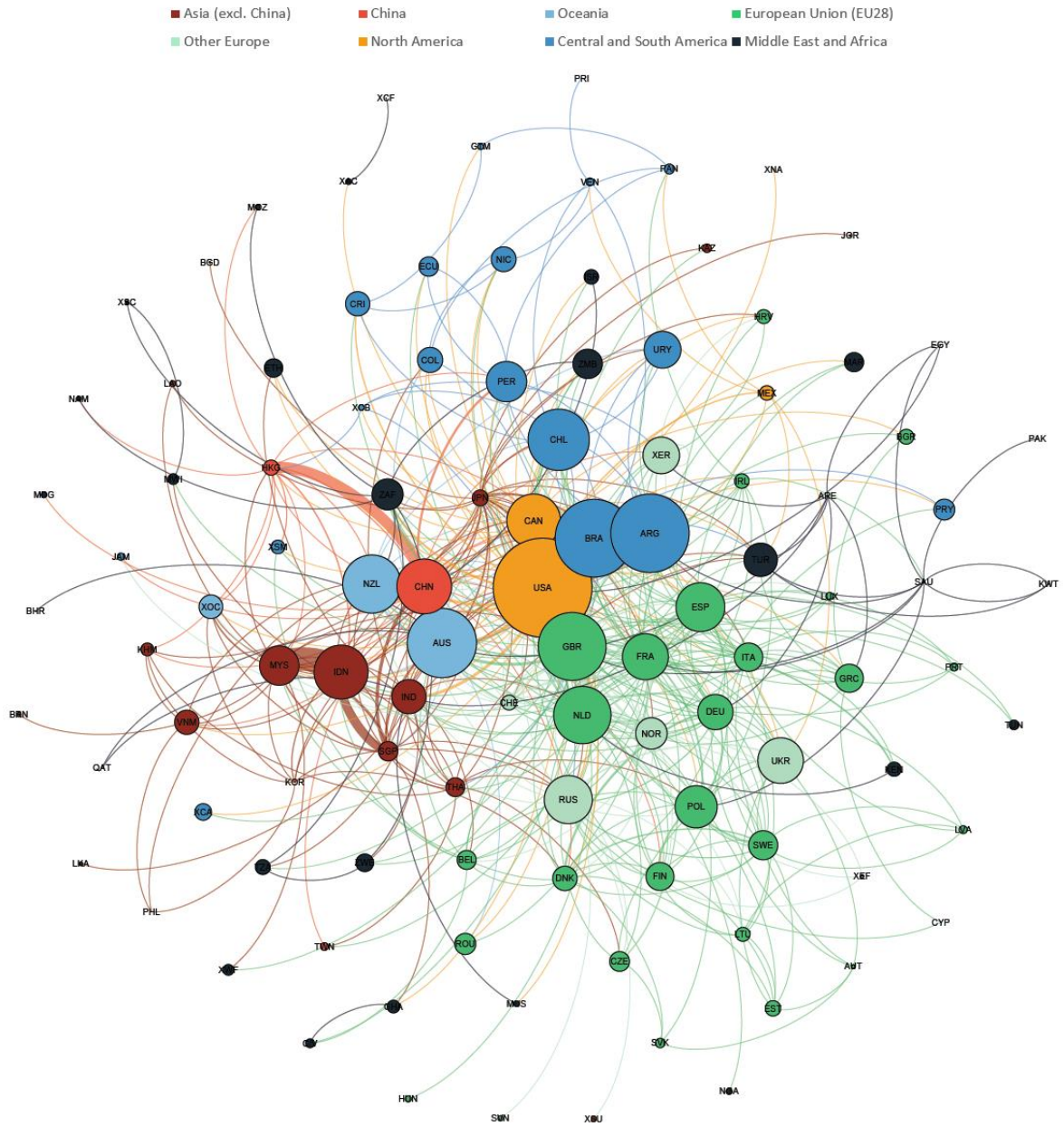
Table 1. Rankings of country centrality and inward FDI in agriculture and food (number of deals), 1997-2017

	Inward FDI in agriculture		Inward FDI in food	
Rank	Centrality	Number of deals	Centrality	Number of deals
1	United States	Indonesia	United States	United States
2	Argentina	Australia	United Kingdom	China
3	Brazil	China	Spain	United Kingdom
4	Australia	United States	Russian Federation	France
5	United Kingdom	Brazil	Germany	Brazil
6	Chile	New Zealand	China	Germany
7	New Zealand	United Kingdom	Poland	Spain
8	Netherlands	Canada	France	Australia
9	China	Spain	Australia	Poland
10	Indonesia	Argentina	Brazil	Russian Federation

Note: See Table B.2 in Annex B for a detailed list of regions in the GTAP database.
Source: Author calculations based on Dealogic.

Looking at FDI in agriculture by deal value reveals that Australia, the United States, Brazil and China are ranked as the most central countries (see Table A.2 and Figure A.4 in Annex A). Canada ranks second in terms of the value of agricultural FDI, but comes in twelfth in terms of centrality due to the high concentration of investment from the United States (86% of the total deal value). Conversely, the United States maintains a wide diversity of investment partners and is the second most central country, despite ranking eighth in terms of the value of inward FDI in agriculture.

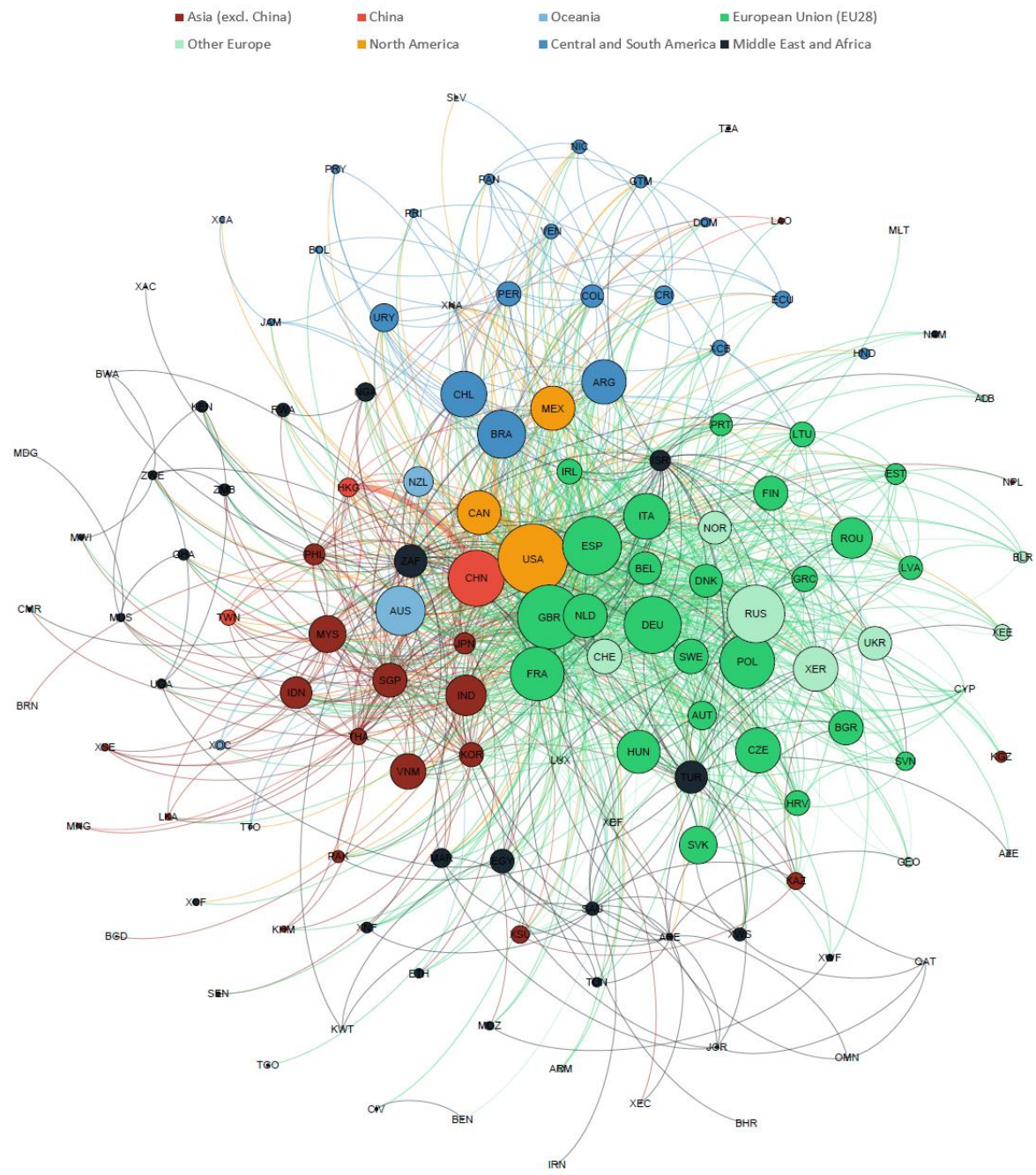
Figure 7. Country centrality for inward FDI in agriculture (number of deals), 1997-2017



Note: The size of the nodes is proportional to their eigenvector centrality score as drivers of FDI in agriculture. Edges are coloured according to the source of the investment. See Table B.2 in Annex B for a detailed list of regions in the GTAP database.
Source: Author calculations based on Dealogic. Figure generated using Gephi v. 0.9.2 https://gephi.org/.

Country centrality for inward FDI in the food sector (by number of deals) is illustrated in Figure 8. The most central countries are the United States, United Kingdom, Spain and the Russian Federation. A similar picture emerges when looking at the deal value indicator, with the most central countries being the United States, United Kingdom, China and Australia (see Table A.2 and Figure A.5 in Annex A). The Russian Federation maintains strong links with Asian, European and North American food systems, and has a highly central position in the food sector (relative to its ranking as a destination for FDI).

Figure 8. Country centrality for inward FDI in food (number of deals), 1997-2017



Note: The size of the nodes is proportional to their eigenvector centrality score as drivers of FDI in food. Edges are coloured according to the source of the investment. See Table B.2 in Annex B for a detailed list of regions in the GTAP database.
Source: Author calculations based on Dealogic. Figure generated using Gephi v. 0.9.2 https://gephi.org/.

The results indicate that there is a strong regional dimension to agro-food FDI. Investment is concentrated around specific regional "hubs", with emerging economies in Asia and Central and South America playing an important role in driving global investment activity. The importance of European countries is particularly evident in the food sector, with the highly integrated food system in the European Union positioning several EU countries as dominant players in the global food FDI landscape (Greenville, Kawasaki and Jouanjean, 2019). The concentration of agro-food FDI in hubs raises the question of whether rapid changes in market conditions could generate shocks to

FDI flows with important global consequences, including potential ripple effects for countries sitting on the periphery of the landscape.

Table 2 provides a ranking of sector centrality in the agro-food value chain, compared against the sectors that attracted the most investment (by number of deals). A visual representation of the network structure of agro-food FDI across sectors is also depicted in Figure 9. The most central sectors are other foods (OFD), vegetable oils (VOL), other crops (OCR), and beverages and tobacco (B_T). Going by the deal value indicator, the top-ranked sectors in terms of centrality are other foods (OFD), vegetable oils (VOL), dairy products (MIL), and other crops (OCR) (see Table A.3 and Figure A.6 in Annex A).

The position of the other foods sector as the most central food processing sector for inward FDI is not surprising, as the sector is quite large and encompasses a diverse range of processed food products. The vegetable oils sector also exhibits a high degree of centrality, particularly when compared with its ranking as a destination for FDI. However, in spite of the high concentration of FDI in the food sector, some agricultural sectors such as crops (OCR) still rank highly in terms of centrality.

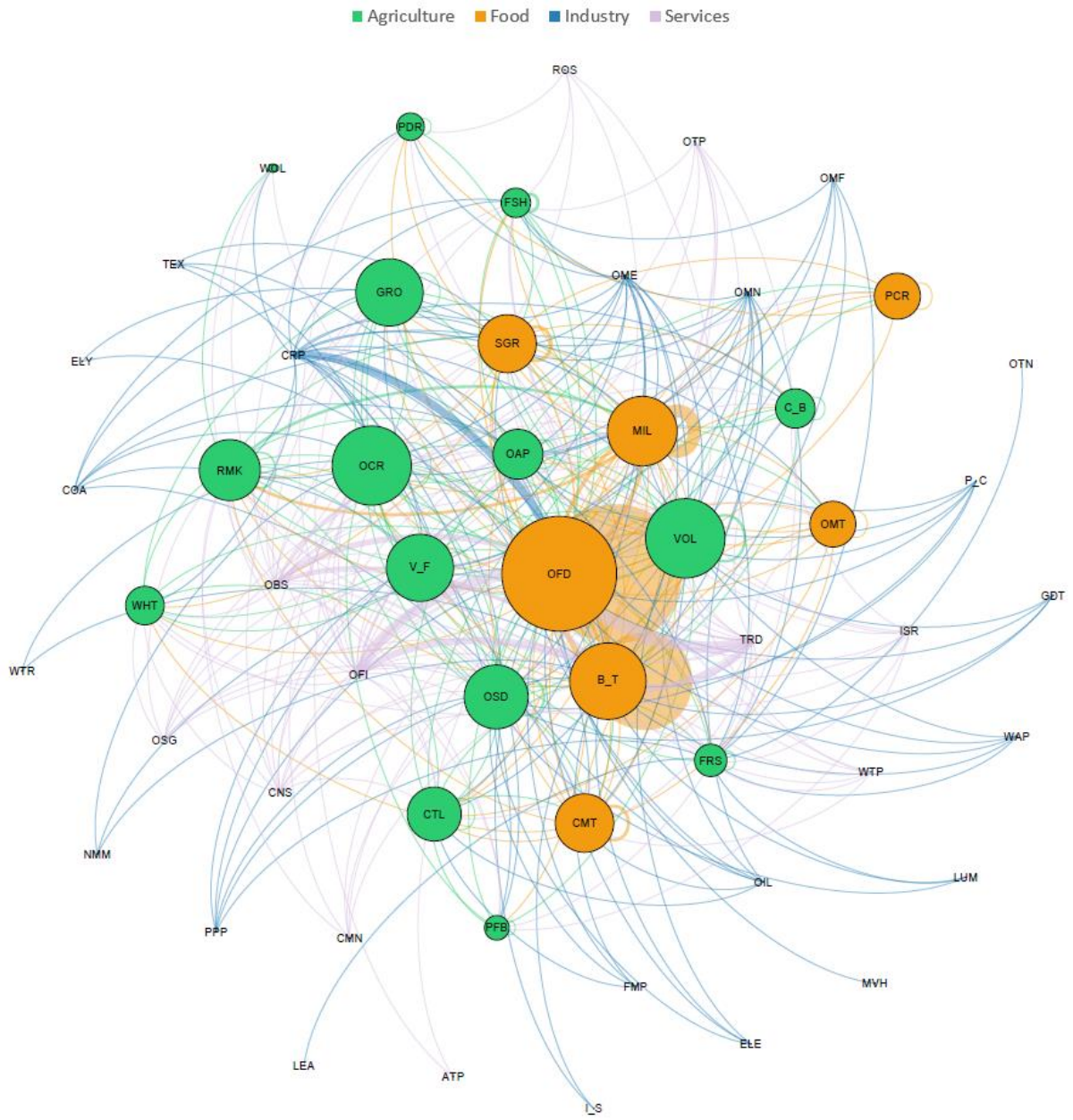
The importance of non-agro-food sectors also stands out in Figure 9 and Figure A.6 in Annex A. Amongst the industrial sectors, chemicals and rubber products invests heavily in the other foods sector. Several services sectors, including other business services, other financial intermediation and wholesale and retail trade also make significant investments in the agro-food value chain.

Table 2. Rankings of sector centrality and inward FDI in the agro-food value chain (number of deals), 1997-2017

	Inward FDI in agriculture and food	
Rank	Centrality	Number of deals
1	Food products nec (OFD)	Food products nec (OFD)
2	Vegetable oils and fats (VOL)	Beverages and tobacco products (B_T)
3	Crops nec (OCR)	Dairy products (MIL)
4	Beverages and tobacco products (B_T)	Vegetable oils and fats (VOL)
5	Dairy products (MIL)	Oil seeds (OSD)
6	Cereal grains nec (GRO)	Raw milk (RMK)
7	Vegetables, fruit, nuts (V_F)	Fishing (FSH)
8	Oil seeds (OSD)	Sugar (SGR)
9	Raw milk (RMK)	Animal products nec (OAP)
10	Bovine meat products (CMT)	Bovine meat products (CMT)

Note: See Table B.1 in Annex B for a detailed list of sectors in the GTAP database.
Source: Author calculations based on Dealogic.

Figure 9. Sector centrality for inward agro-food FDI (number of deals), 1997-2017



Note: The size of the nodes is proportional to their eigenvector centrality score as drivers of agro-food FDI. Edges are coloured according to the source of the investment. See Table B.1 in Annex B for a detailed list of sectors in the GTAP database.
Source: Author calculations based on Dealogic. Figure generated using Gephi v. 0.9.2 https://gephi.org/.

3. How does FDI influence participation and domestic value added creation in agro-food GVCs?

This section aims to understand the impact of foreign direct investment (FDI) on global value chains (GVCs) in the agriculture and food sectors. It starts by explaining how participation and domestic value added creation in agro-food GVCs is measured, and then goes on to provide an overview of the indicators derived from the GTAP database. This is followed by an empirical analysis of the relationships between the GVC indicators and various measures of inward and outward FDI stocks. The work conducted here provides some preliminary insights into the interdependencies between trade and investment in agro-food GVCs, and helps to bring FDI into the core of the discussion.

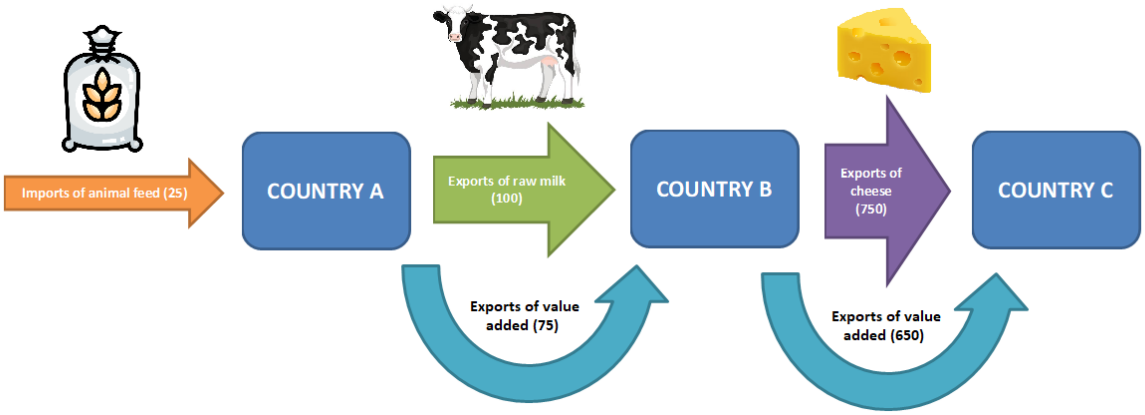
3.1. Measuring participation in agro-food GVCs

A country's gross exports can be decomposed into two parts: a domestic value added component, which includes locally sourced inputs such as land, labour and capital, and a foreign value added component, which may consist of intermediate inputs that were imported for use in the production process. Unpacking these elements allows for the calculation of estimates of *trade in value added*, which form the basis of the indicators that measure participation in GVCs.

Figure 10 illustrates the difference between conventional trade flows and trade in value added for a hypothetical value chain in the dairy sector. In this example, Country A imports EUR 25 of animal feed, and exports EUR 100 of raw milk to Country B. The raw milk then undergoes further processing in Country B, before it is exported on to Country C in the form of EUR 750 of cheese. Conventional trade measures would register gross exports of EUR 100 from Country A to Country B, and EUR 750 from Country B to Country C. However, in reality Country A exports EUR 75 of value to Country C (via Country B), and Country B exports EUR 650 of value to Country C.

Figure 10. Measuring trade in value added

Example of a simple value chain in the dairy sector



This simple illustration allows us to calculate a number of indicators that measure how a country (or a sector within a country) participates in GVCs:

- *Backward participation* refers to the extent to which a country uses imports from other countries in the production of its exports. In the case of Country A, EUR 25 of imports are sourced for the production of EUR 100 of exports. So A's backward indicator is 0.25

(=25/100). Similarly, Country B's backward indicator is calculated as the share of foreign intermediate inputs in gross exports, and therefore equates to 0.13 (=100/750).

- *Forward participation* measures the domestic value added embodied in a country's exports (both direct and indirect through the exports of other industries), which is then exported on to a third country. This indicator is calculated as a share of the country's gross exports. Taking the example of Figure 10 again, Country A exports EUR 100 of raw milk to Country B, of which EUR 75 is domestic value added from Country A. This EUR 75 of value is then entirely exported on to Country C (none of it is used for domestic consumption in B, for example). Therefore, Country A's forward indicator is 0.75 (=75/100). If we assume that all of Country B's EUR 750 of cheese exports are destined for final consumption in Country C (i.e. there are no further exports beyond Country C), then Country B's forward indicator is 0 (=0/750).[10]
- In addition, measures of *domestic value added* and *exports of domestic value added* are useful to assess the benefits derived from engagement with GVCs.

The backward and forward indicators provide useful measures of engagement in GVCs, in the form of buying from (demand) and selling into (supply) GVCs. They can be calculated using harmonised systems of inter-country input-output tables (ICIOs), as in Timmer et al. (2012); OECD (2013a); and UNCTAD (2013). Differences across countries can then be analysed to explore how various structural or policy factors influence engagement in GVCs.

This section makes use of a set of indicators derived from the GTAP database, which were first described and used by Greenville, Kawasaki and Beaujeu (2017a) to analyse changes in the landscape of agro-food GVCs between 2004 and 2014. The GTAP database is advantageous for a number of reasons: it provides a consistent representation of the global economy, by gathering data on trade, macroeconomic variables, taxes and subsidies from a wide range of different sources. The database is compiled to ensure that trade and domestic production data are consistent, and that world supply and demand balance. The GTAP database also provides data on 22 agriculture and food sectors – a considerable degree of disaggregation when compared with the OECD-WTO's Trade in Value Added (TiVA) database, which collects data at the aggregate level for the agriculture and food processing sectors.

