

Effects of FDI on High-Growth Firms in Developing Countries

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Foreign direct investment (FDI) promotes economic growth, job creation, and poverty reduction. Countries more open to trade and investment tend to be more productive and grow faster (Dollar 1992; Harrison 1996; Frankel and Romer 1999). Policy makers seek to attract FDI to create jobs, bring in cutting-edge knowledge and technology, connect to global value chains, and diversify and upgrade their economies' production capabilities.¹ The potential transmission of knowledge between foreign firms and local enterprises is an added benefit of FDI, one that can improve the productivity of domestic enterprises and thus make economic growth more inclusive.

The effects of foreign investment on the host economy are therefore a crucial element in a country's development strategy. These FDI effects—or spillovers—on domestic firms can be positive or negative, depending on whether local firms improve or worsen their performance as a result of FDI. It can have positive effects if it brings foreign technology and frontier knowledge that, if

successfully transmitted to local firms, improves their productivity. At the same time, FDI can exert a negative effect by increasing the competition in local input and output markets, thereby undermining the performance of local firms. The balance between these two forces determine the overall effect of foreign firms on local enterprises. At the sectoral level, greater competition in product and factor markets results in the efficient reallocation of resources from less productive to more productive firms, thereby increasing sectoral productivity over the long run.²

FDI can benefit domestic firms through two main channels:³

- *Contractual linkages* between foreign firms and local suppliers that promote the formal transmission of foreign firms' knowledge and practices, which may help domestic suppliers upgrade their technical and quality standards.⁴
- The *demonstration effect*, in which domestic firms imitate foreign technologies or

managerial practices either through observation or by hiring workers trained by the foreign company.⁵

This chapter explores the role of these two transmission channels of FDI spillovers on the performance of firms across 50 sectors and 121 economies in the developing world.⁶ Employing data from the World Bank’s Enterprise Surveys, it constructs sectoral measures of the linkages and demonstration channels and examines their role in the ability of domestic firms in the sector to benefit from FDI. The analysis reveals a large variation of FDI spillovers across local firms. In line with the literature, an average firm in the developing world does not necessarily benefit from these FDI effects (Damijan and others 2013; Fons-Rosen and others 2017). It is primarily the local high-growth firms that are able to internalize FDI spillovers through both linkages and demonstration channels.⁷ For the linkages channel, an increase of 1 percentage point in the share of inputs sourced domestically by foreign firms is correlated with a 0.6 unit rise in the measure of output growth of domestic high-growth firms. For the demonstration channel, an increase of 1 percentage point in the share of foreign output in the sector is correlated with a 0.1 unit gain in output growth of high-growth firms.

This chapter therefore focuses on domestic high-growth firms, which the analysis shows benefit from FDI more than other firms. This is likely due to their higher absorptive capacity—their ability to recognize the value of new information, assimilate it, and apply it to improve production processes.⁸ High-growth firms account for a sizable share of job creation and productivity gains in developing countries. The distinctive characteristics of these firms have been the subject of study from the perspective of both individual firms interested in sales and revenue growth and policy makers interested in job creation and economic growth.

From a policy perspective, developing countries are interested in spreading the benefits of FDI to the local economy.

The evidence presented here shows that linkages programs to connect local suppliers with foreign firms can help achieve this goal. Considering the different absorptive capacities of indigenous firms and the various potential market failures is fundamental for evidence-based policy making. Particularly important is the design of programs that target high-potential suppliers and tackle specific failures, such as information asymmetries, and scale and quality constraints of domestic suppliers. Linkages programs should include a comprehensive set of interventions aimed at the supply side, the demand side, and market exchange. Compulsory local content requirements may cause more harm than good because they may discourage FDI from entering the country, thereby shutting down any channel of positive spillover effects. A comprehensive policy intervention aimed at reducing search costs and tackling constraints of both buyers and sellers is more effective than a piecemeal approach.

High-Growth Firms Are Important for Job Creation, and Are Small and Young

While the private sector is the main engine of countries’ economic growth, only a small part of the private sector—the “high-growth” firms—plays a disproportionately large role in job creation (Coad and others 2014; Haltiwanger, Jarmin, and Miranda 2016; Hsieh and Klenow 2014). Identifying them and assessing the constraints that hinder the emergence and performance of these high-growth firms is critical to realize their full potential (box 2.1).

The identification of high-growth firms in this dataset focuses exclusively on domestically owned enterprises to highlight the ability of these firms to benefit from the presence of foreign firms. The analysis uses the rate of firm-level job creation to characterize firm growth.^{9,10} In each country, high-growth firms are located in the top fifth percentile of the distribution of firm-level job growth rates

BOX 2.1**Factors Influencing High-Growth Firms: The Four-Layer Onion Framework**

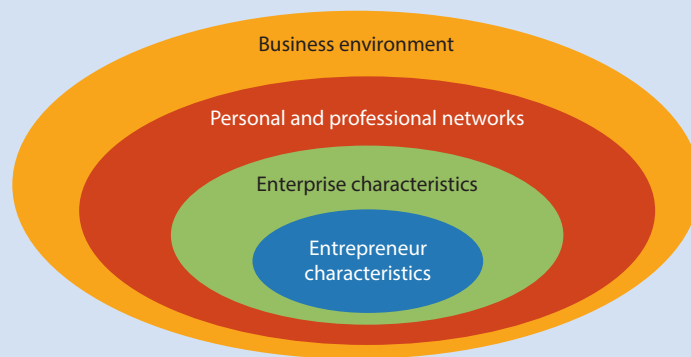
Firm performance, and hence the potential emergence of high-growth firms, is influenced by a variety of factors:

- Individual characteristics of entrepreneurs such as age, education, experience, and motivation.
- Firm-level attributes such as firm age, size, location, sector, and absorptive capacity.

- Personal and professional networks.
- The overall business environment in which firms operate.

The “four-layer onion” provides a representation of these factors (see figure B2.1.1).

FIGURE B2.1.1 The Four-Layer Onion Framework of Growth Factors



Source: Hampel-Milagrosa, Loewe, and Reeg 2015.

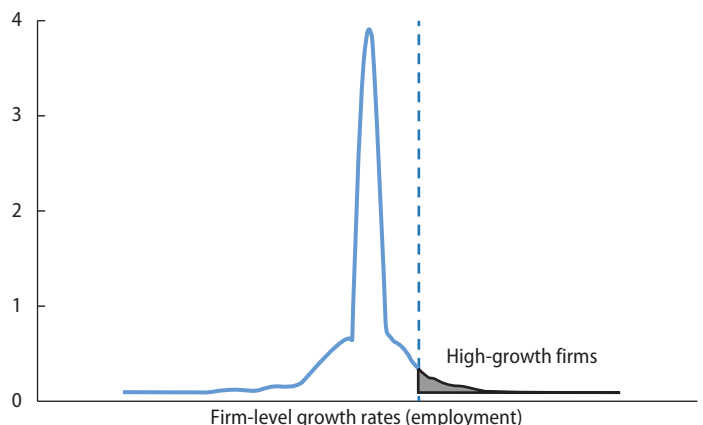
over two years. The key advantage of this method is that it establishes country-specific minimum growth rates required for firms to be classified as high-growth, thereby taking into account characteristics that support or hinder the performance of the private sector in each economy (annex 2A provides the complete list of economies and the years in which each Enterprise Survey was conducted).¹¹

The case of Indonesia—where the Enterprise Survey was conducted in 2015—illustrates the identification of high-growth firms. According to the chosen criterion, high-growth firms increased employment by at least 35.3 percent between 2012 and 2014.¹² In figure 2.1, these firms are shown in the shaded right tail of the firm growth distribution.

Applying the criterion to the sample of countries, two common characteristics of

FIGURE 2.1 High-Growth Firms Create the Most Jobs

Distribution of firm-level growth rates in Indonesia, 2012–14



Source: Computation based on data from Enterprise Surveys, the World Bank.

Note: This figure shows the distribution of firm-level mid-point growth rates for Indonesia between 2012 and 2014. The survey was conducted in 2015 and firms were asked about the total number of full-time employees the year before (2014) and three years ago (2012). The dotted line indicates the 95th percentile. The shaded area of the distribution indicates the presence of high-growth firms.

high-growth firms in the developing world emerge: they tend to be small and young. Across countries, they represent 7.9 percent of small firms, relative to 2.3 percent of large firms (figure 2.2). In 89 countries,

the median size of these firms is less than 10 employees (annex 2C). High-growth firms are also more common among young enterprises; 6.9 percent of firms younger than 10 years are high-growth while only 2.3 percent older than 50 years are high-growth (figure 2.3). The median age of high-growth firms is lower than the median age of the rest of firms in 105 countries in the sample (annex 2C).¹³

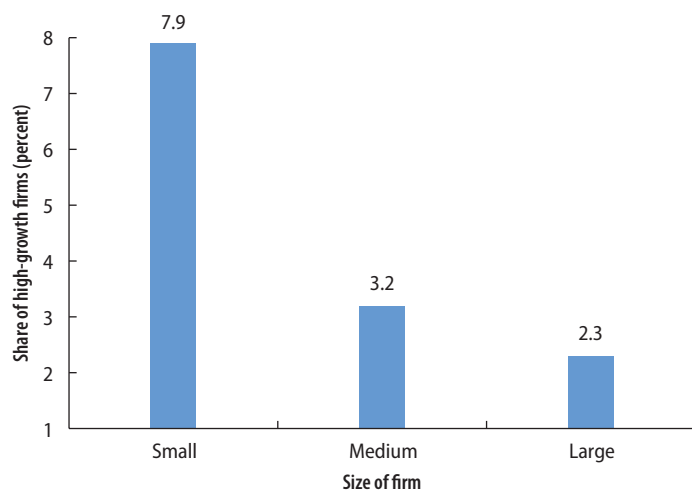
High-growth businesses in the developing world exist in all economic sectors but are more common in services than in manufacturing (table 2.1). Information and communications technology (ICT) and the construction sector show the highest shares of high-growth firms; these firms account for 8.1 percent of all firms in the ICT sector and 6.6 percent of all firms in the construction sector.¹⁴ In terms of output and employment growth, high-growth firms in services outperform those in manufacturing. Overall, high-growth firms in services grew in terms of employment by 133 percent (versus 127 percent in manufacturing) and increased sales by 40 percent over the previous two years (versus 38 percent in manufacturing).

Many variables determine the presence of high-growth firms across sectors in developing economies. As noted above, these elements range from the characteristics of the entrepreneur to the regulatory and institutional framework in which the firm operates. Key determinants also vary across the life cycle of the firm, but the process of internationalization is usually a central element in the firms' success (box 2.2).

In sum, high-growth firms are few in number but critical for job creation. The evidence indicates that they are young, small, present across all economic activities, and diverse in terms of the factors that determine their performance. Their strong performance indicates their superior capabilities relative to other firms in the economy facing the same constraints on operations and growth, which enable them to benefit from the presence of multinational corporations (MNCs).

FIGURE 2.2 High-Growth Firms Tend to Be Small...

Share of high-growth firms, by size bins

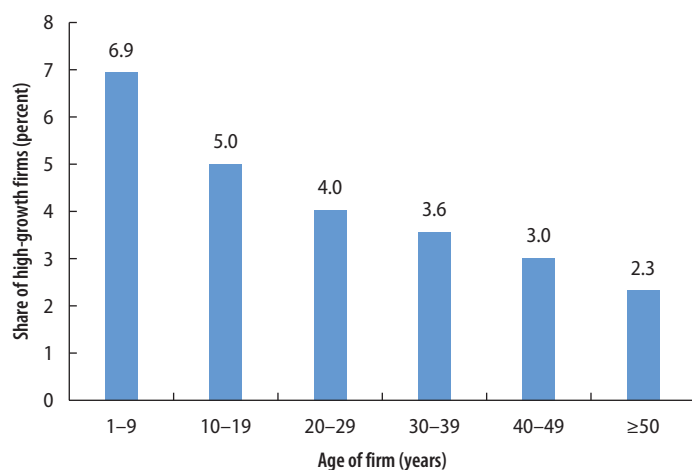


Source: Computation based on data from Enterprise Surveys, the World Bank.

Note: This figure shows the number of high-growth firms as a share of the total number of firms, by size bins. Small firms have fewer than 20 employees, medium firms have 20–100 employees, and large firms have more than 100 employees.

FIGURE 2.3 ... and Young

Share of high-growth firms, by age bins



Source: Computation based data from Enterprise Surveys, the World Bank.

Note: This figure shows the number of high-growth firms as a share of the total number of firms, by age bins.

TABLE 2.1 High-Growth Firms Appear in All Economic Sectors*Firm-level employment and output growth across sectors*

ISIC codes—sector	High-growth firms [1]	Rest of firms [2]	Share of high-growth firms in the sector [3] = [1]/([1] + [2]), percent	High-growth firms		Rest of firms	
				Employment growth (percent)	Output growth (percent)	Employment growth (percent)	Output growth (percent)
Manufacturing	1,608	27,188	5.6	127	38	0	14
17—Textiles	158	2,414	6.1	124	43	0	13
29—Machinery and equipment	123	1,972	5.9	100	33	0	15
18—Apparel and fur	226	3,574	5.9	141	40	0	14
28—Metal products	180	2,938	5.8	150	47	0	17
15—Food products and beverages	393	6,508	5.7	133	35	0	14
36—Furniture	114	1,927	5.6	150	52	0	15
24—Chemicals	150	2,789	5.1	132	35	0	17
26—Nonmetallic mineral products	144	2,684	5.1	130	34	0	11
25—Rubber and plastic	120	2,382	4.8	100	33	0	14
Services	1,479	24,446	5.7	133	40	0	13
64 & 72—ICT	116	1,319	8.1	115	53	9	17
45—Construction	173	2,463	6.6	115	53	0	12
50–52—Wholesales and retail trade	929	14,845	5.9	133	39	0	13
60–63—Transport and storage	109	2,251	4.6	150	34	0	11
55—Hotels and restaurants	152	3,568	4.1	130	33	0	9

Source: Computation based on data from Enterprise Surveys, the World Bank.

Note: This table shows the total number of firms by type and their associated employment and output growth across economic sectors. To reduce clutter, sectors with fewer than 100 enterprises have been dropped. Sectors are ranked by the presence of high-growth firms (column [3]). The data use the revision 3.1 of the International Standard Industrial Classification (ISIC). For output and employment, the table presents the median standard growth rate within each cell. ICT = Information and communications technology.

BOX 2.2

AAA Growers: A High-Growth Firm in Kenya

AAA Growers is a company that produces vegetables and flowers in Kenya—and is the largest commercial grower and exporter of chilies in the nation. The company started with 50 employees in 2000 and now owns five farms that employ some 4,000 during peak seasons. The workforce consists of rural workers, 60 percent of whom are women. The main objective of AAA Growers since its inception is to produce vegetables to export, primarily to the U.K. market. Currently, about 98 percent of its production is sold in international markets.

The management team cited three elements as central to the company's success:

- *Family support to set up the business.* Family capital was used to set up and maintain low-scale operations during the company's first three years. This period did not generate positive margins but was central to learning about the dynamics of different crops, the requirements to export, and the need to build professional networks.

box continues next page

BOX 2.2**AAA Growers: A High-Growth Firm in Kenya (continued)**

- *Connection with foreign buyers.* Establishing a commercial presence in international markets was challenging. The owners employed family connections to identify potential buyers in the U.K. market and secured small orders with the goal of building long-term professional relationships. The first three to five years of operations of the company were dedicated mostly to identifying and securing international buyers.
- *IFC funding to set up large-scale operations.* An International Finance Corporation (IFC) loan

allowed AAA Growers to invest in state-of-the-art equipment and installations, which helped not only to expand output but also to comply with stringent production and agricultural standards in the European market.

After growing at a high rate over the last 10 years, the company is now consolidating. The top priority for management is to stabilize the company's operations to ensure sustainable expansion.