There are also several limitations associated with the use of GTAP data. For a number of countries, the underlying input-output tables are not updated regularly and therefore some do not differ across various years in the database. Instead, adjustments are made to update the database in line with changes in macroeconomic and trade data. The consequence is that changes in production technologies may not be captured over time. Furthermore, the underlying input-output tables are based on a wide variety of sources, base years and sectoral detail (often due to differences in sector definitions within the system of national accounts) (Greenville, Kawasaki and Jouanjean, 2019; GTAP, 2016). These factors are likely to influence the outcomes of the analysis and should be borne in mind when viewing the results.

[10] An additional complication arises with forward participation, as both direct and indirect exports are included in the computation of the value added component of the indicator. Direct exports would include exports from the raw milk industry into a production process in another country, which exports processed dairy products to a third country. Indirect exports are counted if the dairy industry's exports contain raw milk that has been sourced domestically, and if these exports contribute to the third country's exports. Hence, the value added attributed to the domestically sourced raw milk within processed dairy exports is included in determining the forward participation of the raw milk industry (Greenville et al., 2019).

3.2. Estimating the impacts of FDI on agro-food GVCs

Various attempts have been made to construct a global database of bilateral FDI statistics, most commonly to allow for modelling within a computable general equilibrium (CGE) framework. Gouel, Guimbard and Laborde (2012) pulled together various data sources to construct a balanced database of FDI for 2004, covering the investor, host and sector dimensions. Missing values and gaps in the database were then filled using estimates obtained from gravity-based regressions. Fukui and Lakatos (2012) used Eurostat's Foreign Affiliate Statistics database as a basis for the construction of a global database of foreign affiliate sales (which is seen as an alternative measure of the activities of MNEs). Several studies have used the aforementioned databases to conduct further CGE analysis: Lakatos and Fukui (2014) quantified the economic impact of the removal of investment restrictions on the retail sector in India. Latorre (2016) analysed the impact of FDI and tariff reform on female and male workers in Tanzania. The Australian Productivity Commission (2017) constructed a model with a bilateral capital structure, complemented with additional data on FDI. And Yuan and Tsigas (2018) used FDI data to quantify the economic impact of US offshoring activities in China and Mexico. However, the methodology used by these studies to construct missing data and balance the dataset using gravity models makes the data inappropriate for use in econometric estimations.

This study takes a novel approach by using mergers and acquisitions (M&A) data from Dealogic as a proxy for bilateral FDI activity. While there are a number of limitations associated with the use of M&A data (outlined in detail in Section 2.2), the Dealogic database provides ample variation across countries and sectors, thus helping to avoid the use of estimated data. In order to address the question of how FDI influences agro-food GVCs, transactions from the Dealogic database were aggregated to the 22 agro-food sectors and 141 countries and regions in the GTAP database (see Annex B for a detailed list of sectors and regions). This allows for the M&A data to be compared alongside the GVC participation indicators described in Section 3.1. Specifically, four indicators of cross-border M&A activity are constructed, each of which is tested separately:

- Inward FDI stock (deal value)
- Inward FDI stock (number of deals)
- Outward FDI stock (deal value), and
- Outward FDI stock (number of deals).

FDI stocks are generally preferable to measures of flows, particularly when used in empirical estimations, as they are less likely to be subject to high levels of volatility and extreme fluctuations. Moreover, GVC participation is often determined by the ongoing activities of foreign MNEs, which may have undertaken an initial cross-border investment to establish operations many years prior to the period currently being observed. As such, FDI stock variables can serve as an indication of the extent to which foreign MNEs are present in a particular country-sector.

The FDI stock indicators are calculated by aggregating the value or number of investments within a particular country-sector, between the first year of the dataset (1997) and the years for which the GVC participation indicators from the GTAP database are available (2004, 2007, 2011 and 2014). These then form the basis of an econometric estimation of the impact of FDI on backward and forward participation in agro-food GVCs (see Annex C for the model specification and detailed results). In addition, the relationship between FDI and the benefits obtained from GVC participation is also investigated, measured through the lens of domestic value added.

The model is estimated using Ordinary Least Squares (OLS) on a panel dataset for the years 2004, 2007, 2011 and 2014. The dataset covers 22 agro-food sectors (GTAP sectors 1-14 and 19-26) and 141 countries and regions (see Annex B for a detailed list of sectors and regions in the GTAP database). It includes country-year fixed effects, to account for variations related to unobservable factors such as weather and climatic conditions, and differences in macroeconomic and policy settings. Sector-year fixed effects are also introduced, to account for unobservable factors such as variations in product characteristics and industry structure.

The model results are summarised in Table 3. The estimations test the impact of the four FDI variables on backward participation, forward participation, domestic value added, and exports of domestic value added.

The results indicate that both the inward and outward FDI stock (by number of deals) are weakly associated with backward participation. The ambiguity surrounding this relationship is understandable: when foreign investors are more inclined to use imported intermediates in the production process, one would expect to see a positive link between FDI inflows and backward participation. On the other hand, if FDI inflows stimulate upstream industries in the domestic economy, a reduction in imports of foreign intermediates could be observed, leading to a negative relationship with backward participation.

Similarly, outflows of market-seeking FDI might boost domestic production of intermediates in response to demand from abroad – this could reduce the need for foreign imported intermediates and lead to a decline in the backward indicator. Conversely, if FDI outflows are directed to upstream industries with the aim of securing a stable supply of imported intermediates, this could augment imports of foreign intermediates and generate an increase in backward participation.

Table 3. Significant estimates from the empirical model

Variables	Backward				Forward			
Inward FDI stock (deal value)					Positive***			
Inward FDI stock (number of deals)		Positive #				Positive**		
Outward FDI stock (deal value)							Positive***	
Outward FDI stock (number of deals)				Positive ~				Positive***

Variables	Log(Domestic Value Added)				Log(Domestic Value Added in Exports)			
Inward FDI stock (deal value)	Positive***				Negative**			
Inward FDI stock (number of deals)		Positive***				Negative***		
Outward FDI stock (deal value)			Positive***				Positive**	
Outward FDI stock (number of deals)				Positive***				Positive*

Note: *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. Weakly significant results are denoted by # (15.5%) and ~ (10.0%). The model specification and detailed results are reported in Annex C.
Source: Author estimates.

A strong positive relationship is observed between inward FDI (measured both by deal value and by number of deals), and forward participation. This underscores the close complementarities between trade and investment, and suggests that FDI inflows can foster exports to downstream industries, leading to greater integration in agro-food GVCs. Similar results are observed for FDI outflows: an increase in the outward FDI stock (measured both by deal value and by number of deals) is associated with an increase in forward participation. This is because outflows of FDI can lead to improved productivity and production capacity in the target market, generating higher exports to third countries.

Critically, the results suggest that the influence of FDI on participation in agro-food GVCs is highly dependent on the strategic motivations underlying firm-level investment decisions. The relationship between FDI and trade (i.e. whether the firm views them as complements or substitutes), relative differences in the production technologies of foreign and domestic firms, and the impact of FDI on upstream and downstream industries, are all important considerations. These questions are explored further in Section 4.

The results presented in Table 1 largely corroborate the outcomes of previous work, by demonstrating that FDI is a driving force for increased participation in agro-food GVCs. For instance, Kowalski et al. (2015) find a positive and significant association between FDI openness and backward participation in the agricultural and food sectors. They suggest that FDI directed at the establishment of an export-processing facility can boost backward linkages, and natural resource-seeking FDI can foster forward linkages. M&As can often result in more global sourcing of inputs, using new technologies and distribution channels, and developing new products destined for global markets. Greenville, Kawasaki and Beaujeu (2017b) also find evidence of a positive link between FDI inflows and backward participation, as well as a positive association between FDI outflows and forward participation.

Table 1 also presents the results for domestic value added and exports of domestic value added. A positive and highly significant relationship is observed between domestic value added and all four FDI indicators. This suggests that foreign investment activity also generates positive spillovers at the local level by boosting the capacity of local production and enhancing the domestic benefits derived from GVC participation. While the results for exports of domestic value added are negative for the two inward FDI stock variables, they do come out as positive and significant for the two outward FDI stock variables. One possible explanation is that export-oriented FDI may be generating increases in the foreign value added embedded in exports. Further research in this area could help to understand the precise mechanisms underlying the relationships between FDI and domestic value chains.

4. How do policies influence FDI in the agro-food value chain?

Understanding the private sector's perspective on the factors that influence foreign direct investment (FDI) in agro-food global value chains (GVCs) is essential to alert policy makers to the implications of different regulatory approaches, and the areas where action may be needed to promote cross-border investment. However, information about how agro-food multinational enterprises (MNEs) engage in foreign markets is difficult to come by. To this end, a tailored survey was developed and distributed to a broad range of multinationals in the agro-food value chain. This section summarises and discusses the findings from the responses received.

4.1. Characteristics of responding firms

The survey questionnaire (Annex D) was developed in February and March 2019, and was administered between mid-March and October 2019. The questionnaire was sent to more than 750 individuals in agro-food MNEs around the world, as well as a number of industry associations and business networks. Respondents could choose between filling out a form in Microsoft Word format and completing an online version of the questionnaire.

Before delving into an analysis of the data collected, a number of caveats should be mentioned here. Online and computer-based surveys suffer from biases related to the means of distribution and the self-selection by responding firms. The analysis in this section is therefore not intended to provide a complete or statistically representative picture of the factors that influence FDI in the agro-food value chain. Rather, the information presented should be seen as illustrating certain characteristics that might be considered important for agro-food MNEs engaging in cross-border investment.

Responses were received from 41 companies in total, with respondents based in 20 different countries. Some questions received fewer responses, as a number of firms chose to respond to only the first half of the questionnaire. Due to concerns surrounding the confidentiality and sensitivity of business information, a number of companies declined to participate in the survey, and several responses were submitted anonymously. The respondents tended to be senior executives (including five CEOs), senior managers for corporate strategy and business development, or directors responsible for public affairs and government relations. Additional information was gathered through phone calls and email exchanges to follow up on the responses that had been submitted.

Annex E provides detailed information on the sample of firms that responded to the survey. The majority of respondents are based in Europe (44% in the European Union and 15% in Other Europe), followed by North America (20%). The remaining 21% of responses were received from firms in Australia, Brazil, China, India, Japan, Nigeria, Thailand, and the United Arab Emirates. The responses are therefore heavily biased towards firms in high-income countries.

The sectors covered are biased towards food and beverage manufacturing (44% of respondents). The remaining firms in the sample are reasonably distributed across other segments of the agro-food value chain. Four firms (10%) identified as a private equity fund, hedge fund or some other form of collective investment fund.

While it is difficult to have a complete picture of the sample's distribution by firm size, five firms are small or medium-sized enterprises (less than 250 employees) and 26 are large-scale enterprises. Collectively, these 31 companies employ more than 1.5 million people (it was not possible to identify the size of the remaining 10 respondents). It is worth noting that some of the large-scale firms that participated in the survey are leading firms in their respective industries, including:

- three of the world's five largest agricultural chemicals and seeds companies
- three of the world's four largest agricultural commodity trading firms
- six major global food and beverage manufacturing companies, including two of the world's largest producers of beverages and one of the world's largest producers of chocolate and confectionery products
- one of the world's largest tobacco companies
- one of the world's largest food catering companies
- one of Asia's largest restaurant companies, and
- two major global asset management companies.

These large-scale MNEs have an important global presence, often with operations and investments in several segments of the value chain. The perspectives of these companies are therefore particularly relevant, as they account for a significant volume of FDI and are a driving force in agro-food GVCs.

Although there are numerous potential biases in the sample, there is also sufficient variation across geography, sector of activity and firm size to provide some useful illustrative insights for policy makers. This can be seen in Figures E.3 and E.4 in Annex E, which indicate that a significant proportion of the surveyed firms actively undertake foreign investment in all geographic regions and all segments of the value chain.

4.2. How and why do agro-food MNEs participate in GVCs?

How firms participate in agro-food GVCs

One way to begin exploring this question is to ask domestic firms why they are not active in foreign markets. The survey sample included three domestic firms: The first is a French start-up with about 100 employees, intensely focused on developing its operations in the home market. They are growing at a fast pace and are currently considering the possibility of investing abroad. The second is a Canadian food manufacturing business that has been in business for over 100 years. They own and operate several production facilities across Canada but are reluctant to invest abroad due to the scale and complexity associated with such endeavours. The third is a food retail co-operative with more than 1 000 stores and nearly 30 000 employees; they are owned by consumers and do not have a mandate to invest internationally.

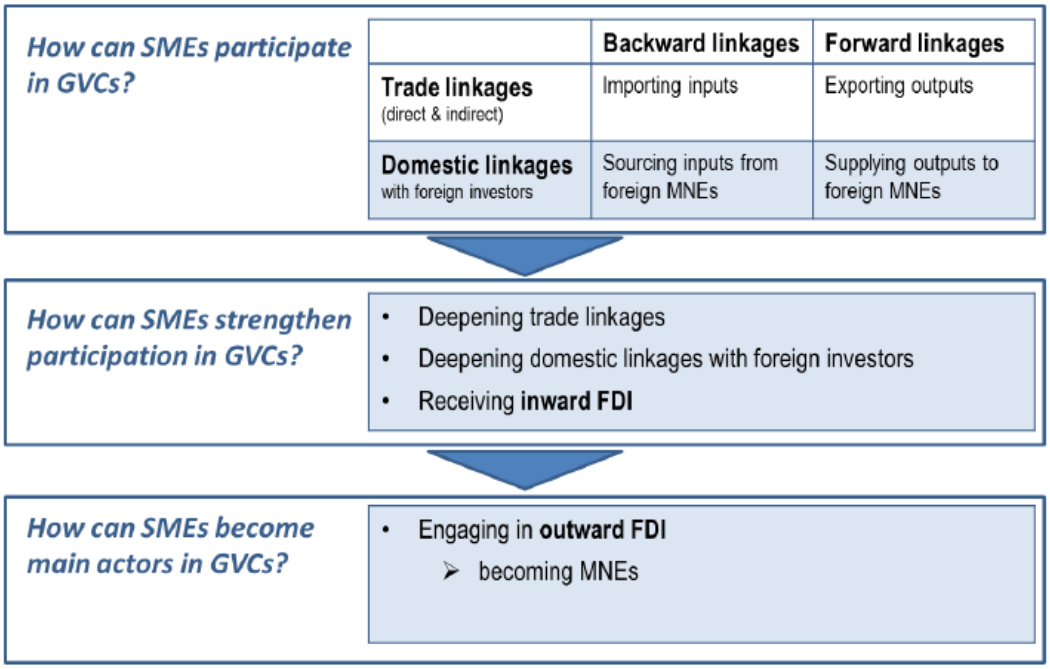
These short anecdotes provide a useful starting point to discuss how and why firms decide to participate in agro-food GVCs. While some firms actively choose to concentrate their efforts on the domestic market, it is important to recognise that not all firms have the potential to overcome the barriers to growth and internationalisation. OECD-UNIDO (2019) outlines a conceptual framework (Figure 11) for the growth trajectory of firms from small and medium-sized enterprises (SMEs) to MNEs:

- SMEs often begin accessing GVCS through arm's length transactions involving the purchase and sale of goods and services (trade linkages), by supplying to or sourcing from local affiliates of foreign MNEs (FDI linkages), or by supplying larger more established domestic firms, which in turn have linkages with foreign MNEs (indirect trade/FDI linkages).
- SMEs can then strengthen their participation in GVCs by forging deeper linkages with foreign firms, both domestically and abroad. These deeper linkages can take many forms, including partnerships, contractual arrangements, technology licenses, franchises, research collaborations, and informal arrangements. SMEs can also receive direct equity investments from foreign firms (inward FDI). This may result in improved production

practices, a broadened scope of activities within the value chain, or a complete change and reorientation of the firm's core activities.

- The third and final stage involves SMEs at a more advanced stage of development investing abroad (outward FDI). Eventually, they may evolve into large-scale multinational corporations and becoming the main actors in GVCs.

Figure 11. Conceptual framework for participation in GVCs



Source: OECD-UNIDO (2019).

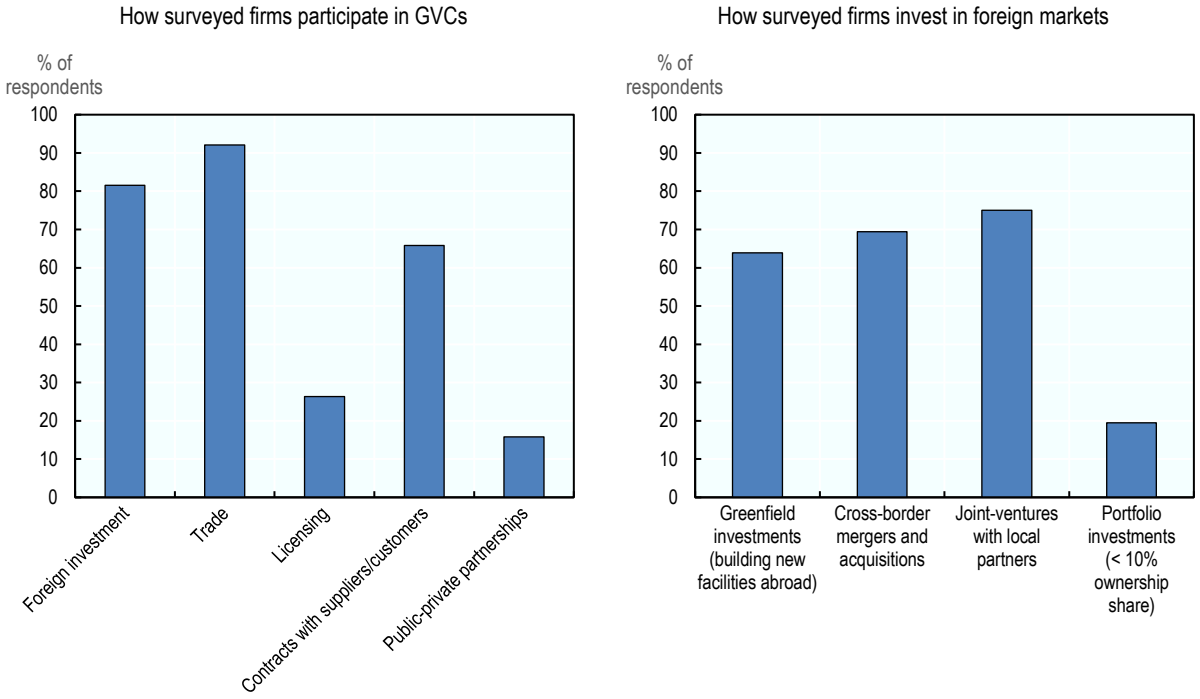
The conceptual framework above suggests that firms have broad array of options to choose from when participating in GVCs. This is reinforced by the findings from the survey, which indicate that agro-food MNEs participate in GVCs through multiple channels (Figure 12). Trade (importing and/or exporting) is the most common means of participation, followed by foreign investment and contracts with suppliers/customers. Licensing and public-private partnerships are less common forms of engagement, but still important nonetheless. The interdependencies between these different channels, in particular the three most prevalent forms (trade, investment and contracting), is an important finding that is explored further in this section.

Agro-food MNEs invest in foreign markets in a variety of different ways (Figure 12). Joint ventures with local partners is the most common means, followed by cross-border mergers and acquisitions (M&As), and Greenfield investments (building new facilities abroad). Some of the large-scale MNEs in the sample also make portfolio investments (<10% ownership share), although this strategy tends to be less frequently observed. Most of the surveyed MNEs undertake foreign investment through some combination of two or three different modes of market entry.

The relatively high importance attributed to joint ventures with local partners could be explained by the need to access local knowledge and networks when engaging in foreign markets. Cross-border M&As may also be perceived to be less risky than Greenfield FDI, as they allow the acquiring firm to benefit from established production and supplier networks. Furthermore, M&As provide acquired firms with an important source of capital, helping to alleviate financing constraints and potentially

facilitating domestic investment and Greenfield FDI in the future (Calderón, Loayza and Servén, 2004).

Figure 12. Participation in GVCs and types of foreign investment



Note: Based on responses from 38 firms (participation in GVCs) and 36 firms (types of foreign investment).
Source: OECD survey of agriculture and food firms.

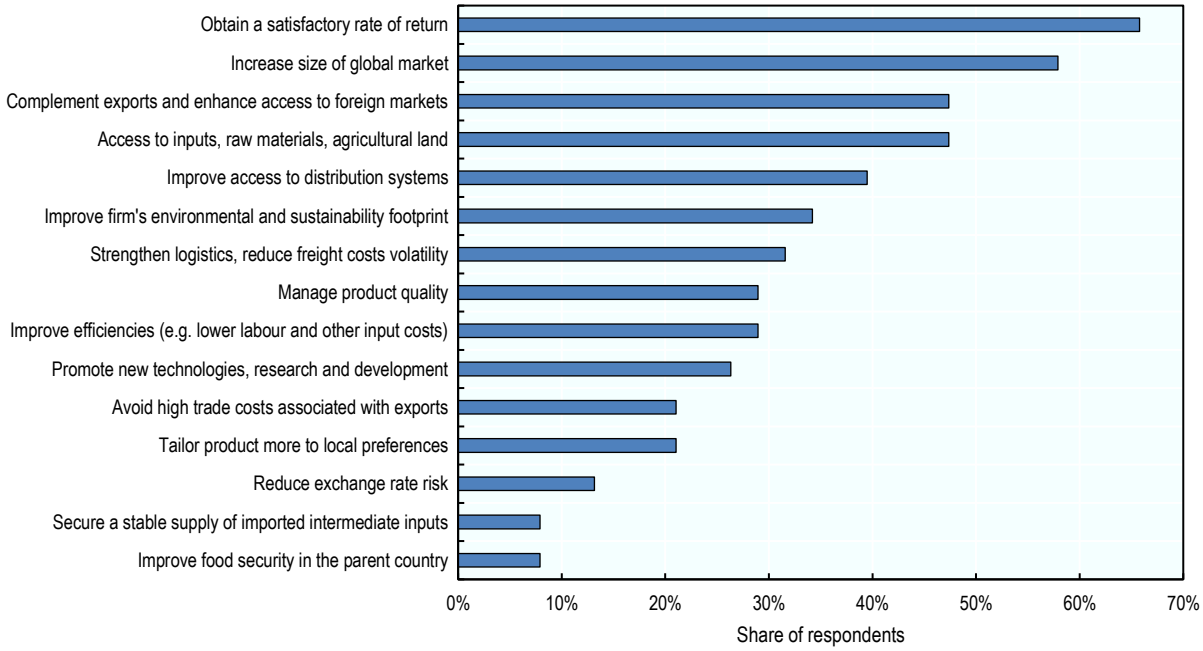
Strategic motivations for agro-food FDI

The survey results indicate that a diverse range of strategic motivations underpin FDI decisions in the agro-food value chain (Figure 13). Obtaining a satisfactory return on investment is, perhaps unsurprisingly, the most important factor identified by firms in the sample. For institutional investors in particular, commercial and return factors are central to their investment decisions. Large-scale asset managers may also be driven to invest in the agriculture and food sectors in order to diversify their portfolio of assets. Agricultural land can be attractive as a hedge against inflation, as it offers low return volatility and is generally uncorrelated with economic cycles that affect other asset classes (IPE, 2019). Pension funds with liabilities (i.e. pension payments) linked to inflation may want to gain exposure to assets that are linked to inflation, such as agricultural commodities.

More than half of the respondents identified the need to increase the size of their global market as a key driver of FDI, and about half of the firms selected the need to complement exports and enhance access to foreign markets. This underscores the importance of market-seeking FDI as well as the complementary relationship between FDI and trade. Access to inputs, raw materials and agricultural land was also selected as a key priority, reflecting the prominence of natural resource-seeking FDI.

The need to improve access to distribution systems, strengthen logistics and reduce freight costs volatility also ranked highly. This is due to the close interdependencies between trade and investment: firms may begin exporting to a particular location, and could invest in order to strengthen pre-existing trade flows. They may also decide to invest in a country where the relative costs of manufacturing and exporting to third markets is considered competitive.

Figure 13. Strategic motivations for agro-food FDI



Note: Based on responses from 38 firms.
Source: OECD survey of agriculture and food firms.

Box 2. Institutional investors in the agro-food value chain: Insights from survey respondents

Aqua Capital

Aqua Capital is a Brazilian private equity firm that invests in medium-sized companies in the South American agro-food value chain. The firm's portfolio includes companies involved in fertilisers, animal feed and nutrition, agricultural machinery, food processing, logistics, distribution and retail. Aqua Capital has USD 650 million of assets under management, and maintains a hands-on operational involvement to its investment strategy. The firm's foreign investment decisions are primarily driven by commercial and return factors, with relatively little impact from government policies and incentives.

Macquarie Infrastructure and Real Assets

Macquarie Infrastructure and Real Assets (MIRA) is an operating business within Macquarie Group, a global diversified financial institution, headquartered in Australia. MIRA manages over 4.7 million hectares of farmland across Australia and Brazil, with over AUD 2.5 billion of agricultural assets under management. The company raises capital from investors – including domestic and international institutional investors such as investment or pension funds – seeking to generate returns from the ownership of farm gate enterprises. By building portfolio investments, MIRA is able to leverage its extensive sector expertise to manage farms within a well-defined long-term investment strategy.

Source: OECD survey of agriculture and food firms.

One-third of firms in the sample undertake foreign investment in order to improve the firm's environmental and sustainability footprint. This underlines the heightened influence of environmental considerations on MNEs' investment decisions, driven by increasing consumer demands for responsible sourcing and sustainable supply chains.

The strategic motivations for agro-food FDI are vast and can vary depending on a range of factors such as firm size, sector and geography. For large-scale multinationals with investments and operations in many countries across the globe, the strategic approach to FDI can differ depending on the subsidiary or product line in question. It is therefore difficult to make general statements characterising cross-border investment in agro-food GVCs.

Horizontal FDI (i.e. the establishment of affiliates in different markets with similar business functions) is the most commonly observed strategic approach to investment, undertaken by 71% of firms (i.e. 27 out of 38 firms). This reinforces the finding that agro-food MNEs often invest abroad in order to expand their global presence and benefit from new markets. Common examples include the duplication of industrial processes (e.g. fertiliser production, food and beverage manufacturing operations) in foreign countries, or supermarket chains expanding and setting up food retail outlets around the world.

Vertical FDI (i.e. investments upstream or downstream from the firm's core business) is also a popular strategy, adopted by 61% of surveyed MNEs (i.e. 23 out of 38 firms). For instance, a meat manufacturing company may invest in primary agricultural production in order to secure control over the production of inputs, such as animal feed. Increasing vertical integration is a central focus for some of the world's largest agricultural commodity trading firms.

Box 3. Vertical integration of agricultural commodity traders: Insights from survey respondents

Bulk commodities account for a declining share of the global agricultural and food trade, with processed and value-added products playing an increasingly important role. In response to growing competitive pressures from food processors and international retailers, a number of large-scale agricultural commodity trading firms are seeking to increase vertical integration.

Bunge Limited

Bunge is active along the entire agro-food value chain. The company is a global leader in oilseed processing and grain and oilseed origination and marketing, and has major investments in wheat, corn and rice milling, sugarcane milling and fertiliser production. Highly integrated value chains are central to ensuring quality control and consistency, while controlling costs and mitigating risk. As a result, Bunge also actively invests in the transportation, storage, marketing and distribution of agricultural commodities.

Cargill, Incorporated

Cargill is one of the largest privately held companies in the United States. The company is involved at multiple points along the value chain, including the origination, processing, marketing, risk management and distribution of agricultural commodities. The company delivers animal nutrition products and services to producers, and supplies ingredients, meat and poultry products to food manufacturers and retailers. It also has significant investments in storage infrastructure, ocean freight and port facilities.

Louis Dreyfus Company

Louis Dreyfus Company accounts for about 10% of the world's agricultural product trade flows, and is the world's largest trader of raw cotton and rice. The firm is moving beyond its traditional roles in origination, logistics and distribution to become a fully vertically integrated player in the value chain. This strategy was developed in response to increasing demands from consumers for traceability, food safety and sustainability, as well as out of a desire to diversify the business by moving downstream into high value branded products.

Source: OECD survey of agriculture and food firms.

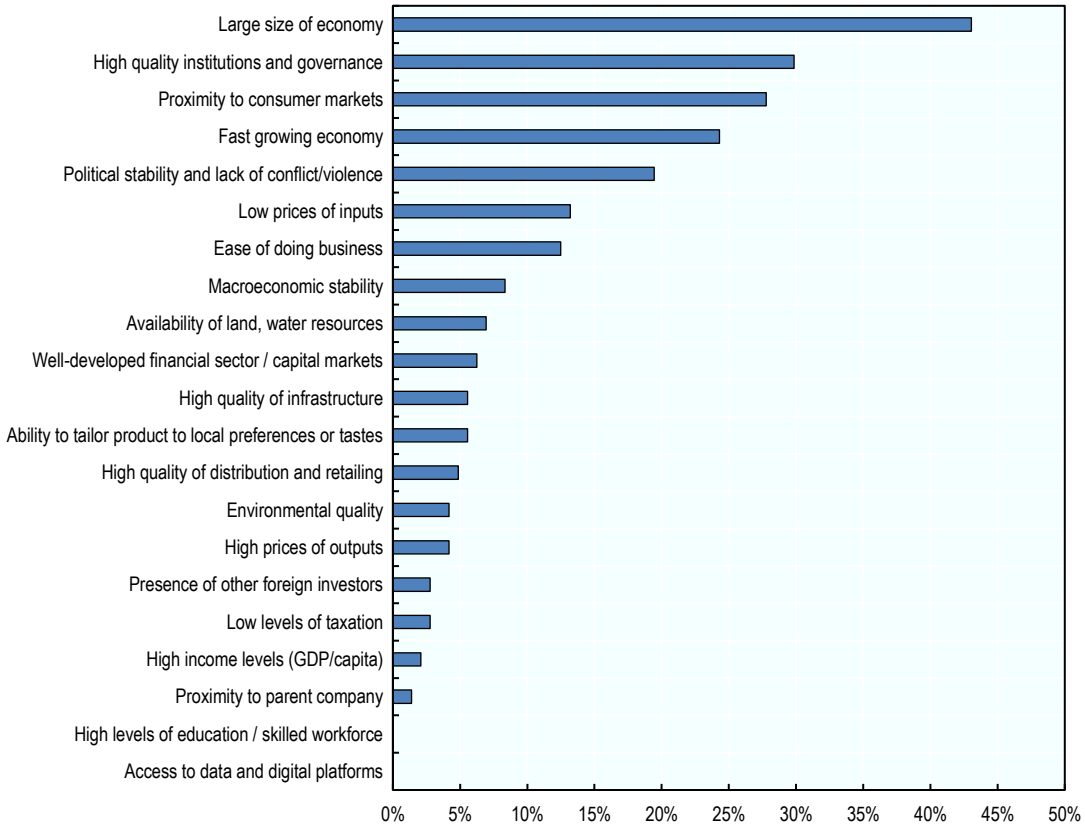
Characteristics of foreign markets

The most important market-related drivers of agro-food FDI, as perceived by responding firms, include traditional gravity-related factors such as size of the economy, proximity to consumer markets and fast growing economy (Figure 14). This further supports the notion that market-seeking FDI accounts for a large share of cross-border investment in the agro-food value chain.

High quality institutions and governance was identified as the second most important factor. Other related factors such as political stability, lack of conflict/violence, and ease of doing business also ranked highly. A number of respondents also stressed the importance of low levels of corruption and good governance in the target country. This underlines the importance that investors attribute to governance, institutional quality and the broader business climate when making investment decisions.

Low input prices was also selected as a positive factor by a number of firms. Being able to source large quantities of high quality inputs at competitive prices is a fundamental criterion for many agro-food MNEs looking to invest in foreign markets. The importance of supplier and customer linkages for agro-food FDI is explored further in Section 4.4.

Figure 14. Market-related drivers of agro-food FDI (weighted by rank)



Note: Based on responses from 36 firms. The bars indicate the share of respondents that identified each factor as a positive driver of FDI, with a weight of 1 attributed if the factor was selected as most important, 0.75 weight attributed if it was the second most important, and 0.5 weight if it was the third most important.
Source: OECD survey of agriculture and food firms.

The questionnaire also asked firms about the impact of market concentration on their FDI decisions. Sixty percent of surveyed firms[11] said they were more likely to invest when market concentration in the target industry is low (i.e. when many firms account for small shares of the market). The reasons for this are obvious: firms seeking to enter new markets typically believe that they have a competitive edge over local firms, such as cutting-edge technologies, better production practices, or superior management and organisational processes. They are thus more likely to grow and gain market share in an environment where competition from incumbent firms is easily surmountable.

Nonetheless, an important share of firms also expressed a preference for high market concentration in the target industry (i.e. when a few large firms account for a high share of the market). These tended to be large-scale agro-food MNEs and institutional investors. For companies seeking to expand into new markets through mergers or acquisitions, acquiring a local player with a high market share may be an attractive option. This allows the acquiring firm to benefit from a dominant position in the local market, along with access to local production and distribution networks. In the food and beverage manufacturing sector, cross-border M&As are increasingly employed by multinationals as a vehicle to enter new markets and generate organic sales growth (Box 4).

Box 4. M&As in food and beverage manufacturing: Insights from survey respondents

Anheuser-Busch InBev

In 2016, Anheuser Busch InBev announced the combination with SAB. The transaction brought together the best-in-class brands, geographic footprints and talent of the two companies to create a global brewer and one of the world's leading consumer goods companies. The combined entity has leadership positions in seven of the top ten largest beer profit pools and a superior portfolio of brands that includes eight of the top ten most valuable beer brands in the world, according to BrandZ. The combination of largely complementary operating regions significantly diversified AB InBev's geographic footprint and provides a much stronger presence in emerging markets with the most compelling growth prospects, particularly Africa and Latin America. AB InBev completed the delivery of its cost synergies target of USD 3.2 billion, one year ahead of its initial schedule and with USD 750 million more savings than originally planned.

Ferrero

Ferrero is the third largest chocolate producer and confectionery company in the world. In 2018, Ferrero acquired Nestlé's American confectionery business for USD 2.8 billion. The deal was part of a strategy to expand the group through acquisitions, helping the firm to strengthen its position in the United States and face up to increased competition in a consolidating market.

Source: OECD survey of agriculture and food firms.

4.3. How do trade and investment policies influence agro-food FDI?

Agro-food MNEs often combine trade, investment and other forms of corporate relationships when engaging in foreign markets (as demonstrated in section 4.2). The interdependencies between these different modes of market entry suggest that trade and investment policies cannot be treated in isolation. Unfavourable policy settings in one domain can create significant disruptions for FDI across the entire agro-food value chain.

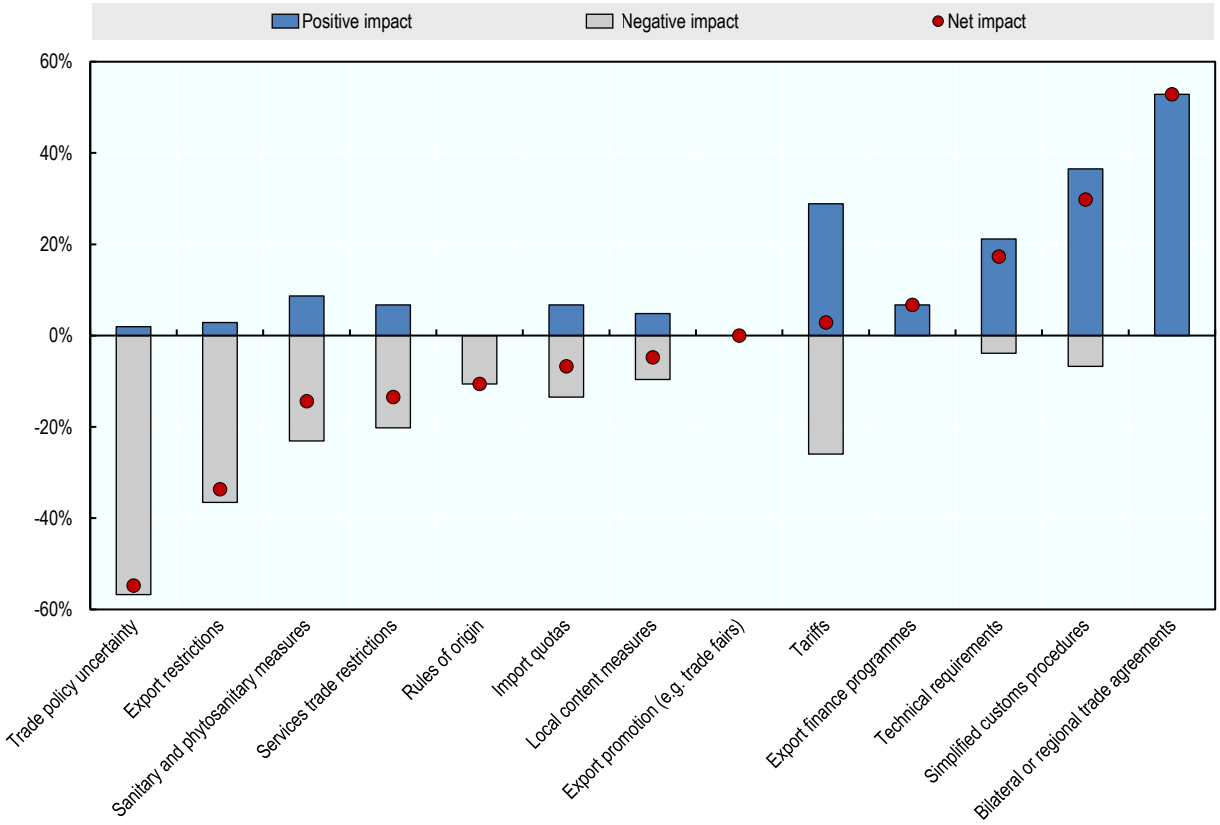
[11] Based on responses from 35 firms; 21 firms expressed a preference for low market concentration.

Trade policies in the foreign market

Trade is often the first point of entry for firms seeking to participate in GVCs, and can remain central to their engagement with a foreign market even after FDI takes place. In Section 3, a positive and significant relationship was established between agro-food FDI and indicators of participation in GVCs. The empirical estimations revealed that FDI is closely intertwined with trade: FDI inflows can increase imports of foreign intermediate inputs (backward linkages); they can also boost exports of domestic value embodied in third country exports (forward linkages). Effective trade policies are therefore crucial to encourage increased FDI and participation in agro-food GVCs.

The questionnaire asked respondents to rank the top three positive and top three negative trade policies in terms of their influence on agro-food FDI. The results are presented in Figure 15, arranged according to the net impact[12] of each policy measure. They provide useful insights into the perceived impact of trade policies on FDI decisions.

Figure 15. Influence of trade policies on agro-food FDI (weighted by rank)



Note: Based on responses from 26 firms. The bars indicate the share of respondents that identified each factor as a positive or negative driver of FDI, with a weight of 1 attributed if the factor was selected as most important, 0.75 weight attributed if it was the second most important, and 0.5 weight if it was the third most important. The dots represent the net impact of each policy, i.e. the difference between the positive and negative shares.
Source: OECD survey of agriculture and food firms.

[12] The net impact is calculated as the difference between the share of respondents (weighted) that identified the policy as having a positive influence on agro-food FDI, and the share of respondents (weighted) that identified the policy as having a negative influence.

The trade policy identified as most conducive to FDI is bilateral or regional trade agreements. Bilateral and regional trade agreements have become increasingly prevalent in the global agro-food trading environment since the early 1990s, in part due to the slow progress of multilateral negotiations. Often viewed as a vehicle for economic and political integration amongst members, these agreements have resulted in substantial improvements in market access, delivering reduced tariffs across a broad range of agricultural commodities. They typically include provisions relating to Sanitary and Phytosanitary Systems (SPS) and Technical Barriers to Trade (TBT), and increasingly encompass features relating to investment, competition and intellectual property (Thompson-Lipponen and Greenville, 2019). It is thus understandable that the respondents view trade agreements in such a favourable light, as the broad scope of these agreements can send a powerful signal to prospective investors.

Simplified customs procedures was the second most important trade policy selected by the survey respondents. Bureaucratic delays at the border and excessive red tape can increase business costs and discourage investors, particularly firms seeking to transport perishable agricultural products. Greater regulatory co-operation between countries can help to harmonise requirements and simplify border procedures. An effective regulatory interface between government bodies and traders is essential, along with periodic impact assessments of customs and administrative procedures (OECD, 2014).

Technical requirements were identified as the third most important factor. Technical requirements (i.e. TBTs) include a broad range of non-tariff measures such as standards on technical specifications, quality standards, and measures to protect the environment. When applied in a fair and non-discriminatory manner, technical requirements can encourage investment by giving manufacturers confidence in the latest standards in their prospective markets. However, regulatory heterogeneity and a lack of coherence across jurisdictions can create unnecessary trade costs, by requiring producers to gather information on regulatory requirements, adjust the specification of goods and services to ensure compliance, and undertake conformity assessment procedures (WTO-OECD, 2019). In some instances, MNEs may be inclined to invest and locate production in a foreign market in order to avoid technical requirements.

On aggregate, tariffs have the second largest impact on FDI, with 55% of respondents (weighted) affirming either a positive or a negative influence (although the net impact is low overall). Tariffs make exporting to the target market less profitable, and can induce FDI by encouraging MNEs to invest in local production to avoid trade costs (“tariff jumping”) and benefit from the same protections enjoyed by domestic firms. However, high tariffs can also be an impediment to FDI, if they increase the cost of imported intermediates that serve as inputs into the production process. This is particularly relevant for investments in agro-food GVCs, where production may be distributed over several countries. Lopez Gonzalez (2016) shows that barriers to imports of more sophisticated intermediate products can reduce domestic value added and participation in GVCs. Moreover, there is some evidence to suggest that excessively high tariffs deter joint ventures with local partners and can constitute a barrier to FDI (Beladi, Marjit and Chakrabarti, 2009).

Overall, trade policy uncertainty was perceived by respondents to have the largest negative influence on agro-food FDI. Unpredictable government decisions can obstruct the smooth functioning of agro-food GVCs, causing investors to compensate for the added uncertainty by requiring a higher rate of return. Ultimately, this tends to result in firms reducing the size of their overall investment. Frequent and effective communication of policy decisions and regular public consultations with businesses can help to increase the transparency and predictability of trade policies (OECD, 2014).

Export restrictions also have a strong negative influence on investment, according to the survey respondents. Export bans are often introduced as emergency measures without consulting investors.[13] By restricting access to larger regional markets, export restrictions can discourage export-oriented FDI. Export taxes typically aim to support domestic processing industries or boost the domestic supply of agro-food products at below world prices. Investors may incur losses in the short run, as they may be forced to sell their output in domestic markets at lower prices. In the long term, firms may shift production to less profitable crops. These measures can send the wrong signal to prospective investors, and undermine the credibility of countries seeking to attract FDI (OECD, 2014).

The third most restrictive trade policy is Sanitary and Phytosanitary measures. These measures include food safety regulations and animal and plant health standards, and can discourage investment if they are used to shield domestic producers from foreign competition. The WTO Agreement on the Application of Sanitary and Phytosanitary Measures allows countries to set their own standards, but encourages them to develop science-based standards that do not discriminate between countries on an arbitrary or unjustifiable basis (FAO-WTO, 2017).