High-Growth Firms Benefit from FDI Mainly through the Linkages Channel

This section looks at the two channels through which FDI affects domestic enterprises, with a focus on high-growth firms. The linkages channel is characterized by direct contractual arrangements in which domestic firms become suppliers of foreign firms. The demonstration channel enables domestic firms to replicate foreign technologies or management practices either through observation or by hiring workers trained by foreign firms. Thus, the stronger the presence of FDI in the sector, the more opportunities for the demonstration channel to positively affect local firms.

But while foreign firms bring technology and frontier knowledge that can improve the performance of indigenous firms, they may also increase competitive pressures in the host economy, which could hurt some local businesses (Alfaro and Chen, forthcoming; Fons-Rosen and others 2017). The relative magnitude of these two forces determines the ultimate effect on domestic firms. At the sectoral level, however, more competition promotes the efficient reallocation of factors of production from low-productivity to high-productivity firms, thereby

increasing sectoral productivity over the long term.

Because all firms in the same sector face the same degree of competitive pressures posed by the presence of the foreign firm, their ability to ultimately benefit from FDI hinges on whether they can capture positive spillovers through the linkages and demonstration channels.¹⁵ This ability, in turn, depends on their absorptive capacity—the ability to recognize the value of new information, assimilate it, and apply it to improve production processes. By virtue of their fast growth trajectory, which may reflect high absorptive capacity and productivity, high-growth firms may be better able to capture positive spillovers than other local firms.

Using information from the World Bank's Enterprise Surveys, the team constructed indicators of the linkages and demonstration channels across 50 sectors and 121 developing countries. Following the literature, the linkages channel is captured by the average share of inputs of domestic origin that foreign firms acquire in the host country.¹⁶ The demonstration channel is measured as the share of foreign output in total output (see Blalock and Gertler 2009; Farole and Winkler 2015; and annex 2D). These measures represent the importance of the FDI spillover channels within country-sector observations and,

therefore, capture the potential for intra-industry spillover effects.¹⁷

The relevance of the transmission channels of FDI spillovers varies across sectors and countries. On average, linkages are more apparent in manufacturing than in services (table 2.2). In manufacturing, Asia shows the highest prevalence of linkages. In East Asia, for example, foreign manufacturing firms source 70 percent of the inputs locally, relative to the average for the rest of the world of about 60 percent. Demonstration effects are relatively balanced between manufacturing and services; foreign firms account broadly for 20 percent to 30 percent of sectoral output across sectors and regions.

The sole presence of linkages and demonstration channels does not guarantee that domestic enterprises benefit from FDI. Domestic firms can become suppliers of foreign enterprises but may be incapable of using the information acquired to improve their production techniques. Arguably, the transmission of FDI benefits to local firms via the demonstration channel can be even more challenging, given the absence of a direct link between the foreign and domestic enterprises. To examine the relationship between domestic firms' performance and the two channels of FDI spillover, the analysis employs a regression framework to investigate whether firms operating in sectors with high potential for FDI spillover effects—as indicated by the presence and importance of the linkages and demonstration channels—display a higher rate of output growth. The analysis differentiates between high-growth firms and others. The regression controls for other variables relevant to firm growth, specifically, age, export status, and labor productivity (annex 2D).

The results indicate that, on average across firms and countries, FDI benefits are not uniformly transmitted to local firms. While both linkages and demonstration channels are positively correlated with output growth at the firm level, they are not statistically different from zero. In other words, the average firm in the developing world is unable to benefit from the presence of foreign companies. Two self-enforcing mechanisms

explain this: First, the competition that foreign firms bring to the domestic market outweighs the FDI benefits that the average firm internalizes. Second, the low absorptive capacity of the average firm prevents it from capturing more FDI benefits.¹⁸

Contrary to these aggregate results, the analysis finds that high-growth firms are able to capture the benefit of FDI in their markets through both channels. The results are particularly significant for the linkages channel, where an increase of 1 percentage point in the share of inputs that are sourced domestically by foreign firms is associated with a 0.6 unit gain in the measure of output growth of high-growth firms (figure 2.4).¹⁹ The demonstration effect is also positively related to the performance of high-growth firms, albeit its impact is lower: an increase of 1 percentage point in the share of foreign output in the sector is associated with a 0.1 unit rise in the output growth of high-growth firms.²⁰ The impact of these channels on the performance of non-high-growth firms is also positive but statistically insignificant.²¹

High-growth firms are better able to internalize foreign technologies and processes to improve their productivity and counterbalance FDI's competitive effect. From a policy perspective, increasing absorptive capacity in domestic enterprises is therefore key to maximizing the benefits of FDI for job creation.

The importance of FDI for the performance of local high-growth firms varies across regions. Employing the same empirical framework, the analysis estimates the role of the linkages and the demonstration channels across six regions of the world (figure 2.5 and annex 2D). The analysis yields three key messages:

- High-growth firms in Sub-Saharan Africa do not internalize FDI spillovers. Since the lion's share of FDI going to Africa is directed to natural resources, this result may indicate that the potential of this type of investment to generate positive spillovers is limited.
- Europe and Central Asia is an outlier because the demonstration channel outweighs the linkages channel. In fact,

TABLE 2.2 Linkages Are More Important in Manufacturing while Demonstration Effects Are Balanced across Sectors

Average size of linkages and demonstration channels across sectors and regions

ISIC codes—Sector	East Asia and Pacific		Europe and Central Asia		Latin America and the Caribbean		Middle East and North Africa		South Asia		Sub-Saharan Africa	
	Linkages	Demonstration	Linkages	Demonstration	Linkages	Demonstration	Linkages	Demonstration	Linkages	Demonstration	Linkages	Demonstration
Manufacturing	0.7	0.3	0.6	0.2	0.6	0.3	0.6	0.2	0.8	0.1	0.6	0.4
15—Food products and beverages	0.8	0.3	0.7	0.2	0.7	0.4	0.7	0.2	0.8	0.1	0.7	0.5
17—Textiles	0.8	0.3	0.7	0.2	0.6	0.3	0.7	0.1	0.8	0.1	0.5	0.5
18—Apparel and fur	0.6	0.4	0.5	0.2	0.7	0.2	0.4	0.3	0.6	0.0	0.6	0.2
24—Chemicals	0.7	0.3	0.6	0.4	0.5	0.4	0.5	0.2	0.8	0.1	0.4	0.4
25—Rubber and plastic	0.7	0.1	0.5	0.2	0.4	0.5	0.6	0.1	0.9	0.0	0.4	0.5
26—Nonmetallic mineral products	0.8	0.4	0.7	0.3	0.7	0.2	0.8	0.2	1.0	0.2	0.7	0.4
28—Metal products	0.6	0.2	0.6	0.1	0.5	0.5	0.6	0.2	0.9	0.0	0.5	0.4
29—Machinery and equipment	0.8	0.2	0.6	0.2	0.7	0.5	0.6	0.4	0.9	0.1	0.6	0.3
36—Furniture	0.7	0.3	0.4	0.1	0.8	0.2	0.8	0.1	0.6	0.0	0.6	0.2
Services	0.3	0.2	0.0	0.1	0.3	0.3	0.7	0.2	0.0	0.0	0.4	0.4
45—Construction	—	0.1	0.0	0.1	0.7	0.2	0.7	0.2	—	0.0	0.7	0.4
50—52—Wholesale and retail trade	0.7	0.2	0.0	0.2	0.7	0.3	0.3	0.2	0.0	0.0	0.5	0.3
55—Hotels and restaurants	—	0.2	—	0.2	—	0.3	0.9	0.1	0.0	0.1	0.4	0.5
60—63—Transport and storage	0.7	0.2	0.0	0.1	—	0.3	1.0	0.2	0.0	0.0	0.6	0.3
64 & 72—IT and communications	0.2	0.1	0.0	0.2	—	0.4	0.6	0.2	—	0.1	—	0.3

Source: Computation based on data from Enterprise Surveys, the World Bank.

Note: This table shows the average value of the linkages and the demonstration effects across economic sectors and world regions. For the linkages channel, each figure shows the average share of domestically sourced input for foreign firms within the sector. For the demonstration channel, each figure shows the average share of foreign output as a percentage of total sectoral output.

— = data unavailable.