Box 5. Trade policy influences on agro-food FDI: Insights from survey respondents

Pernod Ricard

Pernod Ricard is the world's second largest producer of wine and spirits. In 2019, the firm acquired Firestone & Robertson Distilling Co (a leading whiskey portfolio in the United States), and MALFY (a premium gin manufacturer in Italy). In both cases, the investments benefit from tariff-free exports to neighbouring markets (under NAFTA and the EU Single Market). The trade agreements negotiated over the past few years by the European Union with Canada (CETA), Korea, Colombia, Peru, Viet Nam and Japan (Economic Partnership Agreement) are added advantages, along with the absence of US tariffs on imported spirits.

Pernod Ricard has also invested in local manufacturing operations or set up manufacturing partnerships with domestic companies in Indonesia, Myanmar, Viet Nam, Nigeria, Kenya, and Cameroon, seeking to capitalise on large populations and fast growing economies in Sub-Saharan Africa. An important factor behind the firm's decision to invest was the presence of high import tariffs and excise taxes, which made exporting directly to these markets uncompetitive. In the case of Viet Nam, the FTA came too late and was circumvented by a very significant increase in taxation on imported spirits thus leaving this market very difficult to access with imports. In Africa, the firm notes that it faces a major difficulty in expanding production and servicing neighbouring markets in the region, because of the lack of enforcement of tariff preferences in West Africa (ECOWAS) and the East African Community

Source: OECD survey of agriculture and food firms.

Other factors that were found to discourage FDI include services trade restrictions, rules of origin, import quotas and local content measures. Internationally traded services are important inputs for agro-food MNEs and essential to their globalisation strategies. Liberalising the trade of services can help firms, particularly SMEs, to access agro-food GVCs while boosting investment and job creation in the services sector. Rules of origin can impose higher compliance costs on firms by requiring them to arrange their supply chains in a less efficient manner. In addition, insufficient harmonisation across trading countries of rules of origin applied to agriculture can undermine the

[13] During the food price crisis in 2007-08, several countries attempted to protect domestic consumers from rising prices by introducing temporary export restrictions on staple foods. These measures influenced prices in global markets and had long lasting effects, including reduced demand from traditional trading partners (Deuss, 2017).

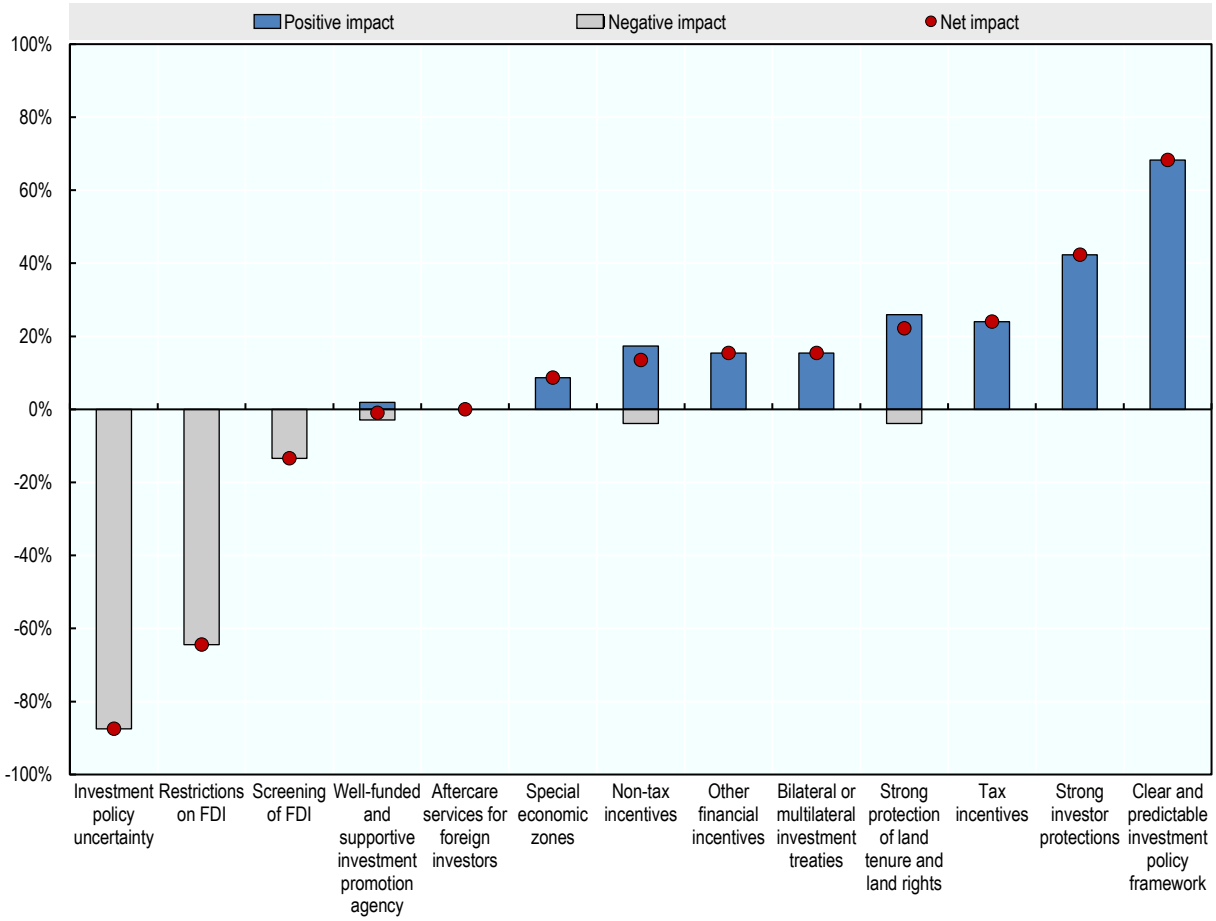
benefits of liberalisation (Thompson-Lipponen and Greenville, 2019). Finally, import quotas and local content measures also create barriers for firms seeking to participate in international supply chains. Local content requirements oblige firms to use domestically manufactured goods or domestically supplied services, raising production costs and leading to reductions in trade and competitiveness (Stone, Messent and Flaig, 2015).

Investment policies in the foreign market

Good investment policy is fundamental to building an enabling investment climate. Section 3 established that FDI in the agriculture and food sectors is positively associated with participation in GVCs. This suggests that improvements in the investment policy framework can help countries to increase their integration in cross-border supply chains.

The questionnaire asked respondents to select the top three investment policies with a positive influence on FDI, and the top three investment policies with a negative influence on FDI. Figure 16 presents the weighted positive and negative impact of each policy measure (arranged by net impact).

Figure 16. Influence of investment policies on agro-food FDI (weighted by rank)



Note: Based on responses from 26 firms. The bars indicate the share of respondents that identified each factor as a positive or negative driver of FDI, with a weight of 1 attributed if the factor was selected as most important, 0.75 weight attributed if it was the second most important, and 0.5 weight if it was the third most important. The dots represent the net impact of each policy, i.e. the difference between the positive and negative shares.
Source: OECD survey of agriculture and food firms.

The overwhelming majority of survey respondents identified having a clear, transparent and predictable investment policy framework as a positive driver of FDI. Clear and accessible laws and regulations allow investors to assess potential investment opportunities more easily, leading to reduced transaction costs and increased investor confidence. Governments can improve the transparency and predictability of investment policy by consulting regularly with domestic and foreign investors, strengthening inter-governmental co-ordination, and keeping the public informed of changes to regulations. They can also take steps to simplify regulations and administrative processes, develop registers of existing and proposed regulations, and conduct regulatory impact analysis to evaluate the benefits and costs of regulations.

Strong investor protections (including compensation for expropriation) was the second most important investment policy selected by the respondents. Investors need to feel confident that their rights will be properly recognised and protected by the host country, and that they will receive timely and adequate compensation in the event of government expropriation. Governments need to find an effective balance between the right to expropriate investors (when in the public interest), and the need to ensure adequate protections of investors' interests. Decisions to expropriate land or property should serve a public purpose, observe due process of law, and be non-discriminatory. They should follow transparent rules defining when expropriations can happen, how the process is undertaken, and how compensation is calculated.

This relates closely to the protection of land tenure and land rights,[14] which was selected as the fourth most important investment policy measure. Secure and well-defined land rights (either ownership or lease rights) give investors confidence that their property rights will be respected, and that they will be able to operate effectively without being forcibly evicted. They also create incentives for firms to invest in improving the productivity and long-term sustainability of their land holdings. Governments can enhance tenure security by establishing an effective land cadastre and land registration system, and allowing investors to seek legal redress to protect their property rights. Furthermore, measures should be taken to allow agricultural land to be used as collateral for loans from banks and financial institutions (OECD, 2014).

These actions can help to increase the value of agricultural land, and accelerate structural transformation as land resources are put to their most efficient uses. At the same time, measures to facilitate land acquisition by investors should be accompanied by appropriate safeguards to protect the existing legitimate tenure rights of smallholders and rural communities, and protect against risks arising from large-scale transfers of land tenure rights. The *Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security* (FAO, 2012) and the *Principles for Responsible Investment in Agriculture and Food Systems* (CFS, 2014) provide guidance for policy makers to promote secure tenure rights and equitable access to land, fisheries and forests.

The third most important investment policy was the availability of tax incentives (e.g. tax holidays, tax credits, capital cost allowances, customs duties exemptions, VAT refunds). Tax incentives can be used to encourage investment in specific segments of the agro-food value chain, or specific locations or regions within a country. Indeed, agro-food MNEs have been known to invest in low-tax jurisdictions as part of corporate tax minimisation strategies. Johansson et al. (2017) use firm-level data to study tax planning by multinationals, and find that approximately 10% of large-scale MNEs in the food, beverages and tobacco sector have at least one entity their corporate group in a country with no corporate income tax. However, the consensus amongst firms that were interviewed was that tax incentives are "nice to have", but not a fundamental driver of investment

[14] Similar to land, access to water can also promote FDI and encourage the continuation of existing investments in the agro-food value chain. Water rights allocations should promote the sustainable management of water resources, taking account of its economic, social and environmental value.

decisions. Other factors such as the investment climate, transparency of the regulatory framework, access to agricultural land, inputs and raw materials, are often more important considerations for investors. Governments should therefore focus on ensuring certainty and consistency of tax treatment, the avoidance of double taxation and efficient tax administration, rather than tax incentives (OECD, 2014).

Bilateral or multilateral investment treaties were also deemed a positive driver of FDI by respondents. International investment law plays an essential role in the governance of foreign investment in the agro-food value chain. Nearly 3 300 bilateral investment treaties and treaties with investment provisions have been concluded around the world, with over 2 650 currently in force (UNCTAD, 2019b). Investment treaties typically require that states treat foreign investors fairly and equitably, with adequate compensation provided for expropriation or measures that may significantly affect an investment ("indirect expropriation"). In addition, most investment treaties and international investment contracts include provisions relating to investor-state dispute settlement (ISDS). In recent years, growing investment in large-scale agricultural, forestry and fishing projects has been accompanied by an increase in ISDS cases in the agro-food sector (around 50 known cases, with investors being awarded approximately USD 100 million on average). With the potential for investor-state claims likely to increase in the future, governments should ensure that they understand their rights and obligations under investment treaties, that they have sufficient capacity to negotiate contracts, and that treaties do not place undue restrictions on the right to regulate in the public interest (CCSI-IIED-IISD, 2018).

Other investment policies that registered a positive result include non-tax incentives (e.g. provision of infrastructure, fast-track customs procedures, simplified legal and regulatory requirements), other financial incentives (e.g. subsidies, grants and loan programmes), and special economic zones.

Investment policy uncertainty was identified as a negative influence by 88% of respondents (weighted). This mirrors the finding relating to trade policy uncertainty, and reinforces the notion that uncertainty creates additional costs for firms and has a chilling effect on FDI. As noted above, governments should communicate openly with the business community regarding major policy decisions, and take measures to ensure the transparency and predictability of investment policy.

Restrictions on FDI also have a strong negative influence on investment, according to the survey respondents. Policies that favour domestic firms at the expense of foreign firms can result in lower levels of competition and efficiency. Although barriers to FDI have been decreasing over time in many countries around the world, many primary and service sectors remain partly off limits to foreign investors, thus hindering potential productivity improvements. Some of the surveyed MNEs singled out the ability to repatriate profits as a key concern. The presence of stringent foreign exchange controls, difficulties converting profits into internationally traded currencies, or significant withholding taxes on dividends can diminish investor confidence and prompt foreign multinationals to limit the size of their investments.

Similarly, screening of FDI was also viewed as a constraint by some of the respondents. Foreign investment screening refers to the imposition of additional government approval requirements that discriminate against foreign-owned enterprises. Screening policies were widespread in the 1980s, but many countries have eliminated them or narrowed their scope to focus on specific sectors or types of investment (e.g. by state-owned enterprises and sovereign wealth funds). A number of screening mechanisms have been replaced by *ex ante* or *ex post* notification requirements. In other cases, reforms have narrowed the scope of screening to focus on safeguarding national security, or incorporated screening into the granting of incentives (Mistura and Roulet, 2019). Screening for national security reasons has begun to pick up more recently, particularly in OECD countries (OECD, 2019c).

4.4. Broader policy influences on agro-food FDI

Attracting FDI in the agro-food value chain requires a broad set of well-designed policies beyond trade and investment policies. Policy coherence across various sectoral policies is therefore essential when developing an investment climate to foster agro-food FDI. This section presents the results from the remaining sections of the survey, pertaining to research and development (R&D) activity, linkages with suppliers/customers, and other relevant policy areas.

Research and development activity

Dynamic agricultural innovation systems are crucial to facilitate FDI in the agro-food value chain. Multinationals may be encouraged to invest by the innovative capacity of local enterprises and the presence of high-quality R&D networks. Agro-food MNEs can also drive investments in R&D infrastructure, and promote the adoption of new production techniques, practices and technologies.

The most important R&D-related driver of FDI, as perceived by 67% (weighted) of survey respondents, is strong protection of intellectual property rights (IPRs). Well-defined IPR regulations and enforcement mechanisms can foster investment by providing firms with the exclusive rights to commercialise an innovation, thus allowing them to recoup the costs of their investment. Stronger IPR protections have facilitated increased investment in agricultural R&D and the commercialisation of innovations in agricultural chemicals, seeds, and new production technologies (OECD, 2013b). However, overly rigid IPR regimes can also limit further innovation and result in adverse and inequitable outcomes. Examples include the appropriation of indigenous or traditional knowledge, misappropriation of genetic resources in the public domain, constraints to competition resulting from test data exclusivity, and consolidated ownership of intellectual property due to excessive industry concentration. Key challenges for policy makers include ensuring that IPR regulations are tailored to local contexts, do not create unnecessary barriers for small-scale producers, and encourage knowledge-sharing and equitable access to new technologies (Eaton, Louwaars and Tripp, 2006; FAO, 2007).

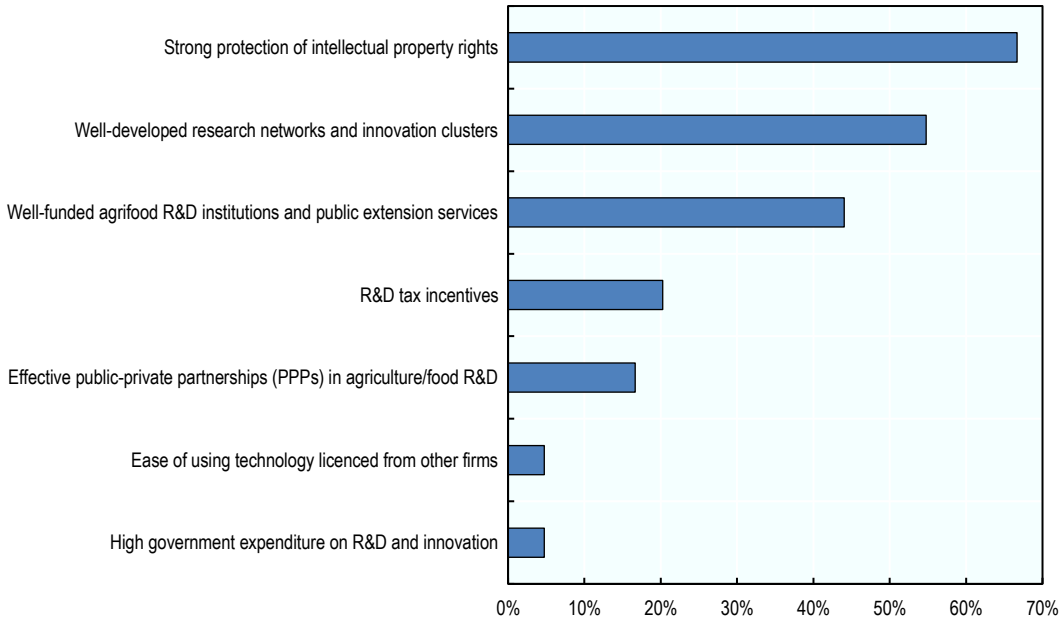
Well-developed research networks and innovation clusters was the second-most important driver of FDI identified by respondents. Governments can foster the development of research networks with targeted innovation and agricultural policy measures: in the EU, for instance, Pillar 2 of the Common Agricultural Policy (CAP) provides funding for innovation clusters and co-operative approaches to innovation. In Canada, the Network of Centres of Excellence programme has been running since 1989 and helps to engage the public sector, private sector and academia in the creation of large-scale research networks (OECD, 2019b).

Governments can also support international collaboration on R&D, to reduce research costs and facilitate the transfer of information, new technologies and production practices across borders. Some respondents involved in the production of agricultural inputs highlighted the importance of harmonised laws and regulatory practices across countries, allowing for the free movement of seed and crop protection products. Reducing barriers to regional seed trade can facilitate the dissemination of seed research, incentivise regional collaboration on R&D, and allow firms to benefit from advanced seed technologies at competitive prices (OECD, 2014).

The presence of well-funded agro-food R&D institutions and public extension services ranked third-highest amongst respondents. Public funding for agricultural R&D with stable budgetary allocations for long-term multi-year research programmes is crucial (OECD, 2019b). Close consultations with local farmers, producer organisations and industry associations can help to identify research needs, set priorities according to existing constraints, and ensure that agricultural R&D incorporates and builds on local knowledge.

Both public and private extension services have an important role to play in disseminating knowledge and technical advice, and promoting the uptake of new technologies. By providing training and support to meet quality standards, extension services can help smallholders to respond effectively to the needs of large agricultural investors. Governments should allow for a diverse range of competitive public and private extension service providers, and should take measures to promote linkages between agricultural extension and R&D. When government funding is scarce, public extension services should concentrate on areas where the private sector may have less incentive to operate, such as promoting sustainable production practices. Furthermore, while decentralised extension systems can be better positioned to respond to the needs of small-scale farmers, the government also has a role to play in facilitating the sharing of experiences (OECD, 2019b).

Figure 17. Influence of R&D-related policies on agro-food FDI (weighted by rank)



Note: Based on responses from 21 firms. The bars indicate the share of respondents that identified each factor as a positive driver of FDI, with a weight of 1 attributed if the factor was selected as most important, 0.75 weight attributed if it was the second most important, and 0.5 weight if it was the third most important.
Source: OECD survey of agriculture and food firms.

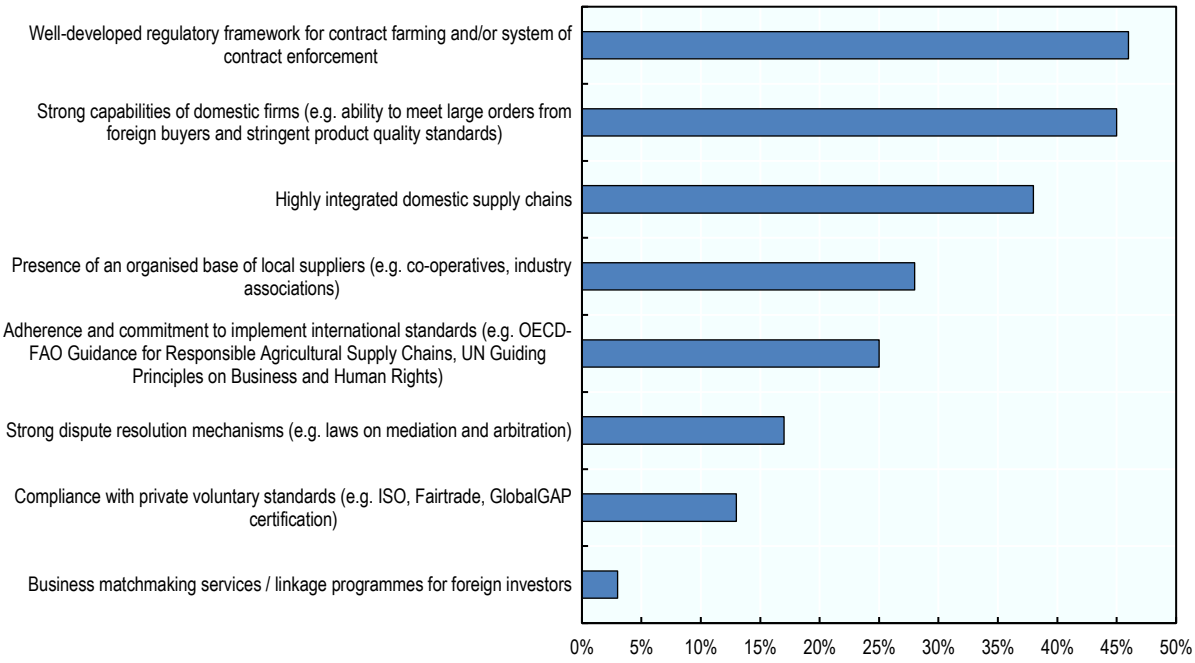
Linkages with suppliers/customers

As outlined in Section 4.2, agro-food MNEs frequently establish contracts with suppliers and customers as part of their engagement in GVCs. Contract farming provides MNEs in downstream segments of the value chain (e.g. food processors, supermarkets) with opportunities to acquire agricultural commodities whilst avoiding production risks and potential regulatory difficulties associated with acquiring agricultural land. Contract farming also offers small-scale producers new opportunities to participate in GVCs, but often requires that farmers develop better capabilities (UNCTAD, 2009).