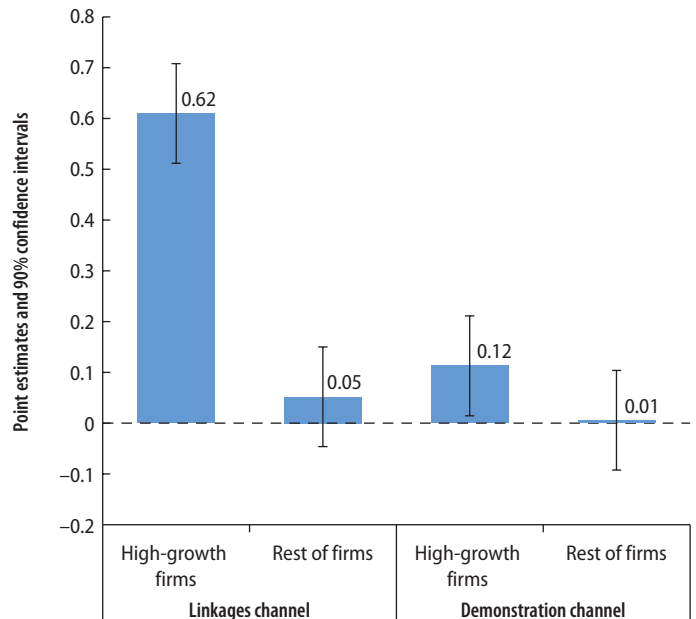
the role of the demonstration channel is much larger than in other regions.

- The linkages channel is the key engine for FDI spillovers to high-growth firms in Latin America and the Caribbean, East Asia and Pacific, South Asia, and the Middle East and North Africa.

The linkages channel is more important than the demonstration channel for leveraging FDI spillovers in both manufacturing and services for high-growth firms. In services, both linkages and demonstration channels transmit FDI benefits (figure 2.6 and annex 2D). High-growth firms in manufacturing, however, benefit from FDI only through linkages. The findings indicate that a 1 percentage point increase in linkages is associated with a 0.7 unit rise in the measure of sales growth of high-growth firms in manufacturing, and a 0.5 unit gain in service sectors. In services, an increase of 1 percentage point in the demonstration channel is associated with a 0.2 unit increase in the measure of sales growth of domestic high-growth firms. The demonstration channel is not statistically significant for the manufacturing sector’s high-growth firms.

FIGURE 2.4 High-Growth Firms Benefit from the Presence of Foreign Firms

Average impact of FDI spillovers on firm growth, by firm type

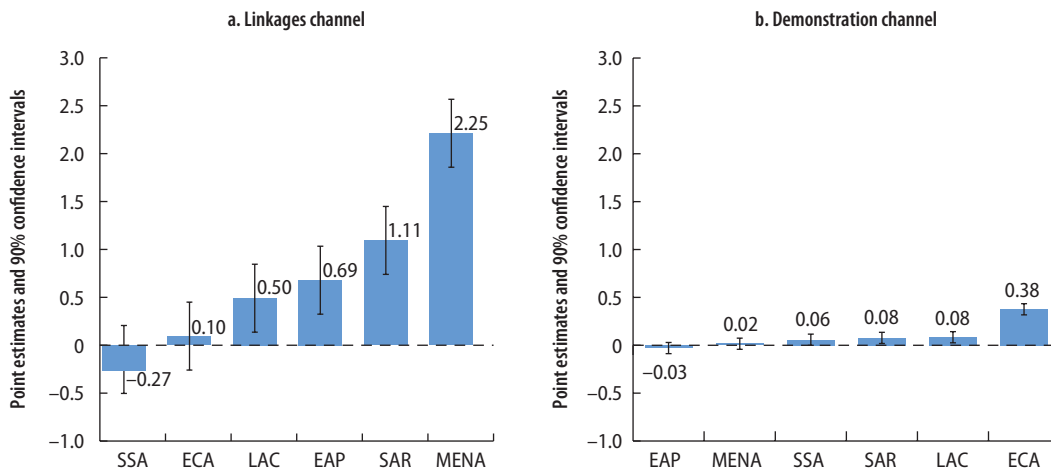


Source: Computation based on data from Enterprise Surveys, the World Bank.

Note: This figure shows the estimated coefficient of the linkages and demonstration channels on high-growth firms and the rest of businesses in a sample of 121 countries. Vertical lines capture 90 percent confidence intervals. The estimates correspond to the estimation shown in column 7 in table 2D.1 in annex 2D. FDI = foreign direct investment.

FIGURE 2.5 The Linkages Channel More Efficiently Transmits FDI Benefits in Nearly All Regions

FDI spillovers to high-growth firms, by region

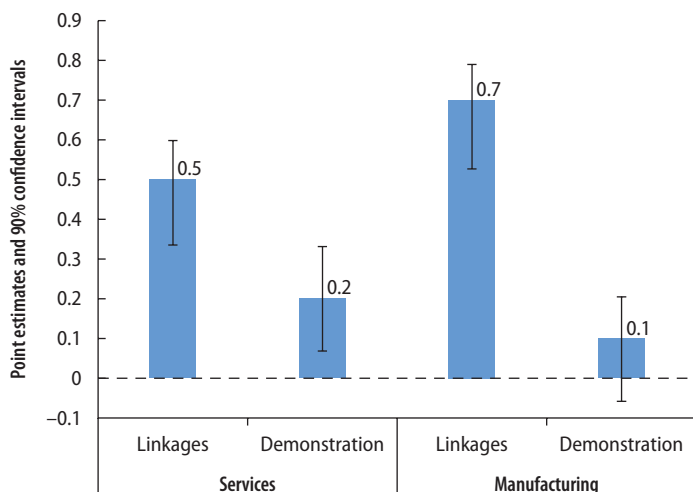


Source: Computation based on data from Enterprise Surveys, the World Bank.

Note: These figures show the estimated coefficient of the role of the channels for foreign direct investment (FDI) spillover effects on high-growth firms, by region. Vertical lines capture 90 percent confidence intervals. Regression results are presented in annex 2D. The regions are EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa.

FIGURE 2.6 High-Growth Firms Benefit from FDI Mainly through the Linkages Channel, Both in Services and Manufacturing

Average impact of spillover effect on high-growth firms, by sector



Source: Computation based on data from Enterprise Surveys, the World Bank.

Note: This figure shows the estimated coefficient of the role of foreign direct investment (FDI) spillovers on high-growth firms in manufacturing and services. Vertical lines capture 90 percent confidence intervals. Regression results are presented in annex 2D.

Policies to Maximize the Gains from FDI: Promoting Linkages for Development

While FDI may result in negative distributional effects for particular groups of local firms, countries open to multinational production experience aggregate productivity gains. These benefits can be accrued via positive spillovers for domestic enterprises and the reallocation of factors of production from less productive firms to more productive firms. From a policy perspective, governments are advised to design policies to reduce the adjustment cost of the reallocation process and increase the ability of local enterprises to internalize positive spillovers from the presence of foreign firms. Policies and programs that can increase the absorptive capacities of local enterprises—mainly by promoting domestic linkages—will maximize the potential gains from FDI. While the analysis focuses on connecting domestic firms to MNCs, these policies can be tailored to also support linkages between domestic suppliers and large buyers.

Policy interventions aimed at strengthening linkages programs should tackle specific market failures. The most common failure preventing the development of linkages is asymmetry of information, which increases search costs for both buyers and sellers (Monge-González and Rodríguez-Álvarez 2013). Foreign companies may find it difficult to identify potential local suppliers while domestic enterprises may struggle to identify potential contracting opportunities with foreign enterprises. Another common failure is the small size and scale of domestic suppliers who may find it impossible to respond to large orders from MNCs, yet find it too risky to invest in production expansion. Additionally, domestic enterprises may not have the production standards required to meet minimum quality requirements of foreign enterprises.