Many of the large-scale MNEs in the sample have extensive contracting arrangements established throughout their supply chains, with a broad variety of different firm types. More than two-thirds of respondents[15] affirmed having established long-term contracts with local suppliers, foreign suppliers abroad, and local buyers. These three company types were all considered highly important by the respondents. Long-term contracts with foreign buyers were slightly less common (44% of surveyed firms) and therefore less importance was attributed to them.

Respondents identified a number of policies related to supply chain linkages that can encourage agro-food FDI (Figure 18). The most important factor perceived by the surveyed firms was the presence of a well-developed regulatory framework for contract farming and system of contract enforcement. Strong capabilities of domestic firms (e.g. ability to meet large orders from foreign buyers and stringent product quality standards) ranked second, followed by highly integrated domestic supply chains.

Figure 18. Influence of linkage policies on agro-food FDI (weighted by rank)



Note: Based on responses from 25 firms. The bars indicate the share of respondents that identified each factor as a positive driver of FDI, with a weight of 1 attributed if the factor was selected as most important, 0.75 weight attributed if it was the second most important, and 0.5 weight if it was the third most important.
Source: OECD survey of agriculture and food firms.

[15] Based on responses from 27 firms.

Box 6. Supporting linkages with small-scale producers: Insights from survey respondents

Arla Foods amba, Nigeria

Arla Foods amba is a multinational co-operative based in Denmark and the fourth largest dairy company in the world (by milk volume). Arla Foods has been active in Nigeria for more than 30 years, through its subsidiary Dano Milk. A fast growing population – set to reach nearly 400 million by 2050 – and rising incomes were key drivers of the company's decision to invest in the country. However, Nigeria faces a large milk deficit, with the local dairy industry meeting less than 10% of domestic demand. Local farmers often suffer from low yields, poor infrastructure, a lack of well-functioning cold chains, and limited knowledge of quality management practices.

In September 2019, Arla Foods established a public-private partnership with the government of Kaduna state in Northwest Nigeria, committing to support the growth and development of 1 000 small-scale nomadic dairy farmers. The government agreed to provide the farmers with permanent farmlands and access to water, and to invest in the upgrading of local roads and utility infrastructure. Arla Foods, in its turn, plans to support the establishment of milk collection centres, and will purchase, collect, process and bring the farmers' milk production to market. The project will primarily be financed by loans from the Central Bank of Nigeria, guaranteed by the government of Kaduna state.

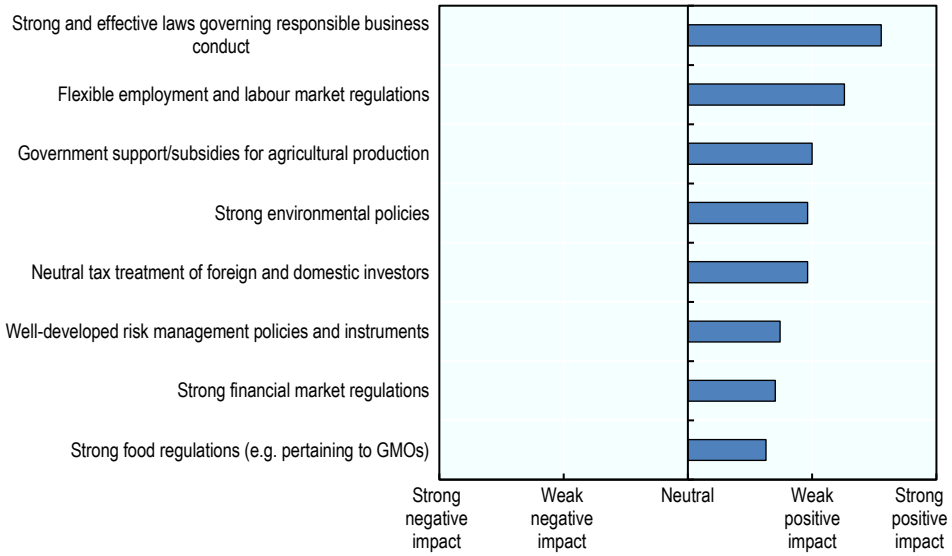
Source: Arla Foods (2019); OECD survey of agriculture and food firms.

Other policies in the foreign market

The final section of the survey asked firms to assess a broader set of policy areas, and evaluate the extent to which they influence FDI decisions. The results of this assessment are presented in Figure 19. The area with the strongest perceived positive influence on FDI was strong and effective laws governing responsible business conduct (e.g. labour standards, tenure rights over natural resources, human rights, anti-corruption and integrity). Flexible employment and labour market regulations also ranked highly.

Multinationals are under increasing pressure to minimise environmental and social impacts in their supply chains. Issues commonly encountered in the agro-food value chain relate to tenure rights, animal welfare, environmental protection, the use of natural resources, human rights, labour rights, health and safety, food security and nutrition, and the governance of technology and innovation. The OECD-*FAO Guidance for Responsible Agricultural Supply Chains* outlines the standards that companies should observe to build responsible agricultural supply chains, and provides a five-step framework for companies to implement risk-based due diligence (OECD/FAO, 2016). Other relevant standards include the *Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security* (FAO, 2012), and the *Principles for Responsible Investment in Agriculture and Food Systems* (CFS, 2014). Promoting the use of these internationally agreed standards can encourage responsible investment in the agro-food value chain.

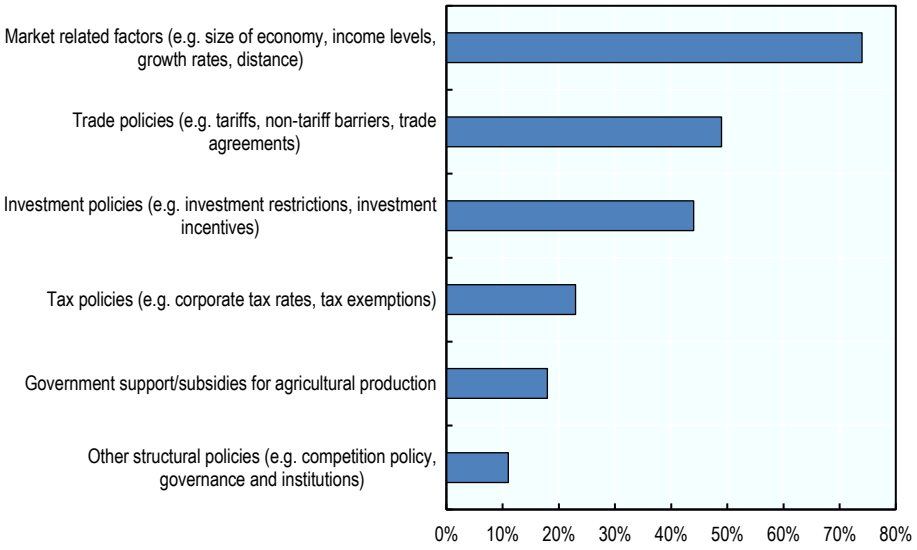
Figure 19. Other policy influences on agro-food FDI



Note: Based on responses from 27 firms.
Source: OECD survey of agriculture and food firms.

The questionnaire also asked firms to rank the top three policy areas that encourage investment in foreign agri-food markets. The results are presented in Figure 20. Consistent with the findings from Section 4.2, market-related factors were considered the most important factor by more than 70% of firms (weighted). Trade and investment policies also ranked highly among respondents.

Figure 20. Broader policy drivers of agro-food FDI (weighted by rank)



Note: Based on responses from 25 firms.
Source: OECD survey of agriculture and food firms.

5. Conclusions and further work

This paper maps the landscape of foreign direct investment (FDI) in the agriculture and food sectors, and estimates the impact of FDI on participation and domestic value creation in global value chains (GVCs). It also provides new evidence on the strategic factors that drive the investment decisions of multinational enterprises (MNEs), as well as the role of policy in influencing cross-border investment.

Mapping the landscape of agro-food FDI

The results indicate that agro-food FDI remains small relative to industry and services. Within the agro-food value chain, however, food processing accounts for the lion's share of cross-border investment activity, with large multinational food and beverage companies playing a critical role in driving FDI activity. Investments in primary agricultural production, while smaller in size and number, are propelled by the oil seeds, forestry, fishing and raw milk sectors. The services sector (which includes a diverse range of business activities ranging from wholesale and retail trade, to transport and logistics, other business services, and investment and holding companies) is the largest source of FDI inflows in agriculture and the second-largest source of inward investment in food.

Looking across regions, companies in North America and the European Union are the source of half of FDI inflows in agriculture and more than two-thirds in food processing. They invest in agriculture with a broad geographic reach: the European Union, Asia, Central and South America and Oceania are among the most attractive destinations. In the food sector, however, FDI inflows remain highly concentrated in the European Union and North America. Agriculture and food firms typically invest within their own region, highlighting the important influence of proximity on cross-border investment decisions. Investment appears to be concentrated around specific regional hubs, suggesting that volatility in FDI flows could have important consequences for countries on the periphery.

The use of data on mergers and acquisitions (M&As) to describe the landscape of agro-food FDI is advantageous, as it allows for a detailed analysis of bilateral relationships between countries and cross-sectoral interactions. Further work could attempt to incorporate other forms of FDI in the analysis, such as Greenfield investments (building new facilities abroad), joint ventures with local partners and portfolio investments. Greenfield investments may be an important source of foreign capital in emerging and developing economies, particularly in countries where the financial sector is underdeveloped and capital markets are less sophisticated. Other activities of MNEs, such as intra-company loans, reinvested earnings and divestments, also account for an important share of cross-border investment. A more granular mapping of multinationals and their networks of foreign affiliates could help to improve our understanding of the landscape of agro-food FDI.

Estimating the impact of FDI on participation in GVCs

This study finds evidence of a positive and significant link between FDI and indicators of participation and domestic value added creation in agro-food GVCs. Both inward and outward agro-food FDI are found to have a positive impact on forward participation (i.e. exports of value added included in third country exports). This suggests that FDI plays an important role in stimulating productivity and the capacity of downstream industries to export. The link between FDI and backward participation (i.e. the use of foreign imports in the production of exports) is less obvious, and may depend on strategic and operational factors at the firm level (e.g. whether foreign firms are more likely to use domestic or imported intermediates in the production process, or whether

FDI outflows aim to secure imports from upstream industries). The results also indicate that both inflows and outflows of agro-food FDI are positively associated with domestic value added creation.

The empirical estimations conducted in this paper help to improve our understanding of the links between FDI and participation in GVCs. As such, the work helps to bring FDI into the core of the discussion on agro-food GVCs. While not within the scope of this study, further work could investigate the impact of FDI on the share of value added attributed to specific factors of production, such as land, skilled and unskilled labour, and capital.

Understanding the role of policy in influencing agro-food FDI

The positive relationship between FDI and participation in agro-food GVCs reflects the close interdependencies between the various channels that multinational enterprises (MNEs) use to engage with GVCs – in particular, trade, foreign investment and contracts with suppliers and customers. In addition, agro-food MNEs tend to invest in foreign markets through a variety of different ways (the most common ones being joint ventures with local partners, cross-border M&As, and Greenfield investments).

The results from a survey of multinationals, while subject to numerous potential biases, suggest that a diverse range of strategic motivations underpin FDI decisions. Agro-food MNEs may invest out of a desire to expand their reach to new markets; complement exports; access inputs, raw materials and agricultural land; and improve access to distribution systems. Commercial and return factors are central to the investment decisions of large-scale asset managers and institutional investors, who often view investments in agriculture and food processing as part of a strategy to diversify their portfolio of assets and hedge against (or gain exposure to) inflation. Furthermore, many firms invest in order to improve their environmental footprint, reflecting growing consumer demands for responsible sourcing and sustainable supply chains.

Firms evaluate a range of factors when choosing to invest in a particular market. Gravity-related factors such as size of the economy, proximity to consumer markets and fast growing economy are often the most relevant considerations. High quality institutions, low levels of corruption, political stability and good governance are also fundamental criteria. While many MNEs do invest in unstable environments, they typically expect to be compensated for their risk-taking with higher rates of return.

Firms seeking to enter new markets generally prefer low levels of concentration in the target sector, as it allows them to grow and compete with local firms on an equal footing. However, in some instances firms may prefer high levels of market concentration. This is particularly the case for large-scale MNEs seeking to acquire an established local player with a dominant position and access to local production and distribution networks.

The survey also gathered evidence on the influence of various policies on MNEs' propensity to invest in foreign markets. The results provide a number of valuable insights for policy makers:

- Since FDI and trade are closely intertwined, policy settings cannot be treated in isolation. The liberalisation of trade and investment policies can have a strong positive influence on agro-food FDI. Conversely, unfavourable policy settings in one domain can create significant disruptions for FDI along the entire value chain.
- Uncertainty surrounding trade and investment policies can have a significant negative influence on agro-food FDI. A lack of transparency and predictability in trade and investment policies can create additional costs for firms, and result in them reducing the size of their overall investment.
- Bilateral and regional trade agreements, simplified customs procedures and harmonised technical requirements can help to encourage inward investment. Trade policy measures

that negatively influence FDI include export restrictions, Sanitary and Phytosanitary measures (when applied in a discriminatory manner), and services trade restrictions.

- High tariffs in the target market can constitute an impediment to FDI, if they increase the cost of imported intermediates that serve as inputs into the production process. However, in some instances tariffs may have the perverse effect of boosting FDI inflows. By making exports to the target market less profitable, tariffs can encourage MNEs to invest in local production to avoid trade costs ("tariff jumping") and benefit from the same protections enjoyed by local firms.
- A clear, transparent and predictable investment policy framework is a fundamental component of an attractive investment climate. Other investment policies with a positive impact on agro-food FDI include strong investor protections (including compensation for expropriation), strong protection of land tenure and land rights, and tax incentives. Restrictions on FDI and screening of FDI have a strong negative influence on investment decisions.
- Dynamic agricultural innovation systems are crucial to facilitate agro-food FDI. The most relevant policy priorities identified by respondents include strong protection of intellectual property rights, well-developed research networks and innovation clusters, and well-funded agro-food R&D institutions and public extension services.
- Policies to support supply chain linkages can play an important role in facilitating MNEs' business activities. Priorities include a well-developed regulatory framework for contract farming and/or system of contract enforcement, strong capabilities of domestic firms, and highly integrated supply chains.
- Promoting the use of the *OECD-FAO Guidance for Responsible Agricultural Supply Chains* can encourage agro-food MNEs to observe internationally agreed standards for responsible investment in agricultural supply chains, and integrate risk-based due diligence into their corporate management systems.
- Measures to facilitate land acquisition by investors should be accompanied by appropriate safeguards to protect the existing legitimate tenure rights of smallholders and rural communities, and protect against risks arising from large-scale transfers of land tenure rights. The *Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security* and the *Principles for Responsible Investment in Agriculture and Food Systems* provide guidance for policy makers to promote secure tenure rights and equitable access to land, fisheries and forests.
- Developing a sound and enabling investment climate for agro-food FDI requires addressing a broad set of policies areas beyond trade and investment policies. Governments should pay close attention to laws governing responsible business conduct, employment and labour market regulations, agricultural support policies, environmental policies, and taxation.

Further work in this area could seek to gather a larger number of survey responses, to reduce the various biases in the sample and approach a more complete and statistically representative picture of the agro-food value chain. Understanding how the benefits of FDI can be better distributed amongst small-scale producers and SMEs is particularly important in light of increased opportunities for SME participation in agro-food GVCs. Future studies could also investigate the interactions between FDI and specific policy areas in detail (e.g. R&D and innovation, supply chain linkages, resilience).

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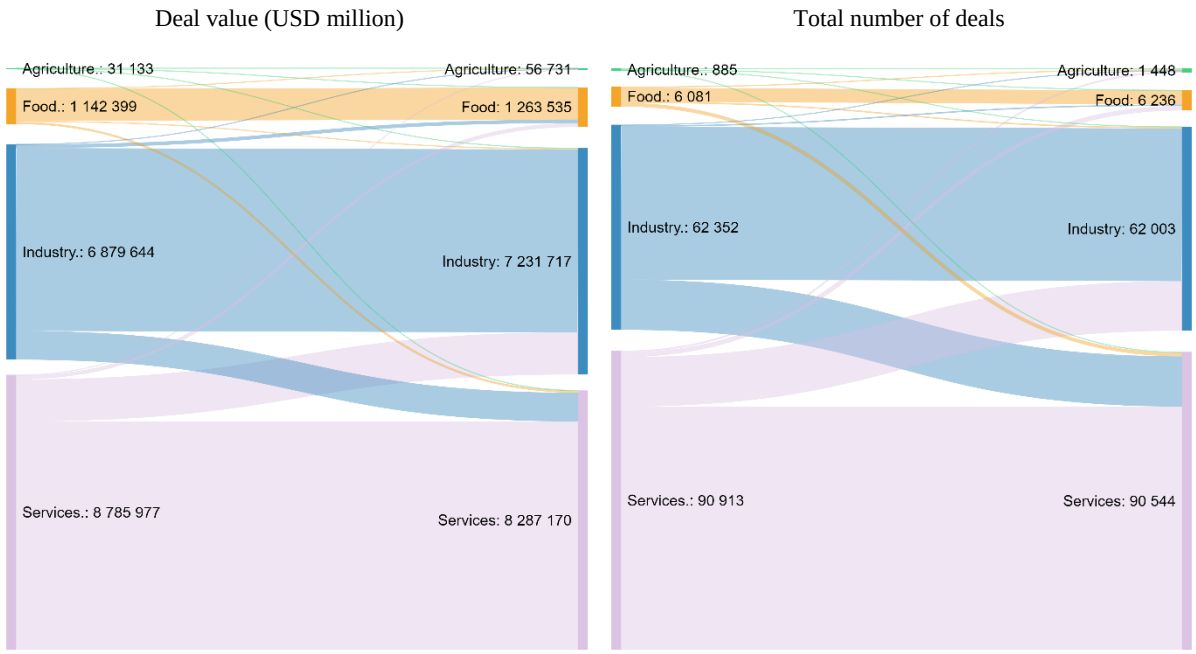
Annex A. Supplementary figures and tables

Table A.1. Agro-food MNEs in the top 100 non-financial MNEs ranked by foreign assets, 2018

Rank	Corporation	Home economy	Industry	Assets		Sales		Employment	
				Foreign	Total	Foreign	Total	Foreign	Total
7	British American Tobacco PLC	United Kingdom	Tobacco	185 974	187 330	32 415	32 660	37 468	63 877
11	Anheuser-Busch InBev NV	Belgium	Food and beverages	162 270	202 375	40 265	47 623	148 999	172 603
22	Nestlé SA	Switzerland	Food and beverages	120 407	139 215	92 170	93 439	298 334	308 000
60	Unilever PLC	United Kingdom	Food and beverages	61 545	68 424	46 621	61 120	128 000	158 000
76	Mondelez International, Inc.	United States	Food and beverages	52 429	62 729	19 537	25 938	68 000	80 000
86	Danone Groupe SA	France	Food and beverages	46 960	50 580	26 574	29 083	80 395	105 783

Note: Rank is by foreign assets. Assets and sales are expressed in million USD.
Source: UNCTAD (2019a).

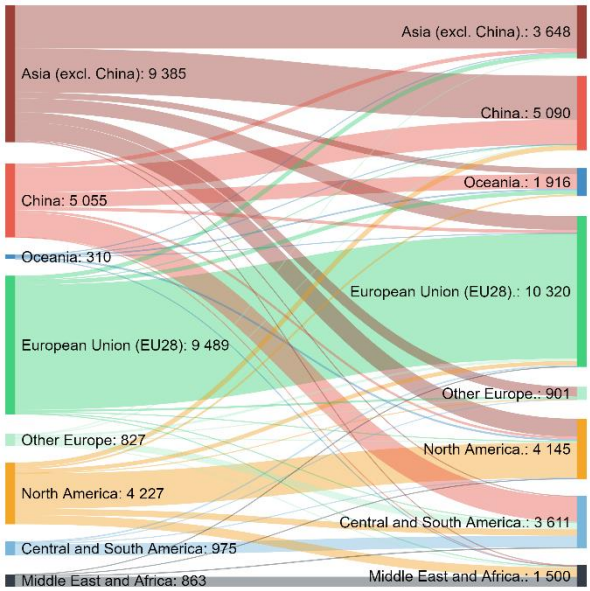
Figure A.1. Cross-border M&A transactions between major sector categories, 1997-2017



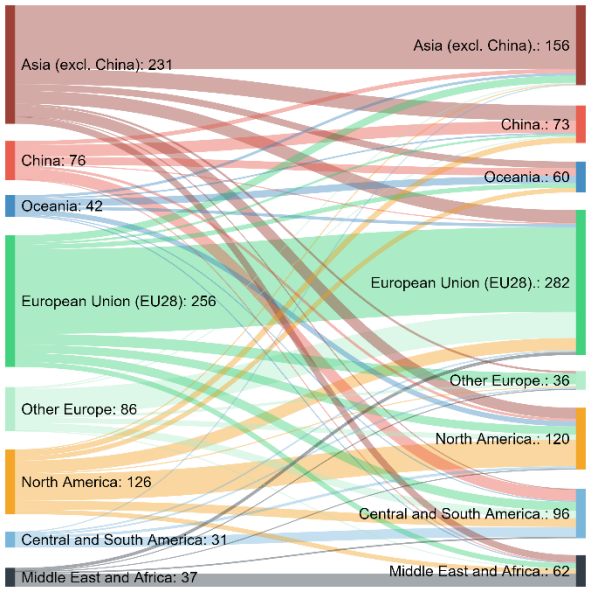
Note: Cross-border investment flows from the sectors listed on the left (outflows) to the sectors listed on the right (inflows).
Source: Author calculations based on Dealogic. Figures generated using SankeyMATIC (http://sankeymatic.com/build/).

Figure A.2. Cross-border M&As (outward investment) in agriculture and food by region, 1997-2017

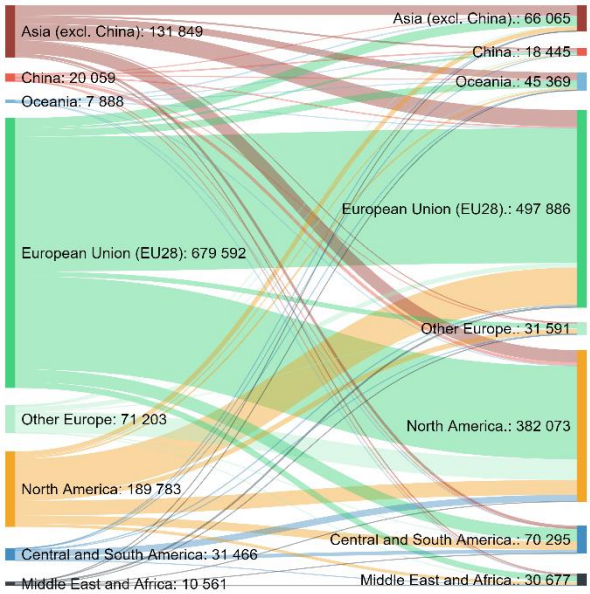
Agriculture, outward investment, deal value (USD million)



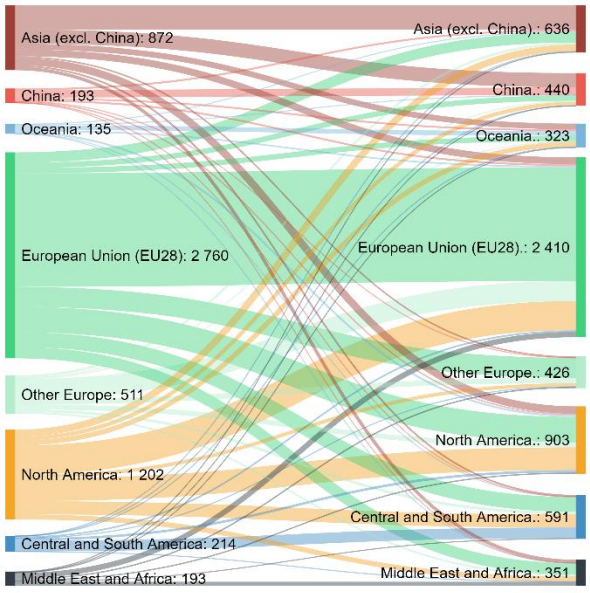
Agriculture, outward investment, total number of deals



Food, outward investment, deal value (USD million)

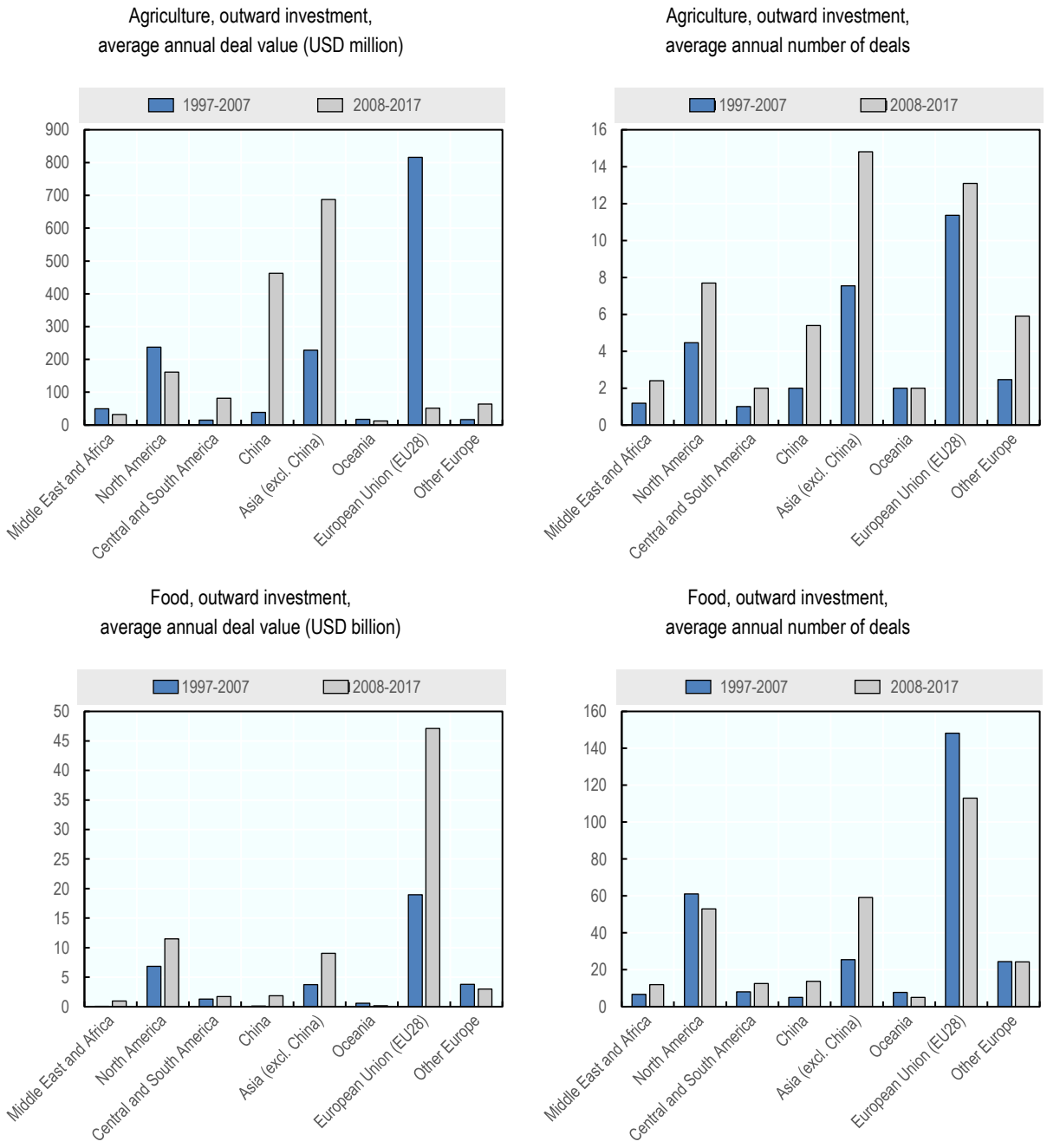


Food, outward investment, total number of deals



Note: Cross-border investment flows out from the regions listed on the left (outflows) and into the regions listed on the right (inflows). Only outward agro-food investments (where the acquiring firm is an agricultural or a food firm) are depicted here. See Figure 5 for a perspective on the geographic structure of inward agro-food FDI.
Source: Author calculations based on Dealogic. Figures generated using SankeyMATIC (http://sankeymatic.com/build/).

Figure A.3. Regional trends in cross-border M&As (outward investment) from agriculture and food



Source: Author calculations based on Dealogic.

Table A.2. Rankings of country centrality and inward FDI in agriculture and food (deal value), 1997-2017

	Inward FDI in agriculture		Inward FDI in food	
Rank	Centrality	Deal value	Centrality	Deal value
1	Australia	Australia	United States	United States
2	United States	Canada	United Kingdom	United Kingdom
3	Brazil	Brazil	China	Canada
4	China	New Zealand	Australia	Netherlands
5	New Zealand	Netherlands	Russian Federation	France
6	Malaysia	China	Spain	Brazil
7	Indonesia	United Kingdom	Brazil	Mexico
8	United Kingdom	United States	France	Australia
9	Argentina	Turkey	Netherlands	Spain
10	Turkey	Malaysia	Rest of Europe	China

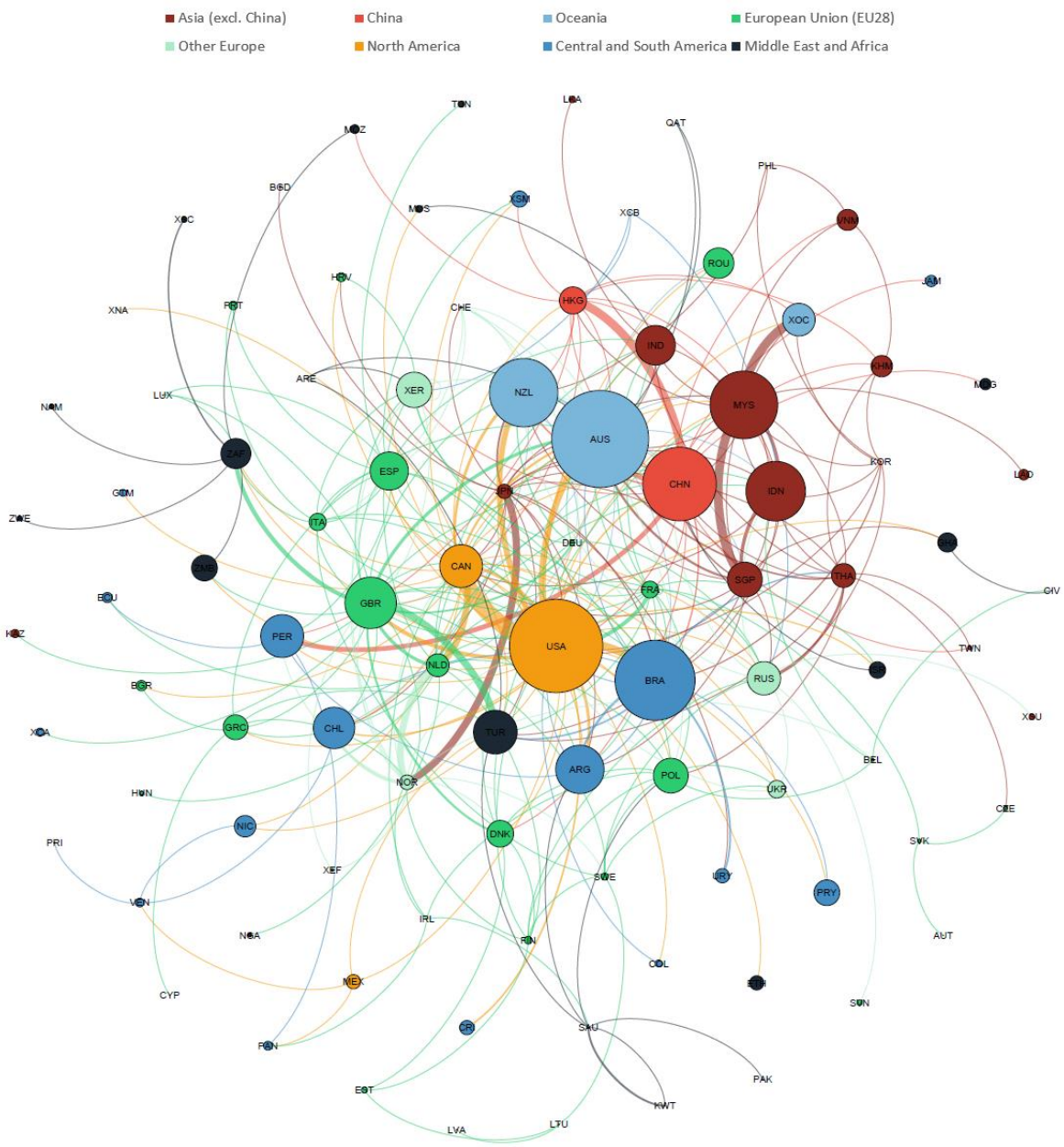
Note: See Table B.2 in Annex B for a detailed list of regions in the GTAP database.
Source: Author calculations based on Dealogic.

Table A.3. Rankings of sector centrality and inward FDI in the agro-food value chain (deal value), 1997-2017

	Inward FDI in agriculture and food	
Rank	Centrality	Deal value
1	Food products nec (OFD)	Beverages and tobacco products (B_T)
2	Vegetable oils and fats (VOL)	Food products nec (OFD)
3	Dairy products (MIL)	Dairy products (MIL)
4	Crops nec (OCR)	Sugar (SGR)
5	Beverages and tobacco products (B_T)	Bovine meat products (CMT)
6	Bovine meat products (CMT)	Vegetable oils and fats (VOL)
7	Vegetables, fruit, nuts (V_F)	Forestry (FRS)
8	Oil seeds (OSD)	Meat products nec (OMT)
9	Bovine cattle, sheep and goats, horses (CTL)	Fishing (FSH)
10	Sugar (SGR)	Oil seeds (OSD)

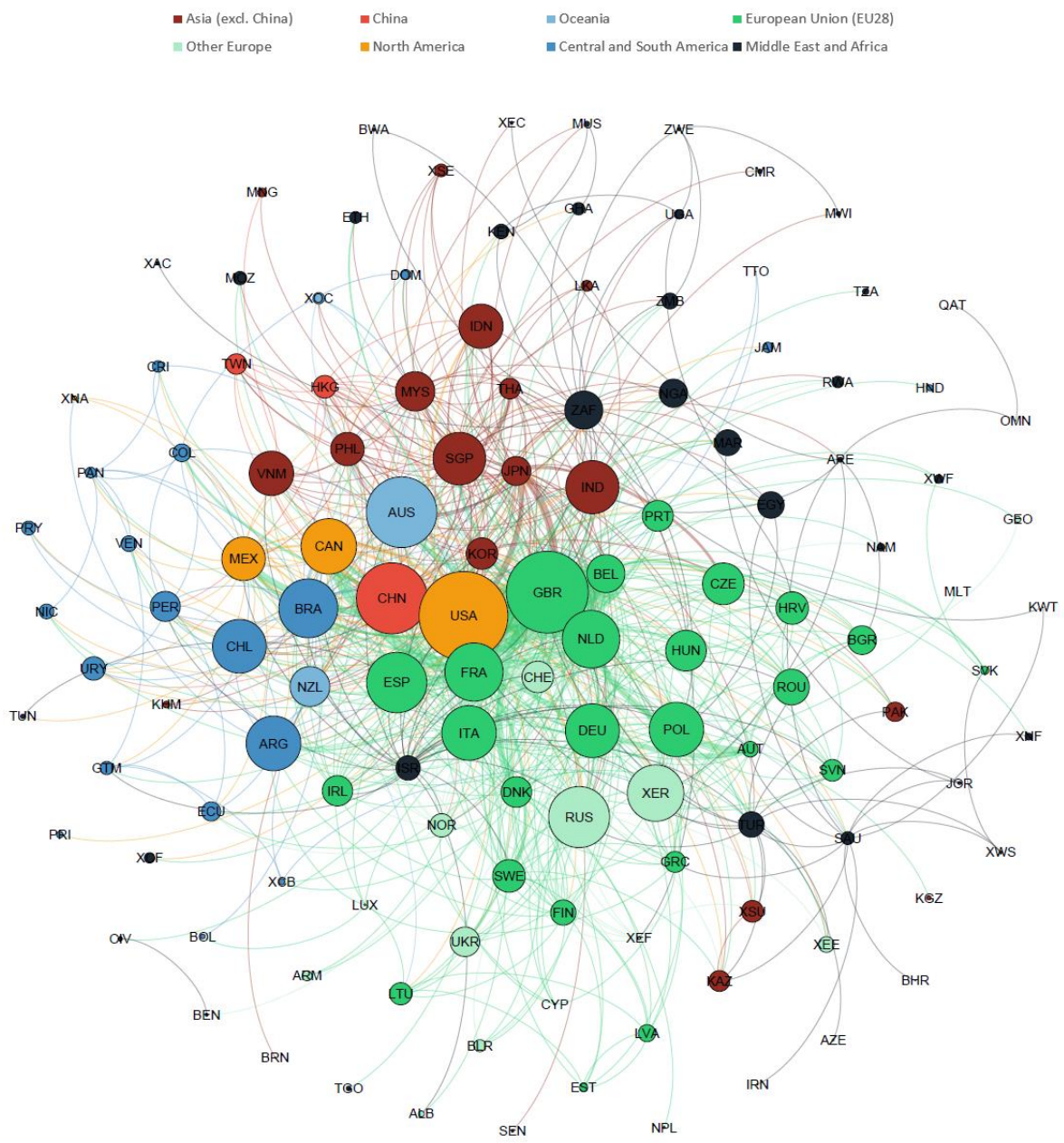
Note: See Table B.1 in Annex B for a detailed list of sectors in the GTAP database.
Source: Author calculations based on Dealogic.

Figure A.4. Country centrality for inward FDI in agriculture (deal value), 1997-2017



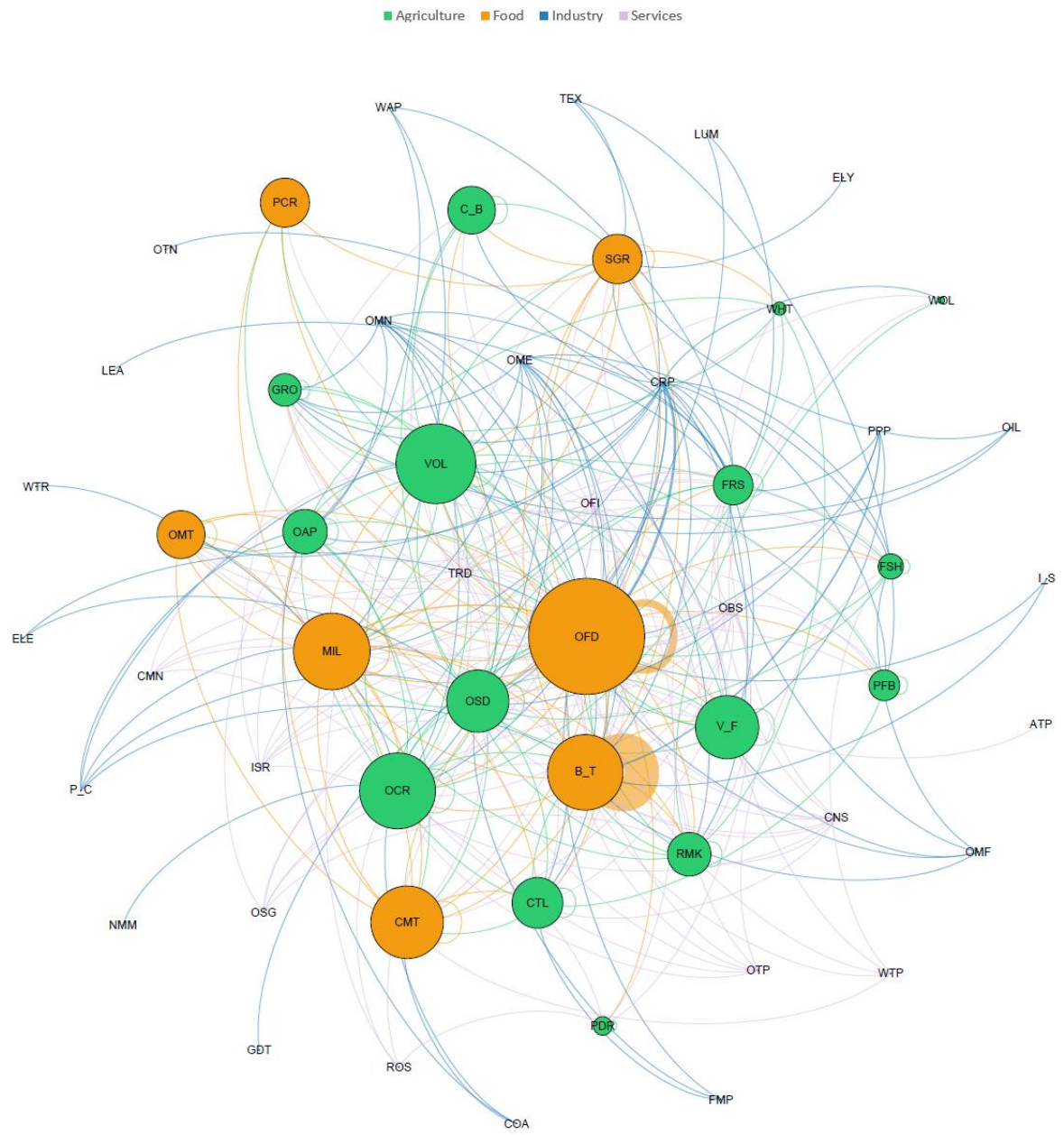
Note: The size of the nodes is proportional to their eigenvector centrality score as drivers of FDI in agriculture. Edges are coloured according to the source of the investment. See Table B.2 in Annex B for a detailed list of regions in the GTAP database.
Source: Author calculations based on Dealogic. Figure generated using Gephi v. 0.9.2 https://gephi.org/.

Figure A.5. Country centrality for inward FDI in food (deal value), 1997-2017



Note: The size of the nodes is proportional to their eigenvector centrality score as drivers of FDI in food. Edges are coloured according to the source of the investment. See Table B.2 in Annex B for a detailed list of regions in the GTAP database.
Source: Author calculations based on Dealogic. Figure generated using Gephi v. 0.9.2 https://gephi.org/.

Figure A.6. Sector centrality for inward agro-food FDI (deal value), 1997-2017



Note: The size of the nodes is proportional to their eigenvector centrality score as drivers of agro-food FDI. Edges are coloured according to the source of the investment. See Table B.1 in Annex B for a detailed list of sectors in the GTAP database.
Source: Author calculations based on Dealogic. Figure generated using Gephi v. 0.9.2 https://gephi.org/.