Linkages programs should consider a mechanism to identify and support high-potential local firms in becoming suppliers of foreign firms. The evidence presented in this chapter shows that not all domestic firms are equal in terms of their ability to benefit from FDI. High-growth firms have the absorptive capacity allowing them to internalize FDI spillovers that, in turn, improve their productivity and support job creation. There is no empirical basis for setting up linkages programs to support the broad group of small- and medium-sized enterprises (SMEs), yet such programs are rather common in many economies.²²

Linkages programs should include a comprehensive set of interventions to tackle constraints at the *market level*, the *supply side* (domestic firms), and the *demand side* (foreign company). A comprehensive approach is more effective than a piecemeal one. Interventions at the market level seek to reduce search costs and facilitate matchmaking. For example, they usually tackle information asymmetries by providing information about business opportunities for both buyers and sellers. The most common intervention is the creation of supplier databases that contain contact details and the menu of goods and services offered by potential domestic suppliers. Matchmaking services among buyers and sellers are another common practice for

promoting business-to-business transactions. They include organizing trade fairs, supporting supplier audits, and organizing site visits, missions, exhibitions, and seminars.

Supply-level interventions seek to improve the capacity of domestic firms to meet minimum scale and quality standards expected by MNCs. Two common policy instruments are relevant. The first set of policies is aimed at improving firm-level productivity via the creation of supplier development programs that provide targeted training support aligned with buyer requirements. These programs are often based on a partnership between domestic enterprises and foreign firms, and may also include local educational institutions (for example, universities and colleges) and consulting firms in the form of joint research projects, customized training programs, and help in identifying local strategic partners. These

policies may also include more broad-based entrepreneurship development and training programs to support local skills development as well as help in obtaining international quality certifications (box 2.3). The second set of policies leverages and encourages existing business groups (business clusters, for instance) to tackle their capacity constraints. The rationale is that domestic firms acting in a coordinated manner can provide the scale expected by foreign firms, thus allowing the cluster to jointly fulfill large orders from foreign companies.

Demand-level interventions are directed at foreign firms with the goal of encouraging their increased use of domestic inputs. Financial and tax incentives are the most common policy tool. Examples include exempting foreign firms from value added taxes to encourage their use of local rather than imported inputs, treating expenditures incurred in the creation of

BOX 2.3

Chile's Supplier Development Program

Chile's Supplier Development Program (SDP) was launched by the Chilean Economic Development Agency (*Corporación de Fomento de la Producción de Chile*; CORFO) in 1998. The program is aimed at improving and stabilizing the commercial linkages already existing between domestic suppliers and their large-firm customers to achieve higher levels of adaptability and guarantee the quality of goods and services at different stages of production. By requiring that a commercial relationship be already established among firms, the program sought to ensure that suppliers were local firms with high potential. The SDP provides partial funding to strengthen the management of local businesses through specialized services, professional advice, training, and technology transfers.

For a large firm to be eligible to participate in the program and receive a subsidy to train the local firms that make up its supply chain, its net annual sales had to be greater than or equal to \$42.6 million in August 2010. Each project must include at least 20 domestic firms (in the agriculture and forestry sector), or a minimum of 10 in other economic activity sectors. After the project is approved, the program is implemented in two stages: a diagnostic stage and a development

stage. The diagnostic stage lasts up to six months and identifies areas of intervention that the sponsor (that is, the large firm) wishes to develop with its suppliers. The result is a development plan designed by a consultant or consulting firm. CORFO pays for up to 50 percent of its cost with a ceiling of \$16,000. The development stage is the implementation of the development plan and can last up to three years. CORFO pays for up to 50 percent of the cost of this stage with an annual ceiling of \$110,000 (or \$5,000 per supplier firm). CORFO assesses annually the renewal of the project financing depending on the implementation progress. The implementation of the development plan is the responsibility of the sponsor firm and can be carried out by a consultant or consulting firm or by the sponsor's in-house staff.

A rigorous impact evaluation has shown that the SDP not only increased sales, employment, and the sustainability of suppliers, but also improved the sales of large firms and raised their probability of becoming exporters (Arráiz, Henríquez, and Stucchi 2013). The positive effect on suppliers appeared one year after the firms enrolled in the program while the impact on large firms appeared after two years.

linkages (for example, training or research and development activities) as tax-deductible expenses, incentives for training programs of local suppliers, and co-financing skills development activities (see box 2.3). While compulsory local content requirements are sometimes used, they can discourage the entry of foreign investors and, more important, preclude altogether the entry of foreign technology that could itself be the source of positive spillover effects. In practice, these requirements are also often circumvented by foreign companies, rendering them largely ineffective (Echandi, Krajcovicova, and Qiang 2015; Hufbauer, Schott, and Cimino-Isaacs 2013).

Key elements for creating an enabling policy environment for linkages also include a suitable lead agency, proper coordination mechanisms across institutions, and strong stakeholder engagement. The lead agency should have political clout and a clear mandate to coordinate among the different agencies involved in private sector development. The lead agency, typically associated with the Ministry of Commerce and Industry, should organize the representatives of different agencies involved in supporting linkages programs, which can include the investment promotion agency, the regulators of special economic zones, private sector representatives, the agency to support small and medium enterprises and industry associations. Clear operating rules should govern the coordination mechanism among them to ensure policy coherence along the different parts of the program. A key component of the linkages program is also the constant interaction with the private sector, including feedback mechanisms. Designing and implementing rigorous impact evaluation of the linkages programs are useful for basing policy design and decisions on evidence.

Last, flexible labor markets and better access to finance remain key constraints on the ability of domestic firms to internalize FDI spillovers. A flexible labor market facilitates the movement of managers and skilled workers between foreign and local companies. The shift of experienced workers from foreign firms to domestic enterprises could be the channel through which spillovers are accrued

by indigenous firms (the demonstration channel). These workers can also launch successful business ventures on their own.

Lack of access to finance often limits the ability of local firms to strengthen their productivity and, therefore, improve their chances of becoming suppliers of foreign enterprises. Various types of incentives can financially and legally support local firms in obtaining finance to fund further investment in their human capital, technological and managerial capacities; and lower the risks of linkages. Some of these interventions include loans, grants, guarantees, and legal protection against unfair contractual arrangements.

Conclusion

Foreign investors bring a wide range of knowledge and know-how with the potential to bring positive spillovers for the host economy. These benefits, however, are not guaranteed. Indeed, foreign firms may also generate competitive pressures in the local economy to the detriment of some local firms. The balance between these potentially positive and negative impacts determines the overall effect of foreign firms on local enterprises.

Over the long run, competitive pressures encourage the efficient reallocation of factors within sectors, thereby increasing sectoral productivity. Foreign knowledge and technology can be transferred to domestic firms through two main channels. The first is *linkages* between foreign firms and domestic suppliers. The second is the *demonstration* channel through which domestic firms imitate and replicate foreign technologies and management practices in their own production processes.

Employing a firm-level dataset for 121 developing economies, this chapter evaluates the role of these channels in supporting the performance of local firms across the developing world. It finds that high-growth firms internalize positive spillover effects mainly through the linkages channel. This points to their superior absorptive capacities, which make them ideal targets for policy interventions aimed at maximizing the benefits of FDI in the local economy.

Governments can implement an array of policies to maximize the potential for FDI spillover. Government interventions should seek to offset specific market failures, which usually take the form of information asymmetries or the small scale and low quality of domestic firms. Linkages programs should consider a mechanism to identify domestic suppliers with potential to connect with foreign firms. Supplier databases and matchmaking services are the most common tools to promote linkages. Supplier development programs and support for cluster development are interventions that seek to improve the capacity of domestic firms to connect to foreign firms. Financial and tax incentives are also used to encourage the use of domestic inputs by foreign enterprises. A flexible labor market can go a long way to support workers' movement from foreign firms into the domestic economy.

More policy-oriented research is needed to better understand the role of FDI on the performance of domestic high-growth firms. One aspect is the long-term consequences of FDI spillovers, particularly on productivity, innovation, and the ability of high-growth firms to create better jobs. Another aspect that merits further study is the different potential of FDI spillovers that different types of FDI bring to developing countries. Reyes (forthcoming) finds that FDI embedded in global value chains may have higher potential to generate FDI spillovers than FDI that seeks to serve mostly the domestic market.