Annex B. List of sectors and regions in the GTAP database

Table B.1. Detailed list of GTAP sectors

Number	Code	Description	Sector
1	pdr	Paddy Rice: rice, husked and unhusked	Agriculture
2	wht	Wheat: wheat and meslin	Agriculture
3	gro	Other Grains: maize (corn), barley, rye, oats, other cereals	Agriculture
4	v_f	Veg & Fruit: vegetables, fruit vegetables, fruit and nuts, potatoes, cassava, truffles	Agriculture
5	osd	Oil Seeds: oil seeds and oleaginous fruit; soy beans, copra	Agriculture
6	c_b	Cane & Beet: sugar cane and sugar beet	Agriculture
7	pfb	Plant Fibres: cotton, flax, hemp, sisal and other raw vegetable materials used in textiles	Agriculture
8	ocr	Other Crops: live plants; cut flowers and flower buds; flower seeds and fruit seeds; vegetable seeds, beverage and spice crops, unmanufactured tobacco, cereal straw and husks, unprepared, whether or not chopped, ground, pressed or in the form of pellets; swedes, mangolds, fodder roots, hay, lucerne (alfalfa), clover, sainfoin, forage kale, lupines, vetches and similar forage products, whether or not in the form of pellets, plants and parts of plants used primarily in perfumery, in pharmacy, or for insecticidal, fungicidal or similar purposes, sugar beet seed and seeds of forage plants, other raw vegetable materials	Agriculture
9	ctl	Cattle: cattle, sheep, goats, horses, asses, mules, and hinnies; and semen thereof	Agriculture
10	oap	Other Animal Products: swine, poultry and other live animals; eggs, in shell (fresh or cooked), natural honey, snails (fresh or preserved) except sea snails; frogs' legs, edible products of animal origin n.e.c., hides, skins and furskins, raw , insect waxes and spermaceti, whether or not refined or coloured	Agriculture
11	rmk	Raw milk	Agriculture
12	wol	Wool: wool, silk, and other raw animal materials used in textile	Agriculture
13	frs	Forestry: forestry, logging and related service activities	Agriculture
14	fsh	Fishing: hunting, trapping and game propagation including related service activities, fishing, fish farms; service activities incidental to fishing	Agriculture
15	coa	Coal: mining and agglomeration of hard coal, lignite and peat	Industry
16	oil	Oil: extraction of crude petroleum and natural gas (part), service activities incidental to oil and gas extraction excluding surveying (part)	Industry
17	gas	Gas: extraction of crude petroleum and natural gas (part), service activities incidental to oil and gas extraction excluding surveying (part)	Industry
18	omn	Other Mining: mining of metal ores, uranium, gems. other mining and quarrying	Industry
19	cmt	Cattle Meat: fresh or chilled meat and edible offal of cattle, sheep, goats, horses, asses, mules, and hinnies. raw fats or grease from any animal or bird.	Food
20	omt	Other Meat: pig meat and offal. preserves and preparations of meat, meat offal or blood, flours, meals and pellets of meat or inedible meat offal; greaves	Food
21	vol	Vegetable Oils: crude and refined oils of soya-bean, maize (corn),olive, sesame, ground-nut, olive, sunflower-seed, safflower, cotton-seed, rape, colza and canola, mustard, coconut palm, palm kernel, castor, tung jojoba, babassu and linseed, perhaps partly or wholly hydrogenated,inter-esterified, re-esterified or elaidinised. Also margarine and similar preparations, animal or vegetable waxes, fats and oils and their fractions, cotton linters, oil-cake and other solid residues resulting from the extraction of vegetable fats or oils; flours and meals of oil seeds or oleaginous fruits, except those of mustard; degras and other residues resulting from the treatment of fatty substances or animal or vegetable waxes.	Food
22	mil	Milk: dairy products	Food
23	pcr	Processed Rice: rice, semi- or wholly milled	Food
24	sgr	Sugar	Food

Number	Code	Description	Sector
25	ofd	Other Food: prepared and preserved fish or vegetables, fruit juices and vegetable juices, prepared and preserved fruit and nuts, all cereal flours, groats, meal and pellets of wheat, cereal groats, meal and pellets n.e.c., other cereal grain products (including corn flakes), other vegetable flours and meals, mixes and doughs for the preparation of bakers' wares, starches and starch products; sugars and sugar syrups n.e.c., preparations used in animal feeding, bakery products, cocoa, chocolate and sugar confectionery, macaroni, noodles, couscous and similar farinaceous products, food products n.e.c.	Food
26	b_t	Beverages and Tobacco products	Food
27	tex	Textiles: textiles and man-made fibres	Industry
28	wap	Wearing Apparel: Clothing, dressing and dyeing of fur	Industry
29	lea	Leather: tanning and dressing of leather; luggage, handbags, saddlery, harness and footwear	Industry
30	lum	Lumber: wood and products of wood and cork, except furniture; articles of straw and plaiting materials	Industry
31	ppp	Paper & Paper Products: includes publishing, printing and reproduction of recorded media	Industry
32	p_c	Petroleum & Coke: coke oven products, refined petroleum products, processing of nuclear fuel	Industry
33	crp	Chemical Rubber Products: basic chemicals, other chemical products, rubber and plastics products	Industry
34	nmm	Non-Metallic Minerals: cement, plaster, lime, gravel, concrete	Industry
35	i_s	Iron & Steel: basic production and casting	Industry
36	nfm	Non-Ferrous Metals: production and casting of copper, aluminium, zinc, lead, gold, and silver	Industry
37	fmp	Fabricated Metal Products: Sheet metal products, but not machinery and equipment	Industry
38	mvh	Motor vehicles and parts: cars, lorries, trailers and semi-trailers	Industry
39	otn	Other Transport Equipment: Manufacture of other transport equipment	Industry
40	ele	Electronic Equipment: office, accounting and computing machinery, radio, television and communication equipment and apparatus	Industry
41	ome	Other Machinery & Equipment: electrical machinery and apparatus n.e.c., medical, precision and optical instruments, watches and clocks	Industry
42	omf	Other Manufacturing: includes recycling	Industry
43	ely	Electricity: production, collection and distribution	Industry
44	gdt	Gas Distribution: distribution of gaseous fuels through mains; steam and hot water supply	Industry
45	wtr	Water: collection, purification and distribution	Industry
46	cns	Construction: building houses factories offices and roads	Services
47	trd	Trade: all retail sales; wholesale trade and commission trade; hotels and restaurants; repairs of motor vehicles and personal and household goods; retail sale of automotive fuel	Services
48	otp	Other Transport: road, rail ; pipelines, auxiliary transport activities; travel agencies	Services
49	wtp	Water transport	Services
50	atp	Air transport	Services
51	cmn	Communications: post and telecommunications	Services
52	ofi	Other Financial Intermediation: includes auxiliary activities but not insurance and pension funding (see next)	Services
53	isr	Insurance: includes pension funding, except compulsory social security	Services
54	obs	Other Business Services: real estate, renting and business activities	Services
55	ros	Recreation & Other Services: recreational, cultural and sporting activities, other service activities; private households with employed persons (servants)	Services
56	osg	Other Services (Government): public administration and defense; compulsory social security, education, health and social work, sewage and refuse disposal, sanitation and similar activities, activities of membership organizations n.e.c., extra-territorial organizations and bodies	Services
57	dwe	Dwellings: ownership of dwellings (imputed rents of houses occupied by owners)	Services

Source: Global Trade Analysis Project (GTAP) database, Version 9, detailed sectoral list, https://www.gtap.agecon.purdue.edu/databases/contribute/detailedsector.asp.

Table B.2. GTAP regions

No.	Code	Region	No.	Code	Region	No.	Code	Region
1	AUS	Australia	48	XCA	Rest of Central America	95	ARM	Armenia
2	NZL	New Zealand	49	DOM	Dominican Republic	96	AZE	Azerbaijan
3	XOC	Rest of Oceania	50	JAM	Jamaica	97	GEO	Georgia
4	CHN	China	51	PRI	Puerto Rico	98	BHR	Bahrain
5	HKG	Hong Kong	52	TTO	Trinidad and Tobago	99	IRN	Iran, Islamic Republic of
6	JPN	Japan	53	XCB	Caribbean	100	ISR	Israel
7	KOR	Korea	54	AUT	Austria	101	JOR	Jordan
8	MNG	Mongolia	55	BEL	Belgium	102	KWT	Kuwait
9	TWN	Chinese Taipei	56	CYP	Cyprus[1,2]	103	OMN	Oman
10	XEA	Rest of East Asia	57	CZE	Czech Republic	104	QAT	Qatar
11	BRN	Brunei Darussalam	58	DNK	Denmark	105	SAU	Saudi Arabia
12	KHM	Cambodia	59	EST	Estonia	106	TUR	Turkey
13	IDN	Indonesia	60	FIN	Finland	107	ARE	United Arab Emirates
14	LAO	Lao PDR	61	FRA	France	108	XWS	Rest of Western Asia
15	MYS	Malaysia	62	DEU	Germany	109	EGY	Egypt
16	PHL	Philippines	63	GRC	Greece	110	MAR	Morocco
17	SGP	Singapore	64	HUN	Hungary	111	TUN	Tunisia
18	THA	Thailand	65	IRL	Ireland	112	XNF	Rest of North Africa
19	VNM	Viet Nam	66	ITA	Italy	113	BEN	Benin
20	XSE	Rest of Southeast Asia	67	LVA	Latvia	114	BFA	Burkina Faso
21	BGD	Bangladesh	68	LTU	Lithuania	115	CMR	Cameroon
22	IND	India	69	LUX	Luxembourg	116	CIV	Côte d'Ivoire
23	NPL	Nepal	70	MLT	Malta	117	GHA	Ghana
24	PAK	Pakistan	71	NLD	Netherlands	118	GIN	Guinea
25	LKA	Sri Lanka	72	POL	Poland	119	NGA	Nigeria
26	XSA	Rest of South Asia	73	PRT	Portugal	120	SEN	Senegal
27	CAN	Canada	74	SVK	Slovakia	121	TGO	Togo
28	USA	United States	75	SVN	Slovenia	122	XWF	Rest of Western Africa
29	MEX	Mexico	76	ESP	Spain	123	XCF	Rest of Central Africa
30	XNA	Rest of North America	77	SWE	Sweden	124	XAC	South Central Africa
31	ARG	Argentina	78	GBR	United Kingdom	125	ETH	Ethiopia
32	BOL	Bolivia	79	CHE	Switzerland	126	KEN	Kenya
33	BRA	Brazil	80	NOR	Norway	127	MDG	Madagascar
34	CHL	Chile	81	XEF	Rest of EFTA	128	MWI	Malawi

No.	Code	Region	No.	Code	Region	No.	Code	Region
35	COL	Colombia	82	ALB	Albania	129	MUS	Mauritius
36	ECU	Ecuador	83	BGR	Bulgaria	130	MOZ	Mozambique
37	PRY	Paraguay	84	BLR	Belarus	131	RWA	Rwanda
38	PER	Peru	85	HRV	Croatia	132	TZA	Tanzania, United Republic of
39	URY	Uruguay	86	ROU	Romania	133	UGA	Uganda
40	VEN	Venezuela	87	RUS	Russian Federation	134	ZMB	Zambia
41	XSM	Rest of South America	88	UKR	Ukraine	135	ZWE	Zimbabwe
42	CRI	Costa Rica	89	XEE	Rest of Eastern Europe	136	XEC	Rest of Eastern Africa
43	GTM	Guatemala	90	XER	Rest of Europe	137	BWA	Botswana
44	HND	Honduras	91	KAZ	Kazakhstan	138	NAM	Namibia
45	NIC	Nicaragua	92	KGZ	Kyrgyzstan	139	ZAF	South Africa
46	PAN	Panama	93	TJK	Tajikistan	140	XSC	Rest of South African Customs Union
47	SLV	El Salvador	94	XSU	Rest of Former Soviet Union	141	XTW	Rest of the World

Notes: 1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".
2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.
Source: Global Trade Analysis Project (GTAP) database, Version 10, https://www.gtap.agecon.purdue.edu/databases/regions.aspx?Version=10.131.

Annex C. Model specification and detailed results

Estimating the impacts of FDI on participation and domestic value added creation in agro-food GVCs

GVC participation can be influenced by a broad range of factors, which are likely to vary across countries, sectors and over time. This Annex presents the detailed results of the empirical analysis of the influence of FDI on participation in agro-food GVCs.

The regression analysis used in Section 3 of this study is based on estimations of the following four benchmark equations:

$$BWD_{cst} = \beta_0 + \beta_1 FDI_{cst} + \eta_{ct} + u_{st} + \varepsilon_{cst} \quad (1)$$

$$FWD_{cst} = \beta_0 + \beta_1 FDI_{cst} + \eta_{ct} + u_{st} + \varepsilon_{cst} \quad (2)$$

$$DVA_{cst} = \beta_0 + \beta_1 FDI_{cst} + \eta_{ct} + u_{st} + \varepsilon_{cst} \quad (3)$$

$$XDVA_{cst} = \beta_0 + \beta_1 FDI_{cst} + \eta_{ct} + u_{st} + \varepsilon_{cst} \quad (4)$$

where the indices *c*, *s* and *t* denote the country, sector and year corresponding to an observation, BWD_{cst} is the backward indicator, FWD_{cst} is the forward indicator, DVA_{cst} is the domestic value-added and $XDVA_{cst}$ is the domestic value-added embodied in a sector's exports. Due to the large range of the domestic value added indicators, equations (3) and (4) are estimated by taking the natural logarithm of the DVA_{cst} and $XDVA_{cst}$ variables.

The FDI_{cst} variable comprises four different indicators of cross-border M&A activity, each of which is tested separately:

- Inward FDI stock (deal value)
- Inward FDI stock (number of deals)
- Outward FDI stock (deal value), and
- Outward FDI stock (number of deals).

The FDI indicators are calculated by aggregating the value or number of investments within a particular country-sector, between the first year of the dataset (1997) and the years for which GVC participation indicators from the GTAP database are available (2004, 2007, 2011 or 2014).

The parameters are then estimated using Ordinary Least Squares (OLS) with a panel dataset for 2004, 2007, 2011 and 2014. The dataset covers 22 agro-food sectors (GTAP sectors 1-14 and 19-26) and 141 countries and regions (see Annex B for a detailed list of sectors and regions in the GTAP database).

Country-year fixed effects are included (η_{ct}) to control for country-specific unobservable factors such as differences in key macroeconomic variables (such as GDP per capita), policy settings, and weather and climatic conditions. Sector-year fixed effects are also included in the model (denoted by the term u_{st}). This helps to control for variation related to unobservable factors such as product characteristics and industry structure. The zero-mean error term is denoted by ε_{cst}. Furthermore, to reduce the influence of outliers, observations with a forward indicator greater than 500 were discarded prior to running the estimations.

The following tables show summary statistics for the variables used, as well as the detailed regression results for the estimations.

Table C.1. Summary statistics

Variable name	Mean	Std. Dev.	Min	Max	Description
Dependent variables					
Backward (BWD)	0.224	0.177	0.000	0.991	Backward indicator
Forward (FWD)	8.266	40.151	0.000	494.112	Forward indicator
Domestic Value Added (DVA)	571.614	3 468.240	0.000	101 772.978	Domestic value added (USD million)
Exports of Domestic Value Added (XDVA)	148.587	644.593	0.000	14 640.979	Domestic value added embodied in exports (USD million)
Independent variables					
Inward FDI stock (deal value)	203.402	2646.785	0.000	91 121.281	Value of cross-border M&A transactions in a target country-sector, cumulated between 1997 and year *t* (USD million)
Inward FDI stock (number of deals)	1.501	8.061	0.000	283.000	Number of cross-border M&A transactions in a target country-sector, cumulated between 1997 and year *t*
Outward FDI stock (deal value)	180.560	2942.665	0.000	135 788.641	Value of cross-border M&A transactions made by an acquiring country-sector, cumulated between 1997 and year *t* (USD million)
Outward FDI stock (number of deals)	1.382	11.141	0.000	417.000	Number of cross-border M&A transactions made by an acquiring country-sector, cumulated between 1997 and year *t*

Table C.2. Detailed results

Ordinary Least Squares (OLS) estimation with country-year and sector-year fixed effects

Variables	Backward				Forward			
Inward FDI stock (deal value)	-0.000				0.000***			
	(0.00)				(0.00)			
Inward FDI stock (number of deals)		0.000 #				0.046**		
		(0.00)				(0.02)		
Outward FDI stock (deal value)			-0.000				0.000***	
			(0.00)				(0.00)	
Outward FDI stock (number of deals)				0.000 ~				0.054***
				(0.00)				(0.01)
Constant	0.224***	0.223***	0.224***	0.224***	8.242***	8.197***	8.253***	8.191***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.33)	(0.33)	(0.33)	(0.33)
Observations	12 081	12 081	12 081	12 081	12 081	12 081	12 081	12 081
R-squared	0.452	0.453	0.452	0.453	0.236	0.236	0.236	0.236

Variables	Log(Domestic Value Added)				Log(Domestic Value Added in Exports)			
Inward FDI stock (deal value)	0.000***				-0.000**			
	(0.00)				(0.00)			
Inward FDI stock (number of deals)		0.005***				-0.004***		
		(0.00)				(0.00)		
Outward FDI stock (deal value)			0.000***				0.000**	
			(0.00)				(0.00)	
Outward FDI stock (number of deals)				0.007***				0.002*
				(0.00)				(0.00)
Constant	2.248***	2.242***	2.248***	2.240***	0.926***	0.931***	0.923***	0.921***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Observations	12 081	12 081	12 081	12 081	12 081	12 081	12 081	12 081
R-squared	0.603	0.603	0.603	0.603	0.639	0.639	0.639	0.639

Notes: *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. Weakly significant results are denoted by # (15.5%) and ~ (10.0%). Robust standard errors are reported in parentheses.
Source: Author estimates.

Annex D. Survey of agriculture and food firms

OECD TRADE AND AGRICULTURE DIRECTORATE

SURVEY OF AGRICULTURE AND FOOD FIRMS:
INVESTMENT AND TRADE IN INTERNATIONAL MARKETS

Introduction

The OECD is conducting a survey to better understand what influences firms to invest in foreign agriculture and food markets. This survey is part of a study on foreign investment and trade in agri-food value chains. It targets multinational firms, however viewpoints of firms not yet investing or trading abroad are also important. Participating companies have an opportunity to highlight factors that encourage and/or impede the international expansion of operations and the smooth functioning of cross-border value chains.

*The information you provide in this questionnaire is **strictly confidential**. Responses will be aggregated and no enterprise or personal information will be disclosed.*

*This survey includes 30 questions in total, primarily multiple choice, and should take approximately **20 minutes** of your time. Please answer the questions in this survey to the best of your ability. If you are not sure about your answer, please select the answer that you think is most appropriate.*

Thank you for sharing your views and experience with us. If you have any questions or comments on the survey, please do not hesitate to contact Jibran Punthakey (jibran.punthakey@oecd.org).

A) General information

1. Which of the following best describes your firm? *[Select **one** option]*
   - ☐ Domestic firm with no foreign affiliates or foreign investment activity
   - ☐ Multinational enterprise (i.e. with operations in more than one country)

If you selected "Domestic firm" above, please answer the following question:

1. **a)** If your firm **does not** undertake foreign investment in agri- food markets, please explain why:

Click or tap here to enter text.

[Skip to section C]

2. Is your firm one of the following: *[Select all that apply]*
   - ☐ Private equity fund, hedge fund, or other collective investment fund
   - ☐ State-owned enterprise (e.g. sovereign wealth fund)
   - ☐ None of the above

3. In which country is the parent headquarters of your firm located?

Click or tap here to enter text.

4. Are you located in the parent country, or do you represent a foreign affiliate? *[Select **one** option]*
   - ☐ Parent country
   - ☐ Foreign affiliate *(please enter your country of location):*

Click or tap here to enter text.

B) Participation in foreign markets

5. How does your firm participate in foreign agri-food markets? *[Select all that apply]*
   - ☐ Foreign investment
   - ☐ Trade (importing and/or exporting)
   - ☐ Licensing (e.g. allowing a foreign firm to use your company's trademark/know-how)
   - ☐ Contracts with suppliers/customers (e.g. contract farming)
   - ☐ Public-private partnerships
   - ☐ Other (please specify):
     Click or tap here to enter text.

6. How does your firm invest in foreign agri-food markets? *[Select all that apply]*
   - ☐ Greenfield investments (building new facilities abroad)
   - ☐ Cross-border mergers and acquisitions
   - ☐ Joint-ventures with local partners
   - ☐ Portfolio investments (< 10% ownership share)
   - ☐ Other (please specify):
     Click or tap here to enter text.

7. a) In which agri-food sector(s) does your firm undertake foreign investment? *[Select all that apply]*
   - ☐ Agricultural inputs (e.g. seeds, fertilisers, pesticides, machinery)
   - ☐ Primary agricultural production (e.g. crop growing, livestock, horticulture, fishing, etc.)
   - ☐ Food and beverage manufacturing
   - ☐ Manufacturing of non-food agricultural products (e.g. biofuels, oils, resins, rubber, textiles, etc.)
   - ☐ Wholesale and retail trade (e.g. traders, supermarkets)
   - ☐ Agricultural services (e.g. harvesting, pest control, transportation, storage, etc.)
   - ☐ Other (please specify):
     Click or tap here to enter text.

   b) Which of the above agri-food sectors represents your core business? *[Select **one** option]*
   - ☐ Agricultural inputs (e.g. seeds, fertilisers, pesticides, machinery)
   - ☐ Primary agricultural production (e.g. crop growing, livestock, horticulture, fishing, etc.)
   - ☐ Food and beverage manufacturing
   - ☐ Manufacturing of non-food agricultural products (e.g. biofuels, oils, resins, rubber, textiles, etc.)
   - ☐ Wholesale and retail trade (e.g. traders, supermarkets)
   - ☐ Agricultural services (e.g. harvesting, pest control, transportation, storage, etc.)
   - ☐ Other (please specify):
     Click or tap here to enter text.

8. In which region(s) does your firm invest? *[Select all that apply]*
   - ☐ Middle East and North Africa
   - ☐ Sub-Saharan Africa
   - ☐ North America
   - ☐ Central and South America
   - ☐ East and South East Asia (including China, Japan, Korea)
   - ☐ Central and South Asia (including India)
   - ☐ Oceania
   - ☐ European Union (EU28)
   - ☐ Other Europe (including Russian Federation, Ukraine)
   - ☐ Other (please specify):
     Click or tap here to enter text.

   Select countries/territories – Middle East and North Africa *(optional)*:

☐ Algeria	☐ Kuwait	☐ Sudan
☐ Bahrain	☐ Lebanon	☐ Syria
☐ Egypt	☐ Libya	☐ Tunisia
☐ Iran	☐ Morocco	☐ Turkey
☐ Iraq	☐ Oman	☐ United Arab Emirates
☐ Israel	☐ Qatar	☐ West Bank and Gaza Strip
☐ Jordan	☐ Saudi Arabia	☐ Yemen

Select countries/territories – Sub-Saharan Africa *(optional)*:

- ☐ Angola
- ☐ Benin
- ☐ Botswana
- ☐ Burkina Faso
- ☐ Burundi
- ☐ Cabo Verde
- ☐ Cameroon
- ☐ Central African Republic
- ☐ Chad
- ☐ Comoros
- ☐ Congo
- ☐ Côte d'Ivoire
- ☐ Democratic Republic of the Congo
- ☐ Djibouti
- ☐ Equatorial Guinea
- ☐ Eritrea
- ☐ Eswatini
- ☐ Ethiopia
- ☐ Gabon
- ☐ Gambia
- ☐ Ghana
- ☐ Guinea
- ☐ Guinea-Bissau
- ☐ Kenya
- ☐ Lesotho
- ☐ Liberia
- ☐ Madagascar
- ☐ Malawi
- ☐ Mali
- ☐ Mauritania
- ☐ Mauritius
- ☐ Mozambique
- ☐ Namibia
- ☐ Niger
- ☐ Nigeria
- ☐ Rwanda
- ☐ Sao Tome and Principe
- ☐ Senegal
- ☐ Seychelles
- ☐ Sierra Leone
- ☐ Somalia
- ☐ South Africa
- ☐ South Sudan
- ☐ Togo
- ☐ Uganda
- ☐ Tanzania
- ☐ Zambia
- ☐ Zimbabwe

Select countries/territories – North America *(optional)*:

- ☐ Canada
- ☐ Mexico
- ☐ United States

Select countries/territories – Central and South America *(optional)*:

- ☐ Antigua and Barbuda
- ☐ Argentina
- ☐ Bahamas
- ☐ Barbados
- ☐ Belize
- ☐ Bolivia
- ☐ Brazil
- ☐ Chile
- ☐ Colombia
- ☐ Costa Rica
- ☐ Cuba
- ☐ Dominica
- ☐ Dominican Republic
- ☐ Ecuador
- ☐ El Salvador
- ☐ Grenada
- ☐ Guatemala
- ☐ Guyana
- ☐ Haiti
- ☐ Honduras
- ☐ Jamaica
- ☐ Nicaragua
- ☐ Panama
- ☐ Paraguay
- ☐ Peru
- ☐ Saint Kitts and Nevis
- ☐ Saint Lucia
- ☐ Saint Vincent and the Grenadines
- ☐ Suriname
- ☐ Trinidad and Tobago
- ☐ Uruguay
- ☐ Venezuela

Select countries/territories – East and South East Asia *(optional)*:

- ☐ Brunei Darussalam
- ☐ Cambodia
- ☐ China
- ☐ Chinese Taipei
- ☐ Democratic People's Republic of Korea
- ☐ Korea
- ☐ Indonesia
- ☐ Japan
- ☐ Lao People's Democratic Republic
- ☐ Malaysia
- ☐ Mongolia
- ☐ Myanmar
- ☐ Philippines
- ☐ Singapore
- ☐ Thailand
- ☐ Timor-Leste
- ☐ Viet Nam

Select countries/territories – Central and South Asia *(optional)*:

- ☐ Afghanistan
- ☐ Bangladesh
- ☐ Bhutan
- ☐ India
- ☐ Kazakhstan
- ☐ Kyrgyzstan
- ☐ Maldives
- ☐ Nepal
- ☐ Pakistan
- ☐ Sri Lanka
- ☐ Tajikistan
- ☐ Turkmenistan
- ☐ Uzbekistan

Select countries/territories – Oceania *(optional)*:

- ☐ Australia
- ☐ Fiji
- ☐ Kiribati
- ☐ Marshall Islands
- ☐ Micronesia
- ☐ Nauru
- ☐ New Zealand
- ☐ Palau
- ☐ Papua New Guinea
- ☐ Samoa
- ☐ Solomon Islands
- ☐ Tonga
- ☐ Tuvalu
- ☐ Vanuatu

Select countries/territories – European Union (EU28) *(optional)*:

☐ Austria	☐ Germany	☐ Poland
☐ Belgium	☐ Greece	☐ Portugal
☐ Bulgaria	☐ Hungary	☐ Romania
☐ Croatia	☐ Ireland	☐ Slovak Republic
☐ Cyprus	☐ Italy	☐ Slovenia
☐ Czech Republic	☐ Latvia	☐ Spain
☐ Denmark	☐ Lithuania	☐ Sweden
☐ Estonia	☐ Luxembourg	☐ United Kingdom
☐ Finland	☐ Malta	
☐ France	☐ Netherlands	

Select countries/territories – Other Europe *(optional)*:

☐ Albania	☐ Iceland	☐ Russian Federation
☐ Andorra	☐ Kosovo	☐ San Marino
☐ Armenia	☐ Liechtenstein	☐ Serbia
☐ Azerbaijan	☐ Monaco	☐ Switzerland
☐ Belarus	☐ Montenegro	☐ North Macedonia
☐ Bosnia and Herzegovina	☐ Norway	☐ Ukraine
☐ Georgia	☐ Republic of Moldova	

9. Which of the following best characterises your firm's global value chain strategies? *[Select all that apply]*

☐ Horizontal Investment – establishment of affiliates in different markets with similar business functions (e.g. setting up supermarkets in many countries)
☐ Vertical Investment – upstream or downstream from the firm's core business (e.g. setting up a food processing plant downstream from an agricultural production firm)
☐ Conglomerate Investment – in a sector unrelated to the firm's core business
☐ Other (please specify):
Click or tap here to enter text.

10. Which of the following best describes your firm's motivations for investing in foreign agri-food markets? *[Select all that apply]*

☐ Obtain a satisfactory rate of return
☐ Increase size of global market
☐ Avoid high trade costs (e.g. tariffs, transportation) associated with exports
☐ Complement exports and enhance access to foreign markets
☐ Manage product quality (e.g. more control over local management and production)
☐ Tailor product more to local preferences
☐ Improve access to distribution systems
☐ Reduce exchange rate risk
☐ Strengthen logistics, reduce freight costs volatility
☐ Access to inputs, raw materials, agricultural land
☐ Promote new technologies, research and development
☐ Improve efficiencies (e.g. lower labour and other input costs)
☐ Improve firm's environmental and sustainability footprint
☐ Secure a stable supply of imported intermediate inputs
☐ Improve food security in the parent country (i.e. the country where the investment originates)
☐ Other (please specify):
Click or tap here to enter text.

C) Characteristics of foreign markets

11. Please rank the top three market factors that encourage your firm to invest in foreign agri-food markets. *[The options below relate to the country/countries where your firm undertakes foreign investment]*

	Rank from (1-3)
Large size of economy	
High income levels (GDP/capita)	
Fast growing economy	
Proximity to parent company	
Proximity to consumer markets	
Presence of other foreign investors	
High quality institutions and governance (low levels of corruption, strong business environment, rule of law, property rights, judiciary)	
Political stability and lack of conflict/violence	
Macroeconomic stability (low inflation, limited exchange rate volatility)	
Well-developed financial sector and capital markets	
Low levels of taxation	
Ease of doing business (simplified administrative procedures)	
High levels of education / skilled workforce	
High quality of infrastructure (roads, railroads, internet, irrigation networks, storage, etc.)	
High quality of distribution and retailing	
Access to data and digital platforms	
Availability of land, water resources	
Environmental quality (e.g. unpolluted land and water resources)	
Low prices of inputs (e.g. raw materials, fuel, water, labour)	
High prices of outputs (e.g. food prices)	
Ability to tailor product to local preferences or tastes	

☐ Other market factors (please specify):

Click or tap here to enter text.

12. How does market concentration in the target agri-food industry influence your firm's foreign investment decisions? *[Select **one** option]*

☐ More likely to invest when market concentration is high (i.e. a few large firms account for a high share of the market)

☐ More likely to invest when market concentration is low (i.e. many firms account for small shares of the market)

D) Trade and investment policies in the foreign market

13. a) Please rank the top three trade-related policies that **a) positively** influence your firm's decision to invest in foreign agri-food markets.
[The options below relate to the country/countries where your firm undertakes foreign investment]

b) Please rank the top three trade-related policies that **b) negatively** influence your firm's decision to invest in foreign agri-food markets.
[The options below relate to the country/countries where your firm undertakes foreign investment]

	(a) Strongest Positive Impact Rank (1-3)	**(b) Strongest Negative Impact** Rank (1-3)
Tariffs		
Import quotas		
Sanitary and phytosanitary measures (e.g. quarantine requirements)		
Technical requirements (e.g. standards on technical specifications, quality standards, etc.)		
Services trade restrictions (e.g. restrictions on freight, insurance, transport, financial, business services)		
Export restrictions		
Bilateral or regional trade agreements		
Rules of origin		
Local content measures		
Simplified customs procedures and regulatory interface between government bodies and traders, limited bureaucratic delays / red tape		
Export finance programmes		
Export promotion (e.g. trade fairs)		
Trade policy uncertainty		

14. a) Please rank the top three investment-related policies that **a) positively** influence your firm's decision to invest in foreign agri-food markets.
[The options below relate to the country/countries where your firm undertakes foreign investment]

b) Please rank the top three investment-related policies that **b) negatively** influence your firm's decision to invest in foreign agri-food markets.
[The options below relate to the country/countries where your firm undertakes foreign investment]

	(a) Strongest Positive Impact Rank (1-3)	**(b) Strongest Negative Impact** Rank (1-3)
Clear, transparent and predictable investment policy framework		
Restrictions on FDI (e.g. on foreign ownership of agricultural land)		
Screening of FDI (e.g. in strategic sectors)		
Strong protection of land tenure and land rights		
Strong investor protections, including compensation for expropriation		
Special economic zones (e.g. free trade zones, export processing zones)		
Bilateral or multilateral investment treaties		
Availability of tax incentives (e.g. tax holidays, tax credits, capital cost allowances, customs duties exemptions, VAT refunds)		
Availability of other financial incentives (e.g. subsidies, grants and loan programmes)		
Non-tax incentives (e.g. provision of infrastructure, fast-track customs procedures, simplified legal and regulatory requirements)		
Aftercare services for foreign investors		
Presence of a well-funded and supportive investment promotion agency		
Investment policy uncertainty		

15. Which other trade and investment-related policies and/or incentives influence your firm's decisions to locate production in a foreign market?

Click or tap here to enter text.

E) Research and Development (R&D) activity

16. Please rank the top three R&D-related factors that encourage your firm to invest in foreign agri-food markets. *[The options below relate to the country/countries where your firm undertakes foreign investment]*

	Rank (1-3)
Well-developed research networks and innovation clusters	
Ease of using technology licenced from other firms	
R&D tax incentives	
Strong protection of intellectual property rights	
High government expenditure on R&D and innovation	
Presence of well-funded agricultural/food sector R&D institutions and public extension services	
Effective public-private partnerships (PPPs) in agriculture/food R&D	

17. Which other government policies and/or incentives influence your firm's decisions to invest in or undertake R&D in foreign agri-food markets?

Click or tap here to enter text.

F) Linkages with suppliers / customers

18. Does your firm have a long-term contract, alliance or partnership with any of the following types of companies in foreign markets? *[Select all that apply]*

☐ Local suppliers
☐ Foreign suppliers abroad
☐ Local buyers
☐ Foreign buyers abroad
☐ None of the above

19. Which of the aforementioned company types is of highest importance to your firm? *[Select **one** option]*

☐ Local suppliers
☐ Foreign suppliers abroad
☐ Local buyers
☐ Foreign buyers abroad
☐ None of the above

20. Please rank the top three structural factors that encourage your firm to invest in foreign agri-food markets.
[The options below relate to the country/countries where your firm undertakes foreign investment]

	Rank (1-3)
Highly integrated domestic supply chains	
Presence of an organised base of local suppliers (e.g. co-operatives, industry associations)	
Strong capabilities of domestic firms (e.g. ability to meet large orders from foreign buyers and stringent product quality standards)	
Well-developed regulatory framework for contract farming and/or system of contract enforcement	
Strong dispute resolution mechanisms (e.g. laws on mediation and arbitration)	
Compliance with private voluntary standards (e.g. ISO, Fairtrade, GlobalGAP certification)	
Adherence and commitment to implement international standards (e.g. OECD-FAO Guidance for Responsible Agricultural Supply Chains, UN Guiding Principles on Business and Human Rights)	
Business matchmaking services / linkage programmes for foreign investors	

☐ Other structural factors (please specify):

Click or tap here to enter text.

G) Other policies in the foreign market

21. To what extent do the following policies influence your firm's decision to invest in foreign agri-food markets?
[The options below relate to the country/countries where your firm undertakes foreign investment]

	1 Strong negative impact	2 Weak negative impact	3 Neutral	4 Weak positive impact	5 Strong positive impact
Government support/subsidies for agricultural production	☐	☐	☐	☐	☐
Strong environmental policies (e.g. on sustainable use of land/water/natural resources, carbon pricing, renewable fuel mandates)	☐	☐	☐	☐	☐
Flexible employment and labour market regulations	☐	☐	☐	☐	☐
Strong financial market regulations	☐	☐	☐	☐	☐
Neutral tax treatment of foreign and domestic investors	☐	☐	☐	☐	☐
Strong food regulations (e.g. pertaining to GMOs)	☐	☐	☐	☐	☐
Well-developed risk management policies and instruments (e.g. insurance, forward contracts)	☐	☐	☐	☐	☐
Strong and effective laws governing responsible business conduct (e.g. labour standards, tenure rights over natural resources, human rights, anti-corruption and integrity)	☐	☐	☐	☐	☐

22. Please rank the top three factors from the following list, in terms of the extent to which they encourage your firm to invest in foreign agri-food markets:
[The options below relate to the country/countries where your firm undertakes foreign investment]

	Rank (1-3)
Market related factors (e.g. size of economy, income levels, growth rates, distance)	
Trade policies (e.g. tariffs, non-tariff barriers, trade agreements)	
Investment policies (e.g. investment restrictions, investment incentives)	
Tax policies (e.g. corporate tax rates, tax exemptions)	
Government support/subsidies for agricultural production	
Other structural policies (e.g. competition policy, governance and institutions)	

23. Which other government policies and/or incentives influence your firm's decisions to locate production in a foreign market?

Click or tap here to enter text.

H) Additional information (optional)

24. What is the name of your firm?

Click or tap here to enter text.

25. What is your position within the firm?

Click or tap here to enter text.

26. Is your firm a publicly listed company? (i.e. freely traded on a stock exchange)
*[Select **one** option]*

☐ Yes
☐ No

27. How many years has your firm been in operation?

Click or tap here to enter text.

28. How many permanent, full-time employees does your firm have?

Click or tap here to enter text.

29. What were your firm's total sales in the last financial year, in USD million?
(If you represent *an investment fund, please enter your firm's total assets under management, in USD million).*

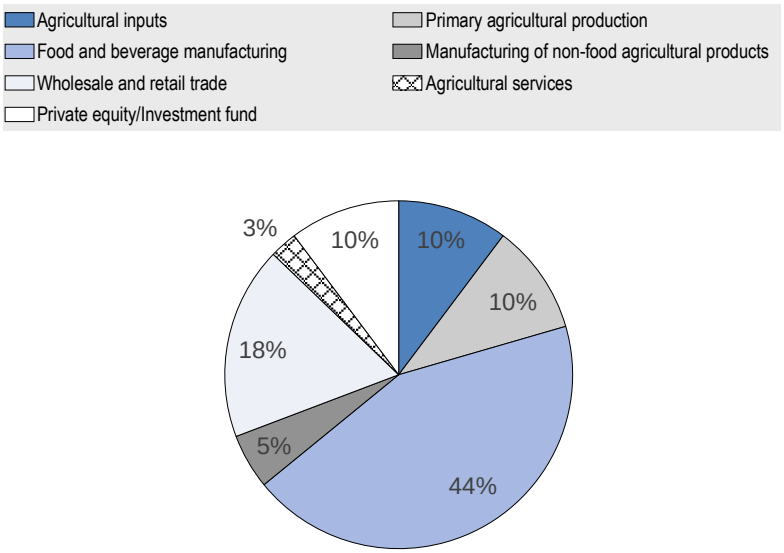
Click or tap here to enter text.

30. Can we contact you to ask further follow-up questions, if necessary?
If yes please enter your email address below:

Click or tap here to enter text.

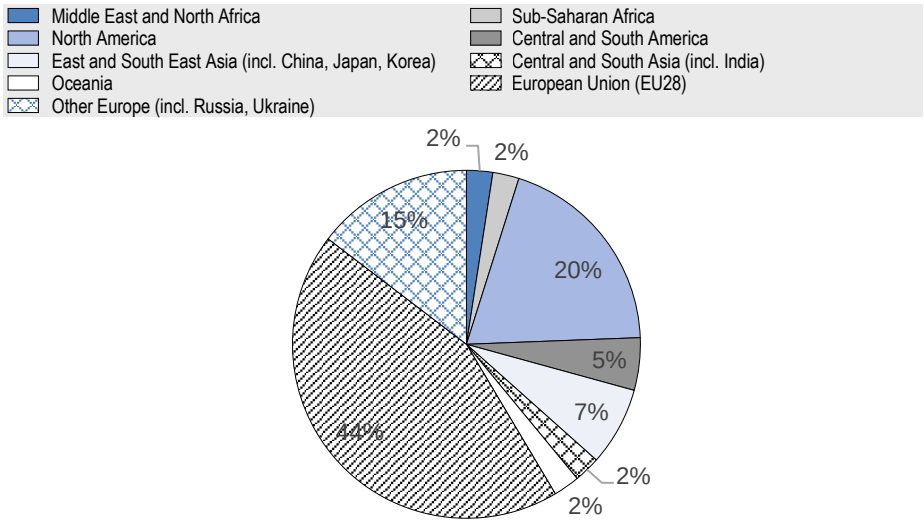
Annex E. Profile of survey respondents

Figure E.1. Breakdown of respondents by core sector of operations



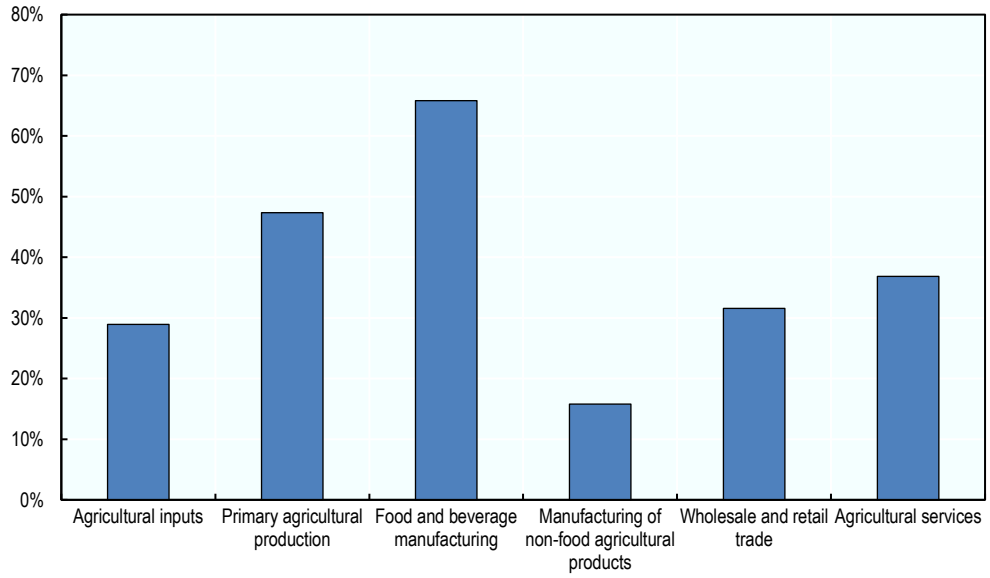
Note: Based on responses from 39 firms.
Source: OECD survey of agriculture and food firms.

Figure E.2. Breakdown of respondents by geography



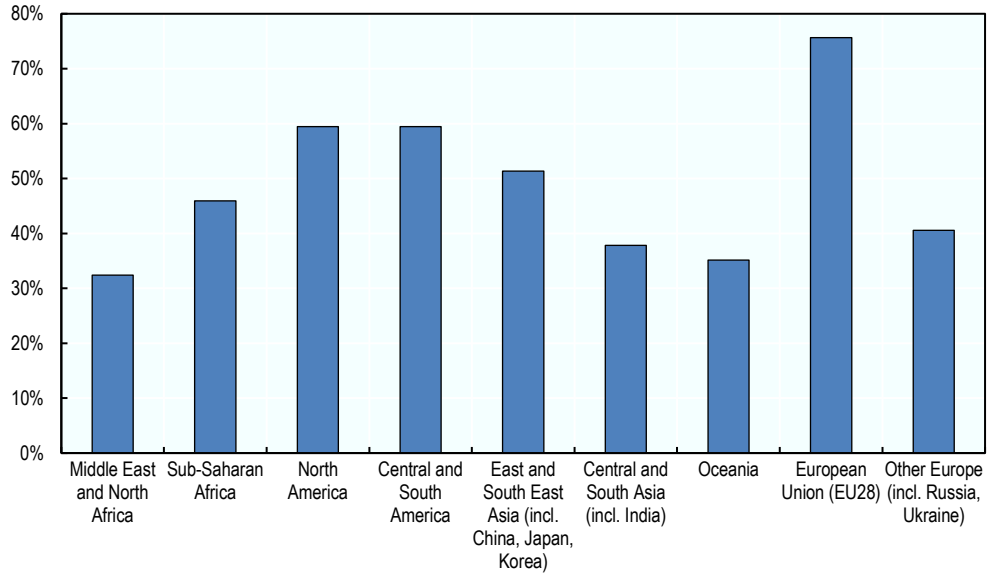
Note: Based on responses from 41 firms.
Source: OECD survey of agriculture and food firms.

Figure E.3. Sectors where respondents undertake FDI



Note: Based on responses from 38 firms.
Source: OECD survey of agriculture and food firms.

Figure E.4. Geographic regions where respondents undertake FDI



Note: Based on responses from 37 firms.
Source: OECD survey of agriculture and food firms.