But regardless of the distributional impact of foreign firms on domestic businesses, countries open to multinational production tend to experience aggregate productivity gains. These benefits are accrued through spillover effects on domestic firms and the reallocation of factors of production from less productive firms to more productive firms.

Annex 2A. Economies Included in the Analysis

East Asia and Pacific	Cambodia (2016), China (2012), Fiji (2009), Indonesia (2015), Lao PDR (2016), Malaysia (2015), Micronesia, Fed. Sts. (2009), Mongolia (2013), Myanmar (2014), Papua New Guinea (2015), Philippines (2015), Samoa (2009), Solomon Islands (2015), Thailand (2016), Timor-Leste (2015), Tonga (2009), Vanuatu (2009), Vietnam (2015)
Europe and Central Asia	Albania (2013), Armenia (2013), Azerbaijan (2013), Belarus (2013), Bosnia and Herzegovina (2013), Bulgaria (2013), Macedonia, FYR (2013), Georgia (2013), Hungary (2013), Kazakhstan (2013), Kosovo (2013), Kyrgyz Republic (2013), Moldova (2013), Montenegro (2013), Romania (2013), Serbia (2013), Tajikistan (2013), Turkey (2013), Ukraine (2013), Uzbekistan (2013)
Latin America and the Caribbean	Argentina (2010), Belize (2010), Bolivia (2010), Brazil (2009), Colombia (2010), Costa Rica (2010), Dominica (2010), Dominican Republic (2010), Ecuador (2010), El Salvador (2010), Grenada (2010), Guatemala (2010), Guyana (2010), Honduras (2010), Jamaica (2010), Mexico (2010), Nicaragua (2010), Panama (2010), Paraguay (2010), Peru (2010), St. Lucia (2010), St. Vincent and the Grenadines (2010), Suriname (2010), Venezuela, RB (2010)
Middle East and North Africa	Djibouti (2013), Egypt, Arab Rep. (2013), Iraq (2011), Jordan (2013), Lebanon (2013), Morocco (2013), Tunisia (2013), West Bank and Gaza (2013), Yemen, Rep. (2013)
South Asia	Afghanistan (2014), Bangladesh (2013), Bhutan (2015), India (2014), Nepal (2013), Pakistan (2013), Sri Lanka (2011)
Sub-Saharan Africa	Angola (2010), Benin (2009), Botswana (2010), Burkina Faso (2009), Burundi (2014), Cameroon (2009), Cabo Verde (2009), Central African Republic (2011), Chad (2009), Congo, Dem. Rep. (2013), Congo, Rep. (2009), Côte d'Ivoire (2009), Eritrea (2009), Ethiopia (2015), Gabon (2009), Gambia, The (2006), Ghana (2013), Guinea (2006), Guinea-Bissau (2006), Kenya (2013), Lesotho (2009), Liberia (2009), Madagascar (2013), Malawi (2014), Mali (2010), Mauritania (2014), Mauritius (2009), Mozambique (2007), Namibia (2014), Niger (2009), Nigeria (2014), Rwanda (2011), Senegal (2014), Sierra Leone (2009), South Africa (2007), South Sudan (2014), Sudan (2014), Swaziland (2006), Tanzania (2013), Togo (2009), Uganda (2013), Zambia (2013), Zimbabwe (2011)

Source: World Bank Enterprise Survey.

Note: This table presents the economies included in the analysis using the World Bank Enterprise Survey data. The year in which the survey was implemented in each country is in parentheses. The information was accessed on September 8, 2016.

Annex 2B. Measuring Firm Growth

When characterizing firm performance, there are at least three issues that need to be considered: the indicator of growth, the measure of growth, and the study period.

The indicator of growth refers to the variable over which growth is observed. The most commonly used indicators in the high-growth firm literature are sales and number of employees (Daunfeldt, Elert, and Johansson 2014). Because we are interested in the role of high-growth businesses in job creation, we use the number of permanent, full-time employees of the firm as our growth indicator.

The number of possible indicators for measuring firm-level employment growth is ample. The two most basic approaches are the absolute and relative changes in the indicator of growth. The first one examines the simple difference in employment between two points in time while the second presents this difference relative to the initial size of the firm. These two measures can lead to different results. Almus (2002) and Daunfeldt, Elert, and Johansson (2014) show that measures of absolute growth are biased toward larger firms, while measures of relative growth favor small firms. To reduce these biases, we employ

the midpoint growth rate, a measure proposed by Davis, Haltiwanger, and Schuh (1998) that uses absolute changes relative to the *average* size of the firm across the period of time considered in the study. This measure is formally defined as follows:

$$g_{i,t} = \frac{emp_{i,t} - emp_{i,t-2}}{\frac{1}{2}(emp_{i,t-2} + emp_{i,t})},$$

where $emp_{i,t}$ refers to total number of permanent, full-time employees that firm i reports in year t . By construction, this growth rate is symmetric around zero and bounded between -2 and 2 . It is also monotonically related to the conventional growth rate measure ($G_{i,t}$), and it approximates the latter for small growth rates. Both growth measures are

linked by the following identity: $G_{i,t} \approx \frac{2g_{i,t}}{(2 - g_{i,t})}$

The underlying statistical properties of this growth rate are discussed in detail in Törnqvist, Vartia, and Vartia (1985).

The time period of study of our analysis is two years. The surveys ask firms about total employment during the last fiscal year and in the three previous fiscal years. Three- or four-year periods are used in most studies examining high-growth firms, although some studies have used shorter periods (Coad and others 2014; Reyes, Roberts, and Xu 2017).

Annex 2C. Median Size and Age of High-Growth Firms and Rest of Businesses

	High-growth firms		Rest of firms		High-growth firms		Rest of firms		
	Employment	Age	Employment	Age	Employment	Age	Employment	Age	
Afghanistan	6	7	12	9	Liberia	3	8	6.5	7
Albania	3	10	9	12	Macedonia, FYR	5.5	8	9	16.5
Angola	9	9	15	10	Madagascar	7.5	11	12	12
Argentina	10	15	36	28	Malawi	6	14.5	15	16
Armenia	6.5	8	18	13	Malaysia	13.5	18	32	17
Azerbaijan	10	15	16	12	Mali	4	12	10	10
Bangladesh	20	17	26	18	Mauritania	7	16	19.5	14
Belarus	8	8	17	15	Mauritius	5	5	15	16
Belize	9.5	20	16	15	Mexico	6.5	12	44	20

table continues next page

	High-growth firms		Rest of firms			High-growth firms		Rest of firms	
	Employment	Age	Employment	Age		Employment	Age	Employment	Age
Benin	3	6	7	14	Micronesia, Fed. Sts.	2.5	3.5	10	16
Bhutan	5.5	7	13	15	Moldova	8	13	15	13
Bolivia	8	15	35	23	Mongolia	10	10.5	15	12
Bosnia and Herzegovina	12.5	13	15	16	Montenegro	7	12	10	15
Botswana	6	7	20	14	Morocco	7.5	15	30	18
Brazil	5	16	25	18	Mozambique	3.5	7	10	12
Bulgaria	5	11	15	17	Myanmar	10	10	11	14
Burkina Faso	8	6	10.5	12	Namibia	3	6	12	9
Burundi	10	4.5	16	12	Nepal	3.5	10.5	12	15
Cabo Verde	4.5	6.5	19.5	13	Nicaragua	6	18	24	19
Cambodia	3.5	14	15	13	Niger	4	6	14	11
Cameroon	10	12	20	16	Nigeria	4	14	9	14
Central African Republic	3	12	10	10	Pakistan	10	15	20	20
Chad	4	11	12	14	Panama	20	18	28.5	17
China	20	10	56	11	Papua New Guinea	79.5	41.5	44	25
Colombia	9	15	30	20	Paraguay	4	7	25	18
Congo, Dem. Rep.	4	6	9	9	Peru	9	11	30	16
Congo, Rep.	2.5	7.5	14	11	Philippines	20	14.5	35	19
Costa Rica	20	12	26.5	21	Romania	5	9	15	17
Côte d'Ivoire	3	6	7.5	9	Rwanda	6	5	16	9
Djibouti	5	10	12	14	Samoa	4	9	12	16
Dominica	3	9	13.5	10	Senegal	3.5	10	10	14
Dominican Republic	5	11	35	17	Serbia	8	11	18	17
Ecuador	12	11	30	22	Sierra Leone	2.5	14.5	10	14
Egypt, Arab Rep.	11	13	28	18	Solomon Islands	8.5	5.5	19	18.5
El Salvador	15	12	35	20	South Africa	6	9	25	15
Eritrea	15	8	16	13	South Sudan	3	5	7	6
Ethiopia	5.5	9	16	12	Sri Lanka	5	13	18	19
Fiji	9	13	15	23	St. Lucia	4.5	9	18	13
Gabon	5	7	10	12	St. Vincent and the Grenadines	3	11.5	9	18
Gambia, The	8	6	9	9	Sudan	10	11	15	11
Georgia	3	4.5	11	10	Suriname	34	17.5	20	18.5
Ghana	2	8	10	13	Swaziland	2	8	10	10
Grenada	2	24	13.5	20	Tajikistan	6.5	9.5	17	10
Guatemala	7	13	32	21	Tanzania	2	15	10	13
Guinea	2	6.5	6	8	Thailand	15	16	27	19
Guinea- Bissau	2.5	10.5	7	10	Timor-Leste	6	9	10	11
Guyana	12.5	17.5	30	19	Togo	3	6	13	11
Honduras	4	17.5	20	20	Tonga	3	4	7	10
Hungary	6.5	11	13	16	Tunisia	10	10.5	35	20

table continues next page

	High-growth firms		Rest of firms			High-growth firms		Rest of firms	
	Employment	Age	Employment	Age		Employment	Age	Employment	Age
India	15	13	30	16	Turkey	9	10	22	16
Indonesia	20	15	30	19	Uganda	6	10	10	13
Iraq	3	12	9	10	Ukraine	20	12	20	14
Jamaica	10	10	24	20	Uzbekistan	6	7	25	14
Jordan	7.5	9	22	15	Vanuatu	7	6	12	19
Kazakhstan	10	8	17	12	Venezuela, RB	6	11.5	16	13
Kenya	9.5	13.5	20	18	Vietnam	10	8	28	11
Kosovo	5	7	15	13	West Bank and Gaza	3	11	10	16
Kyrgyz Republic	20	10	22.5	15	Yemen, Rep.	9	16	14	20
Lao PDR	5	12.5	13	16	Zambia	7	8	12	12
Lebanon	7	7	19	22	Zimbabwe	13	19	40	31
Lesotho	4	11	15	10					

Source: Computation based on data from Enterprise Surveys, the World Bank.

Note: This table reports the median employment and age of firms at the beginning of the period under consideration (that is, two years before the implementation of the survey).

Annex 2D. Identifying the Role of FDI Spillover in High-Growth Firms²³

To capture the role of FDI spillovers on the performance of domestic enterprises, we regress measures of linkages and demonstration effects on the growth rate of domestic firms' output as follows:

$$g_{ijc} = \beta_1 linkages_{jc} + \beta_2 demonstration_{jc} + BX_{ijc} + \gamma_c + \gamma_j + \varepsilon_{ijc} \quad (1)$$

where the subscript i stands for firm, j for sector, and c for country. γ_c represents country fixed effects and γ_j sector fixed effects, introduced to the specification in order to account for unobserved heterogeneity within each one of these dimensions. Sector fixed effects are defined at the two-digit International Standard Industrial Classification (ISIC) level. g_{ijc} is the sales midpoint growth rate of firm i over the last two years in which the survey was implemented in each country (see annex 2B).

The *linkages* channel ($linkages_{jc}$) is defined by the average share of inputs of domestic origin that foreign firms in sector j (two-digit ISIC codes) acquire in each country. In line with the literature, foreign firms are identified

as firms with at least 10 percent foreign ownership. Specifically, this variable is constructed as

$$linkages_{jc} = \frac{1}{n} \sum_{i=1}^n \frac{input_{ijc}^{dom}}{input_{ijc}^{tot}} \quad (2)$$

where $input_{ijc}^{dom}$ represents the value of inputs of domestic origin used by the foreign firm, and $input_{ijc}^{tot}$ corresponds to total value inputs, regardless of their origin. The total number of foreign firms in the sector is n .

The *demonstration* channel ($demonstration_{jc}$) is defined by the share of foreign output as a percentage of total output at the sectoral level. This measure is standard in the literature to measure intra-industry spillover effects. See Farole and Winkler (2015) and references therein.

$$demonstration_{jc} = \frac{\sum_i output_{ijc}^{fgn}}{\sum_i output_{ijc}^{all}} \quad (3)$$

where $output_{ijc}^{fgn}$ represents the sales of foreign firms exclusively, while $output_{ijc}^{all}$ accounts for the sales of all firms in each sector, country, and year.

The model controls for firm-specific attributes contained in the matrix X_{ijc} , including

a log transformation of the firm age (defined as the years between the beginning of operations of the firm and the application of the survey), a log transformation of the labor productivity (US\$ sales per worker), and a dummy variable to capture exporter status, taking a value of one if direct exports accounted for more than 5 percent of the local firm's total sales. We retained country-sector cells with presence of foreign firms. The final sample of the regressions included about 33,000 domestic firms in 121 economies.

The coefficients β_1 and β_2 provide the *average* impact of linkages and demonstration effects on domestic firms' sales growth across countries and sectors. To test the

different impact that these effects have on high-growth firms, we modify equation [1] to include a dummy variable indicating if the firm is a high-growth business and interact this term with the FDI spillover channels. A high-growth firm is defined as an enterprise located in the top fifth percentile of the distribution of employment growth in each country. The results of these estimations are presented in table 2D.1.

To examine how FDI spillovers vary across countries, we run the specification separately for six regions of the world, following the World Bank Group country classification. We also separate the sample between manufacturing and services sectors. The results are presented in tables 2D.1 and 2D.2.

TABLE 2D.1 Role of FDI Spillovers on Firm Performance

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Linkages channel		0.023 (0.051)		0.028 (0.052)	0.053 (0.050)		0.053 (0.051)
Demonstration channel			0.010 (0.015)	0.011 (0.019)		0.002 (0.019)	0.006 (0.019)
High-growth firm					0.207*** (0.019)	0.207*** (0.021)	0.190*** (0.021)
X Linkages channel					0.678*** (0.190)		0.568*** (0.201)
X Demonstration channel						0.171*** (0.061)	0.109* (0.063)
Log age	-0.068*** (0.005)	-0.068*** (0.005)	-0.068*** (0.005)	-0.068*** (0.005)	-0.061*** (0.005)	-0.061*** (0.005)	-0.061*** (0.005)
Exporter	-0.001 (0.010)	-0.001 (0.010)	-0.001 (0.009)	-0.001 (0.010)	-0.003 (0.010)	-0.003 (0.010)	-0.003 (0.010)
Log labor productivity	0.082*** (0.005)	0.082*** (0.005)	0.082*** (0.002)	0.082*** (0.005)	0.083*** (0.005)	0.083*** (0.005)	0.083*** (0.005)
Constant	-0.783*** (0.059)	-0.784*** (0.059)	-0.785 (0.551)	-0.786*** (0.059)	-0.813*** (0.060)	-0.816*** (0.059)	-0.816*** (0.059)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	33,305	33,305	33,305	33,305	33,305	33,305	33,305
R-squared	0.165	0.165	0.165	0.165	0.174	0.174	0.174

Source: Computation based on data from Enterprise Surveys, the World Bank.

Note: Standard errors (in parentheses) are clustered at the country-sector level. FDI = foreign direct investment.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE 2D.2 Role of FDI Spillovers on Firm Performance, by Regions and Sectors

Variables	World Bank regions						Economic sectors	
	East Asia and Pacific	Europe and Central Asia	Latin America and the Caribbean	Middle East and North Africa	South Asia	Sub-Saharan Africa	Manufacturing	Services
Linkages channel	-0.123 (0.103)	0.299 (0.265)	0.009 (0.108)	-0.092 (0.164)	0.349 (0.647)	-0.059 (0.098)	0.092 (0.108)	-0.111* (0.064)
Demonstration channel	0.047 (0.050)	-0.051 (0.047)	0.042 (0.036)	-0.003 (0.043)	-0.086 (0.101)	-0.001 (0.034)	-0.003 (0.023)	-0.009 (0.037)
High-growth firm	0.238*** (0.067)	0.171*** (0.065)	0.212*** (0.056)	0.241*** (0.066)	0.127*** (0.025)	0.294*** (0.071)	0.181*** (0.021)	0.235*** (0.061)
X Linkages channel	0.814*** (0.309)	-0.202 (0.892)	0.491 (0.320)	2.342*** (0.700)	0.764*** (0.240)	-0.207 (0.439)	0.570* (0.307)	0.581** (0.284)
X Demonstration	-0.076 (0.118)	0.427** (0.192)	0.042 (0.127)	0.019 (0.208)	0.163 (0.201)	0.059 (0.147)	0.078 (0.077)	0.211** (0.115)
Log age	-0.056*** (0.015)	-0.086*** (0.016)	-0.059*** (0.011)	-0.059*** (0.012)	-0.045*** (0.006)	-0.088*** (0.017)	-0.059*** (0.006)	-0.069*** (0.012)
Exporter	-0.000 (0.023)	0.017 (0.029)	-0.065*** (0.019)	0.015 (0.021)	-0.009 (0.014)	0.064 (0.045)	-0.013 (0.010)	0.083* (0.043)
Log labor productivity	0.062*** (0.009)	0.086*** (0.011)	0.107*** (0.007)	0.099*** (0.009)	0.038*** (0.006)	0.122*** (0.011)	0.075*** (0.005)	0.108*** (0.012)
Constant	-0.579*** (0.100)	-0.718*** (0.171)	-0.679*** (0.089)	-0.983*** (0.128)	0.062 (0.104)	-0.641*** (0.131)	-0.444*** (0.078)	-0.734*** (0.119)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,876	2,749	5,557	4,086	9,155	5,882	26,398	6,893
R-squared	0.103	0.171	0.116	0.306	0.050	0.184	0.175	0.190

Source: Computation based on data from Enterprise Surveys, the World Bank.

Note: Standard errors (in parentheses) are clustered at the country-sector level. FDI = foreign direct investment.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Notes

- Moran (2011, 2015) provides a comprehensive overview of the challenges countries face when using FDI to reach these policy goals.
- Alfaro and Chen (forthcoming) provide empirical evidence on the positive impact of FDI spillovers and the reallocation of factors on aggregate productivity using a rich cross-country database.
- See Alfaro and others (2006), Alfaro and Chen (forthcoming), Lipsey (2004), Barba Navaretti and Venables (2004), and Alfaro and Rodriguez-Claire (2004) for an overview of the empirical literature about the channels of FDI spillovers.
- Linkages can increase the productivity of domestic firms in at least three other ways: First, greater demand for intermediates produced by domestic suppliers can increase potential for scale economies. Second, domestic suppliers may face incentives to improve product quality and increase efficiency, owing to more stringent requirements from the foreign firms. Third, competition for other local firms for foreign consumers may also spur productivity upgrading. The analysis in this chapter focuses on the knowledge diffusion impact of linkages.
- Some studies such as Morrissey, López, and Sharma (2015), separate the learning process from observation from the labor turnover effect. Given data limitations, this chapter compounds these two channels into the demonstration effect.
- The dataset covers a broad range of business environment topics including access to finance, corruption, infrastructure, crime,

- competition, and firm-level performance measures. The raw data include information for various waves of surveys for 139 countries. This analysis retains the latest survey conducted in each country and economies classified as low- and middle-income countries by the World Bank Group. In total, information for about 63,000 firms in 121 developing economies is analyzed.
7. These findings are in line with Damijan and others (2013), which employs 10 transition economies to find positive effects of horizontal spillovers only on large and high-productivity domestic enterprises.
 8. A growing body of literature aims to understand the conditions under which the benefits of FDI materialize at the firm level. Some firm characteristics have been linked to their absorptive capacity, including elements such as the size of their technology gap (Wang and Blomström 1992), their share of skilled labor (Blalock and Gertler 2009), and their size (Meyer and Sinani 2004).
 9. Although the Enterprise Surveys allow the systematic study of firm performance across a broad range of developing countries, some important caveats are in order. First, firm performance outcomes are available for just two points in time, separated by only two years. Second, the surveys are representative only of the broad manufacturing and services sectors, not at the detailed two-digit ISIC codes. Third, the data include only firms that survived between the two points of time, not those that exited. Fourth, there may be some differences across countries in the minimum size of firms included in the surveys.
 10. Because standard growth rates are relative to the initial size of the firm and, therefore, biased toward smaller firms, the analysis uses midpoint growth rates representing the change in employment relative to the average size of the firm between the fiscal year before the survey was administered and three fiscal years prior. Annex 2B discusses the characterization of firm growth adopted in this study.
 11. While this methodology is based on previous literature, there is no general agreement on the definition of high-growth firms. Growth rate thresholds have been employed by Schreyer (2000) and Davidsson and Henrekson (2002), among others. Henrekson and Johansson (2010) provide a meta-analysis of the empirical literature of identifying high-growth businesses. The Organisation for Economic Co-operation and Development (OECD) defines them as firms with 10 or more employees that have an average annualized growth higher than 20 percent for three consecutive years (Ahmad 2008; OECD 2008, 2010). But this definition is overly restrictive for developing countries where 95 percent of businesses have nine or fewer workers (McKenzie 2017).
 12. This threshold changes in every country. On average, across countries in the database, firms need to double the number of employees in two years to be considered high-growth firms (Reyes, forthcoming).
 13. The fact that high-growth firms are an important source of job creation and tend to be young is a well-established empirical fact in the literature (Coad and others 2014). When firm growth is computed in relative terms—as in this analysis—small firms are also overrepresented among high-growth firms (Delmar, Davidsson, and Gartner 2003).
 14. This finding is in line with Henrekson and Johansson (2010), who find that high-growth businesses exist in all industries but tend to be overrepresented in services.
 15. Jiménez-Barrionuevo, García-Morales, and Molina (2011) propose a scale of 18 items to measure the absorptive capacity of firms. They are grouped under four categories: *acquisition* (interaction, trust, friendship, and reciprocity); *assimilation* (common language, complementarity, similarity, and organization culture and management style); *transformation* (communications, meetings, documents, transmission, time, and flows); and *exploitation* (responsibility and application).
 16. This approach on backward linkages, which focuses on the demand for inputs from foreign companies, is also used in Sánchez-Martín, De Piniés, and Antoine (2015) and complements that in Javorcik (2004) and Blalock and Gertler (2008), who adopt the perspective of the local supplying sector and look for foreign presence downstream in the supply chain. Forward linkages, which focus on the relationship with upstream sectors, can also be important, particularly in the services sector. Hoekman and Shepherd (2017) find strong impacts of services efficiency and the productivity of downstream manufacturing firms.

17. Owing to limitations with the level of sectoral disaggregation of the World Bank's Enterprise Surveys data, the channels for FDI spillovers are defined at a broader sectoral classification (two-digit ISIC codes). Consequently, in addition to horizontal spillovers, the measures are likely to capture some vertical spillovers. For example, manufacture of leather and related products (classified under ISIC 15) includes both final footwear and the tanning and dressing of leather—an input for footwear. Thus, FDI in this sector could affect domestic final producers of footwear as well as domestic suppliers of footwear production.
18. The finding that intra-industry spillover effects are rarely accrued by domestic firms is standard in the literature. Meyer and Sinani (2009) and Görg and Strobl (2001) provide two meta-analyses reviewing this literature.
19. This effect is statistically significant at the 1 percent level.
20. This effect is statistically significant at the 10 percent level.
21. These findings are robust to 80 percent and 90 percent thresholds to identify high-growth firms. See Reyes (forthcoming).
22. The argument that medium-sized and large indigenous firms are usually better candidates to qualify as suppliers of MNCs is also made by Freund and Moran (2017).
23. For a discussion of the identification strategy see Reyes (forthcoming).

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